

DEPARTMENT OF HEALTH AND HUMAN SERVICES
CENTERS FOR DISEASE CONTROL AND PREVENTION
National Center for Emerging and Zoonotic Infectious Diseases
Division of Healthcare Quality Promotion



Healthcare Infection Control Practices Advisory Committee

November 14-15, 2019

Atlanta, Georgia

Record of the Proceedings

Contents

Record of the Proceedings.....	1
Meeting Agenda.....	3
List of Attendees	5
Executive Summary.....	9
Thursday, November 14, 2019.....	10
Welcome and Introductions	10
Division of Healthcare Quality Promotion (DHQP) Update	11
Antibiotic Resistance Threats in the United States, 2019: Methods Review	14
Neonatal Intensive Care Unit (NICU) Guideline Update: Draft Text and Recommendations.....	21
Bloodstream Infection Guideline Update Planning	40
Healthcare Personnel Guideline (HCP) Section II Workgroup Update	43
Draft Update: “Testing and Follow-Up Information for Healthcare Personnel Potentially Exposed to Hepatitis C Virus”	49
US Food and Drug Administration Update	53
Federal Entity Comments.....	60
Day 1 Public Comment.....	60
Liaison Representative / <i>ex officio</i> Member Reports.....	61
Adjourn	65
Friday, November 15, 2019.....	66
Welcome and Roll Call	66
New Workgroup Updates	66
Guideline Language Alignment	70
Core Strategies of Environmental Cleaning and Disinfection in Hospitals	74
Federal Entity Comment	81
Public Comment.....	81
Summary, Work Plan, Adjournment.....	81
Certification.....	82
Attachment #1: Acronyms and Abbreviations.....	83
Attachment #2: <i>ex officio</i> Member and Liaison Representative Reports.....	86

Meeting Agenda

Healthcare Infection Control Practices Advisory Committee (HICPAC)

November 14-15, 2019

Centers for Disease Control and Prevention

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

1600 Clifton Rd., NE, Atlanta, GA

Thursday, November 14, 2019

<i>Time</i>	<i>Topic</i>	<i>Purpose</i>	<i>Presider/Presenter(s)</i>
9:00	Welcome and Introductions	Information	Hilary Babcock (HICPAC Co-Chair) Lisa Maragakis (HICPAC Co-Chair) Michael Bell (DFO, HICPAC; CDC)
9:15	Division of Healthcare Quality Promotion (DHQP) Updates	Information	Denise Cardo (DHQP, CDC)
10:00	Break	-	-
10:15	Neonatal Intensive Care Unit Guideline Update: Draft Text and Recommendations	Information/ Discussion	Kristina Bryant (HICPAC)
11:45	Bloodstream Infection Guideline Update	Information	Shannon Novosad (DHQP, CDC) Erin Stone (DHQP, CDC)
12:00	Lunch	-	-
1:30	Healthcare Personnel Guideline Section II Workgroup Update	Information/ Discussion	Hilary Babcock (HICPAC)
3:00	Break	-	-
3:15	U.S. Food and Drug Administration Update	Information	Ann Ferriter (CDRH, FDA) Julia Marders (CDRH, FDA)
3:45	Federal Entity Comment	-	-
3:55	Public Comment	-	-
4:15	Liaison/ Ex officio Reports	-	-
5:00	Adjourn	-	-

Friday, November 15, 2019

<i>Time</i>	<i>Topic</i>	<i>Purpose</i>	<i>Presider/Presenter</i>
9:00	Welcome and Roll Call	Information	Hilary Babcock (HICPAC Co-Chair) Lisa Maragakis (HICPAC Co-Chair) Michael Bell (DFO, HICPAC; CDC)
9:10	New Workgroup Updates	Information/ Discussion	Lisa Maragakis (HICPAC Co-Chair) Deverick Anderson (HICPAC) Mike Bell (DFO, HICPAC; CDC)
9:40	Break	-	-
9:55	Guideline Language Alignment	Information	David Kuhar (DHQP, CDC)
10:25	Core Strategies of Environmental Cleaning and Disinfection in Hospitals	Information	Sujan Reddy (DHQP, CDC) Amy Valderrama (DHQP, CDC)
11:25	Federal Entity Comment	-	-
11:35	Public Comment	-	-
11:45	Summary, Vote, and Work Plan	Information	Hilary Babcock (HICPAC Co-Chair) Lisa Maragakis (HICPAC Co-Chair)
12:00	Adjourn	-	-

List of Attendees

Day 1: November 14, 2019

HICPAC Members

Dr. Hilary Babcock, Co-Chair
Dr. Lisa Maragakis, Co-Chair
Dr. Deverick Anderson
Dr. Kristina Bryant
Dr. Vineet Chopra
Dr. Nicholas Daniels
Ms. Elaine Dekker

Dr. Mohamad Fakih
Dr. Judith Guzman-Cottrill
Dr. Michael Lin
Dr. Jan Patterson
Ms. Michael Anne Preas
Dr. JoAnne Reifsnyder

ex officio Members

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

Liaison Representatives

Ms. Darlene Carey, Association of Professionals of Infection Control and Epidemiology (APIC)
Ms. Karen deKay, Association of periOperative Registered Nurses (AORN)
Dr. Louise Dembry, Society for Healthcare Epidemiology of America (SHEA)
Ms. Kathleen Dunn, Public Health Agency of Canada (PHAC)
Ms. Kristen Ehresmann, Association of State and Territorial Health Officials (ASTHO)
Ms. Ashely Fell, Council of State and Territorial Epidemiologists (CSTE)
Dr. Alan Kliger, American Society of Nephrology (ASN)
Dr. Chris Lombardozi, America's Essential Hospitals (AEH)
Dr. Mark Russi, American College of Occupational and Environmental Medicine (ACOEM)
Dr. Robert Sawyer, Surgical Infection Society (SIS)
Dr. Christa Schorr, Society for Critical Care Medicine (SCCM)
Dr. Andrea Shane, Pediatric Infectious Disease Society (PIDS)
Dr. Valerie Vaughn, Society of Hospital Medicine (SHM)
Ms. Maureen Washburn, DNV GL

CDC Representatives

Matt Arduino, DHQP
Ana Bardossy, DHQP
Michael Bell, DHQP
Andrea Benin, DHQP
leisha Brown, DHQP
Stefanie Bumpus, DHQP
Angela Campbell, DHQP
Denise Cardo, DHQP
Chris Carr, DHQP
Bryan Christensen, DHQP
Zeshan Christy, DHQP
Koo Chung, DHQP
Nicole Coffin, DHQP

Kendra Cox, DHQP
Chris Elkins, DHQP
Ryan Fagan, DHQP
Nicole Gualandi, DHQP
Alison Halpin, DHQP
Rita Helfand, NCEZID
Jamesa Hogges, DHQP
john Jernigan, DHQP
Cecilia Joshi, DHQP
Saleem Kamili, DVH
David Kuhar, DHQP
Preeta Kutty, DHQP
Serina Lees, DHQP

Joe Lutgring, DHQP
Lea-Anne Jackson, DHQP
Seth Kroop, DHQP
Shelley Magill, DHQP
Amalia Mendes, CGH
Jeffery Miller, DHQP
Lauren Moccia, DHQP
Anne Moorman, DVH
Kerri Moran, DHQP
Elizabeth Mothershed, DHQP
Heather Moulton-Meissner, DHQP
Lyn Nguyen, DHQP
Shannon Novosad, DHQP
Bola Ogundimu, DHQP
Devon Okasako Schmucker, DHQP

Federal Attendees

Ann Ferriter, FDA
Julia Marders, FDA
Tara Palmore, NIH
Gary Roselle, Department of Veterans Affairs
John Stansberry, FDA

Members of the Public

Alicia Cole, Alliance for Safety Awareness for Patients
Katrina Crist, APIC
Jill Culiner, BD
Valerie Deloney, SHEA
Maryellen Guinan, AEH
Jessica Johnston, BD
Kevin Kavanagh, Health Watch USA
Rosie Lyles, Medline
Elizabeth McGiffert, Patient Safety Action Network
Silvia Quevedo, APIC
Maria Rodriguez, Xenex Disinfection Services
Keith St. John, Professional Disposables International
Connie Steed, APIC
Caitlin Stowe, PDI Healthcare
Lisa Tomlinson, APIC
Stephanie Henry Wallace, Cambridge Communications & Training Institute
Kristy Weinschel, SHEA

Day 2: November 15, 2019

HICPAC Members

Dr. Hilary Babcock, Co-Chair
Dr. Lisa Maragakis, Co-Chair
Dr. Deverick Anderson
Dr. Kristina Bryant

Belinda Ostrowsky, DHQP
Kiran Perkins, DHQP
Joe Perz, DHQP
Sujan Reddy, DHQP
Melissa Schaefer, DHQP
Jessica Schindelar, DHQP
Sri Sen, DHQP
Martha Sharan, DHQP
Rachel Slayton, DHQP
Kevin Spicer, DHQP
Arjun Srinivasan, DHQP
Valerie Stevens, DHQP
Erin Stone, DHQP
Eyasu Teshale, DHQP
Ellen Wan, DHQP
Jing Wang, DHQP

Dr. Vineet Chopra
Dr. Nicholas Daniels
Ms. Elaine Dekker
Dr. Mohamad Fakih

Dr. Judith Guzman-Cottrill
Dr. Michael Lin
Dr. Jan Patterson

Ms. Michael Anne Preas
Dr. JoAnne Reifsnyder

ex officio Members

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

Liaison Representatives

Ms. Darlene Carey, Association of Professionals of Infection Control and Epidemiology (APIC)
Dr. Louise Dembry, Society for Healthcare Epidemiology of America (SHEA)
Ms. Kathleen Dunn, Public Health Agency of Canada (PHAC)
Ms. Kristen Ehresmann, Association of State and Territorial Health Officials (ASTHO)
Ms. Ashley Fell, Council of State and Territorial Epidemiologists (CSTE)
Dr. Alan Klinger, American Society of Nephrology (ASN)
Dr. Chris Lombardozi, America's Essential Hospitals (AEH)
Dr. Mark Russi, American College of Occupational and Environmental Medicine (ACOEM)
Dr. Robert Sawyer, Surgical Infection Society (SIS)
Dr. Christa Schorr, Society for Critical Care Medicine (SCCM)
Dr. Andrea Shane, Pediatric Infectious Disease Society (PIDS)
Dr. Valerie Vaughn, Society of Hospital Medicine (SHM)
Ms. Maureen Washburn, DNV GL

CDC Representatives

Matt Arduino, DHQP
Brandon Attell, DHQP
James Baggs, DHQP
Ana Bardossy, DHQP
Michael Bell, DHQP
Andrea Benin, DHQP
Denise Cardo, DHQP
Monica Chan, DHQP
Bryan Christensen, DHQP
Koo Chung, DHQP
Kendra Cox, DHQP
Chris Elkins, DHQP
Ryan Fagan, DHQP
Lauren Franco, DHQP
William Furin, DHQP
Christine Ganim, DHQP
Jeremy Goodman, DHQP
Jamesa Hogges, DHQP
Hollis Houston, DHQP
Kara Jacobs-Slifka, DHQP
John Jernigan, DHQP
David Kuhar, DHQP

Cliff McDonald, DHQP
Kerri Moran, DHQP
Heather Moulton-Meissner, DHQP
Judith Noble-Wang, DHQP
Devon Okasako Schmucker, DHQP
Geun Woo Park, DVH
Molly Patrick, DHQP
Joe Perz, DHQP
Sujan Reddy, DHQP
Laura Rose, DHQP
Melissa Schaefer, DHQP
Srla Sen, DHQP
Braj Singh, DHQP
Rachel Slayton, DHQP
Kevin Spicer, DHQP
Arjun Srinivasan, DHQP
Erin Stone, DHQP
Nimalie Stone, DHQP
Matthew Stuckey, DHQP
Lisa Tran, DHQP
Amy Valderrama, DHQP
Rolieria West-Deadwyler, DHQP

Carrie Whitworth, DHQP

Federal Attendees

Tara Palmore, NIH

Gary Roselle, Department of Veterans Affairs

John Stansberry, FDA

Members of the Public

Katrina Crist, APIC

Jill Culiner, BD

Valerie Deloney, SHEA

Pamela Falk, Pamela Falk Consulting LLC

Maryellen Guinan, AEH

Kevin Kavanagh, Health Watch USA

Silvia Quevedo, APIC

Maria Rodriguez, Xenex Disinfection Services

Keith St John, Professional Disposables International

Connie Steed, APIC

Caitlin Stowe, PDI Healthcare

Lisa Tomlinson, APIC

Stephanie Henry Wallace, Cambridge Communications & Training Institute

Kristy Weinschel, SHEA

Executive Summary

The United States (US) Department of Health and Human Services (HHS) and the Centers for Disease Control and Prevention (CDC) National Center for Emerging and Zoonotic Infectious Diseases (NCEZID) Division of Healthcare Quality Promotion (DHQP) convened a meeting of the Healthcare Infection Control Practices Advisory Committee (HICPAC) on November 14-15, 2019 in Atlanta, Georgia. Dr. Michael Bell, HICPAC Designated Federal Official (DFO), called the meeting to order at 9:05 am on November 14, 2019. The presence of a quorum of HICPAC voting members and *ex officio* members was maintained throughout each day of the meeting.

Dr. Denise Cardo provided DHQP updates, emphasizing how the role of DHQP has expanded from focusing on hospitals to all healthcare settings. Dr. John Jernigan described the newly-released, updated *AR Threats Report*. Dr. Kristina Bryant provided an update on the work of the *Neonatal Intensive Care Unit (NICU) Guideline* Workgroup, including draft text and recommendations. Dr. Shannon Novosad described plans to segmentally update the *Guideline for the Prevention of Intravascular Catheter-Related Infections, 2011*. Dr. Hilary Babcock described the work of the Healthcare Personnel Guideline Workgroup. HICPAC voted unanimously to approve the draft Parvovirus and CMV recommendations. Dr. David Kuhar discussed proposed updates by CDC's Division of Viral Hepatitis regarding laboratory testing and follow-up of HCP who potentially have been exposed to hepatitis C virus (HCV) through an exposure to blood or body fluid. The U.S. Food and Drug Administration (FDA) discussed ongoing efforts to reduce the risk of infection from reprocessed duodenoscopes and ongoing efforts regarding ethylene oxide (EtO) sterilization of medical devices. HICPAC stood in recess from 4:49 pm on Thursday, November 14, 2019 until 9:05 am on Friday, November 15, 2019.

Dr. Deverick Anderson introduced the newly reformed National Healthcare Safety Network (NHSN) Workgroup. Dr. Bell shared plans to make segmental updates to Appendix A of the *Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings (2007)*. Dr. Kuhar led discussion of the respiratory protection recommendations for measles, varicella, and disseminated zoster. Dr. Sujan Reddy and Dr. Amy Valderrama described the *Core Strategies of Environmental Cleaning and Disinfection in Hospitals*. HICPAC stood in recess at 11:49 am on November 15, 2019.

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

November 14-15, 2019
Atlanta, Georgia

Meeting Summary

The United States (US) Department of Health and Human Services (HHS) and the Centers for Disease Control and Prevention (CDC) National Center for Emerging and Zoonotic Infectious Diseases (NCEZID) Division of Healthcare Quality Promotion (DHQP) convened a meeting of the Healthcare Infection Control Practices Advisory Committee (HICPAC) on November 14-15, 2019, at the Tom Harkin Global Communications Center at the Centers for Disease Control and Prevention, 1600 Clifton Road NE, Atlanta, Georgia.

Thursday, November 14, 2019

Welcome and Introductions

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

Hilary Babcock, MD, MPH
HICPAC Co-Chair

Lisa Maragakis, MD, MPH
HICPAC Co-Chair

Dr. Michael Bell called the meeting to order at 9:05 am and thanked everyone for attending. He called roll of HICPAC members, *ex officio* members, and Liaison Representatives, establishing that a quorum was present. Quorum was maintained throughout the meeting. HICPAC members disclosed the following conflicts of interest:

- Dr. Kristina Bryant has been an investigator on clinical vaccine trials funded by Pfizer and has received honoraria from MedStudy for work on an educational product.
- Dr. Judy Guzman-Cottrill is a consultant to the Oregon Health Authority.
- Dr. Michael Lin receives research support in the form of contributed products from OpGen, Inc. and Sage Products, which is now a part of Stryker Corporation. He previously received an investigator-initiated grant from CareFusion Foundation, which is now part of BD.
- Dr. Lisa Maragakis has received research funding from the Clorox Company.
- Dr. Jan Patterson's spouse has conducted research and consulted on antifungal drug development for Cidara Therapeutics, Inc., Gilead, Merck, Pfizer, Scynexis, and Toyama.

Drs. Maragakis and Babcock welcomed and introduced the following new HICPAC Members, *ex officio* Members, and Liaison Representatives:

HICPAC Members

- Mohamad Fakh, MD, is Vice President of Quality & Clinical Integration at Ascension St. John Hospital. His main focus is standardizing the processes that optimize disease management and avoid patient harm, building structures to improve clinical care, identify best practices, and create processes that support patient and provider adoption. Some examples of his work include sepsis management, mitigating risk of healthcare-associated infections (HAIs), and promoting antimicrobial stewardship.
- Judy Guzman-Cottrill, DO, is a Professor of Pediatrics in the Division of Infectious Diseases at Oregon Health & Sciences University (OHSU) School Of Medicine. She is also an infection prevention and healthcare epidemiology consultant for the Oregon Health Authority (OHA) HAI Program, where she serves as the Medical Director for Ebola and Emerging Pathogen Preparedness. In addition, she serves as a Counselor on the Society for Healthcare Epidemiology of America (SHEA) Board of Trustees.
- Michael Lin, MD, is an Infectious Disease Physician and Associate Professor of Medicine at Rush University Medical Center in Chicago. He serves as a Hospital Epidemiologist with Rush University and is a Co-Investigator on the CDC Prevention Epicenters Program. His recent work has focused on surveillance and control of extensively drug-resistant organisms such as carbapenem-resistant *Enterobacteriaceae* (CRE) and on implementing infection control interventions in both hospitals and long-term care facilities (LTCFs).
- JoAnne Reifsnnyder, PhD, is a Nurse Executive with more than 35 years of combined experience in clinical practice and leadership, consulting, education, and research. She has held numerous executive leadership roles and is currently the Chief Nursing Officer for Genesis HealthCare, headquartered in Pennsylvania. She has authored numerous abstracts, papers, and book chapters and was an Editor of the 2011 text *Foundations for Population Health in Community/Public Health Nursing* and Co-Author of *Nurse's Law: Legal Questions & Answers for the Practicing Nurse*, published in 2014.

ex officio Members

- Health Resources and Services Administration (HRSA): Judy Trawick, RN, is a Public Health Analyst in HRSA's Office of Regional Operations. In this role, she serves as liaison for Region 4 for Alabama and Kentucky, the Alabama Poarch Band of Creek Indians, and Rural Health.

Liaison Representatives

- Council for State and Territorial Epidemiologists (CSTE): Ashley Fell, MPA, is an Epidemiologist and the HAI Coordinator in the Healthcare-Associated Infections and Antimicrobial Resistance (HAI&AR) Section at the Minnesota Department of Health (MDH). Her work focuses on analysis and education regarding National Healthcare Safety Network (NHSN) data, HAI prevention support, outbreak response, and antimicrobial stewardship.

Division of Healthcare Quality Promotion (DHQP) Update

Denise Cardo, MD

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

Dr. Cardo welcomed new HICPAC members and Liaison Representatives, noting that their range of experiences and perspectives reflects how the role of DHQP has improved and expanded. In the past, DHQP focused on evidence for specific practices. Today, DHQP focuses on implementing evidence and

making an impact to prevent infections in the US. Additionally, DHQP has expanded beyond hospitals to all healthcare settings.

DHQP uses a variety of tools to protect patients and improve healthcare through preventing infections and combating antibiotic resistance (AR). Additional DHQP programs are related to medication safety, blood and organ tissue safety, and immunization safety. DHQP's data sources include NHSN as well as data related to infection outcomes; practices, particularly those related to antibiotic use; risk factors, especially with the Emerging Infections Program (EIP); and pathogens through the Antibiotic Resistance Laboratory Network (ARLN), which funds state health departments, all state laboratories, and seven regional laboratories for detecting emerging resistant bacteria phenotypes and genotypes. DHQP uses these data to target implementation of practices with evidence-based recommendations, tools, technical expertise, and support; to target prevention programs; and to develop communication strategies aimed at preventing infections. DHQP supports innovation, including the use of new data sources and methods to analyze information, develop of new practices and strategies for implementation, as well as conduct research to learn about the unknown.

Critical partners for DHQP work include federal agencies, state and local health departments, healthcare systems and organizations, healthcare providers and professional organizations, academic and innovation partners, industry, accreditation organizations, and patients and the public. In order to drive the field forward to fill gaps in knowledge, scale up approaches that work, and bring partners together to make progress, CDC continuously considers these questions:

- How do we add value?
- What can we provide that others cannot?
- How and where can we help?
- Who can we partner with?
- What does success mean to us?

An example of DHQP's partnership is ongoing work to help hospitals prevent CLABSI. CDC works with the Centers for Medicare and Medicaid Services (CMS) and NHSN data to determine which hospitals may need help with CLABSI, and why. CDC also strives to work with the Agency for Healthcare Research and Quality (AHRQ), the Food and Drug Administration (FDA), and other federal partners and non-federal partners who are also engaged in prevention efforts. The National Action Plan to Prevent Health Care-Associated Infections (National HAI Action Plan) has been critical in helping CDC and other federal agencies work together.

Another critical effort is CDC's [Antibiotic Resistance Threats in the United States, 2019](https://www.cdc.gov/drugresistance/pdf/threats-report/2019-ar-threats-report-508.pdf) (<https://www.cdc.gov/drugresistance/pdf/threats-report/2019-ar-threats-report-508.pdf>), or the "AR Threats Report." The first *AR Threats Report* was published in 2013, and the new, updated report was launched on November 13, 2019. The release of the first *AR Threat Report* had a great deal of momentum, with a meeting at the White House that encouraged participation. With the [Antimicrobial Resistance \(AMR\) Challenge](https://www.cdc.gov/drugresistance/intl-activities/amr-challenge.html) (<https://www.cdc.gov/drugresistance/intl-activities/amr-challenge.html>) and publication of the *2019 AR Threats Report*, participants were asked to make a concrete stewardship commitment. The AMR Challenge is a two-year process in which commitments were sought for impacting AR in the US and globally. The AMR Challenge includes the following focus areas; US strategies are listed below each:

- ***Tracking and Data (Share data and improve data collection)***
 - Using data to detect and track resistance
 - Providing tools for healthcare facilities
 - Leveraging new technologies

- **Infection Prevention and Containment (Reduce the spread of resistant germs)**
 - Using national alert systems
 - Providing resources and expertise in outbreak response
 - Advancing research
- **Improving Antibiotic Use (Promote appropriate antibiotic use, including access to these drugs)**
 - Working with partners
 - Providing evidence and tools for facilities to implement antibiotic stewardship practices
 - Collaborating with food partners
- **Environment and Sanitation**
 - Collaborating to identify gaps in knowledge
 - Piloting data-driven solutions
 - Promoting better sanitation and access to safe water globally
- **Vaccines, Therapeutics, and Diagnostics (Invest in development and improved access)**
 - Investing millions of dollars in drug, diagnostic, and vaccine development
 - Supporting basic research
 - Identifying innovative ways to prevent infections using novel therapeutics

CDC has received commitments for the AMR Challenge from all 50 US states and Washington, DC, including all state health departments. Over 75 commitments have been made from 33 countries and across 6 continents, reaching nearly 3 billion people around the world. Additionally, 26 organizations representing 10,000 healthcare facilities globally have pledged to improve infection control or antibiotic use, and 41 major food and agriculture corporations are using their purchasing power to improve antibiotic use in animals. Commitments have been made by 47 organizations related to improving safe drinking water, sanitation, and hygiene. Over 60 pharmaceutical and biotech groups have committed to develop or provide access to products that will prevent and treat resistant infections.

Dr. Cardo provided an update about AR containment activities and other emerging challenges in healthcare. The [Containment Strategy](https://www.cdc.gov/hai/containment/index.html) (<https://www.cdc.gov/hai/containment/index.html>) is a systematic approach to slow the spread of novel or rare multidrug-resistant organisms (MDROs) or resistance mechanisms through aggressive response to targeted organisms. When isolates are submitted to health departments for testing, public health and healthcare can engage in the response quickly to avoid spread. Urgent threats such as Carbapenemase-producing organisms (*mcr-1*), Pan-resistant organisms, and *Candida auris* (*C. auris*) have been areas of focus for containment. CDC supports HAI-AR state programs to conduct assessments of infection control practices of healthcare facilities. Infection control practices are lacking in many post-acute care settings, which may not have the same level of infection control programs as acute care settings, with limited resources dedicated to infection control.

New and emerging challenges continue to arise. For example, non-tuberculous mycobacteria (NTM) are the leading cause of mortality associated with water-related infections. Water is increasingly understood as a reservoir for HAI/AR pathogens, and the healthcare environment is an increasing contributor to these infections, resulting in exposures of large numbers of fragile patients. There is growing concern about healthcare amplifying resistance in the community. These challenges provide opportunities for collaboration using a One Health approach.

To provide better access to data, the [Antibiotic Resistance & Patient Safety Portal](https://www.cdc.gov/hai/data/portal/AR-Patient-Safety-Portal.html) (PSP) (<https://www.cdc.gov/hai/data/portal/AR-Patient-Safety-Portal.html>) was launched on November 1,

2019. This publicly-available site provides data on HAIs, including the [2018 National and State Healthcare-Associated Infections \(HAI\) Progress Report](https://www.cdc.gov/hai/data/portal/progress-report.html) (https://www.cdc.gov/hai/data/portal/progress-report.html). Additional data available on the site include antibiotic resistance, outpatient antibiotic use, and antibiotic stewardship. The mission of the PSP is to create an experience that is informative, intuitive, and exciting; PSP data and content will be accessed by a diverse set of end users who will interact with the information in a variety of ways. The PSP serves as an external-facing, “one-stop shop” for DHQP data.

CDC’s work has progressed from a focus on acute care to all healthcare in community settings, and from a “one-size-fits-all” to a more tailored approach, with a goal of impacting each and every life by preventing infections and complications (e.g., sepsis).

A comparison of the 2019 *AR Threat Report* to the 2013 Report shows that prevention works: there have been 18% fewer deaths from antibiotic-resistant infections overall, and 28% fewer deaths from antibiotic-resistant infections in hospitals. There also have been decreases in infections caused by:

- Vancomycin-resistant *enterococcus* (41% reduction)
- Multidrug-resistant *Pseudomonas aeruginosa* (29% reduction)
- MRSA (21% reduction)
- Carbapenem-resistant *Acinetobacter* (33% reduction)
- Drug-resistant *Candida* (25% reduction)

CRE infections have remained stable from 2013-2019. The 2019 AR Threat report also shows increases in infections caused by erythromycin-resistant invasive group A *Streptococcus* of 315%, drug-resistant *Neisseria gonorrhoeae* of 124%, and extended spectrum beta-lactamase (ESBL)-producing *Enterobacteriaceae* of 50%.

Despite some decreases, the 2019 *AR Threat Report* shows that additional and continued actions are needed to protect people. There continue to be at least 2.8 million antibiotic-resistant infections in the United States each year, with 35,000 deaths as a result. In addition, there are 223,900 *C. difficile* infection cases and 12,800 deaths in hospitalized patients annually.

The good news is that it is possible to combat antibiotic-resistant infections; however, it requires action and commitment from everyone.

Antibiotic Resistance Threats in the United States, 2019: Methods Review

John A. Jernigan, MD, MS

Director, Office of HAI Prevention Research and Evaluation

Division of Healthcare Quality Promotion

National Center for Emerging and Zoonotic Infectious Diseases

Centers for Disease Control and Prevention

Dr. Jernigan described the data sources and methods utilized in the *AR Threats Report* and how the 2013 and 2019 reports differ.

Several issues were considered in the development of an update of the 2013 report. Because no single surveillance system exists for antibiotic resistant HAIs, it is difficult to generate national estimates for the total burden of infections. Two major data sources were used for the 2013 report:

- The 2011 CDC HAI Prevalence Survey is conducted by the EIP. State partners study personnel to hospitals to review records, and a national statistical sample of hospitals is extrapolated. This method is used for CRE, multidrug-resistant *Acinetobacter*, Fluconazole-resistant *Candida*,

ESBLs, Vancomycin-resistant *Enterococcus* (VRE), and multidrug-resistant (MDR) *Pseudomonas aeruginosa*.

- The 2011 EIP Active Bacterial Core Surveillance (ABCs) is a population-based surveillance system in various population centers throughout the United States. ABCs is considered the gold standard that allows for national extrapolation and is used for *C. difficile* infection (CDI) and invasive MRSA.

The HAI Prevalence Survey is likely the best overall estimate for hospital-onset HAIs, though not necessarily antibiotic-resistant infections. The disadvantages of the HAI Prevalence Survey include that it does not capture all community-onset infections, which make up the lion's share of antibiotic-resistant infections. The survey is burdensome, it cannot be conducted every year, and it is difficult to replicate over time. It also is not primarily designed to produce pathogen-specific AR burden estimates. In the past, susceptibility data for infections were not collected. More importantly, the cell sizes become small, and estimates are imprecise in terms of specific infections, specific bacteria within those infections, and specific resistance phenotypes within those bacteria.

The advantage of the ABCs data is that the system is population-based and captures both community-onset and hospital-onset HAIs. The disadvantages of the ABCs are that a limited number of HAIs are under surveillance. In addition, fewer EIP sites are currently reporting invasive MRSA, compared to 2013, and only MRSA infections involving sterile sites are captured. This limitation reduces confidence in national extrapolations.

Because of these limitations, DHQP explored using electronic health record (EHR) data from large samples of United States hospitals to make these estimates. The advantages of this approach are that burden can be estimated from both non-sterile and sterile body sites; the sample sizes are large and estimates are more precise compared to other surveillance systems; it is easy to produce serial estimates and trends; and estimates can be made for community-onset events among hospitalized patients. Importantly, these data are available annually and it is possible to examine trends over time retrospectively. Although this method is efficient, it has the disadvantage is that it is not a statistical sample of hospitals; however, administrative and other data can be used to apply weighted extrapolations to derive national estimates. Further, the data only report positive culture results, and not all positive cultures represent true infection. While this factor makes it difficult to apply detailed epidemiologic definitions of infection to these data, it could be argued that all positive cultures represent a contribution to the epidemiologic "burden."

For the mortality estimates in the 2013 *AR Threats Report*, the number of associated deaths was calculated using an overall estimate of attributable mortality of 6.5% for most healthcare-associated pathogens [Estimated by Roberts et al (CID, 2009)]. This estimate came from a single study from a single institution in Chicago, for which CDC received criticism. At the time, CDC felt that this study was the best available evidence on attributable mortality for this specific group of pathogens of interest. However, the approach could be improved upon.

For the 2019 *AR Threat Report* using EHR, the healthcare-associated pathogens of focus were MRSA, CRE, ESBL, carbapenem-resistant *Acinetobacter* species (CRAsp), VRE, and MDR *Pseudomonas aeruginosa*. The annual number of incident cases from 2012-2017 among inpatients in US acute care hospitals was estimated using three electronic health databases: Premier Healthcare Database¹, Cerner Health Facts², and BD Insights Research Database³. Overall, approximately 890 hospitals were included. The cohort was dynamic over this time, given that not every hospital contributed data every month. Data from this cohort of hospitals resulted in approximately 7.4 million discharges annually, which represents approximately 20% of all United States discharges annually. The pathogens of interest were

estimated using this methodology, including drug-resistant *Candida* [¹Premier Applied Sciences. Premier healthcare database white paper: data that informs and performs. Charlotte, NC: Premier Applied Sciences; 2018. <https://learn.premierinc.com/white-papers/premier-healthcare-database-whitepaper>; ²DeShazo JP, Hoffman MA. A comparison of a multistate inpatient EHR database to the HCUP Nationwide Inpatient Sample. BMC Health ServRes 2015;15:384. ³Becton, Dickinson and Company, Franklin Lakes, NJ].

The general analytic plan was to develop definitions for incident cases that could be applied to the datasets, generate hospital-specific annual burden, apply weighted extrapolations to derive national estimates of annual burden of cases, apply pathogen-specific estimates of attributable mortality to derive annual burden of deaths, and apply pathogen-specific estimates of attributable costs to derive annual burden of costs. The following case definition criteria were used:

- Positive incident clinical cultures for specimen of interest with accompanying susceptibility testing results indicating resistance
- Isolates from patients having no culture yielding the same resistance phenotype of interest in the previous 14 days were counted as an incident case
- CRE, ESBL definitions accounted for cascade reporting
- Excluded likely surveillance cultures
- Cultures were categorized as sterile or non-sterile sites
- Counted only the sterile culture for resistant isolates from both a sterile and non-sterile site collected within 14 days
- Epidemiologic classification
- Community Onset (CO): culture immediately preceding admission or within the first 3 days of hospitalization
- Hospital Onset (HO): culture obtained on day 4 of hospitalization or later

It is important to remember that CO does not necessarily mean community-associated. Many of these infections were likely healthcare-associated, but had their onset outside the hospital.

Iterative proportional fitting (IPF) methodology, sometimes known as raking, was used to match the distribution of discharges and hospitals in the sample to the American Hospital Association (AHA) annual survey of all American hospitals based upon the categories of:

- Bed Size,
- United States Census Division,
- Urban versus Rural Designation, and
- Teaching Status.

The national estimates were produced by a weighted means survey procedure, a widely-accepted method commonly used across CDC to make national estimates from sample data for a number of health conditions. This approach gives appropriate weight to hospital types that might be under- or over-represented in the dataset. Pathogen-specific estimates produced annually from 2012-2017 included the number of cases with confidence intervals, the proportion of isolates displaying resistant phenotype (%R), attributable mortality, and attributable costs by pathogen. As in the 2013 report, these estimates were combined with estimates of non-healthcare-associated pathogens to calculate an aggregate burden for total infections, deaths, and costs. There could be some overlap in categories: for example, some CREs can also be ESBLs, and individual items may not add up to the overall estimate because duplicates were eliminated.

This method also allows for estimation of trends in rates (e.g., national estimates per 1000 discharges). Trends in rates from 2012-2017 were assessed for each pathogen. The modeling used a multivariable logistic model, incorporating a survey design with the corresponding weights and clustered by hospital. The assessment was adjusted for hospital characteristics, month of discharge, proportion of patients in specific age categories, and data source. Annual trends were estimated using a log-linear (continuous) variable and a linear combination of 5 independent (categorical) variables.

Throughout this process, there was interest in proof-checking the work against independent data sources and validating the accuracy of the estimates, since a new methodology was being used. The burden was estimated for each of the 3 electronic health data systems individually, and similar results were found. Because reporting among the cohort was dynamic, a sub-analysis was performed of consistent reporters. The results of that sub-analysis were not systematically different from the full analysis. Most importantly, national extrapolations were double-checked against independent data sources, primarily from the EIP. Burden and trend estimates from the electronic data for MRSA, candidemia, and CRAsp were all similar to the independent “gold standard” surveillance system. Prevalence and trend estimates were consistent with data published by external groups. In addition, estimates of percent-resistant (%r) were consistent with estimates from NHSN.

Assessing attributable mortality is difficult, especially with this set of organisms. The literature is very limited. Few studies have assessed mortality attributable to an MDRO, and the studies that are available are typically limited in scope (1-2 hospitals), focus on specific pathogens, or focus on hospital-onset infections or on a subcategory of hospital-onset infections, such as BSI. There are more reports of associated mortality (i.e., the number of deaths among patients who had an HAI or MDRO, but not necessarily caused by the HAI or MDRO) rather than attributable mortality, and they rarely account for time-dependent bias. An example of time-dependent bias is: if a patient had an HAI on day 14 of hospitalization, the first 14 days before infection are counted as attributable costs to mortality. This approach is not logical, and it typically overinflates the attributable mortality estimates. In addition, many studies report mortality in terms of relative risks, which cannot be applied to infection burden estimates for the purpose of estimating attributable deaths. An absolute attributable risk difference is needed.

Shortly after the 2013 Report, CDC began working with extramural partners. Dr. Richard Nelson at the University of Utah was conducting innovative work in the Department of Veterans Affairs (VA) system, looking at the attributable mortality of HAIs and accounting for time-dependent bias. CDC used a VA data source to estimate attributable mortality for each pathogen, conducting a large cohort study. Exposure density sampling was conducted on each day of an inpatient stay. Each case was matched with up to 10 controls using culture date and length of stay for cases. Multivariable Poisson regression models were run with clustered standard errors by patient. Adjustments were made for patient and hospitalization characteristics. For effect measure, absolute difference in probability of death was adjusted. The 30- and 90-day mortality estimates were generated, including post-discharge deaths. One of the benefits of the VA system is that it is possible to look at not only in-hospital deaths, but also VA's detailed post-discharge records. Depending on the pathogen, post-discharge deaths account for 10% to 50% of deaths. Separate estimates were generated for CO and HO infections.

It was important to address the possibility of bias in the mortality estimates that might result from basing attributable mortality estimates solely on a population of veterans. Therefore, an identical analysis was performed on a group of non-VA patients from hospitals submitting to the Premier Healthcare dataset. Post-discharge mortality could not be assessed with this dataset, so the analysis compared in-hospital mortality to the results for in-hospital mortality in the VA population at 30 and 90 days. The VA and Premier results are very highly correlated ($r=0.93$). This correlation strongly suggests

that there were no unmeasured confounding factors that differed between VA and non-VA patient populations that would impact the attributable mortality estimates. In essence, the mortality estimates derived from the VA cohort are not meaningfully different from those derived from the non-VA cohort. Because the VA dataset has the advantage of post-discharge mortality data, CDC used it.

A similar method was applied, with a similar cohort, to examine attributable costs. The VA Health Economics Resource Center (HERC) methodology allows for application of VA cost information to a more general population. Any cost estimates for these specific pathogens available in the published literature - which are few and far between – were compared with CDC’s estimates: they were similar. Costs are assigned to each encounter based on the characteristics of that encounter; that is, all patients with the same characteristics are assigned the same cost. The average cost is computed by performing a cost regression using Medicare data for veterans and adjusting for LOS, DRG weight, whether the patient died in-hospital, age, gender, intensive care unit (ICU) stay, and number of diagnoses. Coefficients estimated from this model are applied to VA data to generate a predicted cost for each encounter. Estimates are consistent with the available, published literature.

In summary, there were over 600,000 healthcare-associated bacterial pathogens and 29,000 attributable deaths from them in 2017. Those numbers are much larger than were reported in the 2013 report, primarily because the updated figures include community-onset infections and include all types of infections, not just sterile body site infections. Interestingly, MRSA (52%) and ESBL (32%) accounted for the majority of the infections. The trend data are interesting: between 2012 and 2017, incidence decreased significantly for MRSA, VRE, CRAsp, and MDR *Pseudomonas*. CRE incidence remained unchanged, which could represent an infection control success, since models predict that when CRE is re-introduced, it can spread rapidly in the absence of intervention. From 2012 to 2017, ESBL incidence increased significantly (53%): the increase was driven entirely by an increase in community-onset cases, as hospital-onset cases were flat. It is not possible to know what proportion of those cases are truly community-associated onset, versus healthcare-associated community onset, but the other data suggest that the epidemiology of ESBLs may include some community transmission, which may play a major role here.

There are limitations to the data:

- Some hospitals may have contributed to multiple data systems; however, CDC made a considerable effort to identify and remove potential duplicate hospitals, and conducted sensitivity analyses.
- Clinical cultures are not necessarily infections, but they do represent a potential source for spread of resistant organisms.
- It was not possible to account for previous healthcare exposures when determining epidemiologic class.
- The estimate does not include burden of pathogens diagnosed outside of the hospital in outpatient and nursing home settings; however, most mortality should be captured using the hospitalized population.

Discussion Points

The *AR Threat Report* is a great resource.

Dr. Jernigan and his team put a great deal of rigor and thoughtfulness into this effort. This work is a standard to which they should aspire for nationally representative attributable rates of infection. CDC could develop a standard approach in terms of validation, cross-walking, and thinking about external

references. Such an approach could be a good resource for others who conduct methodological work. A white paper or exemplar paper could describe the approach.

MRSA comprises more than 50% of resistant strains or organisms: this percentage is still likely much less than methicillin-susceptible *Staphylococcus aureus* (MSSA). With that in mind, perhaps *Staphylococcus aureus* (*S. aureus*) should be considered by itself.

HICPAC asked about the data sources needed in the future to fill the gap presented when the data from post-acute care are not representative in the *AR Threat Report*. Dr. Jernigan replied that CDC has worked with certain groups that provide laboratory services or collect laboratory data from a large number of post-acute care facilities. They had hoped to be able to use those datasets in the report, but as they began to work with the data, they found limitations such as incompleteness. These datasets could potentially be used in the future, but they did not feel confident enough to include them in the *2019 AR Threat Report*. It is likely that these types of data sources will prove to be an increasingly valuable resource. Acute care is leading the way with these types of data sources, but steps are being made in the post-acute care setting as well. One nuance is that culture rates may be different in post-acute care settings. Rates may look low because culture rates are low, but this may not be indicative of how much actual transmission and carriage are occurring in these settings.

HICPAC asked about the possibility of capturing age-stratified data and information about the burden of resistant organisms in children. Dr. Jernigan confirmed that age-stratified data are available and recalled that the “lion’s share” of resistant organisms are in persons aged 65 years and older. Children are represented in these databases, but given that the data are reflective of the national population, the proportion of patients and discharges among children is small. The proportion of clinical isolates of these pathogens seen in children is small. Even though this information is not in the report, they do have the ability to go back and look at trends and burden among only children.

Dr. Cardo added that the intent of the report was to consider the overall population, as opposed to specifics regarding burden, because other data sources allow for assessment of specifics. Differences are seen in the NHSN data, so they are looking increasingly at children and neonates. For example, they are looking at electronic data sources to determine what is occurring with sepsis among children.

HICPAC asked if other data from the EHRs may be informative about AR in groups of patients, such as dialysis patients. Dr. Jernigan answered that this report did not go to that level of granularity.

HICPAC commented that these data may still represent the “tip of the iceberg.” Many infections occur in areas not captured by these data, and more sophisticated ways of assessing these issues are needed so as not to under-estimate the burden.

Dr. Jernigan agreed: while the new report is expanded from the smaller subset in the 2013 report, it still does not capture “the whole universe” of the burden of antibiotic resistance. The hope for the future is to expand to other areas, which are extremely important.

HICPAC was struck by MRSA and ESBL infections accounting for the majority of the infections, but CRE remaining stable while ESBL is increasing. It seems that from a pathophysiologic standpoint, transmission of these *Enterobacteriaceae* should be the same. The speculative question is, why there is a difference between those two? This difference could potentially be related to the fact that microbiology laboratories no longer specifically test and report ESBLs. HICPAC asked how ESBL was defined for this report.

Dr. Jernigan replied that a phenotypic definition based on laboratory report, not a specific test, was used for ESBL. The marker for ESBL is resistance to cephalosporin that suggests ESBL production. That definition did not change during the period studied, as the Clinical and Laboratory Standards Institute

(CLSI) definitions changed in 2010 to define “resistance” more literally. If the detection of resistance had changed slowly over time as laboratories adopted the new CLSI definitions, the rate could have been affected; however, CDC does not think that is the case. The data also show divergent trends, such as in ESBL, for which hospital-onset was flat, but community-onset increased. This difference cannot be explained by a laboratory artifact, which would affect both epidemiologic categories. It is unclear why ESBL is behaving differently from others. Most of the change was driven by *Escherichia coli* (*E. coli*). Certain strains, such as ST131, have expanded rapidly in the US among healthy people who have no association with healthcare. It is an important, emergent source of resistance in community-onset urinary tract infections in young, healthy people. The common thread among infections that are decreasing or staying stable is that their epidemiology is based fundamentally upon transmission in healthcare settings. CDC does not see a great deal of true community-associated VRE, CRAsp, MDR *Pseudomonas*, etc: infections with epidemiology that is based on transmission in healthcare settings are decreasing. It is notable that ESBL in healthcare was somewhat stable, while community-onset cases showed marked increase. CDC’s hypothesis is that the epidemiology of the strains driving ESBL increases are fundamentally different in that they may not only be transmitted in healthcare, but may have an important element of community transmission. Prevention of transmission in healthcare will not affect community transmission. This idea needs further exploration. MRSA is interesting because of its notable community component. However, it is known from EIP data that rates of true community-associated invasive MRSA has been flat since the early 2000s. The decreases observed in MRSA are primarily hospital-onset and healthcare-associated community onset. Furthermore, it is known from strain data the decreases are driven by decreases in the USA100 strain. USA100 strain’s niche is in healthcare, not the community. These observations are consistent with the hypothesis that interventions in healthcare settings are driving the decreases observed, but those interventions are not sufficient to stop the community spread of these organisms.

Dr. Cardo added that DHQP and EIP are trying to understand what is occurring in healthcare and the community. They also are looking at how antibiotic use is impacting what is occurring, and whether this should be considered a One Health issue.

HICPAC asked whether the volume of cultures was assessed to determine whether an increase or reduction might have affected the data. Dr. Jernigan answered that overall culture rates for blood and urine among the hospitals did not change. The trend was slightly different for urine cultures: rates of culture at hospital admission remained stable across the study period, but the rate of post-admission cultures did decrease significantly. There are several possible explanations for that change. One is a reduction in urinary tract infections (UTIs) and therefore fewer reasons for culturing. Another is that potential UTIs are not investigated as frequently. There is no evidence to suggest that trends in culture practices drove the observed trends.

The American College of Occupational and Environmental Medicine (ACOEM) asked whether CDC generates projections for any of these infections based on the data. Dr. Jernigan suggested that projections regarding future trends have not yet been generated using these data, but it may be feasible. He clarified that this might best be done using dynamic transmission modeling techniques rather than traditional epidemiological modeling techniques.

HICPAC observed that NHSN has invested time and resources in creating the Antimicrobial Use and Resistance (AUR) Module and wondered whether a sufficient number of facilities are reporting to provide continuous AR surveillance.

Dr. Cardo answered that approximately 1500 facilities report AU, and approximately 654 report AR. If more hospitals participate in NHSN on an ongoing basis, these data will be available. Other data sources

can be used for validation. Regarding types of data sources that would be useful for the *AR Threat Report*, in the future, it could be possible to use sources that also could be used within NHSN.

Dr. Jernigan added that the emerging philosophy is to have a diversified portfolio of information sources. In the future, the AR component of NHSN may be useful, in addition to other datasets. There are advantages, disadvantages, and complementary aspects of all of the data sources.

Dr. Bell described the types of questions that CDC hears about methodology. Initially, there were questions about the methods used in 2013. The response was that to begin this work, they did their best to acquire any sources of data they could, to control for any “soft spots,” and to present some information. The first report was not intended to be a perfect reflection of reality, but represented the first “line in the sand.” More questions concern the change in methodology. Several years were spent developing plans for how to improve to reach for an increasingly better system. In the next few years, it is hoped to attain more robust input from sources such as the AUR Module, greater access to a broader base of EHR data, and ever-improving modeling skills. An important caveat is that for each improvement, they will look back to remodel and recalculate trends. CDC is frequently asked why the focus is only on these organisms. Among the thousands of organisms, some are more urgent than others. For example, someone who has CRE is in an urgent situation.

Dr. Cardo added that this process has included difficult decisions, for which they sought a great deal of external input. The team has considered many options regarding how to assess this information. They must work together to continue to prevent infections, particularly in post-acute care. HICPAC plays a major role in helping DHQP.

Dr. Bell referred HICPAC members, *ex officios*, and Liaison Representatives to an opportunity to provide feedback on the AR Patient Safety Portal, which represents a significant attempt to present DHQP data better. This portal is intended to become the place where all DHQP data are maintained, updated, and made available. The portal incorporates utilities to make it easy to export information into PowerPoint slides. It includes cross-linkages to content for background information, tools, and resources. The goal of this work is to do a better job of not only presenting data, but also moving toward sharing files so that their colleagues can examine the data and perform new analyses.

Neonatal Intensive Care Unit (NICU) Guideline Update: Draft Text and Recommendations

Kristina Bryant, MD

Chair, NICU Guideline Workgroup

Dr. Bryant explained that HICPAC uses the Grading of Recommendations, Assessment, Development, and Evaluation (GRADE) methodology in developing guidelines. When evaluating evidence quality in this manner, randomized controlled trials (RCTs) start at a level of high-quality evidence, and non-randomized studies start at a level of low-quality evidence. A number of factors can lower the quality of evidence (e.g., Risk of Bias, Inconsistency, Indirectness, Imprecision, and Publication Bias), while other factors can increase the quality of evidence (e.g., Large Magnitude of Effect, Dose-Response, and Confounding). There are relatively few RCTs of infection prevention interventions in NICU populations.

In 2018, HICPAC approved a new recommendation categorization scheme, which was used for developing the NICU *S. aureus* guideline. In order for HICPAC to make a recommendation, the benefits of the intervention must clearly exceed the harms, or vice versa. The level of confidence in the supporting evidence should be high to moderate, but sometimes can be low, very low, or based on expert opinion if high-quality evidence is impossible to obtain or in the case of a federal regulation. HICPAC’s Recommendation Categorization Scheme also includes Justification Tables, which make

transparent the process by which the committee arrived at a Recommendation, Conditional Recommendation, or No Recommendation. The tables include the following categories:

- Evidence
- Level of Confidence in Evidence
- Benefits
- Harms
- Resource Use
- Balance of Benefits and Harms
- Value Judgments
- Intentional Vagueness
- Exceptions

Dr. Bryant noted that some of the draft recommendations were No Recommendations due to a lack of evidence; she hoped for HICPAC feedback regarding whether some of the interventions have become standard of care, in which case a No Recommendation categorization is not appropriate.

Draft *S. aureus* Section: Public Comment and Proposed Revisions

When work on the *S. aureus* section of the Guideline began, the focus was on MRSA. Several years ago, HICPAC requested that the focus should be broadened to *S. aureus* in general. A draft document that had been approved by HICPAC was posted for public comment on regulations.gov from September 2 – November 4, 2019. Comments were received from:

- Health Watch USA
- Cleveland Clinic Children’s Hospital
- Children’s Hospital of Philadelphia
- Private individuals

***S. aureus* Draft Recommendation 2.1.A.1**

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

Summary of Public Comment:

- “Outbreak” should be defined.

Response:

- CDC maintains outbreak definitions elsewhere, and they will not be repeated in this document.

Proposed Action:

- No change

***S. aureus* Draft Recommendation 2.1.A.2**

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

Summary of Public Comment:

- State that the guidance to perform active surveillance in neonatal units should be enacted if the pathogen is endemic to the community or institution.

Response:

- “Ongoing healthcare associated transmission within the unit” is defined within the Intentional Vagueness section. Additional information on how facilities can determine when action is necessary can be found within the Introduction.

Proposed Action:

- No change

S. aureus Draft Recommendation 2.1.A.1 and 2.1.A.2, Justification Table, Risks, and Harms

“... Identification of some infants with methicillin-resistant S. aureus (MRSA) colonization may result in the implementation of Contact Precautions, which has inconsistently been associated with unintended consequences, such as decreased healthcare personnel-patient contact, in other populations ...”

Summary of Public Comment:

- The requirement for Contact Precautions with MRSA has been weakened with the insertion of “may.” Recommend changing “may result in” to “requires.”
 - The same general comment about the need for Contact Precautions was made by 2 additional commenters. A request was made for further clarification.
- The implementation of Contact Precautions differs among NICUs. A request was made that the document address:
 - Whether the spread of *S. aureus* is influenced by environmental factors and whether the patient is in an incubator versus an open crib, and whether there is a single room versus a ward setting, and how this affects transmission.
 - A suggestion that universal gloving and removal of white coats are forms of Contact Precautions, in the commenter’s institution.

Response:

- The definition of, and recommendations for, Contact Precautions are provided in CDC’s Guideline for Isolation Precautions. Removal of white coats and universal gloving are not a modification of Contact Precautions.
- The literature search did not retrieve data to address environmental factors or variations in the implementation of Contact Precautions.
- The SHEA-sponsored companion document will address topics where evidence was insufficient to formulate evidence-based guidelines.

Proposed Action:

- The Workgroup recognizes that some hospitals do not use Contact Precautions for MRSA.
- The current draft *S. aureus* document does not explicitly state to use Contact Precautions for patients with MRSA.
- Does HICPAC believe that Contact Precautions for NICU patients with MRSA colonization or infection should be explicitly recommended? The Workgroup felt that the issue was “a given,” but public comments suggest otherwise.

S. aureus Draft Recommendation 2.1.A.3

The use of active surveillance testing for methicillin-sensitive S. aureus (MSSA) colonization in neonatal intensive care unit patients to detect ongoing healthcare-associated MSSA transmission is an unresolved issue. (No Recommendation)

Summary of Public Comment:

- “[Our facility] does not perform routine surveillance testing for MSSA colonization, as there is no apparent benefit from performing the additional testing. Implementing this in our 100+ bed unit

would be a significant resource and cost burden with unclear benefit to the patient population, as it would require additional resources in materials, time, laboratory space, and personnel. Our facility would not do any additional interventions if patients were found to be colonized, as we do not institute contact precautions for MSSA, nor do we currently perform any decolonization protocol.”

Response:

- Thank you for your comment.
- Recommendation 2.1.A.1. is not to perform routine active surveillance testing for MSSA, but only to perform active surveillance testing when there is an increased incidence of infection or in an outbreak setting. The use of active surveillance testing for MSSA colonization remains an unresolved issue (Rec 2.1.A.3)

Proposed Action:

- No change

S. aureus Draft Recommendation 2.1.A.5., Risks and Harms, Resource Use

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

- **Risks and Harms:** “... there could be minor patient discomfort from performing nasal swabs.”
- **Resource Use:** “Performing testing for S. aureus colonization ... would result in increased material and human resource costs.”

Summary of Public Comment:

- “The ‘minor discomfort’ from a nasal swab in the newborn is negligible ... the cost of MRSA testing pales in comparison to that of an average NICU patient bill and should be also considered negligible.”

Response/Proposed Action:

- The Workgroup will outline risks, harms, and costs in the Justification Table.
- The Balance of Benefits and Harms section can be reworded to address benefits of prevention, as was done in other sections.

S. aureus Draft Recommendation 2.1.B.1.

If active surveillance for S. aureus colonization in neonatal intensive care unit patients is performed, use culture-based or polymerase chain reaction detection methods. (Recommendation)

Summary of Public Comment:

- The reader is left not knowing which to choose, PCR or culture. There was a request for additional guidance.

Response/Proposed Action:

- The evidence did not suggest a clear benefit to one method over the other. After weighing benefits and harms, as noted in the Justification Table, the choice of test is dependent on an individual facility’s needs. These factors are captured in 2.E.1.E.1.a. Implementation Considerations.
- No change

S. aureus Draft Recommendation 2.1.B.2., Risks and Harms

If active surveillance for S. aureus colonization of neonatal intensive care unit patients is performed, collect samples from at least the anterior nares of neonatal intensive care unit patients.

(Recommendation)

Risks and Harms: “... include minor patient discomfort from performing nasal swabs. Further, if neonates are not colonized in the anterior nares and only the nares are sampled, then colonization at another anatomic site may be missed.”

Summary of Public Comment:

- There was a suggestion to comment on care needed in sampling nares of very low birthweight infants (VLBWI) infants, as the product can cause trauma (bleeding).
- Use of additional sites may be especially important in this size infant.

Response/Proposed Action:

- Additional clarification will be added, emphasizing potential harm (bleeding).
- The option to sample additional sites is already included.

S. aureus Draft Recommendation 2.1.C.1., Risks and Harms

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

Risks and Harms: “... There could be minor patient discomfort from the application of intranasal ointment.”

Summary of Public Comment:

- Address technical difficulties related to using mupirocin in the nose of VLBW infants. Ointment can partially occlude small nares and can accumulate in the prongs of CPAP and cannulas.

Response/Proposed Action:

- Additional details will be added to the Harms section.

S. aureus Draft Recommendation 2.1.C.3

The optimal decolonization agent or combination of agents remains an unresolved issue. (No Recommendation)

Summary of Public Comment:

- There was a suggestion to reword to identify specific concerns with chlorhexidine use in preterm infants.
- There was concern that the phrase “is indicated for use” [Justification Table, Risks and Harms] could be misinterpreted.
- Potential harms are mentioned later in the document, but not the first time chlorhexidine gluconate (CHG) is mentioned. It would be helpful to move the potential harms to the first time CHG is mentioned.
- There was a suggestion to indicate whether data support restricting chlorhexidine use in VLBWI or infants below a specific gestational age.

Response/Proposed Action, Justification Table Text:

- The phrase “topical chlorhexidine is indicated for use ‘with care’” will be re-worded.
 - The FDA indication for topical chlorhexidine specifies to use “with care” in premature infants or infants under 2 months of age.

- The FDA does not specify restrict use based on age, gestational age, birthweight, or any other factor.
- The literature review did not retrieve evidence that would allow a specific recommendation.
- The current statement about harms of CHG can be reworded to include more specific language.

S. aureus Draft Section 2.E.1.A. Multi-Intervention Strategies

Summary of Public Comment:

- There was a suggestion to address strategies of “universal gloving, removing lab coats, and perhaps unit or ward design features such as private rooms and location of sinks.”

Response:

- There is not a specific recommendation about multi-intervention strategies. The literature search retrieved many papers that identified lists of approaches that facilities take to prevent MRSA or MSSA transmission.
 - The literature search did not retrieve data to individually address the efficacy of these strategies.
 - This issue is addressed in the introduction to the document.
- The suggestion is beyond the scope of the document.

Proposed Action:

- No change.
- The SHEA-sponsored document could address some of these issues.

S. aureus Appendix

Summary of Public Comment:

- Mention of culturing HCP hands in the Appendix could be confusing.

Response/Proposed Action:

- The information in the Appendix summarizes what was found in the literature.
- The document makes no recommendation regarding culturing of HCP hands.
- CDC Core Practices are emphasized as key interventions.
- The text will be reviewed to ensure clarity.

S. aureus General Comments

Summary of Public Comment:

- State that surveillance includes both neonates and HCP.

Response/Proposed Action:

- HCP interventions are outside the scope of this document and are addressed in the *Guideline for Infection Prevention in Healthcare Personnel*.

Summary of Public Comment:

- Suggest additional detail regarding infection control strategies such as Contact Precautions, cohorting, hand hygiene, environmental cleaning, and adherence monitoring.
- “Those involved in limiting outbreaks in the NICU would benefit from specific guidance as to ‘when to do what.’ It seems that a tiered approach as described in the HICPAC 2006 MDRO document may be helpful.”

Response:

- HICPAC Guidelines do not repeat recommendations provided in other HICPAC or CDC resources.

- References will be added to the 2006 MDRO Guideline and other applicable documents to direct readers to additional resources for limiting outbreaks.
- The SHEA-sponsored companion document will address topics where evidence was insufficient to formulate evidence-based guidelines.

Summary of Public Comment:

- Suggestions to address kangaroo care, cohorting patients, cohorting staff, staffing ratios, keeping new admissions in a separate area, whole genome sequencing (WGS), cleaning, training environmental services staff, and design of NICUs.

Response:

- Kangaroo care is recognized as having many benefits. One study was retrieved that addressed kangaroo care as a risk factor for MRSA acquisition, but no literature was retrieved regarding how to mitigate risk.
- Cohorting is a well-established strategy that is described as an element of multi-intervention bundles. Cohorting is recommended in the Isolation Guidelines and MDRO Guidelines. While the document will not elaborate further, those references will be included.
- Evidence was not retrieved to formulate specific recommendations about WGS in NICU populations, which may be an important tool for investigating outbreaks.

Proposed Action:

- A brief paragraph summarizing studies that have used WGS will be added to the narrative.
- The SHEA-sponsored companion document will address topics where evidence was insufficient to formulate evidence-based guidelines.

Summary of Public Comment:

- Add a section addressing precautions for surgical infants. "Might screening and decolonizing infants before surgeries be advisable under certain conditions?"

Response:

- The literature search focused on the general NICU patient population.
- It is understood that this question is important and that the strategy has been successful in other populations, but the literature search did not retrieve evidence regarding decolonization as a prevention strategy for surgical site infections (SSIs) in the NICU population.

Proposed Action:

- The SHEA-sponsored companion document has the potential to address topics where evidence was insufficient to formulate evidence-based guidelines.

Summary of Public Comment:

- Comments and suggestions regarding layout, formatting, and organization of the document.
- Suggestions were provided for additional references for the Introduction: MDRO Guideline, *MMWR*.
- There was a request to add a section to guide future research.

Response/Proposed Action:

- Final editing and review will be conducted.
- When the document is published on the Infection Control Guidelines website, the "landing page" provides a matrix of the recommendations.
- References will be updated prior to publication.

- Guidance for future research is beyond the scope of this document, but consideration will be given to a brief paragraph on “research gaps.”
 - Similar section included in *C. difficile* review

Dr. Bryant reviewed the findings of the literature search update, conducted to capture any studies published since the end of the initial literature searches, and to ensure that all relevant studies were included in the analysis.

Key Question 1 (KQ1): *What are the effective strategies to prevent transmission?*

For KQ1, 3 new studies were identified in the literature search, and one was suggested by a Workgroup member. None resulted in proposed changes to the draft recommendations.

Rana 2012: Descriptive study (N=4304)

- Implemented admission screening for *S. aureus* for NICU patients
- Also addressed decolonization and implementation of Contact Precautions
- Does not differentiate between inborn and outborn patients
- Results do not suggest that finding positive cultures was linked to infections
- No harms/adverse events reported
- No change in draft recommendations

Huang 2011: Retrospective Pre-Post Study (N=1233)

- Decolonization of umbilicus and nares as part of a multimodal intervention strategy
- Extension of Taiwanese study, 2 papers already retrieved and reviewed, study population is the same
- No harms/adverse events reported
- No change in draft recommendations

Bozzella 2019: Retrospective Study (N=151)

- Retrospective review after addition of decolonization protocol as part of a multi-intervention approach, including dedicated technician to clean shared medical equipment, to reduce MRSA transmission in a NICU
- Concluded that enhancing cleaning of reusable equipment, not decolonization, led to significant reduction of MRSA transmission
- No harms/adverse events reported
- No change in draft recommendations

Lyles 2016: Diagnostic Study (N=2101)

- Multi-unit and multi-center study examined sensitivity of umbilicus and nares using PCR or culture (with or without broth enrichment)
- Nares is more sensitive than umbilicus for detecting presence of MRSA colonization
- No change in draft recommendations

Key Question 2 (KQ2A): *What are the risk factors for *S. aureus* infection in NICU patients? Do these factors differ between MRSA and MSSA or in the setting of an outbreak?*

Key Question 2 (KQ2B): *What are the risk factors for *S. aureus* colonization in NICU patients? Do these factors differ between MRSA and MSSA or in the setting of an outbreak?*

For KQ2A and KQ2B, seven new studies were identified:

Azarian 2016: Retrospective Cohort Study (N=1940)

- Weekly MRSA screening of infants’ nares

- Risk factors associated with MRSA acquisition (univariate analysis)
 - Infant characteristics: birthweight, born off-site, gestational age, white race, birth by caesarean section
 - Clinical characteristics: length of stay

Denkel 2014: Prospective Cohort Study (N=221)

- MRSA screening via nasal swabs of mothers and infants
- Associated with MRSA acquisition (univariate analysis)
 - Clinical characteristics: patient days

Garcia 2014: Prospective Cohort Study (N=403)

- MRSA screening of multiple anatomical sites of mothers and infants
- Associated with MRSA acquisition (multivariate analysis of all newborns)
 - Maternal characteristics: mother with <4 years of formal education, maternal rhinosinusitis
- Associated with MRSA acquisition (multivariate analysis of newborns hospitalized >72 hours) (n=80)
 - Infant characteristics: breastfeeding

Geva 2011: Prospective Cohort Study (N=2620)

- Universal weekly MRSA screening of multiple anatomical sites of infants
- Associated with MRSA acquisition (multivariate analysis):
 - Hospital characteristics: normalized group degree centrality (the proportion of possible connections that actually exist between MRSA non-colonized infants and ≥ 1 colonized infant via HCP)

Sakaki 2009: Prospective Cohort Study (N=923)

- MRSA surveillance culture of anterior nares of infants on admission and weekly
- Associated with MRSA acquisition (multivariate analysis):
 - Infant characteristics: birthweight, eye mucous
 - Clinical characteristics: kangaroo care
 - Hospital characteristics: MRSA colonization rate

Schultz 2009: Prospective Cohort Study (N=1760)

- Weekly MRSA surveillance via nasopharyngeal swab of all infants using PCR or culture
- Associated with MRSA acquisition (univariate analysis):
 - Infant characteristics: gestational age, inborn birth

Huang 2005: Case-Control Study (N=42)

- Blood cultures of infants with nosocomial MRSA bacteremia and matched controls
- Associated with MRSA acquisition (multivariate analysis):
 - Clinical characteristics: presence of skin infection at onset

CLABSI Section

Key Question: *What are effective strategies to prevent CLABSI in neonatal intensive care unit patients?*

The literature search retrieved 134 studies; 71 studies were captured in the initial search conducted in 2012. An additional 63 studies were included from 2012-2018. HICPAC has approved the draft recommendations, for:

- Central Line Antimicrobial Locks (May 2019)
- Central Line Type and Insertion Site (August 2019)

- Dwell Time, Umbilical Catheters (August 2019)
- Dwell Time, PICCs (August 2019)
- Number of Catheter Lumens (August 2019)
- Systemic Anticoagulant Prophylaxis (August 2019)
- Systemic Antibiotic Prophylaxis (August 2019)

The remaining CLABSI topics for review and approval are:

- PPE: Universal Glove Use
- Skin Prep for Insertion and Maintenance
- Chlorhexidine Bathing
- Catheter Care Team
- Catheter Hub Antisepsis
- Catheter Hub Manipulation
- Insertion & Maintenance Bundles

Dr. Bryant noted that for many of these topics, the literature search yielded only a single study, often not of high quality.

PPE: Universal Glove Use

One RCT by Kaufman in 2014 involved 120 patients. This study examined the efficacy of non-sterile glove use after hand hygiene, compared with hand hygiene alone, in NICU patients. The non-sterile glove use was for all patient contact, not just catheter care. A reduction was reported in possible CLABSI - but not definite CLABSI - and Gram-positive BSI. It is important to note that hand hygiene compliance in both arms of this study was only 79%. It is unclear what the outcome might have been if there was better compliance with hand hygiene.

Draft Recommendation: The use of non-sterile gloves after hand hygiene but before all patient contact, compared with hand hygiene alone, to reduce CLABSI in neonatal intensive care unit patients, remains an unresolved issue. **(No Recommendation)**

- **Supporting Evidence:** One randomized, non-blinded, controlled trial (Kaufman)
- **Level of Confidence in Evidence:** The level of confidence in this evidence is moderate. There was a loss of confidence due to imprecision in the data.
- **Benefits:** The evidence suggested a benefit to using non-sterile gloves after hand hygiene prior to all patient contact to decrease possible CLABSI and gram-positive BSIs in a subset of preterm infants (for infants <1000 g or <29 weeks gestational age and <8 days old) admitted into a single facility.
- **Harms:** Harms were not assessed in this study.
- **Balance of Benefits and Harms:** Although harms were not assessed, the evidence suggested a benefit to implementing glove use after hand hygiene practices as a part of infection prevention and control practices with the potential to decrease possible CLABSI and gram-positive BSI in preterm infants.
- **Resource Use:** Theoretically, compared to standard of care, implementing glove use after hand hygiene could result in an increase in material cost, although this cost could be offset by the decrease in costs associated with CLABSI.
- **Value Judgments:** Value judgments considered in the formulation of this recommendation include the age of the studies compared to the current standard of care, and patient safety.

- **Intentional Vagueness:** The standard of care for hand hygiene in a given NICU may be different than what was used as the control in this study (alcohol hand rub or use of an antimicrobial soap, e.g., 2% chlorhexidine gluconate).
- **Exceptions:** There are no exceptions to this recommendation.

Skin Antisepsis: Skin Preparation for Insertion and Maintenance

Key Question: “In NICU patients requiring skin antisepsis for catheter insertion and maintenance, does alcoholic chlorhexidine compared with alcoholic povidone-iodine prevent CLABSI?”

This question is clinically important. In adult patients, alcoholic chlorhexidine has benefits in reducing CLABSI; however, there is concern about adverse events of chlorhexidine in NICU patients. The FDA indications are to “use with care” in infants less than 2 months of age, and there is a variability in clinical practice. Many units have developed their own practices related to the use of chlorhexidine for skin antisepsis based on gestational age of the infant.

One RCT (Garland 2009) involved 48 patients. This study assessed 2% alcoholic CHG compared with 10% povidone iodine (PI) to prepare skin for catheter insertion and maintenance. The key finding is no difference in the outcomes of interest: catheter-related bloodstream infection (CRBSI), Catheter Associated Blood Stream Infections CABSI, presumed BSI, or septicemia. There was an increase in CHG absorption after a single use for skin preparation, but no systemic side effects were observed. The study authors acknowledge that the clinical implications of this skin absorption are unclear. This study also assessed a specific NICU population of >1500 grams and >7 days of age.

The literature search yielded a great deal of information about potential harms of chlorhexidine, and some information about povidone-iodine, in NICU patients. Initially, the Workgroup included studies that only assessed harms in the justification table. Subsequently, those studies were moved to the narrative.

Studies that assessed only harms:

- 3 observational studies (Brown, Smerdley, Chapman)
- 1 case series (Neri)
- 3 case reports (Kutsch, Lashkari, Mannan)

Studies that reported a variety of harms or potential harms:

- Burns and skin injuries (Chapman, Kutsch, Lashkari, Neri, Mannan)
- CHG absorption (Garland, Chapman)
- Iodine absorption and urinary iodine excretion (Brown, Smerdley)

Burns and skin injuries associated with chlorhexidine use were reported in 5 of these studies. CHG absorption was reported in 2 studies, and iodine absorption and urinary iodine excretion were reported in 2 studies. This point is important because iodine absorption could be associated with thyroid dysfunction in young infants. The studies described a diversity of CHG products, various strengths of aqueous CHG, and 0.5% alcoholic CHG.

Draft Recommendation: The efficacy of alcoholic chlorhexidine, compared with povidone-iodine, for the prevention of CLABSI in NICU patients remains an unresolved issue. **(No Recommendation)**

- **Supporting Evidence:** 1 randomized controlled trial (Garland)
- **Level of Confidence in Evidence:** The level of confidence in this evidence is very low due to indirectness and imprecision. This study was published prior to 2011 before the widespread implementation of insertion and maintenance bundles.

- **Benefits:** One study (Garland) reported there was no reduction in infections found to using either alcoholic chlorhexidine or povidone iodine with an unclear base for catheter insertion or maintenance (1/24 in CHG and 1/24 PI had CRBSI).
- **Harms:** The evidence (Garland) detected an increase in CHG absorption after single use for skin preparation, and no significant systemic side effects were observed. It is unclear what the impact of this level of systemic chlorhexidine absorption is on neonates. This study reported no increased risk of contact dermatitis, although the trial enrolled a select group of NICU infants (those weighing >1500 gm and >7 days of age). Harms were not assessed in younger or smaller infants).
- **Balance of Benefits and Harms:** Neither benefits nor harms were identified in this study.
- **Resource Use:** The evidence retrieved did not report any differences in resource use whether chlorhexidine or povidone-iodine was used. Theoretically, there would be minimal difference in human, education, and material costs.
- **Value Judgments:** Value judgments considered in the formulation of this recommendation include the age of the study and the applicability of the evidence base, the current standard of care, and patient safety.
- **Intentional Vagueness:** There is no intentional vagueness in this recommendation.
- **Exceptions:** There are no exceptions to this recommendation.

Skin Antisepsis: Chlorhexidine Bathing

Key Question: “Does chlorhexidine bathing compared with no bathing or bathing with placebo prevent CLABSI in NICU patients?”

This practice is now standard in adult populations. One RCT and 2 observational studies looked at chlorhexidine bathing in NICU patients. The RCT (Sankar, n=60) utilized a single bath using 0.25% chlorhexidine-impregnated washcloths compared to saline-impregnated washcloths, or no bath. That study reported no decrease in culture-positive sepsis or clinical sepsis at one week between groups. The 2 observational studies by Cleves (n=4243) and Quach (n=790) looked at using 2% CHG washcloths compared with using soap (Quach) or no baths (Cleves). The outcome of interest was CLABSI. There was a suggestion of a clinically meaningful (Quach) or significant (Cleves) decrease in CLABSI rates in NICU patients. “Clinically meaningful” is not statistically significant, but could be important in terms of patient care and safety. Both studies were conducted in facilities with high baseline CLABSI rates, and both were conducted in international settings, although the Quach study was conducted in Canada.

Even though the evidence suggests benefit and data are available regarding benefit in adult populations, the draft recommendation is a No Recommendation. The Workgroup noted that the harms of chlorhexidine bathing in NICU patients are not well-elucidated in the literature. What constitutes absorption, and what the impact of absorption might be, remains unknown. The effect on the microbiome is unclear and has not been well-studied. The potential for chlorhexidine resistance is also unclear. Data regarding about skin reactions are available, but these other important harms remain unclear. Therefore, even though there is a suggestion of benefit in reduction of CLABSIs, the long-term impact in NICU babies is unknown, and the draft recommendation is a No Recommendation.

Draft Recommendation: The efficacy of chlorhexidine bathing to prevent CLABSI in NICU patients remains an unresolved issue. **(No Recommendation)**

- **Supporting Evidence:** One randomized controlled trial (Sankar, and 2 observational studies (Cleves, Quach)
- **Level of Confidence in Evidence:** The level of confidence in this evidence is low because observational studies start at low quality evidence. There was a loss of confidence due to

imprecision in the data. One of the studies was published prior to 2011 and the widespread implementation of insertion and maintenance bundles.

- **Benefits:** The evidence suggested a benefit to routine CHG bathing in facilities with high baseline rates despite implementation of and adherence to insertion and maintenance bundles and infection prevention and control practices (Quach, Cleves). The evidence suggested no benefit to using a single CHG bath (Sankar).
- **Harms:** The evidence (Sankar) suggested no incidences of hypothermia were associated with using CHG washcloths for single bath. All three studies reported no skin reaction associated with chlorhexidine skin bathing with washcloths or solutions. Chlorhexidine resistance was not assessed in any of the studies.
- **Balance of Benefits and Harms:** The evidence suggested a benefit to routine CHG bathing in facilities with high baseline rates despite implementation of and adherence to insertion and maintenance bundles and infection prevention and control practices. Other adverse events were not reported in association with CHG bathing. The long-term impact of CHG bathing on the development of resistance and cross-resistance was not adequately assessed in the evidence.
- **Resource Use:** Theoretically, compared to standard of care, implementing chlorhexidine bathing could result in an increase in human, education, and material cost, but it is anticipated that this cost will be offset by the decrease in costs associated with CLABSI.
- **Value Judgments:** Value judgments considered in the formulation of this recommendation include the age of the studies compared to the current standard of care, and patient safety.
- **Intentional Vagueness:** The delivery method for chlorhexidine bathing and the frequency of bathing are left intentionally vague in this recommendation.
- **Exceptions:** There are no exceptions to this recommendation.

Catheter Care Team

One observational study (n=200) by Taylor in 2011 evaluated the effect of a dedicated percutaneously-inserted central catheter (PICC) team to reduce CRBSIs in extremely low birth weight NICU patients. Implementation of the PICC team was compared to previous standard of care, with no difference reported in CRBSI incidence. The Workgroup felt that the evidence was insufficient to make a recommendation. Some hospitals use this approach and it is potentially beneficial, but it is expensive and there is not enough data to say that it “should be done.”

Draft Recommendation: The efficacy of having a dedicated percutaneously-inserted central catheter care team to prevent CLABSI in NICU patients remains an unresolved issue. **(No Recommendation)**

- **Supporting Evidence:** One observational study (Taylor)
- **Level of Confidence in Evidence:** The level of confidence in this evidence is very low. There was a loss of confidence due to imprecision in the data.
- **Benefits:** The evidence suggested no benefit to using a PICC care team to decrease catheter-related BSI incidence in NICU patients. However, having an indwelling central line ≥ 30 days showed benefit in reducing CRBSIs, no difference if line duration < 30 days.
- **Harms:** Harms attributable to the PICC care team were not reported in this study.
- **Balance of Benefits and Harms:** Even though no harms or benefits were reported from implementing a PICC Care Team, the evidence suggested indwelling central lines placed ≥ 30 days reduced CRBSIs in neonates.
- **Resource Use:** Theoretically, compared to standard of care, implementing a PICC Care Team could result in an increase in material cost, but it is anticipated that this cost will be offset by the decrease in costs associated with CLABSI.

- **Value Judgments:** Value judgments considered in the formulation of this recommendation include the age of the studies compared to the current standard of care, and patient safety.
- **Intentional Vagueness:** The composition of the catheter care team is left intentionally vague.
- **Exceptions:** There are no exceptions to this recommendation.

Catheter Hub Antisepsis

One observational study (n=860) by Bjorkman in 2015 compared HCP scrubbing the hub of central catheters with an alcohol wipe (5% chlorhexidine) for an unspecified time prior to accessing intravenous tubing to administer drugs or collect blood samples, to HCP scrubbing the hub for 15 seconds prior to catheter use. A non-significant decrease in coagulase-negative staphylococcal sepsis (1.5% to 0) was reported. All patients had central lines, but whether this result should be considered CLABSI is unclear. While there no harms are reported and there are potential benefits to the practice, the reported outcome was narrow, and overall the evidence was not sufficient to make a recommendation.

Draft Recommendation: Scrubbing central venous catheter hubs for 15 seconds with an alcohol wipe (chlorhexidine 5%) before use, compared to an unspecified scrub duration, for the prevention of CLABSI in NICU patients remains an unresolved issue. **(No Recommendation)**

- **Supporting Evidence:** One observational study (Bjorkman)
- **Level of Confidence in Evidence:** The level of confidence in this evidence is very low. There was a loss of confidence due to imprecision in the data.
- **Benefits:** The evidence suggests that “scrubbing the hub” of central venous catheters with an alcohol-5% chlorhexidine wipe for 15 seconds prior to catheter use may reduce coagulase-negative staphylococci (CoNS) in NICU patients; the results were not statistically significant but may be clinically significant.
- **Harms:** Harms and adverse events attributable to the intervention were not reported in this study.
- **Balance of Benefits and Harms:** Potential clinical benefit is weighed against the lack of harm; however, the level of confidence in the evidence is very low.
- **Resource Use:** No increase in material or human cost was reported in association with implementing the intervention.
- **Value Judgments:** No value judgments were applied to this recommendation.
- **Intentional Vagueness:** There is no intentional vagueness in this recommendation.
- **Exceptions:** There are no exceptions to this recommendation.

Catheter Hub Manipulation

One observational study (patient n=223; catheter n=357) by Mahieu in 2001 looked at catheter hub manipulations that required disinfection, disconnection, or drawing blood through the central line that were associated with an increased risk of infection. The risk of infection increased with additional manipulations. Although the evidence consists of one study, the Workgroup felt that reducing catheter entries and catheter hub manipulations is standard of care and not an unresolved issue. Under the HICPAC Recommendation Categorization Scheme, a Recommendation can be made even in the absence of strong evidence from RCTs.

Draft Recommendation: Minimize the number of times central line hubs are accessed and minimize blood sampling through central lines to decrease the risk for CLABSI. **(Recommendation)**

- **Supporting Evidence:** One observational study (Mahieu)

- **Level of Confidence in Evidence:** The level of confidence in this evidence is very low because observational studies are at a higher risk of bias than RCTs, and there was a loss of precision because the evidence retrieved only one study.
- **Benefits:** The evidence suggested catheter manipulations were associated with an increase in infections.
- **Harms:** Potential harms associated with reduced catheter manipulation were not reported.
- **Resource Use:** Theoretically, reducing the number of times catheters are physically accessed would reduce human and material costs because supplies are needed every time the line is accessed. However, this reduction would be balanced by the need for thoughtful planning and coordination of multiple access needs to achieve this reduction.
- **Balance of Benefits and Harms:** The evidence suggests a benefit to reducing catheter hub manipulations. Reducing the number of times central line hubs are accessed and minimized is considered standard of care and it is unlikely that future research will be conducted.
- **Value Judgments:** The values considered in the formulation of this recommendation include patient safety and economic and human resource costs.
- **Intentional Vagueness:** Central line hub access is left intentionally vague to capture the range of possible manipulations to the hub (e.g., disinfection, access). Strategies to decrease catheter hub manipulation were not assessed.
- **Exceptions:** There are no exceptions to this recommendation.

Insertion and Maintenance Bundles

On the topic of Insertion and Maintenance Bundles versus standard of care, at least 10 studies show the benefit of using insertion or insertion maintenance bundles in NICU settings. In the spirit of not trying to restate what CDC already has stated, the draft Recommendation simply states to use insertion and maintenance bundles. It was hoped that a statement could be made about the best bundles to use, but there are no head-to-head trials of bundles in NICU infants that would allow for such a statement. Further, other CDC recommendations address elements of these bundles for all patients. The narrative can highlight successful bundles in various settings.

Draft Recommendation: Use “bundled” interventions for central line insertion and maintenance as part of a single or multiple facility quality improvement effort to reduce rates of CLABSIs. Elements of insertion and maintenance bundles for all patients have been recommended by the Centers for Disease Control and Prevention. **(Recommendation)**

- **Supporting Evidence:** At least 10 studies (see table).
- **Level of Confidence in Evidence:** The level of confidence in this evidence is very low. There was a loss of confidence due to imprecision.
- **Benefits:** The evidence suggested a benefit to using insertion and maintenance bundles to decrease CLABSI, BSI, and early bacterial sepsis in NICU patients.
- **Harms:** Neither harms of specific or bundled interventions were systematically assessed in the studies.
- **Balance of Benefits and Harms:** Even though harms were not assessed, the evidence suggested a benefit to implementing insertion and maintenance bundles as part of infection prevention and control practices with the potential to decrease CLABSI, BSI, and early bacterial sepsis in NICU patients.
- **Resource Use:** Theoretically, compared to standard of care, Implementing insertion and maintenance checklists bundles could result in an increase in material cost and personnel, but it

is anticipated that this cost will be offset by the decrease in costs associated with CLABSI, BSI, and early bacterial sepsis.

- **Value Judgments:** Value judgments considered in the formulation of this recommendation include the age of the studies compared to the current standard of care, and patient safety. Use of insertion and maintenance bundles have become the standard of care in patients with central lines, including NICU infants.
- **Intentional Vagueness:** The components of insertion and maintenance bundles studied in NICU patients vary and no study has compared the effectiveness of one bundle versus another in this population. The optimal components of NICU specific bundles, above and beyond the standard measures recommended by the CDC, cannot be determined from the available evidence.
- **Exceptions:** There are no exceptions to this recommendation.

Respiratory Illness Section

The final section of the NICU document is Respiratory Illness, with the Key Question, “What are effective strategies to prevent respiratory illness in NICU patients?” The literature search has been updated. Evidence-based recommendations cannot be drafted based on the available literature. The Workgroup will draft a systematic review, as was done for the *C. difficile* section.

Dr. Bell thanked the NICU Guideline Workgroup for a decade of work on this effort. This work represents HICPAC’s first “big push” in pediatrics. Adult recommendations cannot just be scaled down to be made smaller; the populations must be considered distinctly.

Discussion Points

Dr. Bryant paused for comments after presenting each topic. Discussion points are below, grouped by topic. The disposition of votes appears following this discussion section.

Staphylococcus Aureus (S. aureus)

HICPAC Members

HICPAC agreed that the goal of the *S. aureus* Draft Recommendations 2.1.A.1 and 2.1.A.2 is not to address or readdress specific recommendations that are not part of the Key Questions addressed in the document. It is understood that some facilities using Contact Precautions may feel that the language may unintentionally introduce “wobble room.” Perhaps the text could be amended so that the line reads, “Implementation of Contact Precautions has been inconsistently associated with unintended consequences.”

In response to an inquiry about routine practice for screening of NICU infants, Dr. Bryant replied that this question is important, and practices vary. Some of the key recommendations in this draft document pertain to when and how to screen. Contact Precautions are used routinely for MRSA-colonized or -infected infants. The Workgroup considered the duration of Contact Precautions for an MRSA-colonized infant, evidence was not retrieved to address that question. However, the issue can be addressed in the SHEA-sponsored document.

Dr. Babcock, HICPAC Co-Chair, observed that no further vote is required for this section, given that no significant changes were made to the recommendations based on the public comments. Therefore, HICPAC approved the continued conclusion of the *S. aureus* section and offered many congratulations to the Workgroup for the hard work.

***ex officio* Members and Liaison Representatives**

PIDS agreed with the HICPAC suggestion to modify the language of *S. aureus* Draft Recommendation 2.1.A.1 and 2.1.A.2, given the variation in practice and lack of evidence to support one approach.

CDC

For *S. aureus* Draft Recommendation 2.1.B.1., Dr. Bell suggested that it might be helpful to rephrase the statement to “both culture-based and PCR detection methods are acceptable” instead of “use culture-based or polymerase chain reaction detection methods.”

Dr. Bell commented that while there may be demand for an encyclopedic document that addresses every aspect of an issue, the time required to write such a tome is significant, and by the time it is complete, its conclusions and recommendations are likely to be outmoded. HICPAC guidelines are comprised of approximately 1000 specific recommendations, including the Core Practices. Addressing discrete questions to build a meta-labeled, searchable set of recommendations is more useful. There are opportunities to add specific recommendations where they are needed, when evidence is available. It is important to remember the difference where interest lies, and where peer-reviewed publications, a body of evidence, and sufficient information are available to develop a measured recommendation for a guideline.

Regarding the suggestion to include a brief paragraph on “research gaps,” Dr. Bell emphasized the longevity of the document: an important gap today may not be important in 18 months. Perhaps a free-standing list of areas for additional research could be identified and regularly reviewed as a web-based resource.

Central Line-Associated Bloodstream Infection (CLABSI)

Regarding whether the discussion of the harms or potential harms of chlorhexidine for insertion and maintenance should appear in the Justification Table, or whether the narrative should focus on this issue, the following comments/suggestions were offered:

HICPAC Members

NICUs address this question on a daily basis, and guidance would be welcome.

There was considerable support for including this issue in the Justification Table rather than “burying it in the narrative.” The justification for the wording should be clear.

Consider further guidance regarding appropriate concentrations for an infant, if CHG will be used. Dr. Bryant acknowledged this practical question that arises frequently. Individual hospitals and systems have developed internal guidance for which CHG product to use, when to apply and rinse it, and which preparation to use, sometimes on a sliding scale depending upon the infant’s gestation and age. The skin becomes epithelialized after two weeks. It is not possible to make recommendations based on evidence, because there were no head-to-head comparisons. Is there a place for a best practice recommendation in the absence of data?

Because the only RCT identified for skin antisepsis for insertion and maintenance was conducted in only 48 patients, the benefit-harm balance is not clear. Given that the recommendation is about efficacy rather than safety, it might be preferable to phrase the recommendation differently. Perhaps language could be included to indicate that one study in the NICU population, and many studies in other populations, suggests that chlorhexidine is superior. However, the question of harm should be considered in the NICU population: it could be stated that chlorhexidine is effective, but it also carries risk.

Dr. Bryant suggested the language, “The efficacy and safety of alcoholic chlorhexidine remains an unresolved issue.” The Justification Table could address these concepts and refer to other populations, as the *S. aureus* section refers to harms associated with the implementation of Contact Precautions in adult patients. The narrative explains that a No Recommendation category gives facilities opportunities to determine how to use the agent safely and appropriately.

Dr. Babcock noted that because many users only read the recommendations, it might be wise to indicate in a Conditional Recommendation that many conditions need to be considered, but that benefits are shown in other populations, and each facility will make its own determination.

Another issue with regard to chlorhexidine-related skin injuries is that often the alcohol component is not allowed to dry, and is placed under a dressing that then causes prolonged skin irritation. That problem is not likely to vary among patient populations, so perhaps a suggestion can be made about allowing for full evaporation when applying alcohol-containing chlorhexidine before placing dressings. There is ample information in the adult population about proper technique.

Dr. Bryant said that while this issue was not captured in the literature review, it is well-recognized in the NICU. The *S. aureus* document provides “Implementation Considerations;” a paragraph could be included in this section for chlorhexidine acknowledging the common practice, explaining potential harms, and describing mitigation strategies.

It is important to remember that the standard of care may not be the same across all NICUs.

CDC

Dr. Cardo agreed that all of the data should be provided. While chlorhexidine’s effectiveness is known in other populations, issues such as its long-term impact and its effect on the microbiome are unknown. There must be transparency when evidence is limited, so the recommendation must address potential harms. A recommendation cannot be based on standard of care when no information is available regarding potential long-term harms.

CLABSI and Chlorhexidine Bathing

HICPAC

There may be an opportunity to recognize variability in the population being served, and that for some patients, the risk of using chlorhexidine may not outweigh the potential patient risk. The NICU population is heterogenous: what is appropriate may depend on gestational age and chronologic age.

As in other areas of infection control, the thinking is focused on efficacy when concerns regarding safety remain due to the unknown risk of harm in a vulnerable population. A larger question may be why chlorhexidine is not being studied in this vulnerable population.

CLABSI and Catheter Hub Antisepsis

HICPAC

It is important to be clear that the recommendation is not a No Recommendation with regard to whether catheter hub antisepsis should be done, but with regard to *how long* it should be done.

A CHG-alcohol combination product has recently been approved by the FDA with a 5-second scrub time. Perhaps it should be stated that the manufacturer labeling should be followed, but that the 15-second rule should apply if there is no time specification.

Dr. Bryant agreed that it should be noted that different products have different indications for scrub times. The 2011 CLABSI guideline states at least 5 seconds.

CDC

Dr. Bell emphasized that careful attention should be paid to what label instructions state. If a product specifies a time for use, then that specification takes precedence over a HICPAC or CDC recommendation. However, there could be conversations about incorporating that kind of information into the label, if it is missing, if a product is intended for clinical care. CHG has been used for some time, as has the alcohol formulation, and new and better ways are being found to use it.

Vote: CLABSI

Catheter Hub Antisepsis: The topic of Catheter Hub Antisepsis will be removed, as there is no need for NICU-specific guidance in this area, and it will be addressed in the CLABSI guideline. HICPAC voted unanimously to accept this deletion. The disposition of the vote was as follows:

- 13 Favored: Anderson, Babcock, Bryant, Chopra, Daniels, Dekker, Fakh, Guzman-Cottrill, Lin, Maragakis, Patterson, Preas, Reifsnyder
- 0 Opposed
- 0 Abstained

Universal Glove Use Draft Recommendation: The use of non-sterile gloves after hand hygiene but before all patient contact, compared with hand hygiene alone, to reduce CLABSI in neonatal intensive care unit patients, remains an unresolved issue. **(No Recommendation)**

HICPAC voted unanimously to accept the recommendation for Universal Glove Use. The disposition of the vote was as follows:

- 13 Favored: Anderson, Babcock, Bryant, Chopra, Daniels, Dekker, Fakh, Guzman-Cottrill, Lin, Maragakis, Patterson, Preas, Reifsnyder
- 0 Opposed
- 0 Abstained

Skin Preparation for Insertion and Maintenance Draft Recommendation: Consider use of alcohol-containing chlorhexidine for skin antisepsis to prevent CLABSI in NICU patients in whom the benefits are judged to outweigh the potential risks. Gestational age, chronological age, and skin maturity should be considered when assessing risks and benefits of chlorhexidine-containing agents in determining eligible patients. **(Conditional Recommendation)**

HICPAC voted unanimously to accept the recommendation for Skin Preparation for Insertion and Maintenance. The disposition of the vote was as follows:

- 13 Favored: Anderson, Babcock, Bryant, Chopra, Daniels, Dekker, Fakh, Guzman-Cottrill, Lin, Maragakis, Patterson, Preas, Reifsnyder
- 0 Opposed
- 0 Abstained

Chlorhexidine Bathing Draft Recommendations:

1. Consider use of chlorhexidine bathing to prevent CLABSI in NICU patients in whom the benefits are judged to outweigh the potential risks. Gestational age, chronological age, and skin maturity should be considered when assessing risks and benefits of chlorhexidine-containing agents in determining eligible patients. **(Conditional Recommendation)**
2. The identification of NICU patients who might benefit from chlorhexidine bathing remains an unresolved issue. **(No Recommendation)**
3. If undertaken, the frequency of bathing remains an unresolved issue. **(No recommendation)**

HICPAC voted unanimously to accept the recommendation for Chlorhexidine Bathing. The disposition of the vote was as follows:

- 13 Favored: Anderson, Babcock, Bryant, Chopra, Daniels, Dekker, Fakh, Guzman-Cottrill, Lin, Maragakis, Patterson, Preas, Reifsnyder
- 0 Opposed
- 0 Abstained

Catheter Care Team Draft Recommendation: The efficacy of having a dedicated percutaneously-inserted central catheter care team to prevent CLABSI in NICU patients remains an unresolved issue. **(No Recommendation)**

HICPAC voted unanimously to accept the recommendation for Catheter Care Team. The disposition of the vote was as follows:

- 13 Favored: Anderson, Babcock, Bryant, Chopra, Daniels, Dekker, Fakh, Guzman-Cottrill, Lin, Maragakis, Patterson, Preas, Reifsnyder
- 0 Opposed
- 0 Abstained

Catheter Hub Manipulation Draft Recommendation: Minimize the number of times central line hubs are accessed and minimize blood sampling through central lines to decrease the risk for CLABSI. **(Recommendation)**

HICPAC voted unanimously to accept the recommendation for Catheter Hub Manipulation. The disposition of the vote was as follows:

- 13 Favored: Anderson, Babcock, Bryant, Chopra, Daniels, Dekker, Fakh, Guzman-Cottrill, Lin, Maragakis, Patterson, Preas, Reifsnyder
- 0 Opposed
- 0 Abstained

Insertion and Maintenance Bundles Draft Recommendation: Use “bundled” interventions for central line insertion and maintenance as part of a single or multiple facility quality improvement effort to reduce rates of CLABSIs. Elements of insertion and maintenance bundles for all patients have been recommended by the Centers for Disease Control and Prevention. **(Recommendation)**

HICPAC voted unanimously to accept the recommendation for Insertion and Maintenance Bundles. The disposition of the vote was as follows:

- 13 Favored: Anderson, Babcock, Bryant, Chopra, Daniels, Dekker, Fakh, Guzman-Cottrill, Lin, Maragakis, Patterson, Preas, Reifsnyder
- 0 Opposed
- 0 Abstained

Bloodstream Infection Guideline Update Planning

Shannon Novosad, MD, MPH

Medical Officer

Hospital Infection Prevention Team

Division of Healthcare Quality Promotion

Centers for Disease Control and Prevention

Dr. Novosad described the update of the *Guideline for the Prevention of Intravascular Catheter-Related Infections, 2011*.

Work on this update has begun with the identification of new, priority topic areas that were not addressed in the 2011 guideline. Additionally, the 2011 recommendations were reviewed to determine which are outdated or unclear, or for which there was not enough evidence to make a recommendation in 2011, and should be updated to address high-priority, clinically important questions. The 2011 recommendations were also reviewed to determine which could be brought forward because they are considered standard of care and no new data are available to inform or change them, and which could be retired because they are out of date or no longer standard of care. The update to this Guideline will be structured similarly to the *2017 Chlorhexidine-Impregnated Dressing Recommendation Update*.

The topics are organized in 3 “buckets” to facilitate Workgroup review and consideration. The priority topic areas identified are:

1. Chlorhexidine Bathing and Skin Preparation
2. PICCs
3. Antiseptic-Impregnated Caps, Administration Set Replacement, Needless Connectors, and Catheter Locks.

Recommendations targeted for potential update were presented at a previous HICPAC meeting. Since then, a preliminary literature search was conducted.

For **Daily Chlorhexidine Bathing** (1214 references retrieved), the goal is to determine whether the recommendation can be expanded or made specific to certain groups of patients or settings. The Key Questions for this topic include:

- Does the use of daily chlorhexidine bathing, compared with no bathing or bathing with any agent, reduce CLABSI in adult and pediatric ICU patients?
- Does the use of chlorhexidine bathing, compared with no bathing or bathing with any agent, reduce CLABSI in adult and pediatric wards?
- Does the use of chlorhexidine bathing, compared with no bathing or bathing with any agent, reduce CLABSI in long-term acute care?
- Does the use of chlorhexidine bathing, compared with no bathing or bathing with any agent, reduce CLABSI in skilled nursing facilities?

The 2011 recommendation for **Skin Preparation** is a No Recommendation, but additional literature has been published since the 2011 Guideline that may inform a recommendation update. The preliminary literature search retrieved 3135 references for one Key Question:

- Does the use of chlorhexidine with alcohol, compared with povidone iodine with alcohol, for skin preparation reduce CLABSI in adult and pediatric inpatients?

In the topic area of **PICCs** (7676 references retrieved), DHQP has identified important issues to address based on questions from HICPAC and other partners:

- In pediatric and adult inpatients, what is the efficacy of using a short-term non-tunneled central venous catheter (CVC), compared with a long-term PICCs, for prevention of CLABSI?
- What are the clinical indications for PICC insertion in adult and pediatric inpatients?
- What are the contraindications for PICC insertion in adult and pediatric inpatients?
- What is the optimal inflection point to remove and replace a short term non-tunneled CVC with a PICC?

The topic of **Antiseptic-Impregnated Caps** was not addressed in the 2011 Guideline, although it has been addressed in the SHEA Compendium and other resources. The preliminary literature search yielded 1233 references for the following Key Questions:

- Do antiseptic-impregnated caps, compared with standard of care, reduce the risk of CLABSI in adult and pediatric patients?
- Do antiseptic-impregnated caps, compared with standard of care, reduce the risk of CLABSI in hemodialysis patients?
- In adult and pediatric inpatients, what is the optimal antiseptic-impregnated cap to reduce the risk of CLABSI?
- In all inpatients, what is the efficacy of scrubbing the hub combined with use of antiseptic-impregnated caps, compared with use of antiseptic-impregnated caps alone, to reduce the risk of CLABSI?

Some Key Questions for the topic of **Administration Set Replacement and Needleless Connectors** (398 reference retrieved) overlap:

- Is the optimal frequency of continuously used administration set change more than or less than 96 hours to prevent CLABSI in adult inpatients?
- In adult inpatients, what is the optimal frequency of change for intermittently used administration sets to prevent CLABSI?
- Does the use of needleless connectors, compared with end caps, prevent CLABSI in pediatric and adult inpatients?
- Does the use of needleless connectors, compared with end caps, prevent CLABSI in hemodialysis patients?
- What is the optimal type of needleless connector to reduce CLABSI in pediatric and adult inpatients?
- Does changing needleless connectors at the same frequency as administration sets, compared with other frequencies, prevent CLABSI in adult and pediatric inpatients?

The topic of **Catheter Locks** (1591 references retrieved) is being raised more frequently; a number of trials are underway to address it, so additional evidence may emerge to help inform this work. The Key Questions identified are:

- In adult and pediatric inpatients, what is the efficacy of catheter locks, compared with standard of care, to prevent CLABSI?
- In adult and pediatric inpatients, what is the optimal agent to use in catheter locks (i.e., antimicrobial, antiseptic, etcetera), compared with standard of care, to prevent CLABSI?
- What is the optimal population in which to implement the use of catheter locks, compared with standard of care, to prevent CLABSI?
- In hemodialysis patients, does the use of recombinant tissue plasminogen activator (TPA), compared with standard of care, prevent CLABSI?

Each topic area will undergo title and abstract screening, full-text review, data extraction and aggregation, and Workgroup discussion before draft recommendations are presented to HICPAC. Some areas have longer timelines than others, given the number of references retrieved and the complexity of the topic.

Discussion Points

Dr. Bell noted that a HICPAC Workgroup would be formed to engage in this segmental, targeted update of the existing BSI guidelines. The results of Workgroup deliberations will be presented at public HICPAC meetings, whereupon HICPAC will make recommendations.

HICPAC commented on potential problems associated with “siloes” recommendations; that is, considering questions individually rather than within a larger background, context, and processes. The individual recommendations could then not be feasible, and possibly contradictory in some settings. It could be beneficial, when new recommendations are formulated, to merge them in a manner that supports clinical workflow so that HCP achieve the best results for their patients. HICPAC’s recommendations may be based on one aspect of BSI prevention, but the “whole picture” should be considered.

Dr. Bell acknowledged this aspect of guideline work, because each question is asked and answered independently. There is always a need for synthesis. Implementation guidance can be provided in a variety of ways: white papers, narratives within the guideline itself, etc. Guidance can be provided via the SHEA *Compendium* as implementation recommendations linked to guideline language.

Dr. Cardo emphasized that they always need to keep in mind what is best for the patient.

HICPAC noted tension between the recommendations and implementation. An approach to help the field could be the presentation of common clinical scenarios, or vignettes, with a description of how the evidence might be used to solve that problem. It will not be possible to address every potential scenario, but issues such as chlorhexidine use or device selection in a pediatric patient could be discussed, with key points, to make the recommendations more relevant to end users.

Regarding PICCs, HICPAC suggested specifically addressing coatings and materials. It is also important to highlight special populations and various settings.

HICPAC suggested giving further consideration to midline catheter use in the PICC section.

HICPAC observed that the Key Questions are framed with a focus on efficacy and do not incorporate an assessment of harm or risk. Other infectious and non-infectious risks are associated with PICCs and should be considered in addition to the benefit of CLABSI prevention.

HICPAC hoped that discussion regarding the retirement of some recommendations would be part of the broader decision-making process.

HICPAC emphasized the importance of ensuring that the evidence base for products is integrated into the larger context of BSI prevention in a bundled approach, as with the NICU Guideline. For instance, aspects of central line maintenance are not reflected in the current topic “buckets.” While some devices and products may be helpful adjuncts, it is important to highlight proper occlusive dressings and special scenarios associated with leading lines, and other issues that arise on the “front lines” every day. If there is an implication that a cap can be relied upon for BSI prevention, for instance, there is risk that adequate attention may not be given to evidence-based best practices.

Healthcare Personnel Guideline (HCP) Section II Workgroup Update

Hilary M. Babcock, MD, MPH
Chair, HCP Guideline Workgroup

Dr. Babcock explained that the Workgroup’s goal is to update the *Guideline for infection control in healthcare personnel, 1998. Section 1: Infrastructure and Routine Practices for Occupational Infection Prevention and Control Services*, which was published in October 2019, is an overview of the

infrastructure of an occupational health service (OHS). *Section 2: Epidemiology and Control of Selected Infections Transmitted Among Healthcare Personnel and Patients* provides guidance for specific pathogens and infections. As the Workgroup updates Section 2, evidence-based methods are used where evidence is available.

A great deal of progress has been made on Section 2. HICPAC has approved the following sections:

- Pertussis (February 2018)
- Mumps, Rubella (May 2018)
- Measles (August 2018)
- Meningococcal Disease (November 2018)
- Diphtheria, Group A *Streptococcus* (May 2019)
- Varicella (August 2019).

The Diphtheria, Group A *Streptococcus*, Meningococcal Disease, and Pertussis sections are undergoing CDC clearance. Other sections in progress are:

- Respiratory Viral Pathogens
- *S. aureus*
- Conjunctivitis/Adenovirus
- Rabies
- Vaccinia
- Scabies and Pediculosis

The next sections for update are:

- Hepatitis A
- Hepatitis B
- Hepatitis C
- Herpes simplex,
- Human Immunodeficiency Virus (HIV)
- Tuberculosis (TB)

The methodology for the update of Section 2 is different from the methodology used in prior guideline updates. For each infection, the text and recommendations from the 1998 Guideline are reviewed for elements that can be deleted, updated, or continued. Specifically, the Workgroup looks for outdated recommendations that are already updated elsewhere (e.g., ACIP), areas with significant gaps between the 1998 recommendations and current practices, areas with new data or literature that can inform updated recommendations, and areas of need where the 1998 Guideline does not address a common issue or area of concern. The Workgroup engages pathogen-specific subject matter experts (SMEs) at CDC to provide feedback on gaps, needed updates, and available literature. Depending on that initial review process, the Workgroup decides whether a Systematic Review or an Informal Review will be conducted, and new literature is incorporated as needed.

When a full formal literature review is needed, the Workgroup develops Key Questions that are more open-ended than may be traditional so that a full range of information is captured. 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 harmonizing with existing recommendations. The goal is to provide practical and thoughtful guidance where there is little directly applicable literature.

The overall update workflow is guided by the need for update, logical clusterings, and efficiency in working through the clearance process.

The *HICPAC Core Practices Document* is an important reference for this guideline update. Section 8 of *Core Practices* focuses on occupational health and includes key recommendations:

1. Ensure that healthcare personnel either receive immunizations or have documented evidence of immunity against vaccine-preventable diseases as recommended by the CDC, CDC's Advisory Committee on Immunization Practices (ACIP) and required by federal, state, or local authorities.
2. Implement processes and sick leave policies to encourage healthcare personnel to stay home when they develop signs or symptoms of acute infectious illness (e.g., fever, cough, diarrhea, vomiting, or draining skin lesions) to prevent spreading their infections to patients and other healthcare personnel.
3. Implement a system for healthcare personnel to report signs, symptoms, and diagnosed illnesses that may represent a risk to their patients and coworkers to their supervisor or healthcare facility staff who are responsible for occupational health.
4. Adhere to federal and state standards and directives applicable to protecting healthcare workers against transmission of infectious agents including OSHA's Bloodborne Pathogens Standard, Personal Protective Equipment Standard, Respiratory Protection standard and TB compliance directive.

Parvovirus

Dr. Babcock presented the draft recommendation and narrative for Parvovirus. The Workgroup reviewed the 1998 Guideline recommendations for gaps and outdated recommendations, as well as current CDC guidance. Input was sought from CDC SMEs. The Workgroup presented a "draft" draft recommendation to HICPAC in May 2019. Based on HICPAC feedback and CDC SME input, a narrative section was developed. Following is the updated recommendation:

1998 Recommendations

- a. Ensure that pregnant personnel are aware of the risks associated with parvovirus infection and of infection control procedures to prevent transmission when working with high-risk patient groups (Table 6) (274,275). **Category IB**
- b. Do not routinely exclude pregnant personnel from caring for patients with B19. **Category IB**

Draft Updated Recommendation:

1998 recommendation a is addressed in Section 1 of the Guideline Update, which discusses administrative issues, including counseling.

1. Exclusion of pregnant or immunocompromised healthcare personnel from caring for patients with Parvovirus B19 infection is not necessary.

Section 2: Parvovirus Draft Narrative Section

Occupational Exposures

"Transmission of parvovirus B19 occurs through deposition of respiratory, oral, or nasal secretions from an infected source person onto the mucous membranes of a susceptible host. Parvovirus B19 can also spread through exposure to blood or blood products, including sharps injuries.

"Pregnant personnel are at no greater risk of acquiring B19 infection than are nonpregnant personnel; however, if a pregnant woman does acquire B19 infection during the first half of pregnancy, the risk of fetal death (fetal hydrops, spontaneous abortion, and stillbirth) is increased. Concern for occupational exposures typically occurs

when unprotected pregnant HCP (i.e., not wearing a facemask) provide care for patients with chronic parvovirus B19 infection or parvovirus B19 associated aplastic crisis who have not been placed in Droplet Precautions and are likely to be contagious.”

Testing and Diagnosis

“If erythema infectiosum is present, a clinical diagnosis can be made without laboratory testing. When laboratory testing is performed, parvovirus B19-specific antibody testing and viral DNA testing are available. Testing for parvovirus is not typically performed by OHS.

“Routine testing for parvovirus is not indicated in pregnant women.¹⁷ Guidance for submitting specimens to CDC for testing is available online (<https://www.cdc.gov/laboratory/specimensubmission/list.html>).”

Additional Considerations

“Although PEP is not administered after exposure to parvovirus B19, if clinical symptoms compatible with parvovirus B19 infection develop, it may be the underlying etiology. Pregnant HCP who are exposed to parvovirus B19 or develop signs and symptoms compatible with B19 infection are referred to their obstetrician for counseling and to discuss the need for further diagnostic testing and management.”

Dr. Babcock noted Workgroup discussion internally regarding whether the final statement about the management of pregnant HCP with an exposure might be considered a “buried recommendation.” If so, then an additional draft recommendation could be:

“For pregnant HCP who are exposed to parvovirus B19 or who develop signs and symptoms compatible with B19 infection, refer to their obstetrician for counseling and to discuss the need for further diagnostic testing and management.”

Cytomegalovirus

The Workgroup reviewed the 1998 CMV recommendations and narrative and existing CDC guidance. “Draft” draft recommendations were presented to HICPAC in May 2019, which were revised and edited based on HICPAC feedback and in consultation with CDC SMEs, and a narrative was drafted.

1998 Recommendations

- a. Do not restrict personnel from work who contract CMV-related illnesses (119). **Category IB**
- b. Ensure that pregnant personnel are aware of the risks associated with CMV infection and infection control procedures to prevent transmission when working with high-risk patient groups (Table 6) (3,117). **Category IA**
- c. Do not routinely use workplace reassignment as a method to reduce CMV exposures among seronegative pregnant personnel (88,92,9597,102,105,106,119,120). **Category IA**

Draft Updated Recommendations:

1998 Recommendation b is included in Section 1 of the updated Healthcare Personnel Guideline.

1. Work restrictions are not necessary for healthcare personnel who contract CMV.
2. Exclusion of pregnant or immunocompromised healthcare personnel from caring for patients with CMV infection is not necessary.

CMV Draft Narrative Section

Occupational Exposures

“Occupational transmission of CMV can be difficult to establish because most acute infections in adults are asymptomatic or present with mild symptoms. Transmission of CMV occurs through deposition of infectious body fluids (e.g., urine, saliva, blood, tears, semen, breast milk) from an infected source person on the mucus membranes of a susceptible host. There are no recommended actions, such as administering postexposure prophylaxis (PEP) or work restrictions, after HCP exposure to CMV.”

Testing and Diagnosis

“Testing for CMV infection is not typically performed by OHS, nor indicated for most HCP, regardless of symptoms or potential exposure. Information on testing and diagnosis for CMV infection can be found on the CDC website (<https://www.cdc.gov/cmV/clinical/lab-tests.html>).”

Additional Considerations

“Although PEP is not administered after exposure to CMV, if clinical symptoms compatible with CMV infection develop, CMV infection may be the underlying etiology. No treatment is indicated for CMV infection in healthy adults. For immunocompromised HCP and pregnant HCP who develop signs and symptoms compatible with CMV infection, referral to their infectious diseases specialist, transplant team, or obstetrician may be indicated for counseling or to discuss the possible need for further diagnostic testing and management.”

The Workgroup did not discuss drafting separate recommendation for management of pregnant HCP with an exposure to CMV, given reduced concern with CMV than with Parvovirus. However, the question is important for discussion.

Rabies

The Workgroup reviewed the 1998 Rabies recommendations for gaps and outdated recommendations, and reviewed existing CDC guidance. Dr. Babcock presented “draft” draft recommendations for input and feedback from HICPAC, which will be incorporated before draft recommendations and a draft narrative will be presented for HICPAC vote at a future meeting.

1998 Recommendations

- a. Provide preexposure vaccination to personnel who work with rabies virus or infected animals in rabies diagnostic or research activities (Table 1) (5,22). **Category IA**
- b. After consultation with public health authorities, give a full course of antirabies treatment to personnel who either have been bitten by a human being with rabies or have scratches, abrasions, open wounds, or mucous membranes contaminated with saliva or other potentially infective material from a human being with rabies. In previously vaccinated individuals, postexposure therapy is abbreviated to include only a single dose of vaccine on day 0 and one on day 3 (Table 1) (295297). **Category IB**

DRAFT Draft Updated Recommendations:

In keeping with the approach to the rest of Section 2, 1998 Recommendation a will not be carried forward, as ACIP maintains vaccine recommendations. The narrative will refer and link to appropriate resources for vaccine information.

1. For healthcare personnel who have an exposure to rabies virus, administer postexposure prophylaxis in accordance with CDC recommendations and in consultation with public health authorities.
2. Work restrictions are not necessary for healthcare personnel who have an exposure to rabies virus.

The 1998 recommendations describe rabies exposures; in this update, descriptions of occupational exposures are included in the narrative.

Next Steps

After CDC clearance, the Pertussis, Meningococcal Disease, Diphtheria, and Group A *Streptococcus* sections will be submitted to regulations.gov for public comment. The public comments will be aggregated to present with updated drafts during an upcoming HICPAC meeting for approval and finalization. Work on additional sections is ongoing.

Discussion Points

Dr. Babcock paused for comments periodically after presenting each topic area. For flow and ease of reading the presentation and discussion points, the discussion is grouped together and organized by the topic after which it occurred.

Parvovirus

HICPAC agreed with including a separate recommendation for the management of pregnant HCP who are exposed to parvovirus B19.

Cytomegalovirus

There was HICPAC support for including a separate recommendation for the management of pregnant HCP with an exposure to CMV for consistency. This question arises for other infections and should be standard across the document.

Rabies

No additional questions, comments, or suggestions.

Vote: Parvovirus

The parvovirus recommendations were put forth as presented, with the addition of a recommendation for pregnant HCP who have an exposure to parvovirus or who develop signs and symptoms compatible with parvovirus. HICPAC voted unanimously to accept the recommendations. The disposition of the vote was as follows:

- 13 Favored: Anderson, Babcock, Bryant, Chopra, Daniels, Dekker, Fakh, Guzman-Cottrill, Lin, Maragakis, Patterson, Preas, Reifsnyder
- 0 Opposed
- 0 Abstained

Vote: Cytomegalovirus

The cytomegalovirus recommendations were put forth for approval as presented, with the addition of a recommendation for pregnant or immunocompromised HCP who have an exposure to CMV or who develop signs and symptoms compatible with CMV. HICPAC voted unanimously to accept the recommendations. The disposition of the vote was as follows:

- 13 Favored: Anderson, Babcock, Bryant, Chopra, Daniels, Dekker, Fakih, Guzman-Cottrill, Lin, Maragakis, Patterson, Preas, Reifsnyder
- 0 Opposed
- 0 Abstained

Draft Update: “Testing and Follow-Up Information for Healthcare Personnel Potentially Exposed to Hepatitis C Virus”

David T. Kuhar, MD

Medical Officer

Division of Healthcare Quality Promotion

National Center for Emerging and Zoonotic Infectious Diseases

Centers for Disease Control and Prevention

Dr. Kuhar explained that the *Guideline for infection control in healthcare personnel, 1998* includes an section on Hepatitis C Virus (HCV), which will be updated. CDC’s Division of Viral Hepatitis (DVH) is currently updating guidance for testing and follow-up for HCP exposed to HCV, in collaboration with a number of internal and external experts; that guidance will be incorporated into the HCP Guideline work.

The draft guidance from DVH will provide updated CDC recommendations for laboratory testing and follow-up of HCP who potentially have been exposed to HCV through an exposure to blood or body fluid. Once published, this new guidance is intended to supersede all previous guidance.

CDC last updated testing recommendations for exposed HCP in 2016. That algorithm recommended testing of exposed HCP within 48 hours of an exposure. A positive anti-HCV antibody test is followed by HCV ribonucleic acid (RNA) testing. If positive, the individual is referred to care for pre-existing chronic infection. If the RNA test is negative, or if the initial anti-HCV antibody test is negative, the individual is considered susceptible, and follow-up testing is needed: at 3 or more weeks post-exposure, HCV RNA testing is recommended. If that follow-up RNA test is negative, no further testing is recommended. If the RNA test is positive, the individual is referred to care.

In the draft updated guidance, post-exposure testing of exposed HCP includes anti-HCV antibody testing 4-6 months after the initial exposure. The rationale for the addition is that based upon current understanding of early HCV infection viral dynamics, periods of aviremia are described when older HCV RNA testing methodologies are used. However, relevance to the use of newer, highly sensitive RNA testing is unclear. A second important point is that treatment of acute HCV infection is now recommended in recently updated [guidance](https://www.hcvguidelines.org/) (https://www.hcvguidelines.org/) from the American Association for the Study of Liver Diseases (AASLD) and the Infectious Diseases Society of America (IDSA). Third, source testing has been updated in consideration of the increasing incidence of acute HCV infection among growing numbers of persons who inject drugs (PWID). If the source is known or suspected to have recent behavioral risks for HCV (for example, injection drug use), or if risk cannot be reliably assessed, initial source testing should include a test for the HCV virus, such as a nucleic acid test (NAT) for HCV RNA.

The revised algorithm is still in draft format and under discussion with co-authors and experts. The first half focuses on testing the source:

- Option A: Test for anti-HCV, with reflex to a NAT test for HCV RNA if the test is positive.
 - If NAT is not available, an anti-HCV test should be used, and follow-up testing of the exposed provider should be conducted.
 - If the anti-HCV test is positive and NAT is available, NAT should be used.

- If the NAT is positive, the source should be referred to care, and testing of the exposed provider should proceed.
 - If the NAT is negative, or if the initial anti-HCV test is negative, testing can be stopped, and follow-up testing of the exposed provider is not needed.
- Option B, when a source patient is suspected to be in the “window period:” if a patient is suspected to have had recent behavioral risks for acute HCV, such as injection drug use, antibody tests might not yet be positive.
 - Testing with NAT for HCV RNA is recommended.
 - If the NAT is positive, the source should be referred to care, and follow-up testing of the exposed provider should proceed.
 - If that NAT is negative, testing can be stopped and no further testing of the exposed provider is recommended.

The second part of the algorithm pertains to testing exposed HCP if the source is positive for anti-HCV or HCV RNA, or if the source’s HCV infection status is unknown.

- Initial testing should be conducted for anti-HCV, with reflex to HCV RNA test if positive, as soon as possible after exposure as part of baseline testing, which may be done simultaneously with the source.
 - If the anti-HCV test and HCV RNA test are positive, the individual should be referred to care for pre-existing chronic infection.
 - If the anti-HCV test is negative, or the anti-HCV test is positive but reflexes to the HCV RNA test and it is negative, HCP is susceptible to infection and should be tested with a NAT for HCV RNA at ≥ 3 weeks after exposure.
 - If that test is positive, refer to care.
 - If HCV RNA is negative or not tested, test for anti-HCV with reflex to an HCV RNA test if positive, 4 to 6 months after exposure.
 - If that test is negative, testing may be stopped and HCV may be ruled out.
 - If HCV RNA is positive or anti-HCV seroconverts to positive, refer to care.

Several questions are anticipated regarding the updated guidance:

- *What is recommended for HCP exposed to blood or body fluids from an anti-HCV positive, but HCV RNA negative, source?*

HCP exposed to blood or body fluids from a source testing anti-HCV positive, but HCV RNA negative, are not currently recommended for follow-up testing. However, if there are concerns regarding specimen integrity that may have compromised test results, including handling and storage conditions, or if at any time clinical signs of HCV infection appear in the HCP, follow-up testing may be warranted. CDC is unaware of any transmissions to HCP from an anti-HCV positive, HCV RNA negative source. Most published descriptions of HCV-exposed HCP focus on the source anti-HCV test results, rather than on tests for HCV RNA. However, data are available from one European case-control study of HCP who became anti-HCV positive after exposure to an anti-HCV positive source during 1991-2002, which demonstrated that among the small number for whom source HCV RNA status was known (n=37, 62% of HCP who became anti-HCV positive), all sources had been HCV RNA positive. However, data are sparse.

- *Do HCP who were tested under the 2016 algorithm with a single HCV RNA test at ≥ 3 weeks after exposure need to be re-tested for anti-HCV now, as they did not have the currently recommended anti-HCV test at 4-6 months post-exposure?*

CDC now recommends the 4-6 month post-exposure anti-HCV test out of an abundance of caution because of the potential for periods of intermittent aviremia during acute infection described in several earlier publications, primarily when older HCV RNA testing methodologies were used. Relevance to the use of newer, highly sensitive RNA testing is unclear. CDC is not aware of infections “missed” by the abbreviated HCV RNA-based testing schedule made available in 2016, which was prompted by dramatic improvements in HCV RNA testing methodologies, which have greater test sensitivity. CDC’s assessment, based upon sparse data, is that the risk to persons tested under the 2016 guidance is minimal, but not zero. Hence, CDC does not recommend notification and re-testing of persons tested under the 2016 algorithm. However, for any person who has signs or symptoms of viral hepatitis, or for those who wish to have absolute certain confirmation that transmission did not occur from the past exposure, a test for anti-HCV with reflex to RNA could be considered.

- *When is baseline testing of the source for HCV viral RNA recommended?*

If the source is known or suspected to have recent behavioral risks for HCV, such as injection drug use, or if risk cannot be reliably assessed, initial testing of the source should include a test for HCV. HCV RNA becomes detectable as early as 1-2 weeks after exposure. Anti-HCV does not become detectable until an average of 8-11 weeks after exposure. This timespan could be further delayed among persons with immunosuppression, such with HIV infection. The incidence of acute HCV infection is increasing in the US, primarily related to injection drug use: there was a 3.7-fold rise in cases reported to CDC between 2010 and 2017. Window-period infections (testing anti-HCV negative, but HCV RNA positive) have been identified among 5.3% of HCV RNA-positive organ donors who had recent behavioral risk factors for viral hepatitis during 2014-2017. These data suggest the possibility that in some healthcare settings, HCP may be exposed to source patients with early HCV infection prior to development of detectable HCV antibody. Therefore, more attention is being drawn to this potentially-growing population of infectious source patients.

- *Is there currently recommended post-exposure prophylaxis (PEP) for HCP potentially exposed to HCV to prevent infection?*

HCV PEP is not recommended for HCP who have occupational exposure to blood and other body fluids. Recent estimates indicate that about 0.2% of HCP percutaneous exposures to HCV antibody-positive blood or body fluids result in transmission. Thus, routine PEP for all such exposures would treat approximately 1000 individuals for every 2 who might become infected. The effectiveness and duration of treatment required for HCV PEP has not been established. A pilot trial of a 2-week, direct-acting antiviral (DAA) PEP regimen was initiated in 2019 for HCP who experience hollow-bore needle exposure to an HCV RNA positive source - factors that may be associated with increased transmission risk. Although this study will not have sufficient statistical power to determine the impact of PEP on seroconversion rates, it is the first DAA PEP study for HCP. In contrast with the other bloodborne pathogens (Hepatitis B virus and HIV) for which PEP is recommended, if HCV transmission does occur, currently available DAA therapy is highly effective in eradicating both acute and chronic HCV infections.

Discussion Points

ACOEM expressed concern that, compared to the 2016 guidance, the draft guidance “muddies the water” in reintroducing the antibody test, particularly if an antibody test with a negative PCR yields the same results that an initial PCR would have gotten. Particularly in light of the increasing risk of acute HCV, a source patient potentially in the window period, and the inconsistent ability to characterize recent risk adequately in many of those patients, ACOEM felt that the default should be to the PCR test as the first choice, if it is available, rather than suggesting that it only be used when a patient has disclosed recent risk. Certainly, antibody tests should be used in centers where the NAT with PCR test is

not available. The new guidance has contradictory messages regarding the approach for a source patient who is antibody positive and PCR negative. The text discusses optional follow-up of exposed HCP without necessarily specifying that it is only when there is concern about the quality of the sample from the source patient. This point should be clarified and made consistent. The urge to recommend another safety check by conducting an antibody test on exposed HCP at 4 to 6 months is problematic from a Bayesian standpoint: if, relative to the occupational exposure, a PCR test at 3 to 6 weeks is negative, in looking at positive predictive value (PPV) for conversion from the occupational exposure of an antibody test done at 4 to 6 months, most will be false positives. The results that are not false positives also may be due to an intervening non-occupational risk, which “muddies the waters” in terms of Workers’ Compensation decisions and other considerations.

Ms. Anne Moorman, DVH, CDC, said that these issues can be discussed further, as the guidance is in draft form. In the 2016 guidance, the RNA test was recommended ≥ 3 weeks later. A 3-6 week cutoff was not provided, but it would be another way of “tightening up the time window” and ensuring that aviremia would not be reached during that period. A single case report several years ago concerned a worker in Germany who seroconverted, but remained RNA negative until approximately 9 months after the exposure. Interestingly, that case also had a very late “bump” in alanine aminotransferase (ALT), which raises a question about whether there may have been a later exposure. It is difficult to know exactly what happened. Some stakeholders expressed concern about not including the 4-6 month antibody test. It is true that the vast majority of positive antibody tests in a low-risk population would be false positives. Some providers expressed concern about costs in some healthcare settings.

HICPAC agreed with the concern about risk behaviors, such as intravenous drug use. It is difficult to identify those patients, so defaulting to the RNA test is more reliable than self-reporting risk behaviors.

HICPAC emphasized the difficulty in conducting risk stratification for patients, especially since it is unclear how to operationalize it. Does risk assessment and stratification rely on what has been reported in the medical chart? The value of a social history is highly variable, depending upon who took the history, how carefully, and for what purpose. Additionally, some facilities begin with the antibody test because it is cheaper than NAT testing.

HICPAC pointed out concerns about the late antibody test, as well as related concerns about the language stating that any time HCP have symptoms compatible with HCV, they should be tested. From an Occupational Health Service (OHS) perspective, it is important to be careful about the window of opportunity to attribute symptoms to exposure. It almost gives the impression that if HCP develop symptoms 2 years after an exposure, they should be tested in conjunction with that exposure. It might be more helpful to tighten the time, or to specify the time interval for the NAT screening test. Perhaps it could be stated that “periods of aviremia tend to be early,” and timing for the NAT test could be added.

Regarding performing reflex testing from antibody to NAT, HICPAC noted that some might not conduct reflex testing on the same sample due to the risk of contamination during serologic testing. The American College of Pathology (ACP) recommends that all molecular testing be conducted under sterile processes, and that once a tube has been accessed for serologic tests, it can result in false positives. Reflex testing is difficult from an operational standpoint because 2 tubes are needed. Pointing out the operational difficulties might move the cost consideration discussions toward just using NAT for initial source patient testing.

Dr. Saleem Kamili, DVH, CDC, indicated that there are FDA-approved antibody assays on different automated platforms. Only one has a fixed probe, which introduces the potential of low-level contamination. The manufacturer of this platform has been informed about this problem and is expected to retrofit or fix this issue within 6 to 9 months. Perhaps a footnote could explain this point.

The other platforms used for antibody testing in major commercial and clinical laboratories have a disposable system for sample transfer, for which no evidence of cross-contamination was found. A manuscript will be published on this issue soon, which should address concerns associated with using the same tube for reflex testing on additional platforms.

HICPAC observed that many factors contribute to the choice of testing platform, and it may be difficult to “get into the weeds” of those factors for a recommendation. It may be worth incorporating language into the text to consider the risks of the various strategies.

Dr. Bell pointed out that for the guidelines HICPAC promulgates, academic realities and scientific details are always present; however, ultimately, there are realities associated with implementation. He appreciated that this guideline was being presented in the draft state and emphasized that some practical implementation concepts should be incorporated. He appreciated that industry is engaged with retrofitting and that they are being encouraged to do so, because better equipment is desired. The responsible party for carrying out the recommendation that is contingent upon double-checking results from in-house and send-out laboratories is not clear, but it is probably not OHS. It is not clear how to apply this recommendation in a broad and convoluted health system. At a minimum, some clarification needs to be done, and some thought needs to be given to addressing logistical hurdles.

The National Clinicians’ Post-Exposure Prophylaxis Hotline (PEpline) receives numerous calls from urgent care, emergency departments (EDs), rural EDs, and other facilities around the US because not all of the testing in the algorithm is available to all facilities. It is important to keep this fact in mind, especially in terms of RNA tests, which are send-out tests for many providers.

Regarding the concern about false positivity at 4-6 months, HICPAC said that testing for anti-HCV would be negated by the inclusion of a reflex to the viral load test; however, additional testing leads to stress and worry for HCP who have the false positive test, even if the RNA is negative. The other risk that remains is attribution, and whether a positive result is likely to have been from an exposure that occurred 6 months previously, or from another exposure risk in that timeframe.

US Food and Drug Administration Update

Reducing the Risk of Infection from Reprocessed Duodenoscopes

Ms. Ann Ferriter

Director, Division of Analysis and Program Operations

Center for Devices and Radiological Health

US Food and Drug Administration

Ms. Ferriter described duodenoscopes, a type of flexible endoscope used in endoscopic retrograde cholangio-pancreatography (ERCP) operations. Physicians use the scopes to access the common bile duct and the pancreatic duct. The scopes contain an “elevator mechanism” that is challenging to clean. After each use, duodenoscopes are reprocessed.

In September 2013, CDC alerted FDA of an association between MDRO infections and duodenoscopes. In 2015, under FDA orders, duodenoscope manufacturing companies began a series of 522 Postmarket Surveillance Studies. The final reports from the studies are not complete, but the initial evidence shows contamination rates that are higher than expected. Interim contamination rates with high-concern organisms range from 4% to 6%. These contaminations do not always result in infections; in fact, infections have decreased over the past 5 years. However, reports of infections and outbreaks continue to occur: 5 outbreaks were reported in 2018, and 4 outbreaks have been reported in 2019 to date.

Concerns regarding infections associated with duodenoscopes were brought before the FDA CDRH General Hospital and Personal Use Devices Panel on November 7, 2019. A variety of stakeholders engaged in this panel meeting, including professional societies, accrediting organizations, stakeholder professional societies, device manufacturers, healthcare systems, and CDC. FDA was grateful for the diverse panel that reflected the complexity of this issue.

The panel considered the following 5 questions posed by FDA and made recommendations to address each of them:

- 1.** Considering the currently available MDRO data and post-market surveillance data, as well as the challenges with implementation of new reprocessing methods and adoption of new technologies, does the panel recommend:
 - continued incremental improvements (e.g., disposable endcap duodenoscopes, release of newly validated reprocessing instructions) to improve the safety of reprocessed duodenoscopes, versus
 - more substantial changes to duodenoscopes and reprocessing methods?

Panel Recommendations:

- Focus on training and oversight of reprocessing. Collaborate with manufacturers, accrediting organizations, and other stakeholders to promote correct reprocessing of duodenoscopes in healthcare settings.
- Avoid mandates on strategies to reduce risk. Carefully consider next steps and make deliberate decisions.

- 2.** Does the panel have comments on FDA's proposal to standardize duodenoscope durability testing to include 250 cycles of simulated use, cleaning, high-level disinfection (HLD), and terminal sterilization?

Panel Recommendations:

- Standardize durability testing. Damage to the duodenoscopes is not often recognized by healthcare personnel.
- Collaborate with industry on details of durability testing.

- 3a.** The panel is asked to comment on the potential for new designs to reduce the observed contamination rate with reprocessed duodenoscopes, and the urgency with which the transition to new duodenoscopes should be made.

Panel Recommendations:

- The panel recognized that new designs may help reduce contamination. However, there is insufficient data on reduction in contamination due to new duodenoscope designs.
- Consider additional modifications to the device design and reprocessing instructions, education, and practices.

- 3b.** For technologies that are intended to reduce contamination rates for duodenoscopes, what is the appropriate balance between demonstrating the effectiveness of the technology prior to marketing, versus the benefit of having the technology available for use?

Panel Recommendations:

- There is a need to demonstrate effectiveness of designs intended to reduce the risk of contamination prior to those devices being available for use.
- The panel recognized the challenges associated with generating such data prior to marketing.

4. Does HLD provide an adequate margin of safety? Considering the challenges and benefits of sterilization for routine duodenoscope reprocessing, is a transition towards sterilization warranted, and if so, how can the inherent challenges with sterilization be addressed?

Panel Recommendations:

- Cleaning is the most important step.
- In properly cleaned duodenoscopes, HLD is appropriate. Reports indicate that duodenoscopes are not properly cleaned.
- There are challenges in implementation of sterilization. Ethylene oxide (EtO or EO) is the only gas sterilization cleared for use with duodenoscopes. There are many challenges with EtO in terms of hospital costs and environmental concerns.

In summary, the panel's feedback to FDA was:

- Focus on reprocessing, training, and oversight.
- Standardize durability testing.
- Improve the development of reprocessing techniques.
- Use both pre- and post-market data.
- HLD is sufficient if done properly, but it is difficult to do properly. There are challenges with implementation of sterilization.

FDA has regulatory authority pertaining to durability testing and the use of pre- and post-market data. Collaborations with partners will be important to address the issues of training, oversight of reprocessing, and looking toward the next technology in disinfection or sterilization.

Discussion Points

HICPAC asked about the panel's deliberations regarding challenges associated with proper cleaning of endoscopes.

Ms. Ferriter replied that the panel discussed HLD versus sterilization. After rigorous discussion regarding challenges associated with EtO, the panel noted that the HLD issue should be addressed through training and oversight, not through sterilization. Currently, no sterilizers are cleared for duodenoscopes. There are indications that sterilization damages the duodenoscopes and adhesives, and could lead to future contamination that would be even harder to address. The panel could not recommend sterilization due to a lack of strong options to recommend. Therefore, the panel recommended HLD, but noted its flaws. FDA is pursuing ways to improve HLD and the future of sterilization.

Dr. Bell thanked FDA for taking the time to speak to HICPAC. He asked about the "goalposts" regarding evidence to support recommendations related to disposable parts: is there a quantity or type of information sought? Is it being gathered? Given the design of the tip of the scope, it is difficult to build disposable channels: are removable sleeves being designed? An innovative product was shared as part of CDC's engagement with its vendor colleagues. This extremely fine hydrogel of microscopic wood pulp was demonstrated to do a remarkable job of surface cleaning in comparison with brushes.

Ms. Ferriter indicated that FDA has launched another series of 522 Postmarket Surveillance Studies to collect microbiological data, sampling and culturing disposable tips after reprocessing approximately 800 scopes. She was aware of the fine hydrogel of microscopic wood pulp, but FDA has not cleared anything like it, and no public information is available regarding removable sleeves.

HICPAC asked for clarification regarding whether the panel's recommendation suggested that HLD was also not being done correctly. Many facilities use automated processes. It is not clear how cleaning will be adequate with sterilization if cleaning is inadequate with HLD.

Ms. Ferriter said that the final reports from the current 522 studies are not complete, but they believe that disinfection fails because the cleaning is inadequate. A study to compare different reprocessing methods would be key to answering this question. There are examples of hospitals that have not experienced further outbreaks after beginning sterilization of their scopes, so there is anecdotal evidence that reprocessing with sterilization - probably accompanied by improved cleaning - is working.

HICPAC stressed that most of the country does not have the option of sterilization available. Ms. Ferriter noted that hospital representatives on the panel conveyed the same idea: many do not have access to EtO.

HICPAC wondered how to ensure adequate cleaning of instruments.

Ms. Ferriter replied that answering this question will require significant collaboration. ATP tests can detect protein on scopes, but FDA does not have data to indicate whether those tests can assess scope cleaning. Methods of understanding whether cleaning is done adequately would be beneficial, and FDA has reached out to the firms that make ATP. Current certification programs of which FDA is aware do not have a practical component, and have little oversight. It is not clear whether reproprocessors' instructions for use (IFUs) are applied uniformly and properly.

HICPAC noted the research on presumably-clean scopes which were demonstrated to have areas that were not clean, and were not cleanable by a technician. Discussion regarding novel ways to ensure cleaning, beyond training approaches, is critical. The cleaning process has more than 100 steps.

Regarding scope durability, HICPAC wondered about sending scopes back to manufacturers at an interval for disassembly, cleaning, and checking for cracks and leaks. Leak testing is part of the reprocessing process, but it is user-dependent and may not be sensitive. A process with disassembly and return or trade-out that could look at risk over time would be ideal, preferably in a way that is cost-effective for hospitals. While this concept is not within the purview of HICPAC, it is interesting to keep in mind.

Ms. Ferriter indicated that the IFUs for Olympus, PENTAX, and FUJIFILM scopes call for the scope to be returned after one year of use for preventive maintenance. The results from the 522 Studies could validate the one-year maintenance cycle, or could lead to consideration of more frequent maintenance if one year is not sufficient.

APIC emphasized that the cleaning IFUs are more than 100 pages long. Technologists want to do a good job, but they are not being "set up for success," for patient safety. The design of the endoscope makes it nearly impossible to ensure that it is 100% clean via HLD or sterilization. The design is flawed in many ways. It is not clear how much progress has been made or what priorities are in place, because outbreaks are still occurring.

Ms. Ferriter stressed that there are many fewer outbreaks now than in the past. In 2015, there were over 20 outbreaks. Now there are 5 or 6. She underscored that this is a patient safety concern, and addressing it with training only will not be adequate.

Ethylene Oxide Sterilization of Medical Devices Update

Ms. Julia Marders

**Assistant Director, All-Hazards Readiness, Response, Cybersecurity
Division of All Hazards Response, Science, and Strategic Partnerships
Office of Strategic Partnerships and Technology Innovation
Center for Devices and Radiological Health
US Food and Drug Administration**

Ms. Marders said that more than 20 billion devices sold in the United States every year are sterilized using EtO. That number accounts for approximately 50% of devices that require sterilization. EtO is used because it can penetrate into hard-to-reach areas in certain devices, does not seem to degrade medical devices during the sterilization process, can penetrate paper and packaging, and is relatively easy to use. Many medical devices can be sterilized at once on large pallets. Examples of some of the types of devices that are sterilized with EtO include drug-eluting stent (DES), catheters, shunts, deep brain stimulators (DBS), intravascular infusion ports, surgical kits, full catheter trays, pacemakers, syringes, gauze, intravenous tubing sets, blood lines, fiber optic endoscopes, renal hemodialysis sets, etc. Moving to other forms of sterilization modalities presents a complex problem.

FDA continues to be engaged at all stages of the EtO sterilization issue, which has great impact for patients, healthcare personnel, hospitals, and others. FDA is aware of the concerns of communities surrounding EtO sterilization facilities, and of the uncertainties surrounding the risks of EtO emissions. FDA is working with device manufacturers, federal partners, state and local authorities, healthcare delivery organizations, purchasing organizations, device users, and patients to understand and evaluate potential impacts and take additional steps to mitigate shortages and prevent patient harm.

FDA became aware of facility closures among facilities that use EtO to sterilize medical devices when the Illinois Environmental Protection Agency (EPA) issued a Seal Order on February 15, 2019, to stop the Sterigenics facility in Willowbrook, Illinois, from sterilizing medical products and other products with EtO. Since that time, FDA has focused on addressing the immediate impacts of these closures and other potential closures to help ensure that patients have access to safe and effective devices.

Sterigenics facilities in Willowbrook, Illinois, and Atlanta, Georgia, are closed. The Illinois facility will not reopen. The timing for reopening the Georgia facility, if it will reopen, is uncertain. The large Becton Dickinson manufacturing facility in Covington, Georgia, was closed for a week so that baseline air monitoring could occur. There is a great deal of public pressure surrounding the future of that facility. Medline Industries in Illinois was in jeopardy of closing due to pending state legislation, but that bill did not pass, and that facility is no longer in imminent danger of closure; however, future legislation could impact the facility. Viant in Grand Rapids, Michigan, is closing permanently.

FDA has been involved in shortage activities, working to mitigate supply chain disruptions. The FDA launched a Shortages Mailbox, which is closely monitored to learn of impacts to the supply chain. The sooner that FDA hears about potential supply chain disruptions, the better. There was a shortage involving the Bivona[®] tracheostomy tube, which was sterilized at the now-closed Sterigenics facility in Illinois. FDA helped the manufacturer change its sterilization site so that supply disruptions were minimal.

As additional closures of sterilization facilities are anticipated, FDA continues to reach out to manufacturers to better understand the impact to their devices. FDA offers assistance with identification of substitute devices, expediting sterilization site change requests, and identifying potential alternate methods of sterilization. FDA urges manufacturers to assess their inventories for potential downstream effects of closures on their product distribution, and asks them to continue to inform FDA about those issues. In the process of information-gathering, FDA has found a common theme of increasing concern that if additional facilities close, the system does not have the capacity to absorb the load.

FDA continues with communications activities focused on the EtO issue. On July 15, 2019, FDA announced an *Innovation Challenge: Preventing Medical Device Shortages by Ensuring Safe and Effective Sterilization in Manufacturing*. On October 25, 2019, FDA released an *FDA Commissioner's Statement on concerns with medical device availability due to certain sterilization facility closures, and the need for*

manufacturers and healthcare facilities to take action in assessing their supplies and determining their contingency plans. The FDA website was updated, and a Facility Update page was included. Additionally, the 24-hour summary for the November 2019 Advisory Committee meeting was released.

FDA has also engaged with lawmakers, holding approximately a dozen briefings with state and federal stakeholders and Congress between May and November to inform them about the landscape of medical device EtO sterilization, and the roles of FDA versus EPA to provide insight about anticipated impact on patients if further closures occur. The briefings are informational, providing facts to stakeholders so that they can understand potential impacts on patients. FDA shares the public's objective to reduce the overreliance on EtO for medical device sterilization and is committed to working with manufacturers to identify alternative sterilization options. In these briefings, FDA requests that states share information about potential closures.

Each stakeholder has a different role in this issue.

- The role of sterilization experts is educational, and the objective of FDA engagement is to understand EtO reduction approaches and alternatives.
- EPA's role is to regulate EtO emissions at the state and national levels, and FDA engages to understand and inform EPA rulemaking and maintain awareness of contract sterilizer site closures.
- CDC's role is to understand the public health impact of EtO emissions from an epidemiological perspective to:
 - understand and inform large-scale cancer epidemiologic studies,
 - maintain awareness of health-related studies, and
 - support communications of public health risk associated with environmental concerns to affected communities.

The goals of the aforementioned Innovation Challenge are to encourage ideas from stakeholders, academics, industry and others to submit novel solutions for two challenges:

1. Identify new or alternative sterilization methods and technologies that are alternatives to those that use EtO; and
2. Focus on reducing EtO emissions.

FDA is reviewing the approximately 40 submissions to the Challenge and hopes to share information about the accepted submissions soon.

FDA convened an Advisory Committee meeting on November 6-7, 2019, dedicated to discussing how to encourage innovation in medical device sterilization, and the role of industrial sterilization in maintaining public health. During the meeting, invited speakers presented information regarding:

- the impact of EtO to the medical device supply chain,
- reducing EtO from medical device sterilization, and
- providing alternative modalities for industrial sterilization within the existing infrastructure.

Some of the key takeaways from the meeting were:

- Patients would suffer from abrupt unavailability of devices sterilized using EtO.
- The current EtO ecosystem cannot absorb additional facility shutdowns.
- Alternative methods have significant challenges due to material compatibility, scalability, and packaging.
- Moving completely away from EtO for the sterilization of medical devices could take up to 10 years.

The Advisory Committee Panel provided a number of recommendations, including:

- Continue to work collaboratively with other government entities at the federal and state levels to communicate and manage device shortages.
- Pursue all applicable methods for reducing EtO use, recognizing that no single method will address all of the current issues.
- Encourage the use of alternatives to the “overkill” validation methods, which are included in consensus standards for EtO processes.
- Ensure that manufacturers review sterilization modalities which may be compatible with their devices and, if possible, validate to the newer methods.
- Strongly consider removing IFUs from any devices that are being sterilized with EtO.

FDA will announce the applications that were selected for the Innovation Challenge soon. The Advisory Committee summary will be communicated, and the action items from the meeting will be determined. FDA will continue its engagement with firms regarding potential shortages, with the goal to mitigate any shortages or problems with device availability for patients via real-time review of sterilization approaches using benefit/risk. FDA’s SMEs will continue to submit informational pre-submissions for alternative sterilization methods, with the objective to enhance FDA’s understanding of available methods to inform decision-making. FDA looks forward to continuing to update HICPAC on this issue.

Discussion Points

HICPAC asked whether the EtO sterilization plants were closed due to accidental releases, because levels were high despite correct operation of the plants, or if the closures were due to concern regarding potential problems.

Ms. Marders explained that the State of Illinois issued the Seal Order on Sterigenics because of its emissions. The Georgia Sterigenics plant was closed because it is undergoing upgrades and changes to emissions. The Becton Dickinson plant in Georgia was recently closed, and the state is conducting baseline air monitoring. Communities and citizens are pressuring legislators to close these plants. It is not entirely clear whether the closures are due to accidental releases, fear of releases, or both. The plants have met the current standards. EPA is involved in Rulemaking regarding acceptable EtO emissions, but their Final Rule has not been published. Therefore, various states are addressing the issue themselves.

FDA does not regulate industrial sterilizers. FDA regulates the process for validating medical devices. One of the challenges associated with this issue is the jurisdictional lines between state and federal governments: the federal government cannot cross over into what the state does, and vice versa. Another challenge is that FDA ensures that hospitals are supplied with medical devices that are safe and effective. This issue brings about a “domino effect” as FDA works to prevent device shortages. More than 50% of all medical devices used in hospitals and clinics are sterilized by EtO. While some devices could potentially utilize another modality (e.g., hydrogen peroxide, steam, radiation), challenges will remain regarding material compatibility and Cobalt-60, which is regulated by the Department of Defense (DoD) and is difficult to obtain. FDA expressed gratitude to Dr. Cardo and her team, who have been instrumental in lending SME support, including during the Advisory Panel meeting in November.

HICPAC observed that radiation has been used to eradicate infections in food and wondered about radiating medical equipment. FDA replied that there are medical devices for which radiation is utilized, but there are challenges associated with material compatibility and the ability to obtain Cobalt-60.

Dr. Bell commented that EPA brings a great deal of information to this issue in terms of baseline levels, acceptable levels, measuring levels, etc.

Dr. Cardo inquired as to the percentage of EtO used in health delivery systems in other countries, and whether it is similar to the United States.

Ms. Marders confirmed that other countries use EtO to sterilize medical devices, but other countries do not seem to be experiencing these problems. A representative from the UK spoke at the Advisory Committee meeting.

HICPAC asked whether this issue is considered to be “dire,” given the significant percentage of devices that use EtO, the rolling shortage concept, and the plant closures.

Ms. Marders responded that FDA considers this issue to be challenging and complex. There are areas in which short-term impact can be made, but other areas will take longer to resolve. In the panel meeting, caution was suggested regarding how abruptly the facilities are shut down, as the abruptness can have immediate impact on the availability of devices and on patient care. However, a phased approach or the use of alternative sterilization modalities with niche devices and could help facilitate device movement and decrease the overall EtO emissions footprint.

Federal Entity Comments

Gary A. Roselle, MD
National Director
Infectious Diseases Service
Veterans Health Administration
Department of Veterans Affairs

Dr. Roselle was dismayed by an apparent lack of progress regarding duodenoscope processing in the last 4 years. Manufacturers frequently indicate that they will make improvements, but little seems to have changed, and outbreaks still occur. It is obviously not possible to clean the elevator mechanism, as it is currently designed, properly. Suggested changes to cleaning procedures, such as using a smaller brush, have not worked. Regarding EtO emissions, it is possible for poisonous and toxic gases not to be released into the atmosphere, and it is not clear why this problem persists.

Day 1 Public Comment

Kevin Kavanagh, MD, MS
Health Watch USAsm

Dr. Kavanagh observed that these times are the beginnings of the post-antibiotic era. Of particular concern are nursing homes, where the reported risk of carriage of resistant bacteria is alarming: well over 50%. Carriage in both patients and the environment can last for months. The *2019 CDC Threat Assessment* lists *C. auris* and CRE as urgent threats, and MRSA as a severe threat. A slide from this morning’s presentation about threat assessment stated that *C. auris* and CRE need to be contained through an aggressive approach. However, the current Enhanced Barrier Precautions for nursing homes have lowered the standard of control for these 3 dangerous organisms. Enhanced Barrier Precautions do not require a single room, do not require restriction of movement or of activity participation, and gowns are not required for lowest-risk activities.

MRSA-colonized patients have been shown to contaminate the environment more than those with an infection. According to Roghmann, et al, the risk of nursing home resident MRSA colonization is 28.2%. An example of a low-risk activity would be distributing medication, which has a detected transmission to gowns and gloves of healthcare workers of 8% and 16%, respectively, for each resident interaction. If a typical healthcare worker passes medication and cares for 25 residents, and the average patient receives 3 medications per day, and 7 of these residents are MRSA carriers, then there would be 147 interactions

per week with colonized residents. At an 8% transmission rate to gowns per interaction, one would expect 11 transfers of MRSA to the clothes of an ungowned healthcare worker each week with Enhanced Barrier Precautions. The same calculation can be done for gram-negative bacteria using Blanco, et al, data, and it would equate to one transmission per week. This data also illustrates how hand hygiene alone will not be effective in stopping this epidemic.

The “excuse” that residents need to have dignity preserved pales in reality to the risk inflicted upon visiting grandchildren whom no nursing home resident would want to infect. What is the transmission risk when one hugs their grandchild? Dr. Kavanaugh doubts that the risk is low. Soon nursing homes will not be frequented by young children, which certainly does not preserve dignity of the residents. It is of utmost importance to have an informed public and parents, and to protect healthcare workers. Finally, if we are unable or unwilling to allocate the resources to stop this epidemic, we need to at least provide informed consent to patients regarding the risks of these infections and the carrier rates within their facilities.

Liaison Representative / *ex officio* Member Reports

American College of Occupational and Environmental Medicine (ACOEM)

ACOEM called attention to 2 items in the written report: the release in October 2019 of a Position Statement addressing legalization of marijuana and implications for safety in the workplace, a complex topic, and near-completion of the incorporation of additional input from the National Tuberculosis Controllers Association (NTCA) in a joint ACOEM/NTCA document aimed at fleshing out implementation and practical issues around the new guidance from CDC on tuberculosis (TB) surveillance among HCP.

America’s Essential Hospitals (AEH)

AEH has busy with a variety of collaborative efforts supporting many of the groups in the room and CDC with regard to antibiotic stewardship programs, promoting education, support tools for infection prevention programs, and creating awareness of antimicrobial resistance. Notably, AEH engaged in a collaborative effort centered around stewardship efforts with Los Angeles County-USC Medical Center in July 2019, and the Los Angeles County Department of Public Health. AEH partnered with the US Stakeholder Forum on Antimicrobial Resistance (S-FAR), has been involved in the AMR Challenge, was a participant in the International Infection Prevention Week October 13-19, 2019, and continues to promote information on AR threats and infection control in HCP for employee health.

Agency for Healthcare Research and Quality (AHRQ)

AHRQ released their *Toolkit to Improve Antibiotic Use in Acute Care Hospitals*, which was developed by the AHRQ Safety Program for Improving Antibiotic Use and provides materials to develop or improve antibiotic stewardship programs; improve patient safety culture as it pertains to antibiotic prescribing; and engage frontline staff in improving prescribing behavior using the Four Moments of antibiotic prescribing, and diagnosing and treating hospitalized patients with common infectious syndromes. The *AHRQ Safety Program for Improving Antibiotic Use* is also nearing the end of a long-term care cohort, with over 450 LTCFs participating. An ambulatory care cohort will begin in December, for which AHRQ is still recruiting. This safety program is a five-year program with an aim to recruit 250-500 facilities in each of three settings (clinics, physicians’ offices, and urgent care centers). The *AHRQ Safety Program for Improving Surgical Care and Recovery* incorporates an adaptation of the Compressive Unit-based Safety Program (CUSP) to improve patient outcomes by increasing the implementation of evidence-based enhanced recovery practices in hospitals. This program is also a five-year project that includes colorectal, orthopedic, gynecologic surgery, and emergency general surgery cohorts. The emergency general surgery cohort will be added in March 2020. The *AHRQ Safety Program for Intensive Care Units*

(ICUs) is ongoing, focused on preventing CLABSIs and CAUTIs. Over 500 ICUs have been recruited. The last cohort is recruiting now and will begin in January 2020. On September 23, 2019, AHRQ awarded a one-year task order to Johns Hopkins to create the *Active Bathing to Eliminate Infection (ABATE) Trial Toolkit* based on the results of the ABATE trial, which was funded by National Institutes of Health (NIH) and showed a 30% reduction in all-cause BSIs in non-ICU patients with indwelling devices through decolonization with chlorhexidine bathing and nasal mupirocin. The toolkit is anticipated to be available on the AHRQ website in 2020. AHRQ continues to work with its national partners on the National Action Plan for Combatting Antibiotic Resistant Bacteria (CARB), and is participating in two Workgroups: Goal 1 Promoting Antibiotic Stewardship (AS) and Goal 3 Diagnostics for Antibiotic-Resistant Bacteria.

Association of periOperative Registered Nurses (AORN)

AORN has upgraded all of its guidelines to the new AORN Evidence Model and will revise 7 guidelines over the next year. Two are of interest to HICPAC: one is Instrument Cleaning, and the other is Preoperative Skin Antisepsis. AORN presented a joint statement with the Society of Gastroenterology Nurses and Associates (SGNA) at FDA's Medical Devices Advisory Committee Meeting on November 6-7, 2019, in support of sterilization of duodenoscopes, realizing issues with costs, safety, and patient access.

Association of Professionals of Infection Control and Epidemiology (APIC)

APIC acknowledged similarities between its programs and other organizations' programs, which should result in success for all of their endeavors. APIC has launched a podcast called "5 Second Rule" to educate the public, HCP, and Infection Preventionists (IPs). A recent podcast was on antibiotics. APIC convened its inaugural Applied Learning Conference in October 2019 with about 300 attendees who were focused on learning more about cleaning, disinfection, sterilization, and microbiology and antibiotics. APIC has developed several Position Statements, including the *APIC Public Policy Position Statement on State Vaccine Policies*. In conjunction with that statement, APIC recruited its members to send email campaigns to state and federal legislators promoting the importance of vaccines. In addition, the Practice Guidance Committee worked collaboratively on the *APIC Practice Position Statement: Non-Ventilator Healthcare-Associated Pneumonia (NV-HAP)*, which APIC believes to be just as important as any ventilator-associated pneumonias in the hospital setting. APIC supports CMS with the Antibiotic Stewardship Program and making it a Condition of Participation (CoP). The APIC Research Committee is currently revising its MegaSurvey and plans to deliver it to APIC's membership in early 2020.

American Nurses Association (ANA)

No comments beyond the provided written report.

American Society of Nephrology (ASN)

The ASN has been working with CDC for the last 3.5 years on a project called Nephrologists Transforming Dialysis Safety (NTDS), with a goal of eliminating infections in dialysis units. Proper implementation requires far more than simply knowing the best practices. To that end, ASN is engaged in 2 major activities: the first is teaching the tools and best methods of effective and inspirational leadership. ASN has been working with Medical Directors and Nursing Directors as dyads on ways of prioritizing infection prevention, and bringing its urgency and priority to individual dialysis units. The second major thrust of ASN's work has been with Human Factors Engineers to look "on the ground" at what is happening in dialysis units. Thus far, they have visited 6 dialysis units around the country and will visit 4 more in the next 6 – 8 months. A team of Human Factors Engineers, CDC Representatives, Nephrologists, and Nephrology Nurses spends 2.5 days at each of these facilities, and it is a remarkable experience to be a "fly on the wall" to see what is actually going on. Best knowledge, effective leadership, and human factors engineering will result in progress.

Association of State and Territorial Health Officials (ASTHO)

ASTHO continues to co-lead the Council for Outbreak Response: Healthcare-Associated Infections and Antibiotic-Resistant Pathogens (CORHA) Workgroup with the Council of State and Territorial Epidemiologists (CSTE). ASTHO also is participating in CDC's AMR Challenge. ASTHO recently released tools and resources for state health departments on preventing HAI/AR, a list of which is included in ASTHO's written report. ASTHO also is preparing to launch a new Learning Community to address HAI/AR prevention in rural health settings.

Centers for Medicare and Medicaid Services (CMS)

CMS finalized the Burden Reduction Rule at the end of September 2019 that included new infection control regulations for hospitals, which now require antibiotic stewardship programs. Though internal work remains in terms of creating interpretive guidance for that new regulation, the new rule is exciting.

Council of State and Territorial Epidemiologists (CSTE)

CSTE continues to Co-Chair CORHA. CORHA's Policy Workgroup is developing guidance regarding public disclosure of HAI/AR outbreaks. CSTE continues to support the Antimicrobial Resistance Surveillance Task Force (ARSTF), which released its Year 3 report in September 2019, providing status updates on the ARSTF recommendations from Year 2. This group is also planning a Strategic Planning Meeting for this winter. The Drug Diversion Workgroup developed a *Drug Diversion Planning and Response Toolkit* for state and local health departments that focuses on the response to drug diversion and defining best practices. This toolkit was released at CSTE's 2019 annual conference. No new HAI/AR Position Statements were passed during this year's annual meeting, but updates were made to the Case Definition for National Legionellosis Surveillance, including cases determined to be positive by nucleic acid amplification testing (NAAT) and new appendices with information on incubation period, and considerations for healthcare-associated and travel-associated case definitions.

DNVGL Healthcare, Inc. (DNVGL)

DNVGL expressed appreciation for its relationship with HICPAC and its influence on their activities. In February 2019, DNVGL introduced a certification program for infection prevention departments that includes antimicrobial stewardship requirements: CDC kindly reviewed the requirements. Two representatives from DNVGL attended the AMR Challenge event in September 2019 in New York City. In October 2019, DNVGL introduced a sterile processing program certification. Their client organizations were encouraged to participate in the AMR Challenge through publication of an Advisory Notice in February 2019. In-progress guidelines include revisions of the National Integrated Accreditation for Healthcare® (NIAHO®) for critical access and acute care hospitals to reflect burden reductions as well as the CDC AMR Guidelines. DNVGL recently concluded its annual Client Symposium in Cincinnati, where 3 presentations were focused on infection prevention, including a presentation by Dr. Cardo. Significantly, a presentation by one of their critical access hospitals touted their AMR program. DNVGL is also actively involved in the Association for the Advancement of Medical Instrumentation (AAMI) sterilization Workgroups related to steam sterilization and endoscope processing. It is very important to have a presence there to provide the perspective of accreditation organizations, and the impact that new standards will have on their client organizations.

Food and Drug Administration (FDA)

No comments beyond the provided written report.

Health Resources and Services Administration (HRSA)

No comments beyond the provided written report.

National Association of County and City Health Officials (NACCHO)

No comments beyond the provided written report.

National Institutes of Health (NIH)

Dr. David Henderson, who has served as a HICPAC *ex officio* member for NIH since 2005, will retire from federal service in January 2020. His HICPAC replacement will be Dr. Tara Palmore, NIH Clinical Center Hospital Epidemiologist. Dr. Palmore and her team have continued prospective surveillance for carbapenemase-producing organisms (CPO) in the Clinical Center. She has submitted an abstract to *The Decennial* to describe this experience. Part of that 6-year experience is an ongoing lack of transmission documented by sequencing of each of these isolates. That program has been successful. In addition, the Clinical Center had an outbreak of *Sphingomonas koreensis* infection that was reported in the *New England Journal of Medicine (NEJM)*. Dr. Palmore and her crew of creative plumbers have developed a plumbing strategy that obviates risk, with 13 months of cultures with no evidence of *Sphingomonas koreensis*. They first tried replacing the plumbing, but the *Sphingomonas koreensis* came right back. Therefore, they developed a creative strategy for moving the water right down to the source and continuing to circulate it.

Pediatric Infectious Disease Society (PIDS)

The themes of PIDS' recent work have been vaccine-preventable diseases and antimicrobial resistance. PIDS is engaged in a collaborative effort with the American Academy of Pediatrics (AAP) and its Section on Infectious Diseases (SOID), and Health Care without Harm Clinician Champions to develop the *Pediatric Antibiotic Stewardship Program (ASP) Toolkit*, which is available on the PIDS website. PIDS has been excited that this resource appears to be well-utilized. PIDS continues to collaborate with SHEA on the White Paper series to accompany the HICPAC NICU Guidelines. PIDS also has asked their members to comment on the draft guidelines. Regarding campaigns and related activities, PIDS members continue to advocate for immunization of children and those who interact with them, especially those who for them in healthcare settings. PIDS has obtained unrestricted educational funding to develop an evidence-based vaccine education curriculum. This endeavor has been well-received, and they hope to make those modules available online in early 2020. Regarding publications, PIDS has been involved in an editorial that was published in *Clinical Infectious Diseases (CID)* supporting the vaccination and care of children who have been detained at the US border. The *Handbook of Pediatric Infection Prevention and Control* that was co-edited by Drs. Judy Guzman-Cottrill and Kristina Bryant has continued to be popular. PIDS took it to their World Society for Pediatric Infectious Diseases (WSPID) meeting, where multiple copies were reviewed and purchased by their international partners. PIDS continues to support the education of trainees, especially those who have an interest in antimicrobial stewardship and infection prevention.

Society for Critical Care Medicine (SCCM)

SCCM's *Criteria for Critical Care Infants and Children: PICU Admission, Discharge, and Triage Practice Statement and Levels of Care Guidance* was published in September 2019 in *Pediatric Critical Care Medicine (PCCM)*. Also published in *PCCM* in September 2019 was a paper titled *A Machine Learning-Based Triage Tool for Children with Acute Infection in a Low-Resourced Setting*. SCCM highlighted 3 items in development that pertain to CDC:

1. Guidelines for evaluation of new fever in critically ill adult patients: 2008 update from the American College of Critical Care Medicine and the Infectious Diseases Society of America;
2. Surviving Sepsis Campaign guidelines for the management of adult sepsis and septic shock (underway, with a plan for be included the 2020 guidelines); and

3. Surviving Sepsis Campaign guidelines for the management of sepsis and septic shock in children (under peer review, with an expectation of publication in February 2020).

Regarding campaigns and related activities, the *Surviving Sepsis Campaign Hour-1 Bundle* guidance has been updated and is available on the Surviving Sepsis Campaign website. *Early Identification of Sepsis on the Hospital Floors: Insights for Implementation of the Hour-1 Bundle* is also available. SCCM is also working on *The Effect of Community-Acquired Pneumonia on Pediatric Sepsis Survivors*. SCCM is excited to have CDC, NIH, and Biomedical Advanced Research and Development Authority (BARDA) participate in the SCCM Congress in February 2020 in a session titled *Federal Government Sepsis Priorities: Working Together to Educate, Innovate, and Optimize Patient Outcomes*. The Sepsis Alliance and the Rory Staunton Foundation will present updated community education tools for sepsis at that meeting.

Society for Healthcare Epidemiology of America (SHEA)

The 6th Decennial International Conference on Healthcare Associated Infections will be held March 26-30, 2020 at the Marriott Marquis in Atlanta, Georgia. The Program Committee is Co-Chaired by SHEA and CDC, with involvement from other partners, including IDSA and APIC. SHEA hosted Outbreak Prevention and Response Week September 16-20, 2019, which had 5 themes: Preventing Healthcare-Associated Infections; Preparedness: Outbreak Response and Incident Management; Partnerships: Public Health and Community Response; Antibiotic Stewardship and Risks of Multidrug-Resistant Organisms; and Sustainability: Research and Funding. Regarding SHEA's NICU White Paper Series, the paper addressing *S. aureus* is under external review. Pending are papers on CLABSI and Respiratory Infections. In development are: Sterilization and High-Level Disinfection, Initiation of Antibiotics, Healthcare Workers Infected with Bloodborne Pathogens (SHEA White Paper), Infection Prevention in Long-Term Care, and SHEA/UDSA Compendium 2020 Update. Regarding legislation, SHEA has expanded advocacy efforts on bills that will improve the infrastructure for HAI/AR surveillance, data collection, and outbreak response/containment, including the STAAR Act of 2016, 3 bills authorizing investments to modernize public health IT systems, and the Prevention Fund Restoration Act. Other legislation is detailed in SHEA's written report. Regarding publications, SHEA continues to promote its textbooks *Practical Healthcare Epidemiology, 4th Edition* and *Practical Implementation of an Antibiotic Stewardship Program*. Of note is that *Infection Control & Hospital Epidemiology (ICHE)* launched a new podcast, which is a new way to listen to the highlighted articles. Other items of note are outlined in the provided written report.

Society of Hospital Medicine (SHM)

SHM continues its Fight the Resistance[®] Campaign to promote awareness around antibiotic use and antibiotic stewardship. The *Journal of Hospital Medicine (JHM)*, SHM's flagship journal, continues to promote publications related to resistance, HAI, and stewardship.

Surgical Infection Society (SIS)

One of the themes of SIS's work is outreach to other parts of the world, forging strong relationships with overseas entities to focus on surgical site infection prevention (SSI) in low- and middle-income countries, with several projects in development. Global sites present unique challenges compared to North American sites. The entire October 2019 issue of *Surgical Infections* was a "Special Issue on Assessing Surgical Site Infection Surveillance Technology: Methods and Implementation." The issue examined patient-generated health data, including imaging, from a joint CDC-SIS project led by SIS member Heather Evans. That group is continuing work with CDC, aiming to focus on how imaging or other patient-generated health data can be used for diagnosis, and even defining SSIs.

Adjourn

Dr. Babcock thanked the group for a thought-provoking and productive first day of the meeting. With no additional comments or questions posed, HICPAC stood in recess at 5:00 pm.

Friday, November 15, 2019

Welcome and Roll Call

Dr. Maragakis called the second day of the HICPAC meeting to order at 9:05 am on Friday, November 15, 2019. A roll call by Dr. Bell of HICPAC members, *ex officio* Members, and Liaison Representatives established that a quorum was present. Quorum was maintained throughout the day.

New Workgroup Updates

National Healthcare Safety Network (NHSN) Workgroup

Deverick Anderson, MD, MPH

HICPAC Member

Dr. Anderson introduced the newly reformed NHSN Workgroup. The Workgroup's purpose is to improve the safety, infection prevention, and antimicrobial therapy of patients by informing the evolution of NHSN with information from experts outside of CDC. The NHSN Workgroup has 3 goals:

1. Gather information, conduct research, draft position papers as needed, and analyze relevant issues and facts for HICPAC on specific short- and long-term developmental and planning aspects of NHSN.
2. Generate conversation and elucidate issues and opinions among experts from within the public and private health sectors regarding surveillance for patient safety.
3. Generate bidirectional communication regarding expertise and frontline experiences between NHSN and constituents represented by workgroup members regarding key issues with NHSN.

The Workgroup will meet every other month via teleconference, and its membership includes:

HICPAC Members:

- Deverick Anderson, Co-Lead
- Lisa Maragakis, Co-Lead
- Hilary Babcock
- Vineet Chopra
- Michael Anne Preas

Workgroup Members:

- Sarah Duvall, Healthcare Association of New York State, Inc. (HANYS)
- Patti Grant, APIC
- Anthony Harris, University of Maryland
- Lynn Janssen, California Department of Health
- Lisa McGiffert, Patient Safety Action Network
- Connie Steed, Prisma Health
- Kaede Ota Sullivan, Temple University
- Tom Talbot, Vanderbilt University
- Margaret VanAmringe, The Joint Commission
- Deborah Yokoe, University of California, San Francisco

CDC Technical Staff:

- Andrea Benin

- Kathy Bridson
- Dan Pollock

Areas for discussion in 2020 include hospital-onset bacteremia measure development and *C. difficile* infection measure development. Additional possible areas for discussion include topic proposals from HICPAC and NHSN Workgroup members and topics proposed from CDC technical staff.

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

Dr. Bell commented on the history of the NHSN Workgroup. In the past, NHSN has had an advisory/steering group, and having that connection with constituents who use the system has been extremely valuable. The HICPAC NHSN Workgroup has two important elements:

- The group should include members who understand how NHSN works so that their feedback and reactions are helpful and fit the system. DHQP staff must share information so that Workgroup participants have a clear understanding of the system and its needs.
- Input, feedback, reactions, and technical advice are most helpful when framed as options for going forward. Defining a problem or concern and then proposing a resolution with a strong rationale is helpful for DHQP. This work is “not a short-term project.” Much is involved in determining where NHSN needs to be in 3 years.

The most recent incarnation of the NHSN Workgroup focused on helping CDC improve sharing information and disseminating data. Those tasks have been subsumed by the Patient Safety Portal, so that need has faded. Because of the broader issues of data presentation for DHQP, it does not make sense to focus on NHSN alone. This iteration of the Workgroup will not only address specific issues, but will also represent NHSN back to the field at large. Dr. Bell hopes that Workgroup members will feel confident and comfortable explaining what NHSN is doing, its current status and why, potential future directions, etc.

Bloodstream Infection (BSI) Prevention Workgroup

Dr. Bell reminded the group of Dr. Novosad’s presentation on the proposed segmental updates to the BSI Guideline. The 3 components presented represent the first considerations for update, not the only updates that the Guideline will ever receive.

A HICPAC Workgroup, led by two HICPAC members, is needed for this update. The composition of the rest of the Workgroup is guided by discussion among the HICPAC Co-Chairs, Workgroup Co-Chairs, and Dr. Novosad. Some individuals who participated in initially developing the BSI Guideline want to be engaged, and HICPAC may wish to recruit other leaders in the field. This Workgroup could address the 3 proposed components and change membership over time to address subsequent components, or this group could opt to continue and to address additional components.

Erin Stone and Dr. Novosad from DHQP have conducted basic “homework” to “get a lay of the land” and estimate the time commitment for each component. This homework is helpful not only for planning, but also to facilitate production of the Guideline.

Post-Acute Long-Term Care Workgroup

The Post-Acute Long-Term Care Workgroup was initially focused on helping DHQP think through implementation of Enhanced Barrier Precautions in long-term care facilities (LTCF). The focus is

expanding to include deliberate consideration of how, where, and when the precautions should be implemented; the implications of implementation; and whether Enhanced Barrier Precautions should become routine in some settings. The output of this Workgroup for HICPAC's consideration could be a white paper to frame these issues from the perspective of the experts.

The focus has broadened in response to the increases in care provided in non-acute care settings, and particularly home dialysis. These changes in care provision can be done, but it is important to ensure that they are accomplished in a manner that does not harm patients. Considerations pertaining to home care need to be updated and reconsidered. Several independent parts of DHQP's constituency have reached out to inquire as to whether they should be revised, especially given the conditions of participation (CoP) and other factors. These issues could be addressed by this Workgroup, or the membership could evolve to take on new issues, or a new Workgroup could be formed.

Discussion Points

NHSN Workgroup

HICPAC members Elaine Dekker and Mohammad Fakhri expressed interest in joining this Workgroup.

HICPAC asked about the influence that this Workgroup can have on future NHSN decisions. Dr. Bell explained that HICPAC makes recommendations to CDC: Workgroups have discussions as a group, and they work with technical liaisons and experts within DHQP. The results of their deliberations are presented to HICPAC at a public meeting, and HICPAC makes recommendations to CDC. All HICPAC recommendations are not always able to be adopted. DHQP seeks technical input and thoughtful advice, which is considered and incorporated into Division priorities. HICPAC contributes to the rich combination of DHQP's resources. It is not realistic to expect that all recommendations to DHQP are immediately implemented; however, thoughts, concepts, and options expressed can inform future conversations.

HICPAC supported the "reboot" of this Workgroup. It will be beneficial to have this input from a larger group, the ability to engage in bidirectional communication to understand details of the NHSN process, the capability to provide impact statements to the frontline and the field, and the ability to address concerns about small and large issues within NHSN definitions and rules. The NHSN Workgroup can weigh in on long-term goals, such as the development of a hospital-onset bacteremia measure. *C. difficile* infection measure development is a shorter-term goal in terms of improving the existing measure to make it more functional and helpful for facilities. The proposed structure is good, particularly given that there are strong opinions about NHSN. Without a structured plan, the work could be overwhelming.

HICPAC wondered whether the Workgroup could help inform NHSN regarding smaller issues, such as lists of organisms for BSI that are included or excluded, that could be part of annual updates and changes to the system, in addition to supporting a longer-term vision.

Dr. Bell said that NHSN has 2 goals. The healthcare facility surveillance role is facility-based and should be actionable and not represent a burden. Hospital-onset bacteremia is a topic area of interest because it can be captured electronically, does not require counting catheter days, reduces burden, and is worth measuring. NHSN also has a national function in terms of driving down rates across the country and in all settings, not just making improvements in one facility. Workgroup members and HICPAC will be asked to "wear both hats," and know which one they are wearing, when providing input to DHQP. It is crucial to understand the frontline issues that are routine and difficult to avoid. The Workgroup could build and maintain an active list of issues for consideration. They will not all be solved within a year, but it would be helpful.

Dr. Andrea Benin, Deputy Branch Chief, Surveillance Branch, DHQP, commented on the processes through which multiple stakeholders review updates and iterations of NHSN. It may be valuable for the Workgroup to discuss some of the processes for annual updates with DHQP staff. With only 6 meetings per year, there are many interesting opinions and issues to discuss.

HICPAC uses a “parking lot” to ensure that all ideas are continuously captured, and those ideas can be reviewed and prioritized periodically to determine the next steps have value across both “hats,” so that NHSN helps facilities develop actions to keep patients safer.

Dr. Bell noted that the “parking lot” could also be a list of research gaps, also populated with points that relate to definitional alignment, organism choices, and other topics for NHSN. In many cases, a body of evidence is not available to support a change or a recommendation. DHQP does not have the ability to conduct large-scale studies; having more colleagues in academia engaged in this type of work would be helpful. The “parking lot” can inform a list of proposed actions.

HICPAC commented that the “hats” are one in the same: driving progress at the unit level will help at the hospital level, the state level, and ultimately the national level. This partnership is crucial for understanding and discussion about the lifecycle of a metric. Metrics result in pay-for-performance in the future and must be actionable, and there can be unintended consequences. For those on the frontlines implementing improvement work, the actionable piece is critical. HICPAC can represent NHSN and advocate for it as the gold standard, stand behind the metrics, explain them well, and translate to action on the frontline, with the most leverage in driving rates down.

In order to improve at the local level and nationwide, HICPAC observed that the focus must not be only on work that will help pay-for-performance metrics. Urine culturing on hospital admission has decreased across the country, which is a consequence of hospitals attempting to reduce their catheter-associated urinary tract infections (CAUTI) Standardized Infection Ratio (SIR). Similar changes are observed regarding *C. difficile*. If an electronic medical record (EMR)-based algorithm is applied to reduce testing, unnecessary testing will be reduced, but some may have a high SIR. These issues need to be taken into consideration, because patient outcomes are the crucial result.

Dr. Bell noted that EMR data, laboratory information system data, diagnostic computer data, and automatic data processing (ADP) data are all becoming increasingly accessible. There is a difficult, but deliberate, transition from clipboards and spreadsheets to a more streamlined system driven by many of the devices used in healthcare. He agreed that results should not be about the payment model, though the payment model is a factor: otherwise, most facilities would not report. They must determine how to make the best use of payment as a driver, but not as a definer.

BSI Prevention and Post-Acute Long-Term Care Workgroups

HICPAC indicated that some volunteers have stepped forward for the BSI Prevention and the Post-Acute Long-Term Care Workgroups. Outreach will continue to additional potential members.

Dr. Bell described the work of a Guideline Workgroup, which is efficient, effective, clear, and transparent. In-house DHQP staff conduct systematic literature reviews and evidence analysis. Working with the Workgroup, the original search strategy may expand to multiple search strategies as the DHQP team applies the agreed-upon inclusion and exclusion criteria and conducts title and abstract review. During the full-text review, all Workgroup members participate so that multiple eyes are on each document. The selected articles are abstracted into evidence and GRADE tables to support the formulation of a recommendation and framing language. This process is segmental and transparent, because every recommendation has a Justification Table and evidence tables attached to it. This process, which elucidates harms and benefits, implicit assumptions, and intentional vagueness, is much

more efficient and meaningful for the reader than a textbook. DHQP's in-house subject matter experts (SMEs) serve as points of contact with the Evidence Review Team to support them. DHQP makes the best use of the Workgroup members' limited time.

Guideline Language Alignment

Introduction

Michael Bell, MD

Deputy Director

Division of Healthcare Quality Promotion

National Center for Emerging and Zoonotic Infectious Diseases

Centers for Disease Control and Prevention

Dr. Bell explained that the *2007 Guideline for Isolation Precautions* is a large, textbook-like document that serves as a critical tool in infection control. Appendix A of the *Guideline* is often CDC's most downloaded item. The organisms in Appendix A have not been reviewed in some time.

As the update to the *Guideline for Infection Control in Healthcare Personnel* progresses, Dr. Kuhar and his team are reviewing Appendix A. It has become clear that a "light touch" will not be sufficient to update Appendix A, as many elements need to be reconsidered. Some simple errata can be corrected, some items are obsolete and can be removed, some items have changed (e.g., new technology, vaccines, etc.), and some items not included in the *2007 Guideline*, but that are important to address, will require an evidence review. This work will take place segmentally.

The work will begin with the "low-hanging fruit;" that is, simple editing corrections or items that can be sunsetted. The 2007 Appendix A will remain available: as the updates are incorporated, they will be flagged with links to the 2007 language and an explanation of what was changed, when, and for what reasons. Eventually, all of the changes and updates will be coalesced into a new document, and the 2007 document will be archived.

While this work may seem daunting, Dr. Bell reassured the group that many items in Appendix A will be amendable to evidence-based assessments and review processes. Some topics, however, may not be easily managed by an evidence review process, such as how to implement isolation practices. A "No Recommendation" for a practice risks sending the inadvertent message that it should not be done. If, instead, HICPAC wishes to state that information is insufficient to make a formal recommendation, framing information could be added to articulate what HICPAC believes should be done.

Discussion of Respiratory Protection Recommendations for Measles, Varicella, and Disseminated Zoster

David T. Kuhar, MD

Medical Officer

Division of Healthcare Quality Promotion

National Center for Emerging and Zoonotic Infectious Diseases

Centers for Disease Control and Prevention

Dr. Kuhar reviewed current and proposed updated respiratory protection recommendations for measles, varicella, and disseminated zoster.

Airborne Precautions are recommended for the management of patients with known or suspected measles in healthcare settings. Measles is transmitted primarily through the air via small particle aerosols and is the most contagious of the vaccine-preventable diseases. All HCP should have presumptive evidence of immunity to measles; however, there are both published and unpublished

reports of HCP with presumptive evidence of immunity developing measles after exposures in healthcare settings, including during outbreaks. These personnel include HCP who have documented 2 doses of measles vaccine, as well as those who have previously documented antibody in the blood. Two doses of measles vaccine is highly effective, resulting in more than 98% having detectable antibody and immunity.^{1,2}

Contact and Airborne precautions are recommended for management of varicella (chicken pox) and disseminated zoster in healthcare settings. Varicella-zoster virus (VZV) is transmitted by direct contact with infectious droplets or secretions, or airborne spread. It is believed that scratching vesicles that are filled with virus aerosolizes the virus, making it effectively airborne and able to travel over long distances. Though not the most contagious, VZV is still a highly contagious virus. HCP should have evidence of immunity to varicella. The varicella vaccine is not thought to be quite as effective as the measles vaccine, in that receiving a second dose of varicella vaccine results in approximately 95% immunity. In the literature, there is only one report of a HCP with evidence of immunity 2 years before exposure developing varicella 14 days after an exposure in a healthcare setting. No reports, published or otherwise, document varicella outbreaks leading to infections in HCP who have evidence of immunity.³

The process for updating the *Guideline for Infection Prevention in Healthcare Personnel* includes a review of *Isolation Precautions* to ensure alignment. The Recommendations section of *Isolation Precautions* includes 2 “No Recommendation” statements that address both measles and VZV:

V.D. Airborne Precautions

- V.D.4.b. No recommendation is made regarding the use of PPE by healthcare personnel who are presumed to be immune to measles (rubeola) or varicella-zoster based on history of disease, vaccine, or serologic testing when caring for an individual with known or suspected measles, chickenpox or disseminated zoster, due to difficulties in establishing definite immunity.
Unresolved issue
- V.D.4.c. No recommendation is made regarding the type of personal protective equipment (i.e., surgical mask or respiratory protection with a N95 or higher respirator) to be worn by susceptible healthcare personnel who must have contact with patients with known or suspected measles, chickenpox or disseminated herpes zoster. *Unresolved issue*

Over the years, DHQP has received feedback from facilities indicating that neither susceptible HCP, nor those with (presumptive) evidence of immunity to measles, varicella, or disseminated zoster, are wearing a facemask or respirator when entering the room of patients with known or suspected infections in Airborne Precautions. There is concern that “No Recommendation” for face protection for HCP, or type of face protection for susceptible HCP, may be interpreted that a facemask or respirator is not recommended, rather than that there is no evidence to make a clear recommendation.

Updates to respiratory protection recommendations for measles have been made. In 2011, ACIP put forward the following updated recommendation in *Immunization of Health-care Personnel: Recommendations of the ACIP*:

- Regardless of presumptive immunity status, all staff entering the room should use respiratory protection...(i.e., use of an N95 respirator...)

¹ Shefer A, et al, 2011. Immunization of health-care personnel. *MMWR*.60(7): 1-45

² Feibelkorn, et al, 2015. Measles in Healthcare Facilities in the United States During the Post-elimination Era, 2001-2014. *CID*61(4): 615-8

³ Johnson, et al, 2011. Varicella Reinfection in a Seropositive Physician Following Occupational Exposure to Localized Zoster. *CID*, 52(7): 907-9

- Because of the possibility, albeit low (~1%), of measles vaccine failure in HCP exposed to infected patients, all HCP should observe airborne precautions in caring for patients with measles.

In 2019, *Interim Infection Prevention and Control Recommendations for Measles in Healthcare Settings* joined all recommendations relevant to measles into one resource. That guideline aligns with the updated CDC recommendation statement:

- HCP should use respiratory protection (i.e., a respirator) that is at least as protective as a fit-tested, NIOSH-certified disposable N95 filtering facepiece respirator, regardless of presumptive evidence of immunity, upon entry to the room or care area of a patient with known or suspected measles.

Recommendations for varicella and disseminated zoster have not been updated recently.

DHQP's Evidence Review Team conducted a systematic literature review on the question of whether wearing respiratory protection, compared to a facemask or no protection, prevents transmission from patients in an Airborne Infection Isolation Room (AIIR) to HCP for measles, varicella, or disseminated zoster. The review initially identified well over 1000 potentially relevant articles. That pool was ultimately whittled to just one case series related to measles. In a California outbreak of measles, a large number of exposures occurred in healthcare that resulted in transmissions to 5 HCP who had direct face-to-face contact with measles patients while wearing no face protection of any kind. The exposure occurred before the patients were identified and put on appropriate precautions. Four of those 5 HCP had evidence of immunity and still developed measles. There was no comparator group, and there was no discussion about numbers of contacts between personnel wearing respiratory protection. The confidence in this evidence is very low. Although this paper indirectly addresses the question, it does not answer it. No articles were identified for varicella or disseminated zoster.

In Appendix A in the *Guideline for Isolation Precautions*, the recommendations for measles have been aligned and refer to the *Interim Infection Prevention and Control Recommendations for Measles in Healthcare Settings (2019)*. Varicella recommendations have remained unchanged, with no recommendation for face protection for immune HCP and no recommendation for type of face protection for susceptible HCP (i.e., mask or respirator). However, the text in the *Guideline for Isolation Precautions* remains the same, with no updated recommendation for measles. This area has been identified as problematic. There is a plan to make adjustments to align the measles recommendation in the text with the current CDC recommendations.

Discussion Points

Dr. Bell said that information will be shared at HICPAC meetings throughout the process of updating Appendix A. Items such as the varicella zoster recommendation deserve deliberation, and HICPAC's input will be important. The discussion will be framed by a reasonable list of the elements of Appendix A that need to change. The process of reviewing the table has just begun, and a full list of items that deserve attention is not yet complete. When that list is in hand, it will be presented to HICPAC for feedback regarding the items that need to be "cleaned up," changed, made more concrete, or that are currently not included and should be added (e.g., parainfluenza, respiratory viruses that are identified by increasingly multiplex diagnostics, etc). DHQP needs professional, thoughtful input from HICPAC even in the absence of extensive publication.

HICPAC observed that the updated Measles guidance was helpful in the recent resurgence of measles. With respiratory protection, erring on the side of caution is probably appropriate, given the importance of protecting HCP and the potential for secondary transmission to rapidly cause devastating

consequences. The updated Measles guidance does call into question the current practices with regard to varicella. Perhaps they are observing the difference between wild type immunity versus vaccine-induced immunity: the current cohort of HCP probably have wild type immunity, but more and more vaccinated people are entering the healthcare workforce. Dr. Kuhar agreed, noting that the vaccination program for varicella started in 1996.

HICPAC has previously discussed that healthcare systems have interpreted “No Recommendation” in different ways. Some healthcare systems implemented the policy that everyone entering an AIIR consistently wears a respirator. A change to an explicit recommendation would not represent a difference for those facilities. Other facilities took different approaches, such as having 2 categories of airborne isolation: one with respirator use, and one in which non-immune individuals cannot enter without a respirator. As an example, one facility approached measles and varicella in that way. They updated to align with CDC’s Measles guidance and also assessed measles outbreak reports, including cases documented in immune adults. Updating that guideline did not have a huge impact on practice. For varicella, the facility maintained the approach of allowing people to enter a room without a respirator if immune to varicella, and not to enter without a respirator if not immune. This system has 15 hospitals and 31,000 employees and has not had any occupationally-acquired varicella transmission in 20 years of following that policy. There are no reports of other outbreaks with HCP acquisition of varicella and secondary transmission to others. While the theoretical concerns are understandable, the change would be major for some facilities and difficult to justify in the absence of an evidence-based and risk-based reason to change it.

Another example of a challenge is from a facility that requires N95 respiratory protection for measles and varicella: that facility’s biggest challenge has been with visitors not using the respirators. N95s are offered to visitors and proper use is explained, but a respirator cannot be forced upon someone who refuses it. When it was explained to people who did not have proof of immunity that they would be at risk without appropriate protection, they tended to comply. Another challenge at this facility has been a shift to testing for parainfluenza, which has significantly affected isolation and resulted in the need for acquisition of additional supplies.

PIDS commented on particular challenges for a pediatric hospital, given that someone wearing an N95 may appear threatening to pediatric patients. Additionally, many employees cannot wear an N95; therefore, powered air respirators (PAPR) must be used, which is especially challenging in ambulatory sites with patients in isolation rooms. It also has been challenging to justify the rationale for wearing the N95, which seems to be based on a few isolated situations, to employees. Obviously, the most protection for employees and patients must be provided: there cannot be propagation of infections, especially measles, in healthcare settings. However, requiring use of N95s by immune HCP is not without its concerns.

HICPAC pointed out the importance of fit testing for N95s, and that fit is maintained when people lose or gain weight over time. Offering N95 masks to visitors, but not fit testing them, may convey a false sense of protection, which complicates the situation for a facility.

Regarding an approach for respiratory viruses not previously identified by testing, but for which information is insufficient to make a specific recommendation for isolation, there was support for a general protection plan and “syndromic approach.”

HICPAC agreed that it will be important to review the process for making changes to Appendix A, and to vet proposed changes. The HCP Guideline Workgroup presents an established core of experts who are already thinking about these issues and who could provide a “first pass” of feedback.

HICPAC noted the Occupational Safety and Health Administration (OSHA) Aerosol Transmissible Diseases (ATD) Standards. The system is not perfect in that not everyone is compliant, fit testing is challenging, and some people cannot wear a mask. Some facility policies are that if a person cannot be fit tested and a PAPR cannot be acquired, the staffing model is adjusted so that someone else enters the room.

Dr. Bell thanked HICPAC for the willingness to engage in this process and considerable effort. Understanding “why not to do something” may be as important as understanding what to do; this idea could be incorporated into the document update. Input is important from the perspective of pediatric hospitals, especially regarding respiratory viruses. Recommendations may not translate easily to those settings, and it is important to be cognizant of the implications. Creating a separate set of guidelines for every single virus is not an advisable approach: a reasonable, implementable syndromic approach is necessary. This work is not occurring in a vacuum. In thinking about respiratory pathogens, much work remains in terms of healthcare facility design and air handling systems. Understanding has matured since this document was originally produced, and it is acknowledged that particulate material in the air is being inhaled. As thinking broadens, more consideration is given to heating, ventilation, and air conditioning (HVAC) systems and improving overall air quality in healthcare facilities, other issues need to be addressed beyond updating *Isolation Precautions*. For instance, there can be discussion of a triage system that does not combine air spaces of potentially infectious people and others. Finally, the concept of tailored solutions for each locality represents a weakness in the system, as HCP may be trained in concepts and processes that are specific to their location, but then move elsewhere, where concepts and processes are different. That variation can lead to weakness in practice. Dr. Bell posed the question, what elements should be the same “across the board” so that no matter where someone trains, they take the same understanding with them? There can be variations in practices for specific communities, but the foundational understanding needs to be clear and consistent.

Core Strategies of Environmental Cleaning and Disinfection in Hospitals

Purpose, Scope, and Audience

Sujan Reddy, MD, MSc

Division of Healthcare Quality Promotion

National Center for Emerging and Zoonotic Infectious Diseases

Centers for Disease Control and Prevention

Dr. Reddy noted that the *Core Strategies of Environmental Cleaning and Disinfection in Hospitals* (“Core Strategies”) is a group effort. This document is needed because maintaining a clean hospital environment and minimizing the presence of pathogens is critical for keeping patients safe. HICPAC guidance clearly states that the healthcare environment should be cleaned: while all hospitals have environmental cleaning and disinfection programs, there is variation in these programs across, and even within, facilities.

DHQP’s Environmental Working Group conducted a “landscape view” of the tools and resources available pertaining to environmental cleaning. Many tools are available, such as environmental monitoring tools, assessment tools, training modules for environmental services (EVS) staff in a variety of settings, health department resources, and others. The group concluded that a framework was needed to help facilities navigate all of the available resources and to drive home that all components of a program are necessary. A facility cannot only do monitoring or purchase new technology: a facility must have a system in place for continued improvement and sustainability of a clean and safe environment.

“Core Strategies” focuses on acute care hospitals, but it can be applied to all healthcare facilities, including long-term care facilities and outpatient settings, likely with setting-specific considerations. The

document focuses on non-critical environmental surfaces; that is, surfaces that come in contact with intact skin, but not with mucous membranes. Environmental surfaces, patient care items, and certain equipment are included in this category. Semi-critical and critical surfaces are not in the scope of this document. The intended audience for “Core Strategies” includes hospital executive leadership, EVS managers and supervisors, infection prevention and control (IPC) personnel, quality leaders, and facilities engineering. Higher-level leadership is included because management structures may lie in different areas of a facility. As a program, the goal is to ensure that all of these elements are included.

It is important to understand who does the work of cleaning and disinfection in hospitals. EVS technicians may include personnel directly employed by the healthcare facility, contract staff, staff employed under other management structures, or a combination. It is important for leadership to understand that no matter how EVS technicians are hired, these strategies apply to all them. Other HCP who may be responsible for cleaning and disinfection of equipment and surfaces in patient care areas include nurses, technicians, and others. It is important for them to understand their roles and responsibilities for cleaning the environment as well.

While the Core Strategies can be viewed as categories, they obviously overlap and interrelate. For instance, in a monitoring program, feedback is not provided only to the EVS technician: that information is provided to leadership to support decision-making about technology acquisition, training needs, and other issues.

Core Strategies of Cleaning and Disinfection Programs

Amy Valderrama, PhD, RN, ACNP-BC

Division of Healthcare Quality Promotion

National Center for Emerging and Zoonotic Infectious Diseases

Centers for Disease Control and Prevention

The Core Strategies are foundational activities for establishing and maintaining a clean, safe hospital environment that supports the safety of patients, visitors, and HCP. :

1. **Integrate** environmental services into the hospital’s safety culture.
2. **Educate and train** all HCP responsible for cleaning and disinfecting patient care areas.
3. **Select** appropriate cleaning and disinfection technologies and products.
4. **Standardize** setting-specific cleaning and disinfection protocols.
5. **Monitor** effectiveness and adherence to cleaning and disinfection protocols.
6. **Provide feedback** on adequacy and effectiveness of cleaning and disinfection to all responsible HCP as well as relevant stakeholders.

Integrating EVS into the hospital safety culture is important for achieving and maintaining a clean patient environment. In any hospital, EVS plays a pivotal role in infection prevention and control, and patient and HCP safety. A key activity is to establish the hospital cleaning and disinfection program with a defined management structure and multidisciplinary participation and oversight. The program should have representation from hospital leadership, quality, nursing, purchasing, facility management, IPC, EVS, and others. They should convene regular meetings to review practices, quality measures, and facility goals. They should clearly define the program responsibilities, including implementing the Core Strategies and activities and evaluating the effectiveness of the cleaning and disinfection program using data from clinical surveillance and the environmental monitoring program. Other activities that support the integration of EVS into the hospital’s safety culture include:

- Establishing and maintaining a clear reporting and accountability structure for EVS technicians that aligns with the cleaning and disinfection program;

- Developing a performance, evaluation, and career advancement structure for EVS technicians and EVS management that incentivizes excellence, rewards expertise and skills, and optimizes retention; and
- Incorporating considerations for effective cleaning and disinfection into the design, structure, and layout of patient care areas, including the acquisition of new non-critical items.

Next, all HCP who are responsible for cleaning and disinfection in patient care areas should receive **education and training**. A broad range of personnel, not just EVS technicians, are responsible for cleaning and disinfecting reusable patient care equipment and environmental surfaces, and they all must understand their roles and responsibilities and have the education and training required to clean and disinfect effectively. Education and training should focus on:

- Ensuring competency to hospital cleaning and disinfection protocols by demonstrating proper adherence to protocols;
- Understanding the basic principles of pathogen transmission;
- Recognizing the value of their work on infection control and patient safety; and
- Understanding how to effectively protect themselves while performing their duties, with training on topics such as the use of personal protective equipment (PPE) appropriate to their tasks, safe use of chemicals and cleaning technologies, relevant infection control risks including sharp safety, and other aspects of worker safety as appropriate to the setting or situation.

Training should be provided upon hire, annually, and whenever new equipment or protocols are introduced. Retraining should be performed as necessary to address deficiencies or gaps identified during routine monitoring activities and audits. Competency-based trainings should account for staff turnover rates, education level, language and cultural barriers, and multiple learning styles. It is important to document and maintain competency in cleaning and disinfection procedures for all personnel who clean and disinfect patient care areas and equipment. Contracted staff should have a comparable training program and documentation. EVS staff should be updated on trends in facility infection rates and prevention priorities.

The next strategy is to **select** appropriate cleaning and disinfection technologies and products. A standardized, setting-specific approach to selecting technologies and products supports an effective cleaning and disinfection program. A systematic process should be used to select technologies and products, including advanced technologies such as no-touch disinfection devices, that will be used in patient care areas. The facility cleaning and disinfection program, EVS management, IPC, Materials Management, and others should be incorporated into decision-making. The decision-making process should consider factors such as:

- Compatibility with the device manufacturer's instructions for use (IFU),
- Contact time
- Possible health risks and acceptability to HCP and patients
- Effectiveness of a product in decontaminating a surface
- Impact on overall cleaning efficiency
- Required expertise and training of staff to use those technologies and products, and
- Effect on surfaces of repeated exposure to a product.

Standardize setting-specific cleaning and disinfection protocols is the next strategy. These protocols, including use of technologies and products, will ensure that high-priority surfaces are cleaned effectively and will account for differences in room layout, equipment, and patient risk. Responsibilities should be clearly defined for the cleaning and disinfection of non-critical equipment, shared medical equipment, and other electronics (e.g., ICU monitors, code cards, point-of-care devices). Relevant personnel should

be aware of their responsibilities and appropriately trained to fulfill them, and appropriate supplies for effective cleaning and disinfection should be readily available, including the cleaning cart and supplies in the patient care area. A standardized routine (e.g., daily) and discharge or transfer cleaning and disinfection protocols should be developed for each patient care area or area type (e.g., ICU or ward, OR, ED). The protocols should be readily available, and relevant personnel should receive appropriate training. The protocols should include:

- Appropriate PPE for personnel doing the cleaning and disinfection;
- Processes for routine and discharge or transfer cleaning, specific pathogens, and patient-level factors such as wounds or diarrhea;
- Facility-specific cleaning and disinfection technologies, products, and methods; and
- A process to easily identify equipment and rooms that have been properly cleaned and disinfected and are ready for patient use.

Policies and procedures to address storage of patient and visitor personal items are important to minimize their impact on cleaning effectiveness. Minimum cleaning times should be established for routine and discharge or transfer cleaning for each major patient care room type or area. A process should be defined for establishing minimum cleaning times, and they should be aligned with staffing plans to ensure that effective cleaning and disinfection can be completed and sustained. Cleaning times should be tracked to identify factors that influence them, and to assess the need for mitigating those factors or revising the minimum cleaning time.

The next strategy is to **monitor** the effectiveness and adherence to cleaning and disinfection protocols. An environmental cleaning and monitoring strategy allows EVS technicians, other relevant HCP, and cleaning and disinfection program staff to understand the current state of facility cleanliness and to identify areas for improvement. For this, a facility-specific environmental cleaning and disinfection monitoring strategy should be developed and implemented, and protocols should be developed for monitoring adherence to, and effectiveness of, cleaning and disinfection procedures. The protocols should include:

- Who does the monitoring,
- What type of monitoring will be used (e.g., direct observation, ATP, fluorescent gel),
- How frequently the monitoring will occur,
- What rooms will be monitored, and
- What surfaces will be assessed.

Methods for monitoring cleaning adherence and effectiveness in addition to direct observation should be incorporated. Route audits of adherence should be performed.

The last Core Strategy is to **provide feedback** on the adequacy and effectiveness of cleaning and disinfection to all responsible HCP, as well as to relevant stakeholders, such as infection control and hospital leadership. Monitoring data should be used to improve facility cleaning and disinfection policies and procedures and patient safety. Audit data should be presented to EVS technicians regarding their adherence to cleaning and disinfection procedures in a manner that is non-punitive so that it will encourage improvement. Audit data should also be presented to the facility cleaning and disinfection program and facility leadership to identify active issues and strategies to mitigate them, and the effectiveness of the overall cleaning strategy should be validated.

The “Core Strategies” document is currently in CDC clearance. Once cleared, a promotion plan will be developed with the Communications Team. The “Core Strategies” will be posted on the DHQP Environmental Infection Control webpage. Other planned activities include the development of

implementation tools for each core strategy. Some need more development of implementation tools than others, while some already have tools that may need to be updated. Consideration also will be given to how these strategies can be adapted to other healthcare settings.

Discussion Points

HICPAC observed that the “Core Strategies” work is “fantastic” and a strong foundational framework for important information.

HICPAC asked about plans to establish performance outcome measures, or just process measures.

Dr. Reddy replied that the work had not progressed sufficiently to discuss outcome measures, but he hoped that monitoring strategies would include enough quality measures to provide feedback regarding gel removal, ATP numbers, adherence to minimum cleaning times, etc. The program structure includes IPC, so infection rates will be considered. EVS workers understand that *C. difficile* on the transplant unit is a major target of the infection control strategy. Feedback involves education on current hospital priorities for infection control.

HICPAC pointed out that many facilities contract their environmental services out. Regardless of whether an IP is working with a contracted or an in-house EVS, it is often difficult to determine whether resources are adequate. There are industry standards for the time it takes to perform a room turnover clean or a daily clean. For example, the time for a daily clean of a room on a 30-bed unit is 15 minutes. Just cleaning that unit daily, not including managing peripheral spaces, represents 7 hours of work, so a single EVS technician would be devoted to that unit for a shift. Perhaps there is an opportunity to reach out to industry and set parameters, because not every facility may be aware of the standards.

Dr. Reddy replied that one of the first tasks will be to help facilities understand what constitutes a reasonable minimal cleaning time. Rather than stating that it takes a certain amount of time to clean a room that is a certain amount of square feet, the idea is to empower facilities to develop protocols to make rooms as clean as possible, and to determine how long that cleaning should take. While CDC could provide a starting point with an industry standard, a facility must have a process that allows for modification. Regarding ensuring that workers have the materials they need, EVS technicians and supervisors must be empowered to meet with facility leadership to inform them about equipment or products that are insufficient to fulfill the standards. These materials are a patient safety issue and should be reported to leadership if they are lacking.

HICPAC pointed out the importance of knowing what an EVS contract states, as many metrics are included beyond a facility’s own metrics. Getting that information can be difficult, and HICPAC appreciated that the Strategies specifically state that contractors are expected to have the same level of training recommended for facilities. It also would be beneficial to include a specific comment, perhaps for implementation, about how the details of contractor training should be available to the facility so that they can ensure that it meets the needs and expectations for their program. Similarly, in the monitoring guidance, there should be consideration of whether monitoring can be conducted by the facility. The results of the monitoring can then be presented to the contractor. If the contractor is able to do that monitoring as well, consideration could be given to how that program is structured and how information is shared among the facility, the contractor, and the contracted staff. There is potential for a fraught situation in which a facility may feel that more staff are needed, while the contractor believes that the existing staffing is adequate.

Regarding monitoring practices, HICPAC pointed out the need for sensitivity in giving feedback to frontline staff. For example, when one facility introduced a fluorescent gel monitoring program to frontline staff, they found that the technicians were so worried about their jobs, they were using

blacklights to find where the marks were. This problem speaks to where frontline staff “live” in the staffing hierarchy. This major issue needs to be addressed.

Regarding toolkits, HICPAC observed some facilities experience challenges in using the disinfectant that the institution has selected at the right concentration, either on purpose, or inadvertently because of dispenser issues. Monitoring often focuses on high-touch surfaces, fluorescent gel, or ATP. However, it is important to ensure that the concentration is correct. Effort has focused on the appropriate use of EPA-approved sporicidal disinfectants. Consideration should be given to how to provide guidance about targeted use, versus facility-wide use. Toolkits could be helpful in building acceptance of new disinfectant scents, which has been a major issue in “redefining the smell of clean.” People perceive the smell of bleach as “clean,” but it damages equipment. It would be helpful to offer guidance on how to introduce the new smell of clean without raising undue alarm about the odors associated with disinfectants. In addition, when equipment is moved from place to place, there can be ambiguity about who should clean it and how it should be disinfected.

Dr. Reddy added that it is also important to inform patients about what constitutes a clean smell; for instance, a vinegar smell can be a clean smell. Facilitating patient and EVS technician interaction is important so that EVS can do their jobs appropriately.

In thinking about non-punitive evaluation to encourage improvement, HICPAC commented on the need that remains for punitive consequences to address willful disregard for appropriate practices and protocols. Perhaps “non-punitive” could be framed to convey a shared accountability framework for ensuring that staff have the right tools and understanding of the steps of cleaning and disinfection. EVS personnel should see the importance of their work.

Dr. Reddy noted that the “non-punitive” concept incorporates promoting good behavior within a framework that allows persons to advance if they do a good job. Perhaps an entry-level EVS technician should only work in certain areas, such as common rooms, and then advance to other levels based on performance.

Given that the intended audience for the Core Strategies is acute care, with plans to translate the principles to other settings, HICPAC asked about collaborating with experts from long-term care settings.

Dr. Reddy replied that close work with the long-term care industry will be important to determine that setting’s specific issues, and how that infrastructure is different. The 6 strategies will likely still apply, though they may look different. In some long-term care settings, patients or residents frequently have personal items in their rooms, which presents potential issues with EVS technician and patient interactions. There are dynamics in which EVS may feel uncomfortable touching personal items. Those considerations, along with mobility and common rooms, need to be considered in long-term care. Partners will be critical to ensure that the Core Strategies are appropriately tailored to address special considerations for long-term care.

Dr. Valderrama added that within DHQP, relevant teams will be consulted as the Core Strategies are adapted to other settings.

HICPAC emphasized the importance of considering equipment challenges associated with cleaning and reprocessing. New techniques, equipment, technology, and surfaces now require the use of numerous products, where once perhaps a single product was needed for a majority of cleaning. With that in mind, the Core Strategies could emphasize up-front assessments.

Dr. Valderrama agreed and said that information is included about involving EVS when considering new patient care areas and acquiring new equipment.

HICPAC noted that the number of observations required for data collection and feedback can present issues. Specific guidance would be beneficial regarding how many observations should be done, the importance of separating types of units and shifts, and distinguishing between terminal cleaning and daily cleaning.

While the specific focus on culturally-competent education and training of EVS staff is excellent, HICPAC commented on the tension between “cleaning and reality.” When 50 people in the ED are waiting for beds, EVS may rush through the cleaning process. The right thing to do is clear, but the *how* of doing it, given all of the external factors, is vitally important. The toolkit will be critical for clear and direct messaging, specifically to hospital leadership, that cleaning cannot be rushed through or skipped, and that competent workforces and sufficient staffing ratios are critical.

Dr. Reddy agreed and added that it is empowering for an EVS technician to be able to state how long the work will take. There will be competing factors, but leadership is important to have “on board” to understand that cleaning is a quality issue and an important safety metric.

APIC observed that the Core Strategies are thought-provoking and address all of the components for environmental cleaning. Additional items and thoughts can be included in the toolkit. It is important to remember that cleaning and disinfection are not only issues for EVS, but also for nurses and technicians: it is everybody’s responsibility. Nurses and technicians may not receive appropriate training for environmental, surface, or equipment cleaning. In reality, nurses and technicians may have to turn over rooms or equipment. In terms of sharing data, it also is important to remember that EVS personnel are an important partner in infection prevention. They should receive positive reinforcement demonstrating that they are making a difference and helping to save lives.

Regarding staffing, Dr. Bell wondered whether modeling techniques might help frame minimum cleaning time estimates. Strong estimates could be compelling to share with staffing decision-makers. No matter how good the tools are, it is not possible – and profoundly unfair – to expect improvement if people do not have the time to physically do what they are being asked to do. It also is important to recognize that cleaning and disinfection practices are not static. There is a need to improve design in healthcare facilities to enable efficient and effective cleaning and disinfection. DHQP is making inroads in this area. Empowerment is also critical, such as through an Apprentice, Journeyman, and Master Cleaner certification process. As mentioned earlier, an entry-level EVS technician might clean lobbies, hallways, and perhaps the cafeteria. Once the technician is proficient in these areas and in managing chemical safety, he or she would become a Journeyman and clean routine wards. Only a Master Cleaner would be permitted to clean operating theaters, ICUs, burn units, etc. This process could be tied to reimbursement such that in order to be reimbursed for ICU care, Master Cleaners must be staffed at a certain level. A cultural shift could reframe the way a healthcare facilities think of EVS personnel.

HICPAC agreed with giving consideration to reorganization and pay. For example, individuals in high-risk areas should be celebrated for their work. Perhaps there are opportunities to weave that consideration into suggestions to industry. Also, hospital leaders should know what their organization needs based on the concept of minimum requirements for different spaces and the facility’s footprint. In a smaller setting with less traffic, staffing needs are different from the needs in high-turnover areas. Perhaps guidance could be included for supplemental strategies for staffing models. Staff may have high numbers of callouts, and many who on intermittent Family and Medical Leave Act (FMLA) leave, so coverage can be challenging. Strategies such as “float pools” of staff could supplement the existing pool. Facilities also should know the duration of life for their equipment. For example, a facility may have had stretchers that have a lifespan of 5 years, for 10 to 15 years.

In outpatient medical settings, a clinician may see a patient every 16 minutes, and a nurse may turn over a room in 30 seconds. Given this environment, HICPAC wondered whether the “Core Strategies” would include both inpatient and outpatient facilities.

Dr. Valderrama confirmed that the outpatient setting is a future area for the strategies.

ASN emphasized the critical nature of environmental cleaning in dialysis facilities, where cleaning must be done between patients. Frequently, time is a major limitation, and tremendous pressure is placed on technicians because the patient is in the room, ready to get in a chair. Cleaning is often done simultaneously with care in the next station, which is 10 feet away. Given particular challenges such as these, guidance and tools will be exceedingly helpful.

Federal Entity Comment

No comments from federal entities were made on November 15, 2019.

Public Comment

No members of the public made comments on November 15, 2019.

Summary, Work Plan, Adjournment

Dr. Maragakis summarized the meeting, emphasizing the strong discussions. With no additional business raised or comments/questions posed, the meeting was adjourned at 11:35 am.

Certification

I hereby certify that, to the best of my knowledge and ability, the foregoing minutes of the November 14-15, 2019, meeting of the Healthcare Infection Control Practices Advisory Committee, CDC are accurate and complete.

Date

Lisa Maragakis, MD, MPH
Co-Chair, Healthcare Infection Control Practices Advisory
Committee, CDC

Date

Hilary Babcock, MD, MPH
Co-Chair, Healthcare Infection Control Practices Advisory
Committee, CDC

Attachment #1: Acronyms and Abbreviations

Acronym	Expansion
AAKP	American Association of Kidney Patients
ACIP	Advisory Committee on Immunization Practices
ACOEM	American College of Occupational and Environmental Medicine
AE	Adverse Event
AEH	America's Essential Hospitals
AHRQ	Agency for Healthcare Research and Quality
AMR	Antimicrobial Resistance
AORN	Association of periOperative Registered Nurses
APIC	Association of Professionals of Infection Control and Epidemiology
AR	Antibiotic Resistance
ARLN	Antibiotic Resistance Laboratory Network
ARSI	Antibiotic Solutions Initiative
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
ASM	American Society for Microbiology
ASN	American Society of Nephrology
ASR	Alternative Summary Reporting
ASTHO	Association of State and Territorial Health Officials
BAA	Broad Agency Announcements
BMT	Bone-Marrow Transplant
BSI	Bloodstream Infection
<i>C. auris</i>	<i>Candida auris</i>
<i>C. difficile</i>	<i>Clostridioides difficile</i>
CARB	Combating Antibiotic-Resistant Bacteria
CAUTI	Catheter-Associated Urinary Tract Infection
CDC	Centers for Disease Control and Prevention
CDPH	California Department of Public Health
CDRH	Center for Devices and Radiological Health (FDA)
CFU	Colony-Forming Unit
CLABSI	Central Line-Associated Bloodstream Infection
CMS	Centers for Medicare and Medicaid Services
CMV	Cytomegalovirus
CORHA	Council for Outbreak Response: Healthcare-Associated Infections and Antibiotic-Resistant Pathogens
CRBSI	Catheter-Related Bloodstream Infection
CRE	Carbapenem-Resistant <i>Enterobacteriaceae</i>
CSTE	Council of State and Territorial Epidemiologists
CTI	Cooling Technology Institute
CUSP	Comprehensive Unit-based Safety Program
DASON	Duke Antimicrobial Stewardship Outreach Network
DCASIP	Duke Center for Antimicrobial Stewardship and Infection Prevention
DFO	Designated Federal Official
DHQP	Division of Healthcare Quality Promotion
DICON	Duke Infection Control Outreach Network

Acronym	Expansion
DoD	Department of Defense
DTBE	Division of Tuberculosis Elimination
<i>E. coli</i>	<i>Escherichia Coli</i>
EHR	Electronic Health Record
EIP	Emerging Infections Program
ELC	Epidemiology and Laboratory Capacity
EPA	Environmental Health Protection Agency
EtO	Ethylene Oxide
FDA	(United States) Food and Drug Administration
GAO	Government Accountability Office
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
HLD	High-Level Disinfection
HPC	Heterotrophic Plate Count
HRSA	Health Resources and Services Administration
ICHE	Infection Control and Hospital Epidemiology
IDSA	Infectious Diseases Society of America
IGRA	Interferon-Gamma Release Assays
IP	Infection Preventionist
IPC	Infection Prevention and Control
LEED	Leadership in Energy and Environmental Design
LTBI	Latent Tuberculosis Infection
LTCF	Long-Term Care Facility
MALDI-TOF	Matrix-Assisted Laser Desorption/Ionization Time-of-Flight Mass Spectrometry
MAUDE	Manufacturer and User Facility Device Experience Database
MDR	Medical Device Reports
MDRO	Multidrug-Resistant Organism
MERS	Middle East Respiratory Syndrome
<i>MMWR</i>	<i>Morbidity and Mortality Weekly Report</i>
MRSA	Methicillin-Resistant <i>Staphylococcus aureus</i>
MSSA	Methicillin-Susceptible <i>Staphylococcus aureus</i>
NACCHO	National Association of County and City Health Officials
NARMS	National Antimicrobial Resistance Monitoring System
NCEZID	National Center for Emerging and Zoonotic Infectious Diseases
NDM	New Delhi beta-lactamase-producing <i>Enterobacteriaceae</i>
NHSN	National Healthcare Safety Network
NICU	Neonatal Intensive Care Unit
NIH	National Institutes of Health
NTCA	National Tuberculosis Controllers Association
NTM	Non-Tuberculous Mycobacteria
OGHA	Office of Global Health Affairs

Acronym	Expansion
OHS	Occupational Health Services
OR	Operating Room
OSHA	Occupational Safety and Health Administration
<i>P. aeruginosa</i>	<i>Pseudomonas Aeruginosa</i>
PACCARB	Presidential Advisory Council on Combating Antibiotic Resistant Bacteria
PCR	Polymerase Chain Reaction
PEP	Post-Exposure Prophylaxis
PHAC	Public Health Agency of Canada
PICC	Peripherally Inserted Central Catheter
PIDS	Pediatric Infectious Disease Society
PMA	Premarket Approval
PPD	Purified-Protein Derivative
PPE	Personal Protective Equipment
RCT	Randomized Controlled Trial
<i>S. aureus</i>	<i>Staphylococcus Aureus</i>
SARS	Severe Acute Respiratory Syndrome
SCCM	Society of Critical Care Medicine
SESIP	Sharps with Engineered Sharps Injury Protection
SHEA	Society for Healthcare Epidemiology of America
SME	Subject Matter Expert
SNF	Skilled Nursing Facilities
SSI	Surgical Site Infection
TB	Tuberculosis
TST	Tuberculin Skin Test
UCSD	University of California, San Diego
UK	United Kingdom
UNC	University of North Carolina
UNGA	United Nations General Assembly
US	United States
USDA	United States Department of Agriculture
UVC	Umbilical Vein Catheter
VA	(United States Department of) Veterans Affairs
VRE	Vancomycin-Resistant Enterococci
VZIG	Varicella Zoster Immune Globulin
WHO	World Health Organization
WICRA	Water Infection Control Risk Assessments
WMP	Water Management Program

Attachment #2: *ex officio* Member and Liaison Representative Reports

Liaison Representative Report

HEALTHCARE INFECTION CONTROL PRACTICES ADVISORY COMMITTEE (HICPAC)

Centers for Disease Control and Prevention

Meeting Date: November 14-15, 2019

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

Liaison Representative name: Mark Russi, MD, MPH

Organization represented: ACOEM

Interim activities and updates:

- ACOEM has issued additional guidance documents since the last meeting of HICPAC. In addition, public commentary has been made on a number of issues. ACOEM members have recently concluded a collaboration with NTCA on a guidance document applicable to recent tuberculosis surveillance recommendation changes among healthcare workers. Work is underway on a large guidance document addressing hazards in research and educational institutions. The ACOEM national meeting was held in Anaheim April 27-May 2. Scientific sessions with bearing upon medical center occupational health (MCOH) included offerings addressing the implementation of forthcoming CDC guidance for tuberculosis in healthcare settings, musculoskeletal injury, assaults among healthcare workers, mental health in the workplace, opiate abuse in the workplace, occupational health among animal care workers, burnout and depression among clinicians, safe handling of hazardous drugs, NIOSH health hazard evaluations and OSHA worksite inspections. An update to the Guidance for Occupational Health Services in Medical Centers was approved, incorporating a new section to address physician burnout and depression.

Guidelines and Guidance:

- Ethical Aspects of Drug Testing, Qualifications of Medical Review Officers (MROs) in Regulated and Non-Regulated Drug Testing 7/22/19
- Diagnostic Tests for Low Back Disorders 4/05/19
- Nanotechnology and Health 3/13/19
- Arsenic Exposure, Assessment, Toxicity, Diagnosis, and Management 12/10/2018
- Occupational Noise-Induced Hearing Loss 9/28/2018
- The Role of the Professional Supervisor in the Audiometric Testing Component of Hearing Conservation Programs 9/27/2018
- Fitness-for-Duty Assessments of Industrial Firefighters: Guidance for Occupational Medicine Physicians 2/10/2018
- Responsibilities of the Occupational and Environmental Medicine Provider in the Treatment and Prevention of Climate Change-Related Health Problems 2/8/2018
- Obesity in the Workplace: Impact, Outcomes, and Recommendations 1/30/2018
- Guidance for Occupational Health Services in Medical Centers 4/19/2017
- Global Trends in Occupational Medicine 3/15/2017

Position Statements:

- Legalization of Marijuana – Implications for Workplace Safety: A Statement from the American College of Occupational and Environmental Medicine 10/3/19

- Patient Satisfaction Measurement in Occupational and Environmental Medicine Practice 5/11/2018
- 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 on OSHA Respirable Crystalline Silica Standard for Construction 10/29/19.
- ACOEM Comments to FMCSA Regarding Automated Driving Systems in Commercial Motor Vehicles 8/5/19
- ACOEM Supports National Drug Clearinghouse 7/1/19
- ACOEM Expresses Appreciation for Amendment Protecting Construction and Maritime Workers from Beryllium 6/28/19
- ACOEM Responds to EPA Proposed Rule on Use of Methylene Chloride-Containing Paint Removal Products By Commercial Entities 5/28/19
- ACOEM Comments on DOT Guidance Documents 5/15/19
- ACOEM Voices Support for H.R.1309, the Workplace Violence Prevention for Health Care and Social Service Workers Act 4/14/2019
- ACOEM Responds to HHS Call for Comments on Pain Management Draft Report 4/02/2019
- ACOEM Comments on OSHA's Proposed Revisions to the Beryllium Standard 2/27/19
- ACOEM Comments on Healthy People 2030 1/21/2019
- ACOEM Addresses Proposed Rule Changes to Allow Teens to Use Patient Lifts in Health Care Settings 12/1/2018
- ACOEM Responds to OSHA Proposed Rulemaking on Tracking Workplace Injuries/Illnesses 10/2/2018
- ACOEM Responds to Proposed Changes to 2019 Medicare Physician Fee Schedule 9/21/2018
- ACOEM Expresses Concerns to EPA Regarding Agency's Proposed Rule on Strengthening Transparency in Regulatory Science 7/12/2018 ACOEM Comments to FDA on Opioid Prescribing Activity 3/21/2018
- ACOEM Applauds Proposed Legislation to Combat Opioid Epidemic 12/5/2017
- ACOEM Issues Commitment Statement on NAM Action Collaborative on Clinician Resilience and Well-being 12/5/2017
- ACOEM Urges DOT to Rescind Portion of Its Final Rule (49CFR Part 40) on Drug-Testing Procedures 12/1/2017
- ACOEM responded to proposed revisions to Medicare Physician Fee Schedule. 9/18/2017
- ACOEM commented on future direction of OSHA Voluntary Protection Programs. 9/11/2017
- ACOEM objected to proposed changes to EPA National Ambient Air Quality Standard. 9/7/2017
- ACOEM commented on OSHA proposal to revoke ancillary provisions of Beryllium Rule for Construction and Shipyards. 8/29/2017
- ACOEM issued statements urging Congress to maintain NIOSH funding, and supporting a proposed OSHA Standard addressing workplace violence. 4/26/2017

Campaigns and related activities:

- (insert)

Press activities:

- Employee Behavioral Health Program Improves Depression and Anxiety 10/14/19
- Occupational Medical Society Urges U.S. Congress to Consider the Implications for Workplace Safety if Marijuana Is Legalized 10/9/19
- Integrating Occupational Safety and Health with Workplace Wellness 9/10/19
- Bigger Companies Score Higher on Total Worker Health Implementation 8/13/19
- Online Training Helps Managers to Support Employee Mental Health 7/17/19
- Mental and Physical Health Drive Employee Productivity 6/10/19
- Integrated Physical Medicine Improves Outcomes in Musculoskeletal Disorders 5/10/19
- High Rate of Drug/Alcohol-Related Deaths in WTC Survivors 10/22/2018
- Computer Prompts to Take Breaks from Sitting Lead to Lower Blood Pressure 9/20/2018
- Time for Employers to Consider Social Determinants of Health 8/24/2018
- Wisconsin Physician New President of Occupational Medical Society 7/22/2018
- Defining Worker Well-Being – Experts Propose New Framework 7/20/2018
- Higher 'Culture of Health' Scores Linked to Lower Health Care Cost Trends 6/28/2018
- 'Productive Aging' Is Key to Addressing the Aging Workforce 5/31/2018
- 'Call to Action' on Mental Health and Well-Being in the Workplace 4/12/2018
- Concussions Are Common in Theater Workers 3/15/2018
- Nurses in Worse Health Make More Medical Errors 2/22/2018
- Managing Obesity in the Workplace – New Guidance from ACOEM 1/8/2018
- Influenza Leads to Increased Missed Work Time 12/7/2017
- New Compendium Highlights Development of Clinical Decision Support to Enhance Worker Health 11/17/2017
- 'Khamisiyah Plume' Linked to Brain and Memory Effects in Gulf War Vets 10/11/2017
- Occupational Health and the Arts -- Special Report in JOEM 9/21/2017
- ACOEM Urges OSHA Not to Revoke Ancillary Provisions of Beryllium Rule 9/1/2017
- ACOEM Disappointed DOT Has Withdrawn Proposed Rule to Screen Safety-Sensitive Personnel for Obstructive Sleep Apnea 8/21/2017
- Test May Help Identify Veterans with Deployment-Related Lung Disease 8/17/2017
- CDC Program Helps Smaller Companies Invest in Employee Health 7/14/2017 High Risk of Obstructive Sleep Apnea in Commercial Drivers 6/19/2017

Publications:

- As above

Other items of note:

Forthcoming guidance for management of tuberculosis surveillance in medical centers was discussed at the meeting of ACOEM's Medical Center Occupational Health Section. USP 800 and the need to comment upon medical surveillance recommendations applicable to those with potential for hazardous drug exposure were also discussed.

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

Meeting Date: November 14-15, 2019

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

Liaison Representative name: Christopher Lombardozi, MD

Organization represented: America's Essential Hospitals

Interim activities and updates:

- **Clinical and Public Health Partnerships for Antibiotic Stewardship (webinar, link below)** – In July, America's Essential Hospitals, along with the National Association of County and City Health Officials (NACCHO), hosted a webinar that showcased a partnership between the Los Angeles County Department of Public Health and essential hospital, Los Angeles County USC Medical Center. Speakers discussed how the partnership was established and maintained, how it has improved stewardship efforts, challenges and lessons learned, and recommendations for other local health departments and essential hospitals interested in pursuing a similar partnership. <https://essentialhospitals.org/webinar/clinical-public-health-partnerships-antibiotic-stewardship/>

Guidelines and Guidance:

Position Statements:

Legislation:

Campaigns and related activities:

- America's Essential Hospitals continues to be a partner organization in the U.S. Stakeholder Forum on Antimicrobial Resistance (S-FAR), convened by the Infectious Diseases Society of America (ISDA), to support the principles that antimicrobial resistance (AR) is an urgent problem and to work with stakeholders from all industries to help inform policy and create awareness.
- Antimicrobial Resistance (AMR) Challenge—several members of America's Essential Hospitals committed to this yearlong global initiative, that ended Sept. 2019, to reduce antibiotic and antimicrobial resistance. For example, essential hospitals identified as CDC Prevention Epicenters are evaluating a machine learning model that can provide surgeons real-time decision support to prevent infections.

Press activities:

- **International Infection Prevention Week (Oct. 13-19)** – America's Essential Hospitals' staff participated in the Twitter chat hosted by CDC and Association for Professionals in Infection Control and Epidemiology (APIC). The conversation was robust and provided participants with information about antibiotic resistance and in particular the importance of vaccinations.
- America's Essential Hospitals actively promotes CDC information to our members via social media and our website on timely topics such as:
 - *Infection Control in Healthcare Personnel: Infrastructure and Routine Practices for Occupational Infection Prevention and Control Services* – release of updated guidelines for infection prevention and control in health care workplaces; and
 - *Antibiotic Resistance Threats Report in the United States, 2019* – an update to the 2013

first-ever report highlighting the most threatening antibiotic-resistant germs in the United States.

For this information and more, you can follow us on Twitter at @OurHospitals and on Facebook at facebook.com/essentialhospitals.

Publications:

- **Disaster Response Resources** – America’s Essential Hospitals has compiled a list of resources to assist our members in the event of a natural disaster or other emergency situation. The new [resource page](#) includes links to various agencies, as well as a sample recommended list of contacts that hospitals should have on hand in the event of an emergency, provided by one of our members (e.g., state and local police and first responders; American Red Cross; Federal Emergency Support Function (ESF)8 contacts; State Office of Public Health; the hospital’s major suppliers; dialysis center locations; and shelter locations and numbers.)
- **Population Health** – Essential hospitals around the country are targeting population health in their communities. The Essential Hospital’s Institute maintains a [website](#)—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.

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

Meeting Date: November 14-15, 2019

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

Ex officio member name: Melissa Miller, MD, MS, FCCM

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 and apply improved methods and tools to combat antibiotic resistance in three major domains: 1. Promoting antibiotic stewardship (AS); 2. Preventing transmission of resistant bacteria; and 3. Preventing healthcare-associated infections (HAIs) in the first place. These projects are combating antibiotic resistance in multiple healthcare settings: acute care hospitals, long-term care, and ambulatory care.

AHRQ is participating in working groups to develop the next iteration of the National Action Plan. The working groups are addressing infection prevention and antibiotic stewardship, and diagnostics for antibiotic resistant bacteria.

- AHRQ Safety Program for Improving Antibiotic Use

Results from the acute care cohort of the AHRQ Safety Program for Improving Antibiotic Use were presented at IDWeek in October in Washington, D.C., showing a statistically significant reduction in antibiotic use, driven mainly by reductions in quinolone use. A significant reduction in *C. difficile* infections was also seen. This cohort was completed in November 2018, with over 400 hospitals participating, including 80 critical access hospitals and 6 DoD facilities. An educational toolkit developed in this cohort was just released and is available on the AHRQ web site. The Program is currently recruiting for a one-year ambulatory care cohort to begin in December 2019. A cohort of over 450 long-term care facilities will be wrapping up also in December 2019. The AHRQ Safety Program for Improving Antibiotic Use is funded and guided by AHRQ, and led by Johns Hopkins University and NORC at the University of Chicago. This is a 5-year nationwide project aimed at adapting the Comprehensive Unit-based Safety Program (CUSP) for implementation of Antibiotic Stewardship in 250-500 acute care hospitals, 250-500 long-term care facilities, and 250-500 ambulatory care settings (i.e., clinics, physician's offices, and urgent care centers). This is a collaborative effort that is consistent with CDC Core Elements of Antibiotic Stewardship and involves coordination with CDC and CMS. The project aims 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 hospitals nationwide, addressing a variety of surgeries in a phased approach. To date, more than 390 hospitals have been participating. Colorectal surgery was the initial focus starting

with the first cohort of hospitals. Orthopedic surgery was added starting with the second cohort, and gynecologic surgery was added in the third cohort. Emergency general surgery will be added in the next cohort which begins in March 2020.

- **AHRQ Safety Program for Intensive Care Units (ICUs): Preventing CLABSI and CAUTI**

The AHRQ Safety Program for Intensive Care Units (ICUs): Preventing CLABSI and CAUTI is recruiting for a final one-year cohort to begin December 1, 2019. The project launched a fifth one-year cohort of 150 ICUs in January 2019. Initiated in September 2015, this project aims to reduce central-line associated bloodstream infections (CLABSI) and catheter-associated urinary tract infections (CAUTI) in ICUs with persistently elevated rates of these infections. This is a follow-up to AHRQ's nationwide projects of CUSP for CAUTI and CUSP for CLABSI. Implementation strategies tailored to such ICUs continue to be developed, including a modified set of CUSP training resources. Over 500 ICUs have been recruited to participate nationwide.

- **ABATE Trial Toolkit Development**

On September 23, 2019 AHRQ awarded a one year task order to Johns Hopkins University to develop a toolkit based on the ABATE Trial, which showed a 30% reduction in all-cause bloodstream infections in non-ICU patients with indwelling devices through decolonization with chlorhexidine bathing and nasal mupirocin. The devices of interest are central lines (including port-a-caths and temporary dialysis lines), midline intravascular catheters, and lumbar drains. The written, video and on-line materials will demonstrate techniques to be used during bed baths and after showers to clean the devices and reduce the potential for infections with Methicillin-resistant *Staphylococcus aureus* (MRSA). The cleaning techniques to be used were developed during the NIH-funded ABATE trial led by Dr. Susan Huang, where a subgroup analysis found that they significantly reduced MRSA infections among patients with these devices. Nine pilot hospitals will evaluate usability of the toolkit materials and they will provide feedback designed to help improve the materials.

Guidelines and Guidance:

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

- *Toolkit to Improve Antibiotic Use in Acute Care Hospitals*—Developed from the AHRQ Safety Program for Improving Antibiotic Use, the Acute Care Hospital toolkit provide materials to develop or improve an antibiotic stewardship program, improve patient safety culture as it pertains to antibiotic prescribing, engage frontline staff in improving prescribing behavior using the Four Moments of antibiotic prescribing, and diagnose and treat hospitalized patients with common infectious syndromes. Target launch date: November 6, 2019.
www.ahrq.gov/antibiotic-use/index.html

Publications:

A sample of AHRQ-supported publications in the interim include:

1. Anderson DJ, Watson S, Moehring RW, et al. Feasibility of Core Antimicrobial Stewardship Interventions in Community Hospitals. *JAMA network open*. 2019;2(8):e199369.
2. Barbash IJ, Davis B, Kahn JM. National Performance on the Medicare SEP-1 Sepsis Quality Measure. *Critical care medicine*. 2019;47(8):1026-1032.
3. Barbash IJ, Kahn JM. Sepsis quality in safety-net hospitals: An analysis of Medicare's SEP-1 performance measure. *Journal of critical care*. 2019;54:88-93.
4. Bartsch SM, Wong KF, Stokes-Cawley OJ, et al. Knowing More of the Iceberg: How Detecting a

- Greater Proportion of Carbapenem-Resistant Enterobacteriaceae (CRE) Carriers Impacts Transmission. *The Journal of infectious diseases*. 2019.
5. Briscoe CC, Reich P, Fritz S, Coughlin CC. Staphylococcus aureus antibiotic susceptibility patterns in pediatric atopic dermatitis. *Pediatric dermatology*. 2019;36(4):482-485.
 6. Chiotos K, Rock C, Schweizer ML, et al. Current infection prevention and antibiotic stewardship program practices: A survey of the Society for Healthcare Epidemiology of America (SHEA) Research Network (SRN). *Infection control and hospital epidemiology*. 2019;40(9):1046-1049.
 7. Dyer AP, Dodds Ashley E, Anderson DJ, et al. Total duration of antimicrobial therapy resulting from inpatient hospitalization. *Infection control and hospital epidemiology*. 2019;40(8):847-854.
 8. Elman MR, Williams CD, Bearden DT, et al. Healthcare-associated urinary tract infections with onset post hospital discharge. *Infection control and hospital epidemiology*. 2019;40(8):863-871.
 9. Kahn JM, Davis BS, Yabes JG, et al. Association Between State-Mandated Protocolized Sepsis Care and In-hospital Mortality Among Adults With Sepsis. *Jama*. 2019;322(3):240-250.
 10. Khamash DF, Voskertchian A, Tamma PD, Akinboyo IC, Carroll KC, Milstone AM. Increasing Clindamycin and Trimethoprim-Sulfamethoxazole Resistance in Pediatric Staphylococcus aureus Infections. *Journal of the Pediatric Infectious Diseases Society*. 2019;8(4):351-353.
 11. Libertucci J, Bassis CM, Cassone M, et al. Bacteria Detected in both Urine and Open Wounds in Nursing Home Residents: a Pilot Study. *mSphere*. 2019;4(4).
 12. McGee MF, Kreutzer L, Quinn CM, et al. Leveraging a Comprehensive Program to Implement a Colorectal Surgical Site Infection Reduction Bundle in a Statewide Quality Improvement Collaborative. *Annals of surgery*. 2019;270(4):701-711.
 13. Misch EA, Safdar N. Clostridioides difficile Infection in the Stem Cell Transplant and Hematologic Malignancy Population. *Infectious disease clinics of North America*. 2019;33(2):447-466.
 14. Musuuza JS, Guru PK, O'Horo JC, et al. The impact of chlorhexidine bathing on hospital-acquired bloodstream infections: a systematic review and meta-analysis. *BMC infectious diseases*. 2019;19(1):416.
 15. Musuuza JS, Hundt AS, Carayon P, et al. Implementation of a Clostridioides difficile prevention bundle: Understanding common, unique, and conflicting work system barriers and facilitators for subprocess design. *Infection control and hospital epidemiology*. 2019;40(8):880-888.
 16. Pepper DJ, Demirkale CY, Sun J, et al. Does Obesity Protect Against Death in Sepsis? A Retrospective Cohort Study of 55,038 Adult Patients. *Critical care medicine*. 2019;47(5):643-650.
 17. Rhee C, Wang R, Zhang Z, Fram D, Kadri SS, Klompas M. Epidemiology of Hospital-Onset Versus Community-Onset Sepsis in U.S. Hospitals and Association With Mortality: A Retrospective Analysis Using Electronic Clinical Data. *Critical care medicine*. 2019;47(9):1169-1176.
 18. Sankaran R, Sukul D, Nuliyalu U, et al. Changes in hospital safety following penalties in the US Hospital Acquired Condition Reduction Program: retrospective cohort study. *BMJ (Clinical research ed)*. 2019;366:l4109.
 19. Schimmel JJ, Haessler S, Imrey P, et al. Pneumococcal urinary antigen testing in US hospitals: A missed opportunity for antimicrobial stewardship. *Clinical infectious diseases : an official publication of the Infectious Diseases Society of America*. 2019.
 20. Tandan M, Sloane PD, Ward K, et al. Antimicrobial resistance patterns of urine culture specimens from 27 nursing homes: Impact of a two-year antimicrobial stewardship intervention. *Infection control and hospital epidemiology*. 2019;40(7):780-786.

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

Meeting Date: Nov. 14-15, 2019

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

Liaison Representative name: Holly Carpenter, BSN, RN

Organization represented: American Nurses Association

Interim activities and updates:

- An ANA member attends ACIP meetings in person and sits on the following work groups: Adult Schedule, General Recommendations. Time permitting, ANA staff attend the ACIP meetings via phone.
- ANA staff sit on a nurse sharps injury prevention work group where the key task is to update the 2010 Consensus Statement sponsored by, in part, the International Healthcare Worker Safety Center.
- ANA signed on to the National Adult and Influenza Immunization Summit's Quality and Performance Measurement Working Group letter urging inclusion of the maternal and adult immunization composite measures as part of the Medicaid Child and Adult Core Sets.
- Currently ANA is updating [ANA Immunization webpages](#) and [Infection Prevention & Control webpages](#).
- ANA staff participate in the weekly National Adult and Influenza Immunization Summit calls and the monthly National Adult and Influenza Immunization Summit's Organizing/Steering Committee meeting time permitting.
- ANA was an active participant in Infant Immunization Week, Influenza in Aug, and Sepsis Awareness Month in Sept.: used graphics and blurbs from toolkit in multiple ANA and Healthy Nurse, Healthy Nation social media and e-newsletters.
- On 6/3/19, ANA signed on to a letter by the American Academy of Pediatrics (AAP) - a letter of support to Representatives Kim Schrier, Michael Burgess, Eliot Engel, Gus Bilirakis, Kurt Schrader and Brett Guthrie for introducing the Vaccine Awareness Campaign to Champion Immunization Nationally and Enhance Safety (VACCINES) Act of 2019.
- On 10/17/19, ANA sent comments to Tammy Beckham, Director, Office of Infectious Disease and HIV/AIDS Policy RFI from Non-Federal Stakeholders: Developing the 2020 National Vaccine Plan.

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:

- ANA has a draft statement in process entitled "Prevention and Care for HIV and Related Conditions". It will include Full Practice Authority for APRNs, Testing and referral to Care, Access to Care, Care Coordination, Addressing Disparities, Palliative Care and Pain Management, Criminalization, and Prevent, Care, and treatment for:
 - Black and Latino MSMs
 - Transgender People

- Youth
- People with SUDs, Including IV Drug Users
- People age 50+
- ANA also has an updated draft statement in process entitled “Immunizations”, which notes that ANA does not support religious or philosophical exemptions for immunizations and does support a requirement to update medical exemptions from the proper authority annually.

Legislation:

- None at this time.

Campaigns and related activities:

- None at this time.

Press activities:

- ANA staff attended 2019 NFID Annual Influenza/Pneumococcal News Conference and participated in being photographed receiving a flu shot.
- On 6/22/19, ANA issued a press release “American Nurses Association Takes Action on Critical Public Health Issues” including vaccinations exemptions, see <https://www.nursingworld.org/news/news-releases/2019-news-releases/american-nurses-association-takes-action-on-critical-public-health-issues/> .

Publications:

- Monsees, E. (2019). Nursing Innovations in Antibiotic Stewardship Healthy Nurse, Healthy Nation. Accessed 10/28/19 at <https://engage.healthynursehealthynation.org/blogs/10/3496>.
- Rittle, C. (2019) What’s new about measles? *American Nurse Today*. Accessed 10/28/19 at <https://www.americannursetoday.com/whats-new-about-measles/>
- Rittle, C. & Carpenter, H. (2019). Influenza update 2019-2020. *American Nurse Today*. Accessed 10/28/19 at <https://www.americannursetoday.com/influenza-update-2019-2020/> .

Other items of note:

- On 10/7/19, ANA joined the National Foundation for Infectious Diseases’ *Leading by Example* partnership.
- On 9/18-9/19/19 ANA Enterprise held an Employee Flu Clinic.
- ANA has a liaison member participate in the Presidential Advisory Committee to Combat Antibiotic Resistant Bacteria (PACCARB).
- ANA staff attend the Healthcare Infection Control Practices Advisory Committee (HICPAC) teleconferences as time permits.

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

Meeting Date: November 14-15, 2019

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

Liaison Representative name: Karen deKay

Organization represented: AORN

Interim activities and updates:

- Revised AORN Evidence Model to align with the CDC Infection Prevention and Control Recommendation Categorization Scheme. New format to all guidelines for the 2020 print book, and were released electronically in October
- ECRI Guidelines Trust has accepted the Guideline for Prevention of Hypothermia and Guideline for Surgical Attire, bringing total AORN guidelines for inclusion to 29

Guidelines and Guidance:

- AORN guidelines are available in print and through electronic access. Information on how to obtain the guidelines can be found at www.aorn.org.
- Guidelines are posted for a 30-day public comment period at www.aorn.org
- The 2020 *Guidelines for Perioperative Practice* include 6 new evidence-rated guidelines: Surgical Attire, Hypothermia, Sterilization Packaging Systems, Sharps Safety, Autologous Tissue Management and Environmental Cleaning.
- Guidelines in development for 2021 print publication
 - Laser Safety: public comment October 21- November 21, 2019
 - Pneumatic Tourniquet: public comment December 2, 2019- January 2, 2020
 - Electrosurgery: public comment February 3- March 3, 2020
 - **Instrument Cleaning**: public comment April 30- May 31, 2020
 - Local Anesthesia: public comment June 10- July 10
 - Specimen Management: public comment July 6- to August 6
 - **Patient Skin Antisepsis**: public comment TBD

Position Statements:

- Available at <http://www.aorn.org/guidelines/clinical-resources/position-statements>
- Under revision:
 - Distractions and Noise in the Perioperative Practice Setting
 - Environmental Responsibility
 - Role of Health Care Industry Representative in the Perioperative/Invasive Procedure Setting
 - Perioperative Care of Patients with Do-Not-Resuscitate or Allow-Natural-Death Orders
 - Safe Staffing and On-Call Practices
 - Advanced Practice Registered Nurses in the Perioperative Environment

Legislation:

- AORN and Society of Gastroenterology Nurses and Associates (SGNA) presented their joint statement on recommendations to reduce the risk of infection from reprocessed duodenoscopes at the **FDA Medical Devices Advisory Committee Meeting** in Washington DC,

held November 6th and 7th. Focus of joint statement was on 4 key issues:

- Patient Access, Safety and Cost
- Improving Duodenoscope Design & Processing Instructions for Use
- Environmental Impact
- Research and Data
- AORN Surgical Smoke Protection 2020 legislative priorities will be focused on the states of Oregon, Tennessee, Utah, New Jersey, and Maryland
- AORN legislative priorities for 2020 are RN as circulator, preserving and protecting the Perioperative Registered Nurse's scope of practice, supporting workplace safety and patient safety initiatives, and advancing positive health care improvements.

Campaigns and related activities:

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

Press activities:

- Recent AORN press releases can be accessed at <https://www.aorn.org/Aorn-org/About-AORN/AORN-Newsroom/Press-Releases>

Publications:

- 2019 *Guidelines for Perioperative Practice*, AORN Journal, Perioperative Job Descriptions and Competency Evaluation, Perioperative Policies and Procedures, & Ambulatory Surgery Center Resources

Other items of note:

- AORN Global Surgical Conference & Expo 2020, March 28 – April 1, Anaheim, CA

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

Meeting Date: November 14-15, 2019

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

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

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

Interim activities and updates:

APIC launches [podcast “5 Second Rule”](#). This podcast will serve as a platform for educating the public and healthcare workers on the importance of infection prevention and patient safety matters.

APIC conducted its inaugural [Applied Learning Conference](#) in October 2019 to bring together approximately 300 attendees to learn more about cleaning, disinfection and sterilization and microbiology and antibiotics for the IP.

in December of 2019, APIC will be launching a new virtual conference with a variety of sessions offered over four hours covering topics such as SSI Prevention Strategies, Construction and Infection Prevention, Peripheral Vascular Access Device Infection, Water-Associated Outbreaks and Facility Water Management Plans and Preparing for *Candida auris*.

Guidelines and Guidance:

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

Position Statements:

- [APIC Public Policy Position Statement on State Vaccine Policies.](#)
- [APIC Practice Position Statement on Non-Ventilator Hospital Associated Pneumonia \(NV-HAP\)](#)

Legislation:

- Submitted [response to CDC Request for Information on use of ICD-10 and CPT codes for NHSN SSI reporting.](#)
- Submitted [comments to CMS on the FY 2020 Hospital Inpatient Prospective Payment System/Long-Term Care Payment System \(IPPS/LTC\) proposed rule.](#)
- Submitted [comments to CMS on the FY 2020 Inpatient Rehabilitation Facility Prospective Payment System proposed rule.](#)
- Submitted [comments to CMS on the FY 2020 Skilled Nursing Facility Prospective Payment System proposed rule.](#)
- Submitted [comments to CMS on the CY 2020 Home Health Prospective Payment System propose rule.](#)
- Submitted [comments to CMS on the CY 2020 End-Stage Renate Disease Facility Prospective Payment System proposed rule.](#)
- Submitted [comments to CMS on the CY 2020 Physician Fee Schedule proposed rule.](#)
- Submitted [comments to CMS on Revisions to Long-Term Care Requirements to Promote Efficiency and Transparency, proposed rule.](#)

Campaigns and related activities:

- Recruited member to participate in email campaigns to [state](#) and [federal](#) legislators promoting the importance of vaccines.
- Encouraged CMS to require hospitals to establish an antibiotic stewardship program as a Condition of Participation in Medicare through social media and a member email campaign.
- Celebrated International Infection Prevention Week, October 13-19. Activities focused on “Vaccines Are Everybody’s Business.” Highlights:
 - [Four new infographics](#) for healthcare professionals and the public: three showcasing parent-focused vaccine information, and one focused on herd immunity.
 - Redesign of *Infection Prevention and You* [website](#) to highlight campaign theme and new infographics
 - Promotional toolkit with pre-written articles and social media posts to facilitate sharing of vaccine information
 - Twitter chat with Nurses Who Vaccinate, CDC_Flu and nearly 500 others to discuss the importance of vaccination and herd immunity. Social media activities throughout the week resulted in more than 3,000 campaign mentions from nearly 2,000 engaged users.

Press activities:

- Issued press releases in connection with abstracts presented at APIC’s Annual Conference in Philadelphia in June. Abstracts publicized included:
 - [“Utilizing a Business Case](#) to Link Reduction in Infections to Reduction in Costs”
 - [“Integrating Rapid Diagnostics](#) and Antimicrobial Stewardship for Blood Cultures Improves Antibiotic Use in a Community Hospital”
 - [“The Hidden Truth in the Faucets: A Quality Improvement Project and Splash Study of Hospital Sinks”](#)
 - [“Female External Catheter Use: A New Bundle Element to Reduce CAUTI”](#)
- Promoted recipients of the APIC [“Heroes of Infection Prevention”](#)
- Promoted recipients of APIC’s prestigious awards: Carole DeMille Achievement Award, Distinguished Science Award, Distinguished Service Award
- Issued release about notable studies in the *American Journal of Infection Control*:
 - [“Characteristics of nursing homes with comprehensive antibiotic stewardship programs: Results of a national survey.”](#)
- Issued [release](#) about MedStar Georgetown University Hospital receiving the APIC® Program of Distinction designation for excellence in infection prevention and control (IPC).

Publications:

- *Prevention Strategist* 2019 Fall issue included articles on nurturing novice infection preventionists, building a career ladder for IPs, infection prevention in ambulatory settings, interrater reliability programs, unit-led coaching to improve hand hygiene, case studies to improve HAI surveillance, peripheral vascular access device infection, and dental infection control.
- *Prevention Strategist* 2019 Winter issue included articles on antimicrobial stewardship and antibiograms, navigating conflict, leadership lessons, infection prevention in LTC, survey and accreditation issues around food service, the IP and construction, managing outbreaks, optimizing use of a facility’s antibiogram, tips for becoming a consultant.
- Published [Infection Prevention Updates](#) on preparing facilities for flu season, prevention of infections due to water intrusion, *Staphylococcus aureus*, herd immunity, avoiding the T-zone, and antibiotic resistance.

- Published digital version of *Fundamental Statistics and Epidemiology in Infection Prevention*
- Published the *Infection Prevention Manual for Construction & Renovation, 2019 Addendum*, as well as the digital version of the *Infection Prevention Manual for Construction & Renovation*, which includes the 2019 Addendum
- APIC Text Online published updated chapters on Construction & Renovation, *Legionella pneumophila*, and Surgical Services.

Other items of note:

- APIC's Research Committee is currently revising the MegaSurvey and plans to deliver it to APIC's membership in early 2020.

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

Meeting Date: November 14-15, 2019

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

Liaison Representative name: Alan Kliger, MD

Organization represented: American Society of Nephrology (ASN)

Interim activities and updates:

- A Nephrology Self-Assessment Program (NephSAP) special edition, entitled, “Infection Control and Prevention in Outpatient Hemodialysis Facilities,” was released in July 2019
- An infection prevention Curriculum for fellows and practicing nephrologists has been submitted for review by CDC leaders
- Human factors assessments: the ASN is partnering with engineers at Virginia Polytechnic Institute to conduct human factors assessments at dialysis facilities in the United States. To date, assessments have been done at six facilities; another four will be conducted. The project is studying barriers and facilitators to infection prevention in the following areas:
 - Catheter care and access
 - Injection safety
 - Environmental decontamination
 - Hand hygiene

Guidelines and Guidance:

Please include products that are in progress and planned for the coming year. Include Web links if appropriate. (The ASN does not issue guidelines. However, under its contract with CDC, ASN is developing recommendations for improved infection prevention practices, including the following.)

- Blood Culture Standardization: compilation of best practices and a summary of existing literature. This is accompanied by a SBAR template, competency checklist, and competency testing recommendations.
- Study addressing preventing the transmission of *Clostridium difficile* in out-patient dialysis facilities

Position Statements:

Legislation:

Campaigns and related activities:

- Pilot project to address improving leadership and supporting cultural change in dialysis facilities through the education and engagement of the dyad of medical director and nurse manager. Pilot conducted at Northwest Kidney Centers in Seattle on October 12, 2019.
- Vascular access pilot project implementing chairside electronic checklists and audit tools for patients with catheters.
- Promoting productive relationships between nephrologists and state and federal HAI professionals:
 - Webinar for Council of State and Territorial Epidemiologists (CSTE) (May 21, 2019)

- Developed a web-based compendium of resources which is housed on the NTDS website

Press activities:

- “ASN Launches Diabetic Kidney Disease Collaborative to Ensure People with Kidney Disease Benefit from New Therapies for Diabetic Kidney Diseases”, July 25, 2019
- “ASN Launches New Initiative Aiming to Save Lives of People Suffering with Acute Kidney Injury”, August 20, 2019

Publications:

- ASN Launches New Initiative Aiming to Save Lives of People Suffering with Acute Kidney Injury. Kidney News Online, August 21, 2019
- Kliger A and Garrick R. Targeting Zero Infections in Hemodialysis. AJKD. November 2019, Vol 74, Issue 5, 583-585. DOI: <https://doi.org/10.1053/j.ajkd.2019.05.015>
- Wong L. Fighting a stubborn foe – the guerilla tactics of Hepatitis B virus. Kidney Medicine. Published online October 29, 2019. DOI: <https://doi.org/10.1016/j.xkme.2019.10.003>

Other items of note:

- The Targeting Zero Infections webinar series includes six webinars to date. The webinar series is available on the ASN Learning Center; CME/CNE credits are available. The series includes:
 - “Targeting Zero Infections: Where Do We Begin?” (May 23, 2017)
 - “Targeting Zero Infections: MDROs and Antimicrobial Stewardship in the Dialysis Facility” (September 27, 2017)
 - “Targeting Zero Infections: Infectious Disease Reporting: State Requirements & Resources” (March 29, 2018)
 - “Targeting Zero Infections: Environmental Decontamination” (June 19, 2018)
 - “Targeting Zero Infections: Hepatitis C Detection, Prevention, and Treatment” (December 6, 2018)
 - “Targeting Zero Infections: Human Factors Engineering and Its Application to Dialysis” (September 17, 2019)
 Upcoming webinar: The next webinar is tentatively titled, “Blood Culture Standardization” (March 2020).
- Participation in ASN Kidney Week (November 2019):
 - NTDS Focus Group Session: “Charting a New Course for Patient Safety: Innovative Strategies for Patient Care” (November 7, 2019)
 - NTDS Annual Session: “Is Dialysis Safe? A Critical Look at Hemodialysis and Peritoneal Dialysis in the United States” (November 7, 2019)
 - “Keeping the Bugs Away: Preventing, Diagnosis, and Treating Common Infections in the Dialysis Unit” (November 8, 2019)

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

Meeting Date: November 14-15, 2019

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

Liaison Representative name: Kristen (Kris) Ehresmann

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

Interim activities and updates:

- ASTHO continues to enhance the capacity and performance of state and territorial health officials and other state public health leaders to effectively monitor and address the growing threat of healthcare-associated infections (HAIs) and emerging antibiotic-resistant (AR) infections through building strong partnerships and promoting HAI/AR prevention and control standards and policies. Key areas of ASTHO's HAI/AR work include:
 - Co-leading the Council for Outbreak Response: Healthcare-Associated Infection and Antimicrobial-Resistant Pathogens, (CORHA), with the Council of State and Territorial Epidemiologists (CSTE). CORHA's Workgroups on Detection and Reporting, Investigation and Control, and Policy and Laboratory Practices are tasked with developing resources and tools to support HAI outbreak response activities across the public health-healthcare continuum. [The CORHA website](#) features a "Resource Hub" that includes CORHA-developed products and external resources.
 - Providing capacity building and technical assistance to state and territorial health officials, other state public health leaders, and HAI/AR program directors and coordinators through the dissemination of tools, resources and learning opportunities on HAI/AR, including containment of MDROs, prevention and control best practices, and priorities from the CDC and other state-level partners.
 - Conducting assessments of existing policies to develop recommended practices on state HAI/AR outbreak reporting to public health, sepsis awareness and prevention, and supporting policy change to prevent HAI and reduce AR.
 - Participating in CDC's AMR challenge.

Guidelines and Guidance:

- ASTHO recently released the following tools and resources for state health agencies on controlling and preventing HAIs:
 - An infographic on [10 Ways State and Territorial Health Department Leaders can Support HAI and AR Prevention, Detection, and Response](#)
 - An *ASTHOExperts* blog on [Infection Prevention and Outbreak Control in Dialysis Settings](#)
 - An updated version of the [HAI Communication Toolkit](#) and supplemental infographic on public health's role in preventing HAIs and AR
- The following ASTHO products and activities will be forthcoming:
 - An *ASTHOExperts* podcast episode on sepsis awareness
 - An *ASTHOBrief* infographic on "Tips for Engaging Policymakers to Advance State HAI Prevention Policy Initiatives"
 - An *ASTHOExperts* blog on promoting antimicrobial stewardship and preventing antimicrobial resistance

Other items of note:

- ASTHO is preparing to launch a new Learning Community to apply a new framework on to building, augmenting, and/or sustaining multi-sector partnerships and networks for system-wide coordination, collaboration, and implementation, to address HAI and AR prevention in rural health settings.

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

Meeting Date: November 14-15, 2019

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

Liaison Representative Name: Ashley Fell

Organization represented: Council of State and Territorial Epidemiologists

Interim activities and updates:

- [CSTE annual conference](https://www.csteconference.org) will be held June 28 – July 2 in Seattle, Washington and will include Sunday workshops. <https://www.csteconference.org>
- **Provided comments for:**
 - Centers for Medicare and Medicaid (CMS) conditions of participation (CoP) requirement for antibiotic stewardship programs in hospitals which was just finalized in September

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)** held its last in-person meeting in June 2019. In addition to the detection and reporting and investigation and control groups, CORHA has contracted with APHL to support the new laboratory group. The new laboratory work group held their first meeting last month. CORHA's policy workgroup continues to work on a guidance for public disclosure of outbreaks.
- A [one-pager](http://corha.org/) describing the mission, vision, membership can be found here: <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**
 - 1) Contribute knowledge and support activities to optimize laboratory practices in support of identifying and investigating possible HAI/AR outbreaks.
 - 2) Support effective interactions among laboratory partners and between laboratories, healthcare facilities, and state/local health departments in the context of HAI/AR response activities.
 - **CORHA Policy Workgroup**
 - 1) Improve policy and legal standards for reporting, investigation, notification and disclosure of HAI/AR outbreaks and exposure events

Outbreak Reporting, Notification, and Disclosure.

For the purposes of this workgroup, the following definitions are important:

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

2) Explore options to enhance legal authority and policy options to support best practices

- **Antimicrobial Resistance Surveillance Taskforce (ARSTF):**

- The Antimicrobial Resistance Surveillance Task Force (ARSTF) is a collaboration of the CDC, the Association of Public Health Laboratories (APHL), and the Council of State and Territorial Epidemiologists (CSTE). It consists of thirty-plus individuals from clinical care, public health, laboratories, and informatics. It began in 2016, and after a full year of work, developed a vision statement, strategic map and profile, and a schema of roles and responsibilities for various levels of public health agencies for the next three years, including specific objectives for this year. The objectives address infrastructure building, collaborative alignments, and several specific initiatives (such as ensuring that antimicrobial susceptibility data do not get suppressed for public health purposes).
- The ARSTF has released its [year 3 Report and Recommendations](https://cdn.ymaws.com/www.cste.org/resource/resmgr/arstf/ARSTF_Y3_Progress_Report_FIN.pdf). It is available at: https://cdn.ymaws.com/www.cste.org/resource/resmgr/arstf/ARSTF_Y3_Progress_Report_FIN.pdf
- Other key documents are:
 - [Vision:](https://cdn.ymaws.com/www.cste.org/resource/resmgr/pdfs/pdfs2/ARS_Vision.pdf)
https://cdn.ymaws.com/www.cste.org/resource/resmgr/pdfs/pdfs2/ARS_Vision.pdf
 - [Strategic Plan:](https://cdn.ymaws.com/www.cste.org/resource/resmgr/pdfs/pdfs2/ARS_Strategic_Map.pdf)
https://cdn.ymaws.com/www.cste.org/resource/resmgr/pdfs/pdfs2/ARS_Strategic_Map.pdf
 - [Strategic Profile:](https://cdn.ymaws.com/www.cste.org/resource/resmgr/pdfs/pdfs2/Strategic_Profile_for_Nation.pdf)
https://cdn.ymaws.com/www.cste.org/resource/resmgr/pdfs/pdfs2/Strategic_Profile_for_Nation.pdf
 - [Roles and Responsibilities Table:](https://cdn.ymaws.com/www.cste.org/resource/resmgr/pdfs/pdfs2/ARS_Roles_and_Responsibilities.pdf)
https://cdn.ymaws.com/www.cste.org/resource/resmgr/pdfs/pdfs2/ARS_Roles_and_Responsibilities.pdf

- The Task Force wants to align and keep in communication with other planning bodies, such as HICPAC. There are various ways interested organizations and individuals could keep informed about the work of the Task Force: the Task Force email list, the Task Force's newsletter, or by checking the CSTE website. Individuals could also participate on one of the Task Force's working groups. For more information, contact Brooke Beaulieu at brooke@cste.org
- **Colonization Surveillance Workgroup** – Small focus group of State Epidemiologists and ARSTF members to provide insight into the broad issue of surveillance for colonization. Initial conversations arose from discussion on how to classify people in whom there is laboratory evidence of illness but no signs/symptoms. Proposed a small subset from this group to further

discuss and consider a policy brief. This group would also engage with the ARSTF Workgroup 5 (AR Surveillance Scope) for relevant pieces.

- **Drug Diversion toolkit**
 - The Drug Diversion Workgroup developed a toolkit to provide guidance for state and local HAI programs during response to drug diversion events. It was released at the 2019 CSTE Annual Conference. The [toolkit](#) can be found at:
https://cdn.ymaws.com/www.cste.org/resource/resmgr/pdfs/pdfs2/Drug_Diversion_Toolkit_LiveL.pdf
- **Data analysis and Presentation Standards (DAPS) toolkit**
 - Work is underway to update and expand the DAPS toolkit. [Current toolkit](#) available at: (<http://www.cste.org/general/custom.asp?page=HAIToolkit>). Topics under consideration include presentation of dialysis data, NHSN AUR data, consumer-friendly language around the re-baselining, and guidance on trending (especially with re-baselining). The DAPS work group acquired new leadership and plans to continue updating the 2015 DAPS Toolkit.

Position Statements (passed at the 2019 annual meeting):

- No new HAI/AR position statements
- **[Other Position statements \(passed at 2019 annual meeting and available at:](#)**
<https://www.cste.org/page/PositionStatements>)
- **19-CC-01** – Nonfatal Opioid Overdose Standardized Surveillance Case Definition
- **19-ID-01** – Public Health Reporting and National Notification of Plague
- **19-ID-02** – Standardized Surveillance Case Definition for Blastomycosis
- **19-ID-03** – Case Definition for Non-pestis Yersiniosis
- **19-ID-04** – Revision to Case Definition for National Legionellosis Surveillance
 - Amend NAAT testing to be confirmed
 - Provide new language to help with case classification of Legionnaire’s vs Pontiac Fever
 - Three new appendices to include information on incubation period and considerations for healthcare-associated and travel-associated cases (meant to be tools for health departments, not binding)
- **19-ID-05** – Revisions to the Standard Case Definition, Case Classification, Public Health Reporting for Acute Flaccid Myelitis
- **19-ID-06** – Revision of the Case Definition for Hepatitis C
- **19-ID-07** – Changes to Public Health Reporting and National Notification for Spotted Fever Rickettsiosis (including Rocky Mountain spotted fever)
- **19-ID-08** – Revision to the Case Definition for National Pertussis Surveillance
- **19-MCH-01** – Neonatal Abstinence Syndrome Standardized Case Definition

Liaison Representative Report

HEALTHCARE INFECTION CONTROL PRACTICES ADVISORY COMMITTEE (HICPAC)

Centers for Disease Control and Prevention

Meeting Date: November 14-15, 2019

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

Liaison Representative name: Maureen Washburn, RN, ND, CPHQ, FACHE standing in for Ronell Myburgh, RN, MHA, MBA

Organization represented: DNV GL Healthcare (DNV GL)

Interim activities and updates:

- DNV GL introduced a Certification in Infection Prevention for health care organizations in February 2019 that includes Antimicrobial Stewardship requirements.
- DNV GL representatives (Tammy Allen, Director of Program Development and Certifications, and Ronell Myburgh, Manager, Program Development and Certifications) attended the September 23 AMR Challenge event in NYC.
- DNV GL's Certification for Sterile Processing Programs was introduced in October 2019.
- DNV GL client organizations were encouraged to participate in AMR Challenge through publication of Advisory Notice in February 2019.

Guidelines and Guidance:

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

- Revisions of the DNV GL NIAHO[®] Accreditation Requirements for Critical Access Hospitals and Acute Care Hospitals in process to update CMS Conditions of Participation and CDC AMR guidelines.
- DNV GL's 2019 Symposium in Cincinnati, November 6-8, featured presentations focused on infection prevention including:
 - Pre-event workshop: "Infection Prevention and Control Matters...and Impacts Your Bottom Line"
 - CDC's Dr. Denise Cardo: "Partnering to Combat Healthcare Associated Infections and Antibiotic Resistance"
 - Pender Memorial Hospital: "Successful Antimicrobial Stewardship in a Critical Access Hospital"

Other items of note:

- DNV GL had the opportunity the week of October 21-25 to participate in AAMI Sterilization Standards Week in Arlington, VA, where AAMI standards are reviewed and updated to reflect changes in practice and technology. The standards are reviewed by a select group of subject matter experts representing industry, end-users, government and regulatory agencies. DNV GL participated in two committees that have a significant impact on our organizations and patient safety. Working Group 40 is the committee that focuses on Steam Sterilization in the hospital and is responsible for development and review of AAMI ST79. Working Group 84 is the committee that focuses on Endoscope Processing in organizations and is responsible for the development and review of AAMI ST91. By participating in both of these working groups DNV GL provides the perspective of accrediting organizations and the impact that new standards will have on our client organizations.

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

Meeting Date: November 14-15, 2019

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:

- October 24, 2019: NACCHO published a blog post, [Containing an MDRO: Tools Developed During a Response](http://essentialelements.naccho.org/archives/15553) (<http://essentialelements.naccho.org/archives/15553>), to our Essential Elements of Local Public Health webpage. This post featured tools developed by the Florida Department of Health in Orange County in response to a novel or targeted multi-drug resistant organism (MDRO). Tools shared within the article include laboratory specimen collection guidance, forms to collect patient consent for screening, signs for patients on special precautions, a patient and family guide to MDROs, a stewardship one-pager, an environmental cleaning checklist, and a discharge packet for long term care facilities.
- September 18, 2019: NACCHO convened the Rural Health Section, a group of NACCHO members and partners working together on specific rural public health issues, for a call on the topic of healthcare-associated infections. NACCHO presented the resources available to support local health departments to learn more about the HAI issues and activities in participants' respective states. As the role of local health departments continue to evolve and increase, NACCHO will continue to offer capacity building assistance for local health departments located in rural areas.
- July 30, 2019: NACCHO co-hosted a webinar with America's Essential Hospitals titled, [Clinical and Public Health Partnerships for Antibiotic Stewardship](https://essentialelements.naccho.org/event/webinar-clinical-and-public-health-partnerships-for-antibiotic-stewardship) (<https://essentialelements.naccho.org/event/webinar-clinical-and-public-health-partnerships-for-antibiotic-stewardship>), to highlight a local health department partnering with an essential hospital to improve antimicrobial stewardship and HAI prevention/response. The webinar promoted the importance of partnership in improving stewardship efforts, challenges and lessons learned, and recommendations for other local health departments and essential hospitals interested in pursuing a similar partnership. The webinar recording is available on [YouTube](https://youtu.be/1Tn5C7Zeom8) (<https://youtu.be/1Tn5C7Zeom8>).
- June 2-6, 2019: NACCHO hosted a roundtable session at the CSTE conference. This session featured examples of local health departments participating in regional containment strategies. The roundtable provided an opportunity for health department representatives and other stakeholders to share useful approaches to strengthen capacity and partnerships for infection prevention, control, preparedness, and response.
- Ongoing: NACCHO convenes an Infectious Disease Prevention and Control advisory group comprised of local health department staff who lead epidemiology and infectious disease programs. This group provides expertise and review on NACCHO's infectious disease related policy statements and feedback to NACCHO and external partners on programs, policies, and materials. The workgroup welcomes requests for feedback and opportunities to ensure the local health department perspective is considered on relevant materials related to healthcare-associated infections, antimicrobial resistance, as well as other ongoing and emerging infectious disease issues. For questions or requests, email Erin Laird (elaird@naccho.org).
- Ongoing: NACCHO promotes HAI prevention and infection control news and resources via

NACCHO's regular communication channels that reach nearly 3,000 LHDs.

- Ongoing: NACCHO staff and four local health department representatives participate on The Council for Outbreak Response: Healthcare-Associated Infections (HAIs) and Antimicrobial-Resistant Pathogens (CORHA) workgroup and All-Member calls. Dawn Terashita, MD, MPH (LA County, CA) serves on the governance committee and 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. Stephanie Black, MD, MSc (Chicago, IL) and Hillary Hanson, MS, MPH, CIC (Flathead County, MT) participate on Workgroup A: Detection and Reporting which aims to identify standardized approaches to detection and reporting of infectious disease outbreaks and exposure events within healthcare facilities and in various ambulatory settings.
- Ongoing: NACCHO hosts a quarterly call to convene the ELC HAI/AR directly funded cities to discuss project updates and share lessons learned. This platform for peer discussion supports ELC-funded cities through sharing best practices and discussing challenges while also allowing NACCHO to monitor lessons learned in and materials developed by the ELC-funded cities and disseminate these resources to other local health departments who may benefit from these examples.
- Ongoing: NACCHO provides funding and technical assistance to demonstration projects with local health departments to increase their capacity in preventing HAIs, and combatting antimicrobial resistance including through containment of novel resistant pathogens. From January to July 2019, these demonstration sites were DuPage County Health Department (IL), Florida Department of Health in Orange County (FL), and Lubbock County (TX). On June 19, 2019, NACCHO hosted a webinar, [Local Health Department Role in Containment of Novel Resistance](https://essentialelements.naccho.org/event/webinar-local-health-department-role-in-containment-of-novel-resistance) (<https://essentialelements.naccho.org/event/webinar-local-health-department-role-in-containment-of-novel-resistance>), featuring the containment experiences of these three demonstration sites. The recording is available on [NACCHO's Essential Elements webpage](https://essentialelements.naccho.org/archives/14450) (<https://essentialelements.naccho.org/archives/14450>).
- Ongoing: In January 2019, NACCHO launched a nationwide assessment of local health departments to identify HAI/AR activities locals are involved in, which entities they partner with to conduct this work, and challenges and barriers they encounter. The assessment also aimed to identify opportunities for technical assistance to support local capacity. NACCHO is finalizing the analysis and anticipates presenting initial findings at the CDC ELC Grantees meeting for state HAI coordinators November 13. Further dissemination of the assessment results will take place in early 2020.

Guidelines and Guidance:

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

- No guidance updates at this time.

Position Statements:

- NACCHO's Infectious Disease Prevention and Control workgroup updated a [NACCHO policy statement on Antimicrobial Resistance and Stewardship](https://www.naccho.org/uploads/downloadable-resources/15-07-Antimicrobial-Stewardship-and-Resistance.pdf). It was approved by NACCHO's board in June 2019 and is available on NACCHO's website (<https://www.naccho.org/uploads/downloadable-resources/15-07-Antimicrobial-Stewardship-and-Resistance.pdf>).

Legislation:

- No legislation updates at this time.

Campaigns and related activities:

- NACCHO continues to participate in the following campaign meetings, conference calls, and committees related to (1) obtaining updates on HAIs, injection safety, antimicrobial resistance, and infection control; and (2) determining how NACCHO can support national efforts to address related issues
 - Safe Injection Practices Coalition
 - Making Dialysis Safer for Patients Coalition

Press activities:

- No press updates at this time.

Publications:

- No publications updates at this time.

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: November 14-15, 2019

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). We are now completing five years of active surveillance for CPO and are assembling the data to characterize our experience.
- The Clinical Center investigation of *Sphingomonas koreensis* infection and colonization has identified the source as our potable water supply. In the course of this indolent cluster . eleven clonal infections were identified over a 12-year period. An abstract describing six months' absence of Sphingomonas colonization associated with the novel plumbing intervention was presented at ID Week in Washington, DC in September. In addition to the plumbing intervention, the CC team has also developed a mechanism to monitor and maintain adequate chlorine levels. Whereas our patient population continues to be substantially immunosuppressed, no additional infections have been detected for the past 32 months.
- David Henderson, MD, who has been the HICPAC *ex officio* member from NIH since 2005 will retire from Federal service January 3, 2020. The NIH Director has identified Dr. Tara N. Palmore, NIH Clinical Center Hospital Epidemiologist to replace Dr. Henderson as the NIH *ex officio* representative.

Guidelines and Guidance:

Position Statements:

Legislation:

Campaigns and related activities:

Press activities:

Publications:

1. Chiotos K, Rock C, Schweizer M, Deloney V, Morgan DJ, Milstone AM, Henderson DK, Harris AD, MD, Han J. Current Practices of Infection Prevention and Antibiotic Stewardship Programs: a Survey of the Society for Healthcare Epidemiology of America (SHEA) Research Network (SRN). *Infect Control Hosp Epidemiol* 2019;40(9):1046-9
2. Johnson RC, Deming C, Conlan S, Zellmer C, Michelin A, Lee-Lin S-Q, Thomas P J, Park M, NISC Comparative Sequencing Program, Weingarten RA, Less J., Dekker JP, Frank KM, Musser KA, McQuiston JR, Henderson DK, Lau AF, Palmore TN, Segre JA. Genomic and epidemiologic investigation to identify Sphingomonas koreensis point sources in an indolent hospital outbreak. *N Engl J Med* 2018; 379 (29): 2529-39.
3. Conlan S, Lau AF, Deming C, Spalding CD, Lee-Lin S, Thomas PJ, Park M, Dekker JP, Frank KM, Palmore TN, Segre JA. Plasmid Dissemination and Selection of a Multidrug-Resistant Klebsiella pneumoniae Strain during Transplant-Associated Antibiotic Therapy. *MBio*. 2019 Oct 8;10(5).

Other items of note:

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

Meeting Date: 14-15 Nov 2019

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

Liaison Representative: Andi L. Shane

Organization represented: Pediatric Infectious Diseases Society (PIDS)

Guidelines and Guidance:

- A collaborative effort among the Pediatric Infectious Diseases Society (PIDS) and the American Academy of Pediatrics (AAP) and its Section on Infectious Diseases (SOID), and Health Care without Harm Clinician Champions in Comprehensive Antibiotic Stewardship Group resulted in development of the Pediatric Antibiotic Stewardship Program (ASP) [Toolkit](https://www.pids.org/asp-toolkit.html), (<https://www.pids.org/asp-toolkit.html>). This resource continues to be accessed and well-utilized.
- PIDS is continuing to collaborate with SHEA on the white paper series to accompany the HICPAC NICU guideline. Aaron Milstone is the PIDS representative on the writing group and is leading work on the *S. aureus* white paper.
- PIDS members have been asked to comment on the *Draft Guideline for Prevention and Control of Infections in Neonatal Intensive Care Unit Patients: Draft Recommendations for Prevention and Control of Staphylococcus aureus in Neonatal Intensive Care Unit Patients* as published in the Federal Register (Docket No. CDC-2019-0077)

Campaigns and related activities:

- PIDS members continue to advocate for immunization of children and those who interact with them in healthcare settings. Unrestricted educational funding has been obtained to deploy an evidence-based vaccine education curriculum created by the Collaboration for Vaccination Education and Research team. This curriculum was developed for medical students and residents but modules will also be of interest to practicing physicians. The initial modules of this free curriculum will be available online in early 2020.

Publications:

- PIDS has advocated for [vaccination and healthcare for children detained at the border](#): 10.1093/cid/ciz1029
- Publication of the [Handbook of Pediatric Infection Prevention and Control](#) occurred in April 2019. Edited by Kris Bryant and Judy Guzman-Cottrill with contributions by PIDS members, (<https://global.oup.com/academic/product/handbook-of-pediatric-infection-prevention-and-control-9780190697174?cc=us&lang=en&>). This handbook seeks to “address the nuances and challenges specific to pediatric infection prevention, providing expert guidance on topics where evidence-based guidelines don't currently exist”.
- marketing plan is currently being developed with a focus on infection prevention and adult organizations and frontline infection prevention groups.

Other items of note:

- PIDS continues to support the education of trainees with an interest in antimicrobial stewardship, providing financial support to trainees to design and implement projects related to antimicrobial stewardship. Supporting and maintaining these educational initiatives is vital

to sustaining interest in these important topics by our next generation of clinician-researchers and advocates. The 10th Annual Pediatric Antimicrobial Stewardship conference, co-sponsored by Washington University and SIDP is scheduled for May 28-29,2020.

- PIDS members are participating in the World Society of Pediatric Infectious Disease (WSPID) Conference in Manila in November 2019 as invited speakers addressing the global challenges of pediatric infection prevention and antimicrobial stewardship in healthcare settings.

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

Meeting Date: November 14-15, 2019

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

Liaison Representative name: Christa A. Schorr, DNP, MSN, RN, NEA-BC, FCCM

Organization represented: Society of Critical Care Medicine

Guidelines and Guidance:

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

- **Published**
 - [Criteria for Critical Care Infants and Children: PICU Admission, Discharge, and Triage Practice Statement and Levels of Care Guidance](https://journals.lww.com/pccmjournal/Fulltext/2019/09000/Criteria_for_Critical_Care_Infants_and_Children_7.aspx)
(https://journals.lww.com/pccmjournal/Fulltext/2019/09000/Criteria_for_Critical_Care_Infants_and_Children_7.aspx)
 - [A Machine Learning-Based Triage Tool for Children with Acute Infection in a low Resourced Setting](https://journals.lww.com/pccmjournal/Abstract/onlinefirst/A_Machine_Learning_Based_Triage_Tool_for_Children.98198.aspx) (PCCM, September 2019)
(https://journals.lww.com/pccmjournal/Abstract/onlinefirst/A_Machine_Learning_Based_Triage_Tool_for_Children.98198.aspx)
- **In Development (*related to CDC work)**
 - 1) *Pediatric and Neonatal Analgesia and Sedation in the ICU: pain, agitation and delirium*
 - *2) *Guidelines for the evaluation of adult new fever in the ICU: a 2008 update SCCM and IDSA*
 - 3) *Management of the critically ill adult patient with liver disease (in journal peer review)*
 - 4) *Guidelines for stress ulcer prophylaxis in adult critically ill patients*
 - 5) *Rapid sequence intubation in adults*
 - 6) *Update: Guidelines for the use of an insulin infusion for the management of hyperglycemia in critically ill patients*
 - *7) *Surviving Sepsis Campaign guidelines for the management of adult sepsis and septic shock*
 - *8) *Surviving Sepsis Campaign guidelines for the management of sepsis and septic shock in children (in peer review to be published PCCM and ICM 2/19)*
 - 9) *Recognizing Critical Illness Outside the ICU*

Position Statements:

- None

Legislation:

- None

Campaigns and related activities:

- Surviving Sepsis Campaign Hour-1 bundle guidance updated @ <http://www.survivingsepsis.org>
- [Early Identification of Sepsis on the Hospital Floors: Insights for Implementation of the Hour-1 Bundle](http://www.survivingsepsis.org/SiteCollectionDocuments/Surviving-Sepsis-Early-Identify-Sepsis-Hospital-Floor.pdf) (<http://www.survivingsepsis.org/SiteCollectionDocuments/Surviving-Sepsis-Early-Identify-Sepsis-Hospital-Floor.pdf>) Related SCCM [newsmagazine story](https://www.sccm.org/Communications/Critical-Connections/Archives/2019/Early-Identification-of-Sepsis-The-Journey-Since)
(<https://www.sccm.org/Communications/Critical-Connections/Archives/2019/Early-Identification-of-Sepsis-The-Journey-Since>)

- Since sepsis continues to be a devastating consequence of infection, SCCM has commissioned a task force to develop and disseminate a definition for children’s sepsis and continues to consult with the World Health Organization on initiatives and policies to address this global health crisis.
- [Effect of Community-Acquired Pneumonia on Pediatric Sepsis Survivors](https://www.sccm.org/Blog/June-2019/Concise-Critical-Appraisal-Effect-of-Community-Ac) (https://www.sccm.org/Blog/June-2019/Concise-Critical-Appraisal-Effect-of-Community-Ac)
- The Sepsis Alliance and Rory Staunton Foundation will present updated community education tools for sepsis at the February 16-19, 2020 in Orlando Florida along with the newly published children’s guidelines.
- CDC, NIH & BARDA will participate in a session at the SCCM Congress, *Federal Government Sepsis Priorities: Working Together to Educate, Innovate and Optimize Patient Outcomes* 11:45 am – 12:45 pm February 16, 2020.

Other items of note:

- [SCCM Annual Report](http://annualreport.sccm.me/) (http://annualreport.sccm.me/)
- [Vaping Webcast CDC: What Critical Care Clinicians Need to Know About Vaping: Addressing Real-Life Cases with a CDC Overview](http://sccm.informz.net/z/cjUucD9taT04ODg1NTc3JnA9MSZ1PTEwODM2Mjc1MjkmbGk9NzA3MzgxNjE/index.html) (http://sccm.informz.net/z/cjUucD9taT04ODg1NTc3JnA9MSZ1PTEwODM2Mjc1MjkmbGk9NzA3MzgxNjE/index.html)
Wednesday, October 30, 2019
12:00 p.m. - 1:00 p.m. Central Time
- SCCM Newsletter Critical Care Update Stories Related to CDC Announcements/Data:
 - [Acute Flaccid Myelitis Cases Story CDC](https://www.precisionvaccinations.com/numerous-afm-cases-were-confirmed-texas-ohio-colorado-washington-and-california-during-2018) (https://www.precisionvaccinations.com/numerous-afm-cases-were-confirmed-texas-ohio-colorado-washington-and-california-during-2018)
 - A New Bug Using Old Tricks: The Threat of Candida Auris (<https://www.medpagetoday.com/infectiousdisease/infectioncontrol/81290>)
 - [Rotavirus recommendations leave NICU population vulnerable](https://www.healio.com/pediatrics/vaccine-preventable-diseases/news/online/%7Bfee6ee91-4dee-4d80-acb9-73de88444108%7D/rotavirus-recommendations-leave-nicu-population-vulnerable-study-finds) (https://www.healio.com/pediatrics/vaccine-preventable-diseases/news/online/%7Bfee6ee91-4dee-4d80-acb9-73de88444108%7D/rotavirus-recommendations-leave-nicu-population-vulnerable-study-finds)
 - [Vaping illnesses rise to at least 127 across several states, CDC investigating](https://www.today.com/health/vaping-illnesses-rise-least-127-across-several-states-cdc-investigating-t161104) (https://www.today.com/health/vaping-illnesses-rise-least-127-across-several-states-cdc-investigating-t161104)
 - [CDC Surveillance Report Flu](https://www.sccm.org/Disaster/CDC-influenza-surveillance-weekly-reports) (https://www.sccm.org/Disaster/CDC-influenza-surveillance-weekly-reports)

- **Annual Congress**

49th Critical Care Congress

February 16-19, 2020

Orange County Convention Center

Orlando, Florida USA

[Advance Program](https://www.sccm.org/getattachment/Education-Center/Annual-Congress/CON20_AdvanceProgram_WebReady_20191004.pdf?lang=en-US) (https://www.sccm.org/getattachment/Education-Center/Annual-Congress/CON20_AdvanceProgram_WebReady_20191004.pdf?lang=en-US)

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

Meeting Date: November 14-15, 2019

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

Liaison Representative name: Louise-Marie Dembry, MD, MS, MBA, FACP, FIDSA, FSHEA

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

Interim activities and updates:

- **6th Decennial International Conference on Healthcare Associated Infections** will be held March 26-30, 2020 in Atlanta, GA at the Marriott Marquis. The Program Committee with direction from the Committee Chairs, Daniel Diekema, MD, SHEA, Deborah Yokoe, MD, MPH, SHEA, John Jernigan, MD, MS, CDC, and Benjamin Park, MD, CDC have finished the development of Plenaries, Meet the Consultants, and Symposiums. Speaker invitations have been sent and almost all have been solidified. Workshop speaker invitations have also been sent and we have already received a few acceptances. Registration officially opened Monday, September 9th. Abstracts opened earlier this summer with the new submission deadline is November 12th and the in-person meeting to review submitted abstracts is December 12th in Atlanta.
- SHEA hosted **Outbreak Prevention and Response Week** from September 16-20, 2019. During the week, SHEA and its partners (of which IDSA participated) shared resources with healthcare professionals, the infection prevention community, and patients and families on ways to prevent the spread of infectious diseases. During the week, SHEA and its partners tapped into the expertise of the healthcare epidemiologist and other healthcare professionals in outbreak prevention and response, to lead discussions and share tips and information on five themes:
 - Preventing Healthcare-Associated Infections
 - Preparedness: Outbreak Response and Incident Management
 - Partnerships: Public Health and Community Response
 - Antibiotic Stewardship and Risks of Multidrug-Resistant Organisms
 - Sustainability: Research and Funding
- **Race Against Resistance:** SHEA and the SHEA Education & Research Foundation (ERF) fundraised to create scholarships for members to attend future SHEA-sponsored antibiotic stewardship educational conferences. The top fundraisers were recognized at the SHEA Business Meeting during IDWeek 2019. Funds raised through these race efforts will go to the SHEA ERF and be applied towards scholarships in 2020 for antibiotic stewardship education and training.

Guidelines and Guidance:

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

- **Published 2018-19:**
 - SHEA Expert Guidance: Infection Prevention in Operating Room Anesthesia Work Area
 - Chair Silvia Munoz-Price
 - [Guidance, webinar series, pocket card](http://www.shea-online.org/index.php/practice-resources): <http://www.shea-online.org/index.php/practice-resources>
 - SHEA NICU White Paper Series
 - [C. difficile](#)
 - Co-Chairs Tom Sandora and Allison Bartlett
 - <https://doi.org/10.1017/ice.2018.209>

- Under external review: *S. aureus*
 - Pending: CLABSI, Respiratory Infections
- AAAAI-IDSA-SHEA Evaluation and Management of Penicillin Allergy
 - SHEA Representative Theresa Rowe; SHEA member Erica Shenoy
 - [Consensus paper, tool kit, podcast, patient guide:](#)
<https://jamanetwork.com/journals/jama/article-abstract/2720732>
- **In Development:**
 - Sterilization and High-Level Disinfection (Co-Chairs Erica Shenoy and David Weber)
 - Initiation of Antibiotics (Co-Chairs Chris Crnich and Theresa Rowe)
 - Healthcare Workers Infected with Bloodborne Pathogens (SHEA white paper, Co-Chairs David Henderson and Louise Dembry)
 - Infection Prevention in Long Term Care (Co-Chairs Lona Mody and Rekha Murthy)
 - SHEA/IDSA Compendium 2020 Update (Co-Chairs Deborah Yokoe and Lisa Maragakis)

Legislation:

- Expanded advocacy efforts on bills that will improve the infrastructure for HAI/AR surveillance, data collection, and outbreak response/containment including:
 - STAAR Act of 2016
 - Three bills authorizing investments to modernize public health IT systems
 - Prevention Fund Restoration Act
- Continue to advocate for a FY2020 L-HHS bill to be passed by Congress as soon as possible; seeking new funding for CDC especially for data modernization, NHSN
- Submitted comments in August in response to NQF's draft Patient Safety Report which includes the status of endorsements for new measures being considered for CMS quality improvement programs.
- Convened a writing group of subject matter experts to develop a SHEA position statement on the safety and necessity of healthcare personnel immunization programs.
- Expanded SHEA's Grassroots Network offerings
 - Established a formal collaborative agreement with SIDP to coordinate on calls to action on issues of mutual interest; will use SHEA's grassroots platform to mobilize members and share updates on activities of both societies;
 - Expanded the policy section of the SHEA web site to include new fact sheets on priority issues, an Action Center for calls to action (still under development), and a Tools and Resources section available to SHEA members only.

Press activities:

SHEA has released the following press statements in 2019 since the last HICPAC meeting. [Full text](#) can be found at <http://www.shea-online.org/index.php/journal-news/press-room/press-release-archives>

- Study Shows Healthcare Workers Often Care for Patients While Ill *Published: June 18, 2019*
- Multiple Injection Safety Violations Found in New Jersey Septic Arthritis Outbreak *Published: July 15, 2019*
- Survey Shows Surveillance for Antibiotic-Resistant Bacteria Continues as Core Focus *Published: July 15, 2019*
- Hospital Acquired Infections Cost Patients Time, Money, and Even Their Lives *Published: July 24, 2019*

Publications:

- SHEA is still actively promoting our textbooks released in 2018:

- [Practical Healthcare Epidemiology, 4th Edition](https://doi.org/10.1017/9781316597170): <https://doi.org/10.1017/9781316597170>
- [Practical Implementation of an Antibiotic Stewardship Program](https://doi.org/10.1017/9781316694411)
<https://doi.org/10.1017/9781316694411>
- ICHE has launched a new [podcast](https://podcasts.apple.com/us/podcast/the-iche-podcast/id1459545889), available at <https://podcasts.apple.com/us/podcast/the-iche-podcast/id1459545889>
- SHEA is still actively promoting our [Anesthesia Guideline](https://www.cambridge.org/core/journals/infection-control-and-hospital-epidemiology/article/infection-prevention-in-the-operating-room-anesthesia-work-area/66EB7214F4F80E461C6A9AC00922EFC9) available <https://www.cambridge.org/core/journals/infection-control-and-hospital-epidemiology/article/infection-prevention-in-the-operating-room-anesthesia-work-area/66EB7214F4F80E461C6A9AC00922EFC9>

Other items of note:

- **IDWeek 2019** Drs. Kristina Bryant, MD (chair) and Tom Talbot (vice-chair) and SHEA committee representatives: Drs. Robin Jump, Shelley Magill, and Tara Palmore identified the sessions for IDWeek 2019. Trish Pearl was selected for the SHEA Lectureship. SHEA also worked with Drs. Emily Spivak and Jason Newland to execute our ‘Best Practices for Antimicrobial Stewardship Programs’ pre-meeting workshop. As of September 12, there are 187 registrants. The new Workshop, Expanding Your Influence to Improve Antibiotic Use in Outpatient Settings, led by Lauri Hicks, DO and David Hyun, MD is tracking well with 154 registrants as of September 12.
- **Online Education Center - LearningCE** houses all of SHEA’s online education. This system is available to both members and non-members. Users can learn about innovative topics at their own pace and track their progress while earning CME credits. Top programming includes:
 - The updated *Primer on Healthcare Epidemiology, Infection Control & Antimicrobial Stewardship*
 - Webinars such as *Rapid Response – The Measles Outbreak* and *A Practical Guide to Managing Occupational Exposures*
 - Podcasts including *The Diagnostic Stewardship Podcast* series and *The Outbreak Prevention and Response Week Podcast*
 - Journal CME 2019
 - New E-Learning course: *Are You Ready? Hot Topics in Joint Commission*
- **SHEA Spring 2021** conference will be held from April 14-16, in Houston, TX with direction from the Planning Committee Chair, Dr. Thomas Sandora and Vice Chair, Dr. Jennifer Hanrahan.

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

Meeting Date: November 2019

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

Liaison Representative name: Valerie Vaughn, MD

Organization represented: Society of Hospital Medicine (SHM)

Interim activities and updates:

- SHM continues to promote its Fight the Resistance Campaign dedicated to promoting awareness and behavior change related to antimicrobial stewardship and appropriate prescribing practices

Guidelines and Guidance:

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

- SHM's High-Value Care Subcommittee is currently working to develop the second iteration of the Choosing Wisely topics (Choosing wisely 2.0). This guideline will build on top of the original choosing wisely recommendations. See original [Guide](#) here (<http://www.choosingwisely.org/wp-content/uploads/2015/02/SHM-Adult-Choosing-Wisely-List.pdf>)

Position Statements:

- None

Legislation:

- None

Campaigns and related activities:

- None

Press activities:

- None

Publications:

- [Clinical Guideline Highlights for the Hospitalist](#): Diagnosis and Management of Clostridium difficile in Adult (<https://www.journalofhospitalmedicine.com/jhospmed/article/208016/hospital-medicine/clinical-guideline-highlights-hospitalist-diagnosis-and>)
- [Catheter-Associated Urinary Tract Infections in Adults](#): Diagnosis, Treatment, and Prevention (<https://www.journalofhospitalmedicine.com/jhospmed/article/208025/hospital-medicine/catheter-associated-urinary-tract-infections-adults>)
- [Clinical Progress Note: Procalcitonin in the Diagnosis and Management of Community-Acquired Pneumonia in Hospitalized Adults](#) (<https://www.journalofhospitalmedicine.com/jhospmed/article/206280/hospital-medicine/clinical-progress-note-procalcitonin-diagnosis-and>)

Other items of note:

- [New treatment approved for hospital-acquired bacteria](https://www.the-hospitalist.org/hospitalist/article/202251/critical-care/fda-approves-new-treatment-hospital-acquired-ventilator?utm_medium=Email&utm_source=SHMRounds&utm_campaign=TH&utm_term=6.4.19&utm_content=fda-approves-new-treatment-hospital-acquired-ventilator) (https://www.the-hospitalist.org/hospitalist/article/202251/critical-care/fda-approves-new-treatment-hospital-acquired-ventilator?utm_medium=Email&utm_source=SHMRounds&utm_campaign=TH&utm_term=6.4.19&utm_content=fda-approves-new-treatment-hospital-acquired-ventilator)

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

Meeting Date: 14-15 November 2019

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

Liaison Representative name: Robert Sawyer

Organization represented: Surgical Infection Society

Interim activities and updates:

- The annual SIS meeting was held in June, 2019. This meeting was co-localized with the annual Shock Society meeting to encourage interactions between basic and clinical scientists
- Special symposia were held related to patient-generated health data (from a CDC-funded initiative) and the importance of surgical infections in global surgery
- Launched a specific process with funding to encourage early stage, multicenter studies related to surgical infections
- A Delphi process has been initiated to determine the most important questions related to surgical infections

Guidelines and Guidance:

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

- Members of the SIS continue to be actively involved with the upcoming IDSA guidelines related to the management of intra-abdominal infections
- The SIS has started the process with ASHP, IDSA, and SHEA for revising surgical prophylaxis guidelines

Campaigns and related activities:

- Continuing to promote a [series of informational videos](https://www.youtube.com/watch?v=NvjZKx_pUfo&feature=youtu.be) related to surgical techniques, for example, common errors in scrubbing for surgeons (https://www.youtube.com/watch?v=NvjZKx_pUfo&feature=youtu.be)

Publications/Reviews:

- Antibiotic Prophylaxis in Pediatric Cardiac Surgery: Where Are We and Where Do We Go? A Systematic Review. Jaworski R, Kansy A, Dzierzanowska-Fangrat K, Maruszewski B. Surg Infect (Larchmt). 2019 May/Jun;20(4):253-260.
- Commonly Encountered Skin Biome-Derived Pathogens after Orthopedic Surgery. Garcia DR, Deckey D, Haglin JM, Emanuel T, Mayfield C, Eltorai AEM, Spake CS, Jarrell JD, Born CT. Surg Infect (Larchmt). 2019 Jul;20(5):341-350.
- Lack of Pharmacokinetic Basis of Weight-Based Dosing and Intra-Operative Re-Dosing with Cefazolin Surgical Prophylaxis in Obese Patients: Implications for Antibiotic Stewardship. Blum S, Cunha CB, Cunha BA. Surg Infect (Larchmt). 2019 Sep;20(6):439-443.

Other items of note:

- The entire October 2019 issue of Surgical Infections was a Special Issue On Assessing Surgical Site Infection Surveillance Technologies: Methods And Implementation. These manuscripts

were a direct result of a joint CDC-SIS project