Hand Hygiene Compliance and HAI Reductions

HIIN Leadership, Improvement Advisors, and Hospitals Pacing Event

May 25, 2017
Welcome!

Who’s in the Room?

Kendall K. Hall, MD, MS
Managing Director
IMPAQ International, LLC
NCD Project Director
Overview

• Program Evaluation Contractor Framing
  – Patty Yurchick, RN, CPHQ

• Patient and Family Engagement Perspective
  – Jodi Hansen, Parent Advocate (Utah Family Voices)

• Driving Sustainable Change in Hand Hygiene
  – Paul Alper (Electronic Hand Hygiene Compliance Organization)

• Greenville Health System Hand Hygiene: Our Journey to Improve
  – Connie Steed, MSN, RN, CIC

• Questions and Answers

• Comments from CMS
C. difficile and MRSA

Patty Yurchick, RN, CPHQ
PEC, Pacing Event Support
Program Evaluation Contractor

Reporting for All Core AEAs: Percentage of Hospitals Reporting at Least 3 and 6 Months of Outcomes Data

<table>
<thead>
<tr>
<th>Adverse Event Areas</th>
<th>Reporting at least 3 months of data on or after January 2014</th>
<th>Reporting at least 6 months of data, with at least 3 months of data occurring in the HIIN period</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADEs (all three)</td>
<td>29.4%</td>
<td>50.1%</td>
</tr>
<tr>
<td>CAUTI</td>
<td>84.7%</td>
<td>88.8%</td>
</tr>
<tr>
<td>CLABSI</td>
<td>83.4%</td>
<td>87.5%</td>
</tr>
<tr>
<td>C. difficile</td>
<td>77.0%</td>
<td>83.9%</td>
</tr>
<tr>
<td>Falls</td>
<td>62.6%</td>
<td>78.8%</td>
</tr>
<tr>
<td>PrU</td>
<td>57.3%</td>
<td>85.9%</td>
</tr>
<tr>
<td>Sepsis</td>
<td>38.6%</td>
<td>75.1%</td>
</tr>
<tr>
<td>SSI</td>
<td></td>
<td>81.2%</td>
</tr>
<tr>
<td>VTE</td>
<td>43.1%</td>
<td>80.5%</td>
</tr>
<tr>
<td>VAE</td>
<td>63.8%</td>
<td>73.7%</td>
</tr>
<tr>
<td>Readmissions</td>
<td>50.6%</td>
<td>86.4%</td>
</tr>
</tbody>
</table>

Source: PEC Analysis of HIIN Flat File Submissions, May 2017
Reporting of C. difficile Outcomes Data by HIIN

Percentage of applicable hospitals reporting at least 6 months of data on or after January 1, 2014, with at least 3 months occurring on or after October 1, 2016, by HIIN

Source: PEC Analysis of HIIN Flat File Submissions, May 2017
This area shows which HIINs are showing progress towards improvement, but not yet reaching the PfP reduction goal.
NHSN CDC C. Difficile Rate Per 10,000 Inpatient Days

This area shows which HIINs are showing progress towards improvement, but not yet reaching the PfP reduction goal.
Reporting for MDRO

Percentage of applicable hospitals reporting at least 6 months of data on or after January 1, 2014, with at least 3 months occurring on or after October 1, 2016, by HIIN

Source: PEC Analysis of HIIN Flat File Submissions, May 2017
This area shows which HIINs are showing progress towards improvement, but not yet reaching the PfP reduction goal.
Patient and Family Engagement Perspective

Jodi Hansen
Parent Advocate
Utah Family Voices
Driving Sustainable Change in Hand Hygiene -
The Problem We Only *THINK* We Solved

Paul Alper
Chairman
The Electronic Hand Hygiene Compliance Organization, Inc. (EHCO)
Paul Alper, BA chairman@EHCOhealth.org

Chairman, EHCO, The Electronic Hand Hygiene Compliance Organization, Inc. (A Non-Profit Organization)

All studies and papers cited are available here: http://www.ehcohealth.org/category/the-evidence/

- APIC (Association of Professionals in Infection Control and Epidemiology) Member
- IDSA (Infectious Diseases Society of America) Member
- WHO (World Health Organization) Private Organizations for Patient Safety (POPS) Member

EHCO™
Electronic Hand Hygiene Compliance Organization

EHCO™ is a not for profit consortium of healthcare technology companies that provide SMART (Systems that Measure Accurately and in Real-Time) hand hygiene compliance (HHC) systems.

Technology platform and hand hygiene product brand neutral when it comes to dealing with this patient safety and public health issue.

We are bringing the science and evidence to CMS/CMMI/PfP; TJC, CDC, APIC, SHEA, IDSA, DNV etc.
Partnering for Public Health & Patient Safety
The HAI Problem and Population Impact

More than 1 out of 10 HAIs are fatal

FATALITY FACT:
Every year in the US, more than 700,000 patients contract an avoidable infection known as a Healthcare-associated infection (HAI), and of those 75,000 will die.¹

During the hour we are together – 80 patients will get an HAI and of those, 9 will die!

¹ CDC Data
“Without data you’re just another person with an opinion.”

- W. Edwards Deming, Data Scientist
The Limitations of Direct Human Direct Observation (DO) for Measurement of HHC

Srigley et al demonstrated, in 2014, that HCWs were 3x more likely to clean hands when in the line of sight of a direct observer! A 300% Hawthorne Effect

**COMPLIANCE MYTH:**
Direct Observation (DO) is the best way to measure compliance. **Fact:** Small sample size with DO (only 1.2–3.5% of all events are captured) and the Hawthorne Effect leads to hand hygiene compliance rates **overstated by up to 300%**.

Srigley et al demonstrated, in 2014, that HCWs were 3x more likely to clean hands when in the line of sight of a direct observer! A 300% Hawthorne Effect
First, Do No Harm! A precept of the Hippocratic Oath YET we allow DO by “Secret Shoppers” to observe the care of patients with unclean hands....and not do anything to stop it!

*a direct violation of the principal and intent of the Hippocratic Oath*

Is this ethical? It is NOT

*What can be done?*
Juxtaposed Roles –
Direct Observation (DO) + E Monitoring => the New Gold Standard?

• The New Paradigm will likely be to de-couple DO from measurement – and use it for what it is best for:
  • Real Time Coaching and Feedback
  • Obstacle and Barrier Identification
    • As the Basis for Action Planning to Remove Them
  • Technique Assessment
  • Discipline Specific Behavior

• Enhancing DO with E Monitoring as was presented at SHEA 2016 by Kelly and Steed et al.

• You will hear more details about this later in the session...
The current issue of AJIC reinforces this new paradigm with an article by John Boyce.
Electronic HH Compliance Measurement Can Make a Critical Difference (the first major/disruptive change in HH since Alcohol Based Hand Rubs were introduced)

• Electronic data collection captures 100% of hand hygiene events (HHE) and eliminates the Hawthorne effect

• Visibility to compliance rates 24 / 7 / 365

• Accurate and reliable data provides insight for targeted intervention and continuous improvement – complacency when rates are artificially overstated is eliminated; instead a sense of urgency to improve spurs culture and behavior change
The Improvement Imperative with Hospital Acquired Condition (HAC) Penalty Changes for 2017: MRSA and C Diff rates become part of the penalty calculation

**MANDATORY IMPROVEMENT:**

With significant cuts to reimbursement fees ($94B by 2022) and penalties for poor quality (CMS Penalties), continuous improvement is mandatory. When 100% of hand hygiene events are captured, **compliance can improve, risk of infections and penalties are reduced and costs are avoided.**
The E Monitoring Technology Universe – 3 Categories

1. **Group Monitoring** – Non Badge Based

2. **Individual or Group Monitoring** – Badge Based (Stand Alone)

3. **Individual or Group Monitoring** – Badge Based Enabled with a Real Time Locating System (RTLS) Infrastructure

Capable of Capturing 100% of HHEs and Eliminating the Hawthorne Effect along with the Practice of Secret Shoppers Seeing Non Compliance and Allowing Care to Proceed Anyway
‘Generic’ Example of How E Monitoring Works

1) HH Events are Captured & Transmitted
2) Software Analyzes Data and Creates HH Reports
3) Dashboard With Reports and Data Are Available to Staff

- 100% of Hand Hygiene Events Captured 24/7/365
- Eliminating Bias, Hawthorne Effect and Unreliability of Direct Observation
Real-Time Feedback Proven to Reduce C diff Rates

With E Monitoring, Real Time Feedback on Soap and Water vs Hand Sanitizer Use with C Diff Rooms s Possible!
Real-Time Feedback Proven to Reduce C diff Rates

Staff can be told in real-time to switch from sanitizer to soap to ensure proper C diff protocol is followed – a proven way to reduce C diff.

Individual rooms/dispensers can be accessed to provide virtually real-time feedback on C Diff Protocol Compliance.
...The Evidence...

The Following Are Select Examples of Real World Results Being Achieved by Hospitals Using E-Monitoring Technology
Riverside Medical Center
Kankakee, IL
Participates in MHA Health Foundation HIIN

• 300+ Beds
• Martha Bouk, Infection Prevention
• Dec. 2013 - Commencement of Quality
• Improvement Initiative Focused on HH
Riverside Medical Center

Following implementation of an e-monitoring System:

• Hospital HHC increased from 57% in Dec 2013 to 79% in Sept 2015 – a 39% increase.

• Hospital onset MRSA rate dropped from 3.94 to 1.98 per 10,000 patient days – a 50% reduction.

• The facility paid no Readmissions penalties in 2015 and was one of only 7 hospitals in Illinois that paid no ACA related penalties in 2015. They had paid a 0.24% of CMS Revenue penalty in 2013.
Brief Report

Electronic hand hygiene monitoring as a tool for reducing healthcare-associated methicillin-resistant Staphylococcus aureus infection

J. William Kelly MD a,*, Dawn Blackhurst DrPH b, Wendy McAtee BS c, Connie Steed MSN, RN, CIC c

a Department of Internal Medicine, Greenville Health System, Greenville, SC
b Department of Quality Management, Greenville Health System, Greenville, SC
c Department of Infection Prevention and Control, Greenville Health System, Greenville, SC

Key Words: Electronic monitoring of hand hygiene compliance using the World Health Organization’s My 5 Moments
Improved WHO Five Moment Compliance Reduces Infections (AJIC, 2016)

Five Moment Hand Hygiene Compliance Improvement

MRSA Reduction

Cost Avoidance by Eliminated MRSA Infections > $433,000
Putting It All Together

What is emerging as a “best practice” evidence based model for sustained hand hygiene compliance improvement when giving feedback based on e-monitoring? Here is what the latest outcomes tell us.
Best Practice 7-Point Checklist

- Foster psychological safety and promote a just culture
- Ensure leadership engagement is authentic and known by all
- Use direct observation for unit-based feedback and real time barrier identification - then develop and agree on an action plans to remove them
- Agree on unit specific improvement goals and celebrate small successes (The goal is progress vs. perfection)
- Give frequent feedback on performance – share the data daily at first
- Designate unit based hand hygiene champions (front line staff NOT unit leadership) and adopt a one-minute huddle and handoff practice with hand hygiene champions
- Make HHC improvement part of performance evaluation with routine reporting of results to senior leadership
What to Look for in an E-Monitoring Solution

Must have criteria:

- Captures 100% of all hand hygiene events (soap and sanitizer)
- Includes a behavior change framework for how to use the data with front line staff to drive sustainable behavior change,
- Inherently fosters a “just culture” and “psychological safety”
- Universal design - does not require change of hand hygiene products
- Evidence Based
What to Look for in an E-Monitoring Solution

Other Considerations – User Must Decide Based on What is Best for their Institution and Culture

- **Standard of Care** - Tracks World Health Organization (WHO) 5 Moments for Hand Hygiene or Wash in/Wash Out
- **Reporting Level** – Group, Individual or Both
- **Functionality** – Such as Gentle Reminder & Awareness Function; Auto Push Reports via E Mail
- **Infrastructure** - Stand Alone or RTLS Application
- **Financial** - Capital expense; subscription/annual fee model or hybrid
Discussion and Questions?

Paul Alper, Chairman, EHCO™
chairman@EHCObheath.org
Thank you!
Example Technologies
A number of HIIN-aligned hospitals have implemented electronic hand hygiene monitoring interventions and achieved reductions in HAIs.

A few additional examples include:

- White Plains Hospital, White Plains, NY (NYSPFP HIIN)
- Children’s Hospital and Medical Center, Omaha, NE (Ohio Children’s HIIN)
Greenville Health System Hand Hygiene: Our Journey to Improve

Connie Steed, MSN, RN, CIC, FAPIC
Director, Infection Prevention
Greenville Health System
(Vizient HIIN)
Organization Overview

• GHS includes 7 hospital campuses in the Upstate South Carolina:
  – GMMC campus: 746 bed academic / tertiary hospital, rehab, and psychiatric hospitals, ambulatory surgery facility
  – OCMC: ~ 160 acute care beds, LTC facility
  – HMH: < 100 beds
  – GrMH: < 100 beds
  – PMC: < 100 beds short stay surgery hospital, ambulatory surgery facility
  – LCMH: < 100 beds
  – NG LTACH: 59 bed Long-Term Acute Care > 150 Ambulatory care sites
Hand Hygiene Background

• **2008 and prior years:** Direct observation with secret shoppers (unit staff) Consistent 95-100% compliance > 50 observers. Validity concerns.

• **2009 GHS wide hand hygiene initiative:** 2 RN Dedicated observers. Initial observations 53% and improve to >90%. Concern of Hawthorne effect and small number of observations.

• **2010-Present:** Electronic monitoring research and implementation. GHS Beta Test site for one of the E-monitoring systems now on the market. Assisted in the development of monitoring system including research to establish metrics and the formulas, validate the process and assess impact on HAIs.
Monitor In and Out of Room
HH Not Sufficient

Why?

- 35% of HHO occur inside the patient room and are missed with in and out measurement.
- HHOs inside the room are higher risk than those associated with entry and exit.
- Compliance rates are lower for moments 2 and 5.
Substantial Hawthorne Effect Revealed:
- Compliance Rates with DO Overstated by as high as 47%; 33% on Average

Videotaping and Electronic Group Monitoring Rates are Statistically Equivalent for 12 straight months

Hand Hygiene Compliance Rates on Research Study Unit:
Direct Observation vs. Video Validation vs. Electronic Group Monitoring

Pearson correlation coefficient Video Reality vs. E Monitoring = 0.976 (p-value = 0.004)
Focus on inpatient units and emergency rooms

- Pilot testing on targeted units, then spread to all GHS facilities.
- Education of managers first and those to have access to data; followed by frontline nursing staff.
  1. Push reports & 24/7 access to data.
  2. Process for communication of data to frontline staff, establishment of unit based action plans to improve hand hygiene (HH).
- HH compliance component of unit report card. Reviewed by unit team, including MD director, nursing and others.
- Infection prevention check in with units to monitor process/progress.
- Electronic system used to monitor compliance and communicate with staff.
Reports: Daily, Weekly, Monthly

Compliance Report

Hand Hygiene Compliance: Nov-16 to Apr-17 (monthly points)
Unit: 4A 5D Adult Oncology

Report Summary

Hand Hygiene Tip
Reminder: as of June 5, 2017 you will begin to see the new GMS 2.0 dashboard upon logging into the online reporting portal.
E- Monitoring Dispenser Report
C. difficile Patient Room

Dispenser HH-Events Report
DAILY: Fri, May 13 2016 to Thu, May 19 2016

Graph Summary Table

Dispenser Summary Table

<table>
<thead>
<tr>
<th>Serial Number</th>
<th>Type</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>DD1247D1AD09057</td>
<td>Soap</td>
<td>Greenville Memorial Hospital: 4A Adult Oncology</td>
</tr>
<tr>
<td>DD1247D1AD09248</td>
<td>Foaming Sanitizer</td>
<td>Greenville Memorial Hospital: 4A Adult Oncology</td>
</tr>
<tr>
<td>DD1247D1AD09235</td>
<td>Foaming Sanitizer</td>
<td>Greenville Memorial Hospital: 4A Adult Oncology</td>
</tr>
<tr>
<td>DD1311MTAA02892</td>
<td>Point-of-Care Sanitizer</td>
<td>Greenville Memorial Hospital: 4A Adult Oncology</td>
</tr>
</tbody>
</table>
Unit-based / Team focus: Unit teams developed strategies and implemented them. HH improvement occurred. 
Challenges for Implementation

- Data denial. People liked their direct observation numbers. Vital to helping with this was our validation study.

- Nursing staff felt they were too much of the focus. Why aren’t other areas assessed? Nursing staff 85% of HH opportunities on patient units. Key to success is the safety culture and leadership on the unit. People need to be able to talk to each other about their practices.

- Dispenser battery issues which have been resolved. Batteries now have 5-year life.
### Hand Hygiene Compliance

#### Electronic Monitoring (GMH)

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th># HH Events</th>
<th># HH Opportunities</th>
<th>% Compliance*</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY 2012-2013</td>
<td>9,495,225</td>
<td>18,790,753</td>
<td>50%</td>
</tr>
<tr>
<td>FY 2013-2014</td>
<td>12,182,993</td>
<td>20,936,813</td>
<td>58%</td>
</tr>
<tr>
<td>FY 2014-2015</td>
<td>13,519,934</td>
<td>20,890,758</td>
<td>65%</td>
</tr>
<tr>
<td>FY 2015-2016</td>
<td>14,457,651</td>
<td>21,971,621</td>
<td>66%</td>
</tr>
<tr>
<td>Oct 16-Mar 17</td>
<td>6,343,578</td>
<td>9,401,112</td>
<td>67.5%</td>
</tr>
</tbody>
</table>

**Direct Observation**

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th># HH Events</th>
<th># HH Opportunities</th>
<th>% Compliance</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY 2014-2015</td>
<td>2,485</td>
<td>2,754</td>
<td>90%</td>
</tr>
<tr>
<td>FY 2015-2016</td>
<td>2,384</td>
<td>2,562</td>
<td>93%</td>
</tr>
<tr>
<td>Oct 16-Mar 17</td>
<td>1,194</td>
<td>1,285</td>
<td>93%</td>
</tr>
</tbody>
</table>

*All years statistically significant improvement.*
Have we impacted outcome?

- Marker for outcome improvement: MRSA infections
- Clusters/outbreaks of *C. difficile* and other MDROs. Using patient room level data.
GMH MRSA Study

Background
- 23 nursing units at GMH during April 2014 to March 2015.
- Predicted 81 MRSA infections if rates stayed the same from the pre-intervention period.
- Hand hygiene (HH) improved due to feedback reports from Electronic Monitoring System and unit-based improvements.

Findings
- Hand hygiene compliance improved from 54.9% to 68.8% (25.5% improvement).
- 57 MRSA infections occurred- meaning 24 infections were prevented.
- Total costs avoided=$433,644.00:
  - Actual excess costs avoided= $8668/ patient = $208,000.00
  - Avoided 108 excess LOS days = $2089.00/ day= $225,612.00
Electronic Hand Hygiene Compliance and Hospital-Acquired MRSA Infection

Each circle is a unit’s data point for the overall study time frame

*N=23 units*

**Conclusion:** There is a statistically significant negative correlation between HHCI and MRSA infection rate, i.e., as HHCI increases, MRSA decreases.

*Note: Solid line is regression line, dashed line is 96% confidence interval for regression line.*
C. difficile Outbreak: Successful Control

- 32 bed Oncology unit during 2014
- 6 C. diff cases during 1 month – An increase from previous months where the average # of cases was 0-1/month.
- Hand hygiene (HH) observations found sanitizer use rather than soap and water.
- Used electronic monitoring system to show staff their HH with soap vs sanitizer for C. diff cases. Placed “do not use” signs on sanitizers.
- HH with soap and water increased to 94% quickly.
- Outbreak brought under control. Using the electronic monitoring data helped take quick action to improve.
Lessons Learned

• You can improve HH using electronic technology! The best approach is a combination of electronic monitoring and targeted direct observation (conducted by trained, unbiased observers).

• Direct observation needed to assess for barriers and to identify issues such as not cleaning hands after glove removal, work flow issues.

• Data denial. You have to deal with it! Address it up front.

• Vital to success is the culture on the unit and the leadership.
Lessons Learned (cont.)

- Involvement of the front line staff is important for buy-in and successful improvement. Helpful to assess stakeholders.

- Readily available data helps.

- Leadership buy-in: They want to know their return on investment: HAI reduction, improved patient safety. “Hands are weapons.”

- Accountability for HH compliance rates: We placed on report cards.
Questions and Answers

Please share your questions for our presenters!
Key Takeaways

• **HIINs and hospitals must continue to make reductions on HAIs, such as C.diff, and addressing hand hygiene behaviors is a key strategy for achieving improvements.**

• **Direct observation has been shown to underestimate compliance with hand hygiene.**

• **Implementing both direct observation and electronic monitoring systems can significantly improve hand hygiene behaviors.**
  – Direct observation will help identify barriers that need to be addressed to facilitate proper hand hygiene behaviors.
  – Electronic monitoring offers an opportunity for real-time data collection and feedback that will drive improvements in hand hygiene compliance.
  – Share data frequently to motivate change and ensure accountability.

• **Implementing electronic monitoring, like many other interventions intended to address behavior change, may require a cultural shift.**
  – Engage front-line staff and leaders to ensure buy-in and sustainment.

• **Engage patients and family members in this work by educating all patients and family members – even those who must frequent the hospital – about the best practices and risks at the start of every hospital stay.**
Participant Polling

Please share your feedback!
CMS Comments

Shelly Coyle, RN, MS, MBA
Upcoming Events

NCD Weekly Pacing Event
Audience: HIINs and Improvement Advisors
“Exploring Safety Across the Board”
Thursday, June 1, 1:00 – 2:00 PM ET

PFE Learning Event
Audience: HIINs
“How to Recruit and Maximize a Representative Patient and Family Advisory Council to Improve Patient Safety”
Tuesday, June 13, 2:00 PM – 3:00 PM ET

Please see the weekly HIINsider or visit the Community of Practice site for registration information as it becomes available.