

Driving Sustainable Change in Hand Hygiene - The Problem We Only *THINK* We Solved

Population Health Colloquium
Philadelphia, PA

March 28, 2017

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Disclosure – Employee of DebMed

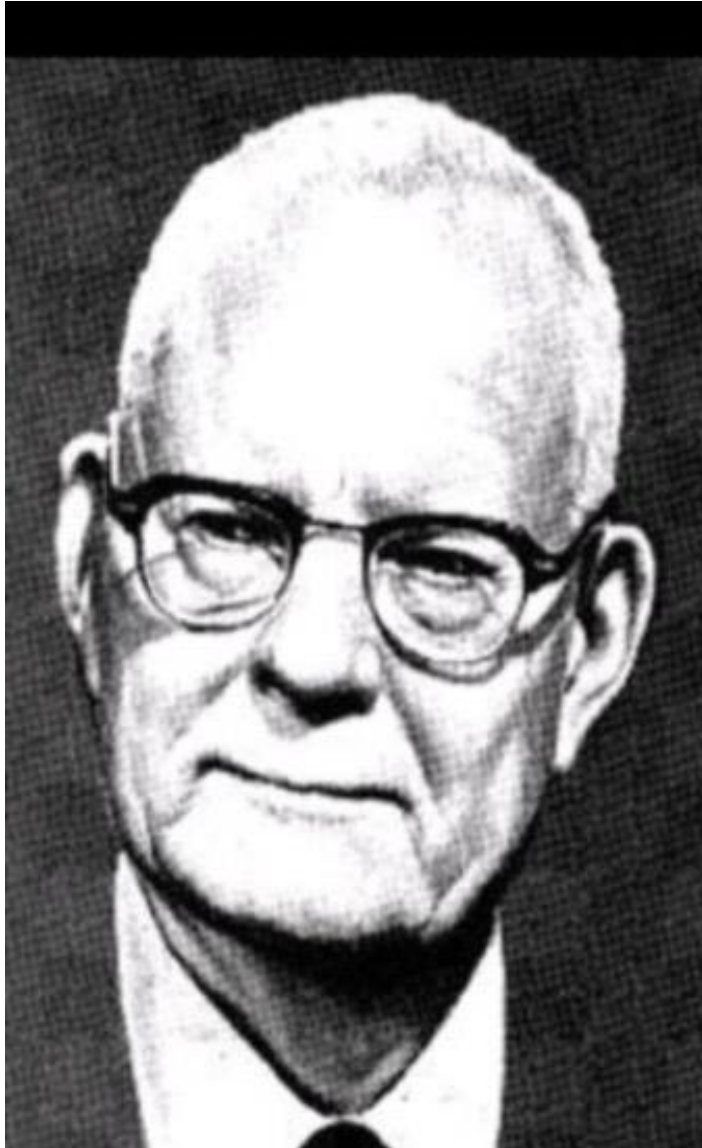
- APIC (Association of Professionals in Infection Control and Epidemiology) Member
- IDSA (Infectious Diseases Society of America) Member
- EHCO (Electronic Hand Hygiene Compliance Organization) Chairman
- IPS (Infection Prevention Society – UK) Member
- IPAC (Infection Prevention and Control - Canada) Member
- WHO Private Organizations for Patient Safety (POPS) Member
- Published in American Journal of Infection Control, Journal of Pediatric Nursing, Antimicrobial Resistance and Infection Control, Joint Commission Journal on Quality and Patient Safety, Patient Safety and Quality Healthcare and more

Learning Objectives

- Learn why current methods for measurement of the this key healthcare quality performance indicator are flawed (peer reviewed evidence will be cited) leading to a dangerous level of complacency that is costing lives and money
- Be able to describe a multi modal and evidence based approach for sustainable hand hygiene compliance improvement

Learning Objectives

- Understand the key findings of the newest peer reviewed evidence in support of improving hand hygiene compliance to reduce HAIs and costs
- Learn about how facilities in Greenville, SC and suburban Chicago have achieved sustainable improvement along with improved patient outcomes and what they have in common in terms of evidence based practice and standards of care.
- Know what to look for when evaluating e-monitoring solutions & what conditions need to be in place prior to implementation



accurate
“Without data
you’re just
another person
with an opinion.”

- W. Edwards Deming,
Data Scientist

The HAI Problem and Population Impact



! 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

We have a serious, expensive and avoidable problem in US Healthcare. We tolerate patient safety behavior measurement methods that are antiquated and inaccurate that result in avoidable harm, suffering and costs. There is a solution.

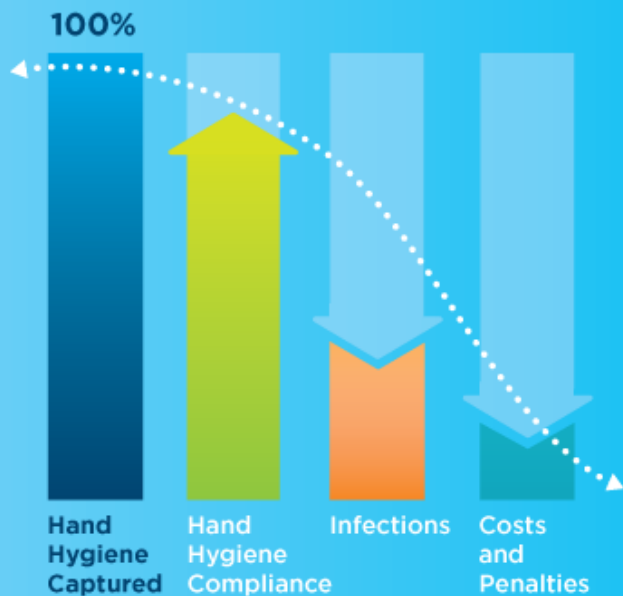
The Reality of Global Compliance Rates



HAND HYGIENE FACT:

Proper hand hygiene is the best way to prevent Healthcare-associated infections (HAIs), yet compliance with hand hygiene guidelines is **less than 50% globally**.²

The Improvement Imperative with HAC Penalty Changes for 2017 (MRSA and C Diff rates become part of your 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.**

HAC Changes for FY 2017

CMS Tips the Scales Heavily Towards Domain 2 - Infections

Finalized Domain Weights for HAC Reduction Program in FY 2017

Domain 1: Patient Safety Measures

Domain 2: CDC/NHSN Surveillance Measures

15%



85%

FY 2017: July 1, 2013 - June 30, 2015

FY 2017: CY2014 & CY2015

PSI-90¹

Composite Metric

Component Indicators:

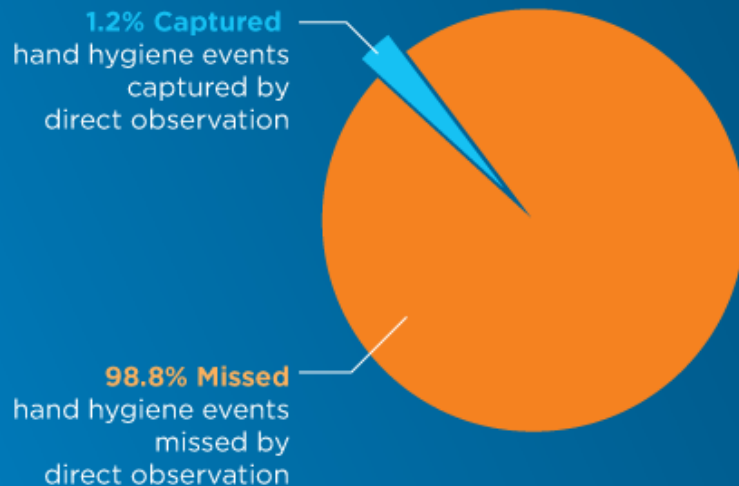
- PSI #3 Pressure Ulcer Rate
- PSI #6 Iatrogenic Pneumothorax Rate
- PSI #7 Central Venous CRBSI Rate
- PSI #8 Postoperative Hip Fracture Rate
- PSI #12 Perioperative PE DVT Rate
- PSI #13 Postoperative Sepsis Rate
- PSI #14 Postoperative Wound Dehiscence Rate
- PSI #15 Accidental Puncture or Laceration Rate

Metric	FY 2015	FY 2016	FY 2017
CLABSI ²	✓	✓	✓
CAUTI ²	✓	✓	✓
SSI – Colon		✓	✓
SSI – Abdominal Hysterectomy		✓	✓
MRSA			✓
C. Difficile			✓

1) PSI-90 currently undergoing review, AHRQ considering addition of PSI-9, (perioperative hemorrhage) 10 (periop. physiologic derangement rate), 11 (port op resp. failure) to PSI-90 composite, CMS will issue notice-and-comment rulemaking prior to inclusion if adopted

2) Starting for FY 2018, will include pediatric/adult medical ward, surgical ward, med/surg ward and adult/med ICU

The Limitations of Direct Human Observation for Measurement of HHC



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**)³ and the Hawthorne Effect leads to hand hygiene compliance rates **overstated by up to 300%**.⁴

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

The Pitfalls of Direct Observation as A Measurement Tool (Excellent for Many Other Applications)

- Hawthorne effect – overstates compliance rates by up to 300%
- Small sample size not statistically reliable
- Lack of accurate data and timely feedback essential to drive behavior change
- Observer bias
- Lack of inter rater reliability

Consider this - How ethical is the secret shopper concept? – They see a HH miss and allow patient contact to proceed!

Juxtaposed Roles – 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 at –
 - Real Time Coaching and Feedback
 - Obstacle and Barrier Identification
 - As the Basis for Action Planning to Remove Them
 - Technique Assessment
- Enhancing DO with E Monitoring as was presented at SHEA 2016 by Kelly et al

Combination of the Targeted Solutions Tool (TST) with E- Monitoring Data

Combines the use of the Joint Commission's Targeted Solutions Tool (TST) with feedback using WHO 5 Moment compliance data from the Electronic Monitoring System to drive improvement in 5 Moment HHC on all 4 units in the study.

Paper Presented at SHEA 2016



Use of Targeted Solutions Tool (TST) and Electronic Monitoring to Improve Hand Hygiene Compliance



GREENVILLE
HEALTH SYSTEM

J William Kelly MD, Dawn Blackhurst DrPH, Connie Steed MSN, RN, CIC, Sue Boeker, RN, BSN, CIC, Wendy McAtee, BS
Greenville Health System, Greenville SC

Introduction

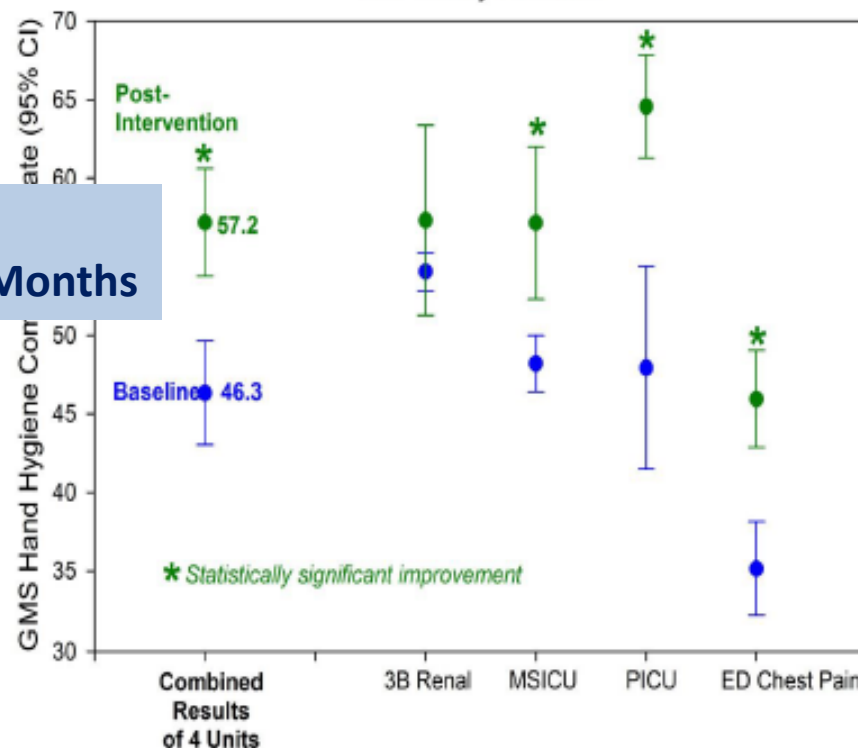
- Improving hand hygiene (HH) among healthcare workers is one of the top priorities of Infection Prevention and Control Programs.
- The Joint Commission Targeted Solutions Tool (TST) is one method that has had some success in improving hand hygiene compliance (HHC) by providing consistent feedback on performance has been difficult.
- Present method of direct observation does not provide ongoing feedback in a timely manner. Electronic monitoring provides accurate real time data improve result of TST process.
- The purpose of this study was to demonstrate improved HHC rates by use of a modified version of the TST combined with an electronic HH monitoring system based on the WHO 5 Moments for Hand Hygiene (DebMed GMS).

Method

- Four units of differing characteristics were selected for the study: MSICU (MedSurg ICU), PICU (Pediatric ICU), Chest Pain ED, and Adult Renal Unit.
- Two full time direct observers collected a total of 30 missed HH opportunities per unit.
- A focus group was held with each unit to review data, obstacles to HH, and ways to implement unit-based change and increase HHC rates on unit.
- Managers used electronic monitoring data to provide ongoing feedback to frontline staff on HHC progress.
- Electronic HHC rates were collected during a 6 month baseline period, a 4 month intervention period, and a 6 month post-intervention period; study effectiveness was assessed using 95% confidence intervals to compare the baseline and intervention HHC rates.

**Aggregate Increase
In HHCI = 24% in 6 Months**

TST Study Results



Conclusion

- All of the units had an increase in HHC, with 3 of 4 the showing a statistically significant increase. The overall (i.e. 4 units combined) improved from a baseline rate of 46.3% to 57.2% (absolute increase of 10.9%, relative increase 23.5%); this difference was also statistically significant.
- A modified version of the TST methodology, along with real-time data from electronic surveillance of HHC, resulted in consistent, sustained improvement in HHC rates across a spectrum of hospital units.

Acknowledgments: Karen Hudson, RN, and Lynda Bingham, RN, collected observations; Research funding provided by DebMed.

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Electronic HH Compliance Measurement Can Make a Critical Difference

- Electronic data collection captures 100% of hand hygiene events 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

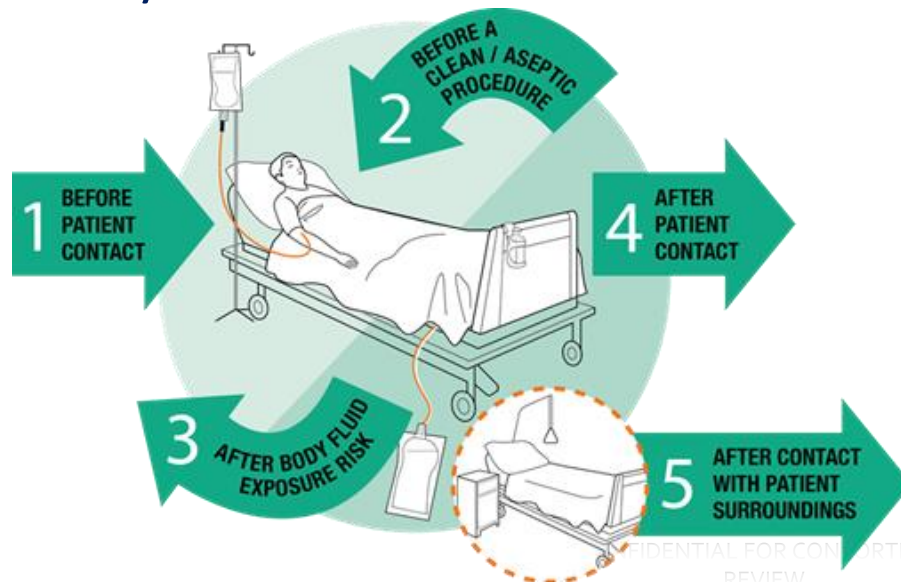
The Technology Universe

There are three basic types of technology each with their own set of features and advantages:

The Technology Universe

1. Group Monitoring Based on the WHO 5 Moments (highest standard of care) or Wash In/Wash Out

These badge free systems provide reports and data at the Group/ Unit/Department level and focus on team work and promotion of a just safety culture



The Technology Universe

2. Individual Monitoring Using Badges Based on Wash In/Wash Out (Stand Alone)

These require badges for all monitored employees and provide individual healthcare worker data or group data based on wash in/wash out only



The Technology Universe

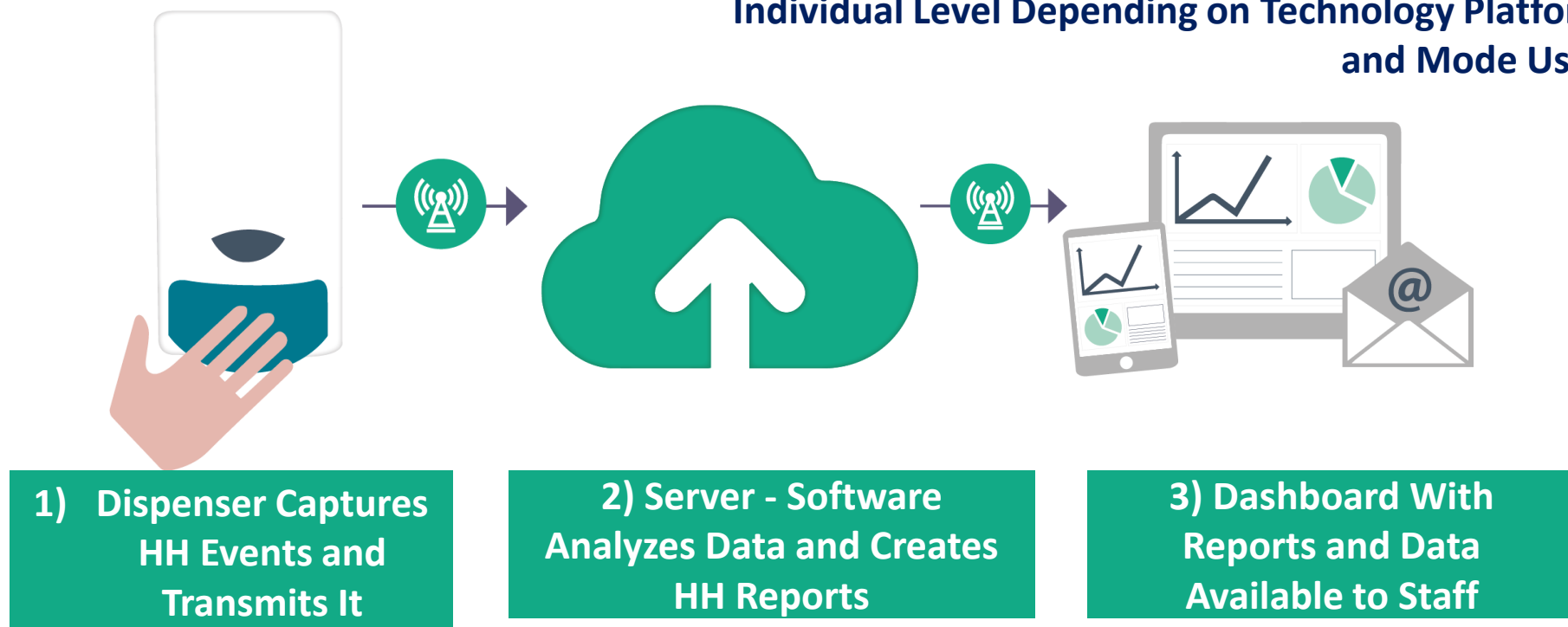
3. Individual Monitoring Using Badges Based on Wash In/Wash Out (RTLS Based)

These require badges along with a pre existing RTLS infrastructure and provide individual healthcare worker data or group data based on wash in/wash out only



'Generic' Example of How E Monitoring Works

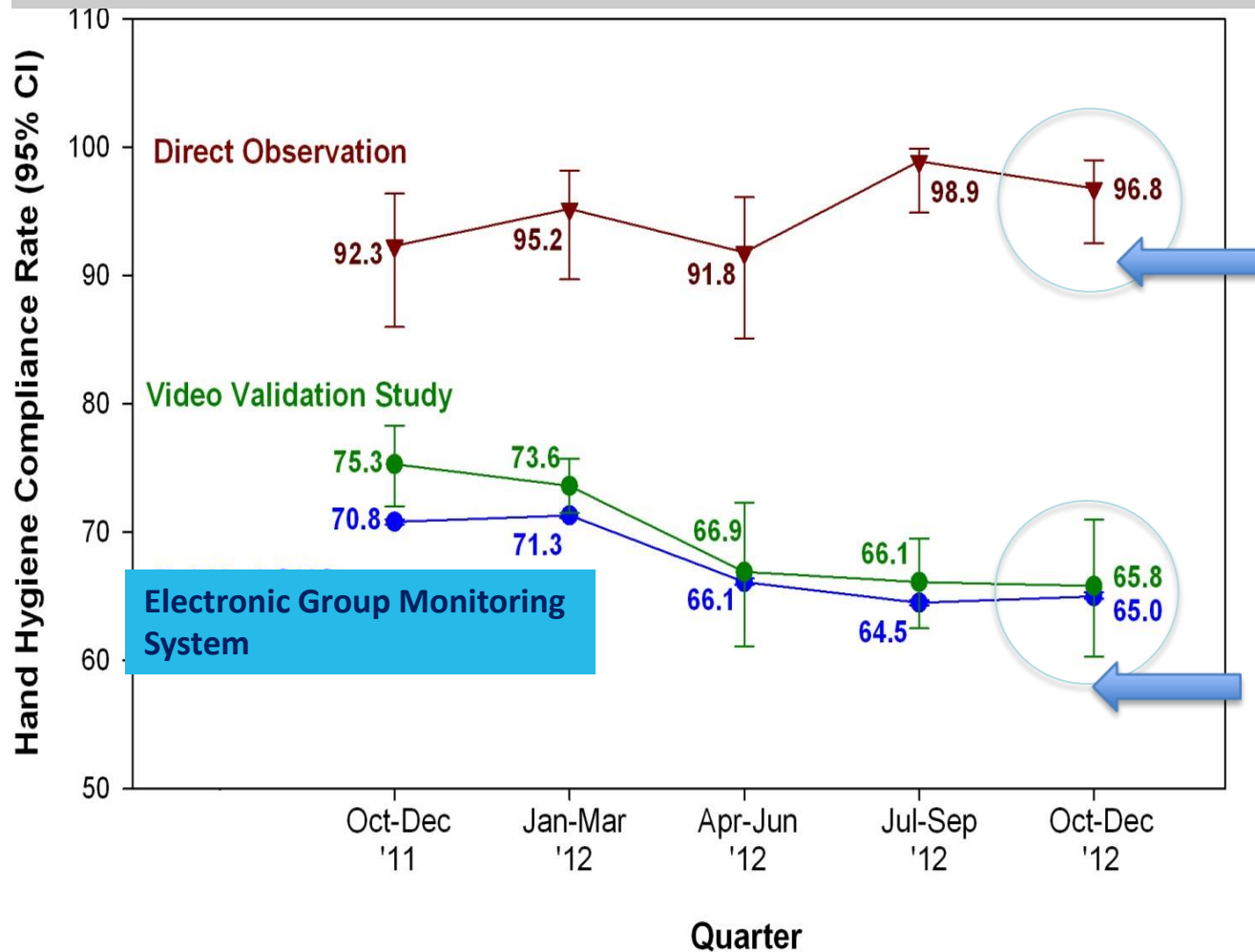
Reports and Data may be at the Unit/Group or Individual Level Depending on Technology Platform and Mode Used



100% of Hand Hygiene Events Captured 24/7/365
Eliminating Bias, Hawthorne Effect and Unreliability of Direct Observation

Accuracy Of Electronic HHC System Validated; Hawthorne Effect Proved (AJIC 2014)

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



Substantial
Hawthorne
Effect Revealed:
- *Compliance
Rates with DO
Overstated by as
high as 47%*

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

...The Evidence...

The Following Are Select Examples of Real World Results Being Achieved by Hospitals Using E-Monitoring Technology



ELSEVIER

Contents lists available at [ScienceDirect](#)

American Journal of Infection Control

journal homepage: www.ajicjournal.org



Brief Report

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



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Key Words:

Electronic monitoring of hand hygiene compliance using the World Health Organization's My 5 Moments

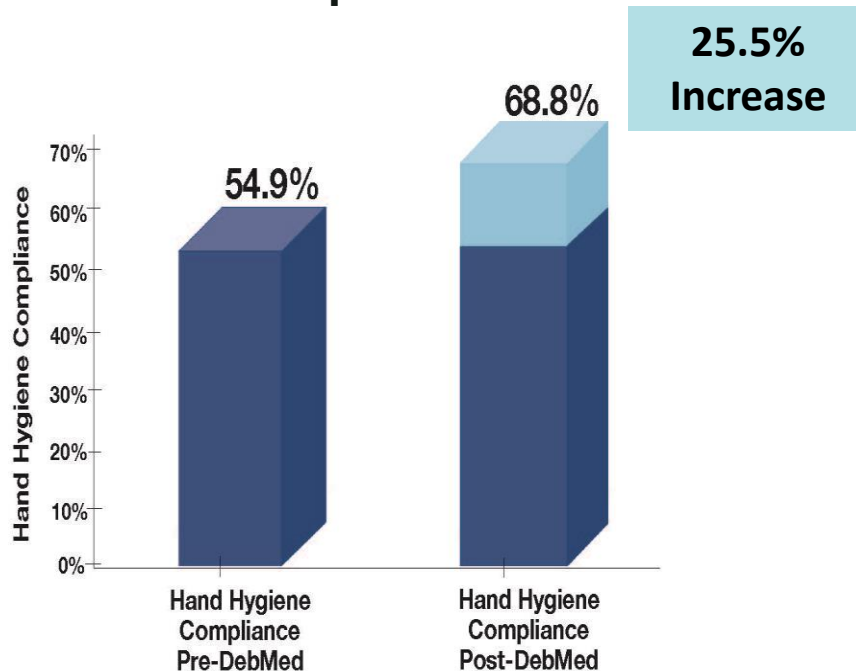
Greenville Memorial Hospital



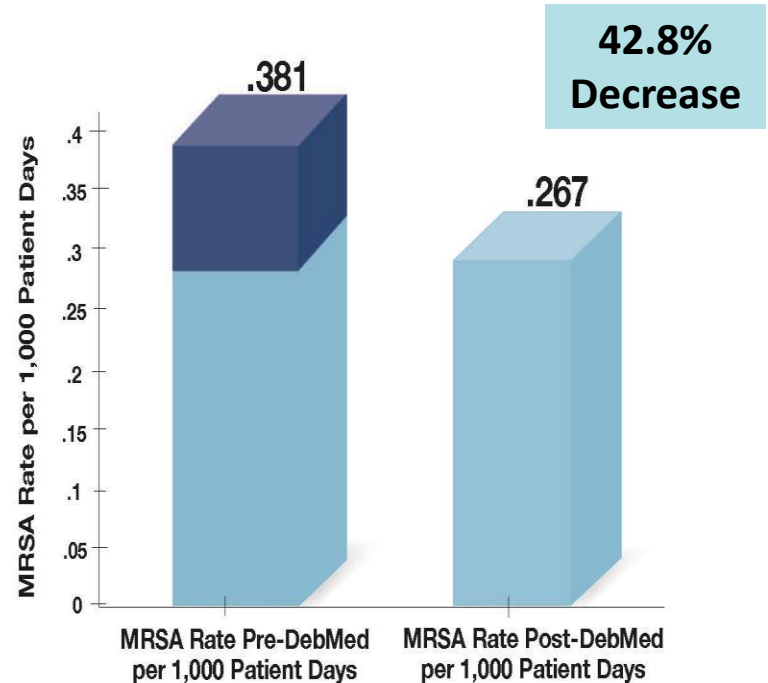
- 746-bed teaching hospital in Greenville, SC
- Connie Steed, IP
- Study conducted on 23 of their units
- 647 total beds; 87% of the total
- Those units/beds had both electronic hand hygiene compliance data and consistent MRSA surveillance during study period
- Results are for the 12 months post completion of the electronic monitoring implementation

Improved Five Moment Compliance Reduces Infections (AJIC, 2016)

Five Moment Hand Hygiene Compliance Improvement



MRSA Reduction



Hand hygiene compliance improved due to feedback based on reports from E- Monitoring System, calculated based on the WHO Five Moments standard

Cost Savings

- 24 MRSA Infections were prevented in the 12 months post completion of e monitoring implementation
- The actual excess care costs avoided were \$8668 per patient or \$208,032 total
- The average excess LOS per MRSA HAI was 4.5 days making the total for the 108 excess LOS days. That would have cost GMH \$ 2089 per day or \$225,612 total

Total costs avoided = \$433,644
(\$670.24 per Bed Annualized)

C Diff Reduction Study (APIC, 2014)

At the same teaching hospital, data on soap versus sanitizer usage provided by their e- monitoring system, resulted in significantly increased hand hygiene compliance along with the clostridium difficile (CDI) rate decreasing from 7.03/10,000 patient days to 2.38/10,000 patient days.

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.

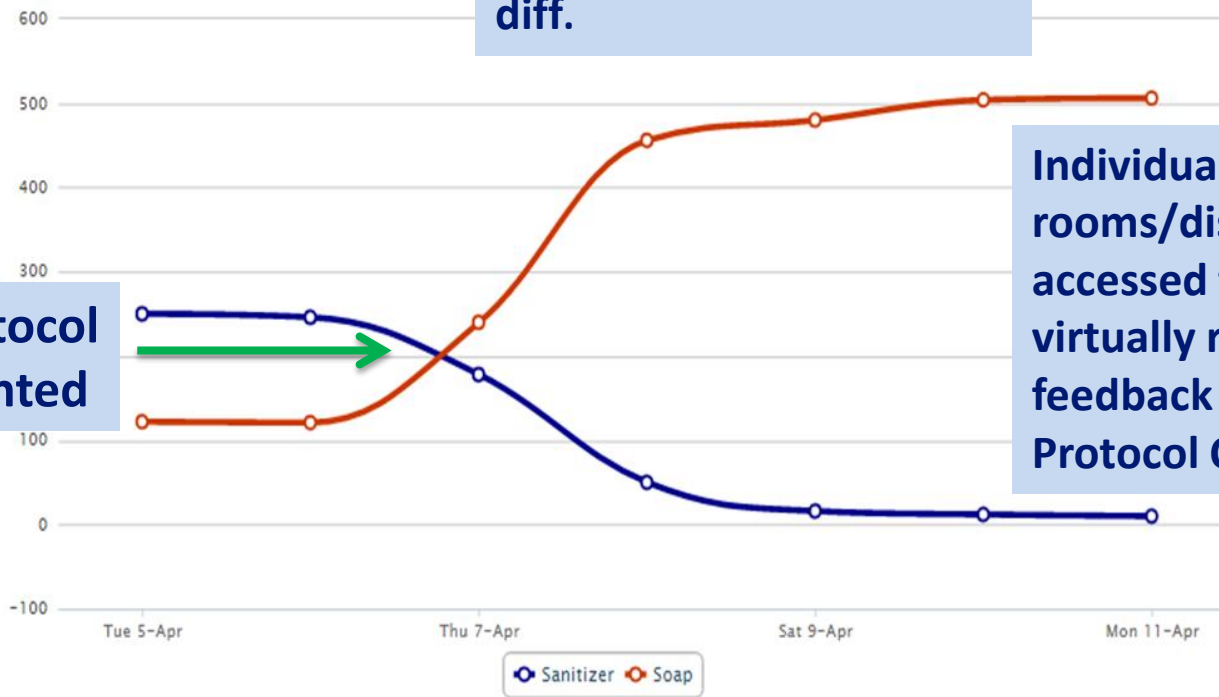
C Diff Protocol Implemented

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

Dispenser HH-Events Report

DAILY: Tue, Apr 05 2016 to Mon, Apr 11 2016

Graph Options



**Riverside Medical Center
300+ Beds Kankakee, IL
Martha Bouk, IP
Dec 2013 Commencement of Quality
Improvement Initiative Focused on HH**



MRSA Reduction/Penalty Elimination – APIC, 2016

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

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 – ensure leadership champions (role models/positive deviants) are established in all of the “tribes” MDs etc.
- ✓ Use DO for feedback and real time barrier identification - then develop and agree on an action plans to remove them
- ✓ Agree on unit specific improvement goals & celebrate small successes (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) & adopt one minute huddle and hand off practice with hand hygiene champions
- ✓ Make HHC improvement part of performance evaluation

What to Look for in an E-Monitoring Solution

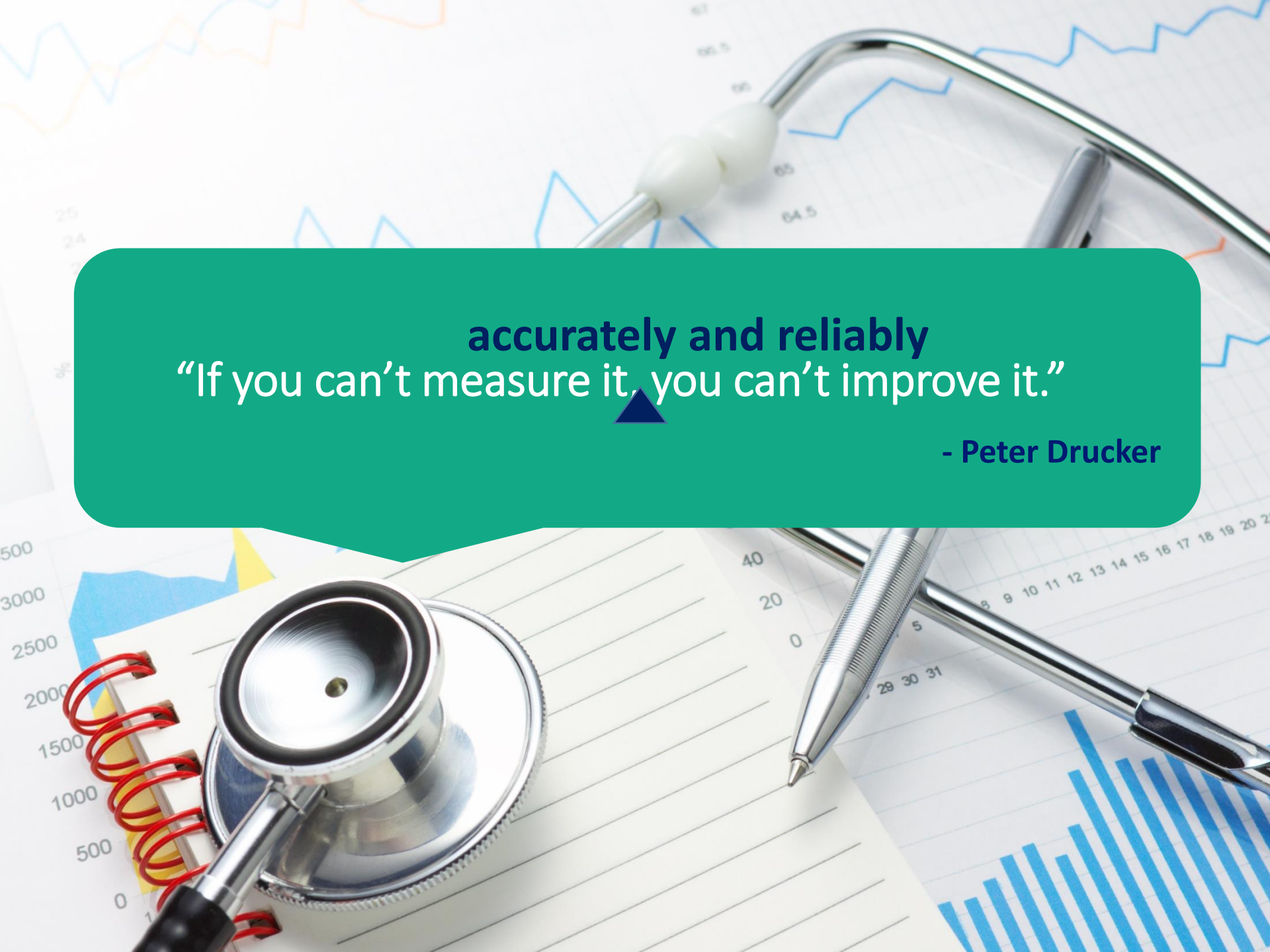
Must have criteria:

- ✓ 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

- ✓ Standard of Care - Tracks WHO 5 Moments or Wash in/Wash Out
- ✓ Reporting Level – Group, Individual or Both
- ✓ Gentle Reminder Functionality – Badge with Lights/Vibrations; Voice at Dispenser or None
- ✓ Infrastructure - Stand Alone or RTLS Application
- ✓ Cost - Capital expense; subscription/annual fee model or hybrid



accurately and reliably
“If you can’t measure it, you can’t improve it.”

- Peter Drucker

EHCO™

Electronic Hand-Hygiene Compliance Organization

EHCO™ is a not for profit consortium of healthcare technology companies that provide SMART (**S**ystems that **M**easure **A**ccurately and in **R**eal-Time) hand hygiene compliance systems.

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



ELECTRONIC HAND HYGIENE COMPLIANCE ORGANIZATION

Partnering for Public Health & Patient Safety



CONSORTIUM MEMBER
W

See our Evidence Road Map for A Compendium of
Outcome Studies

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Discussion and Questions?

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Thank you!