



Enhancing Hospital Safety Culture - Achieving Reliable Measurement of Hand Hygiene Compliance

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Paul Alper, BA

Co Author:

- Hand Hygiene Opportunities Where and When – The HOW2 Benchmark Study
- Hand Hygiene Opportunities in Pediatric Long Term Care Facilities
- Implementing an Electronic Hand Hygiene Monitoring System - Meeting the Challenges
- Product Dose Considerations for Real-World Hand Sanitizer Efficacy
- Electronic Hand Hygiene Monitoring for the WHO 5 Moments Method
- HH Feedback at a Community Hospital

Disclosure – Employed by DebMed USA, LLC



The Next Disruptive Innovation in HH and Patient Safety Since the introduction of Alcohol Based Hand Sanitizers –

Electronic Monitoring of HH Compliance



The Key Concept

The primary reason to invest in enhanced measurement and monitoring of hand hygiene compliance to is to improve patient safety and quality.



The Key Concept

If the goal is to achieve high reliability and enhanced patient safety, then accurate, reliable performance measures are essential as is timely feedback of HCW performance. The evidence is clear - *Direct Observation CANNOT provide this level of data.*

The Key Concept

If you train and expect performance based on a certain standard of care (for example WHO 5 Moments)

Then you MUST measure and give feedback on the same standard of care

Background

While direct observation has been the standard way to monitor hand hygiene compliance behavior - the drawbacks of small sample size, the Hawthorne Effect and lack of inter-rater reliability can make data highly unreliable.



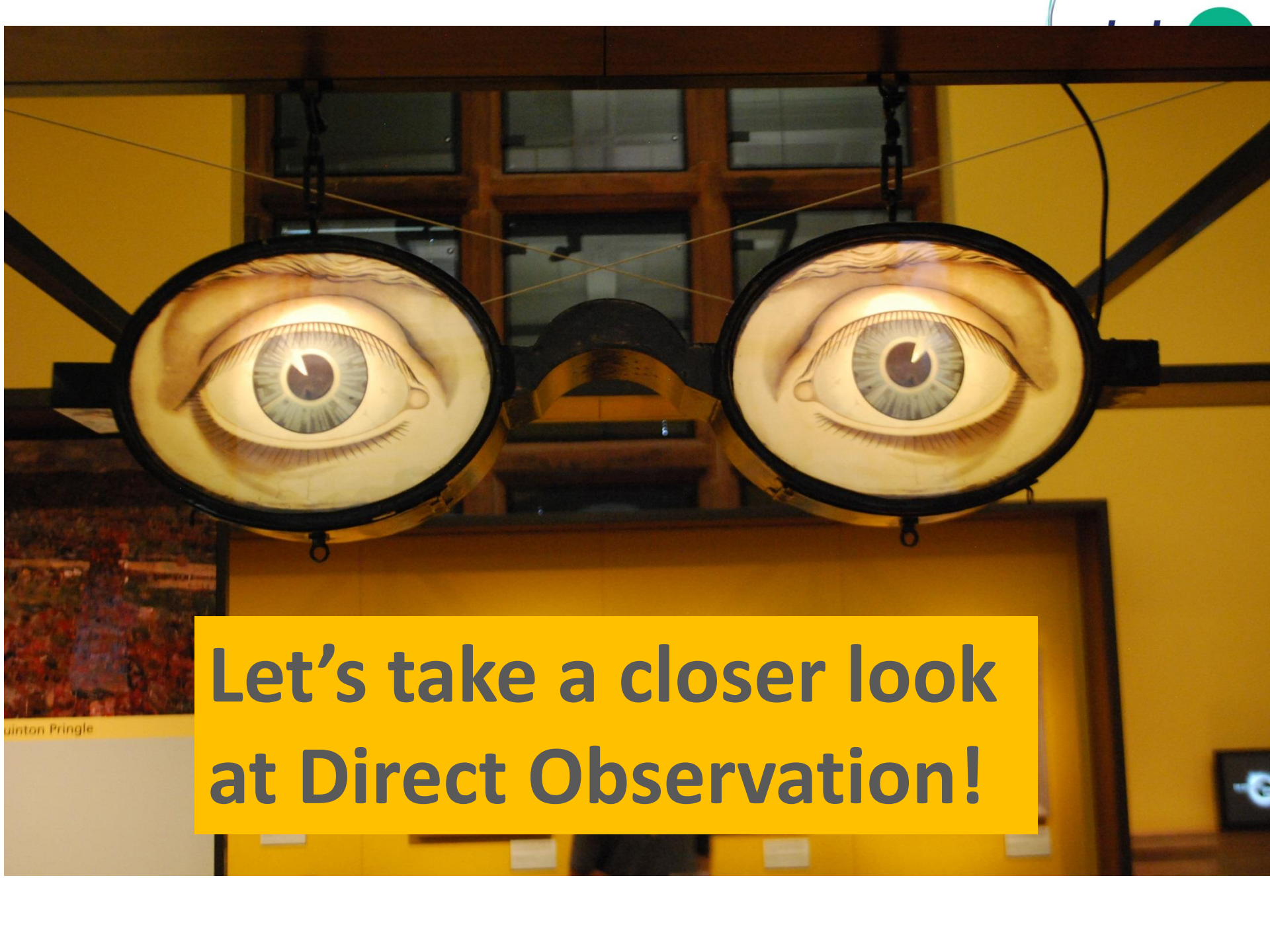
Evidence based technologies are emerging that have been proven to provide a significantly more reliable way to monitor this essential measure of healthcare quality and patient safety



This session will share the latest research on the category of electronic monitoring of hand hygiene compliance and explain how to best evaluate systems to meet the needs of your facility.

Learning Objectives

1. Understand the typical way hand hygiene is monitored and the evidence that says it should no longer be the standard
2. Understand how different types of electronic monitoring systems work; can provide accurate and reliable data in real time and provide a better way to give feedback and drive improvement
3. Know the difference between Group and Individual Monitoring Systems; understand the benefits and drawbacks of each
4. Know what to look for when evaluating electronic hand hygiene monitoring systems
5. Become aware of recent outcomes research that demonstrates improved HHC and reduced HAIs coincidental with the implementation of an EHCMS
6. Know how to make the case for technology adoption to senior leadership



**Let's take a closer look
at Direct Observation!**

Quinton Pringle



ISSUES:

Small sample size

Hawthorne Effect

Lack of inter rater reliability

Feedback not timely

Costly

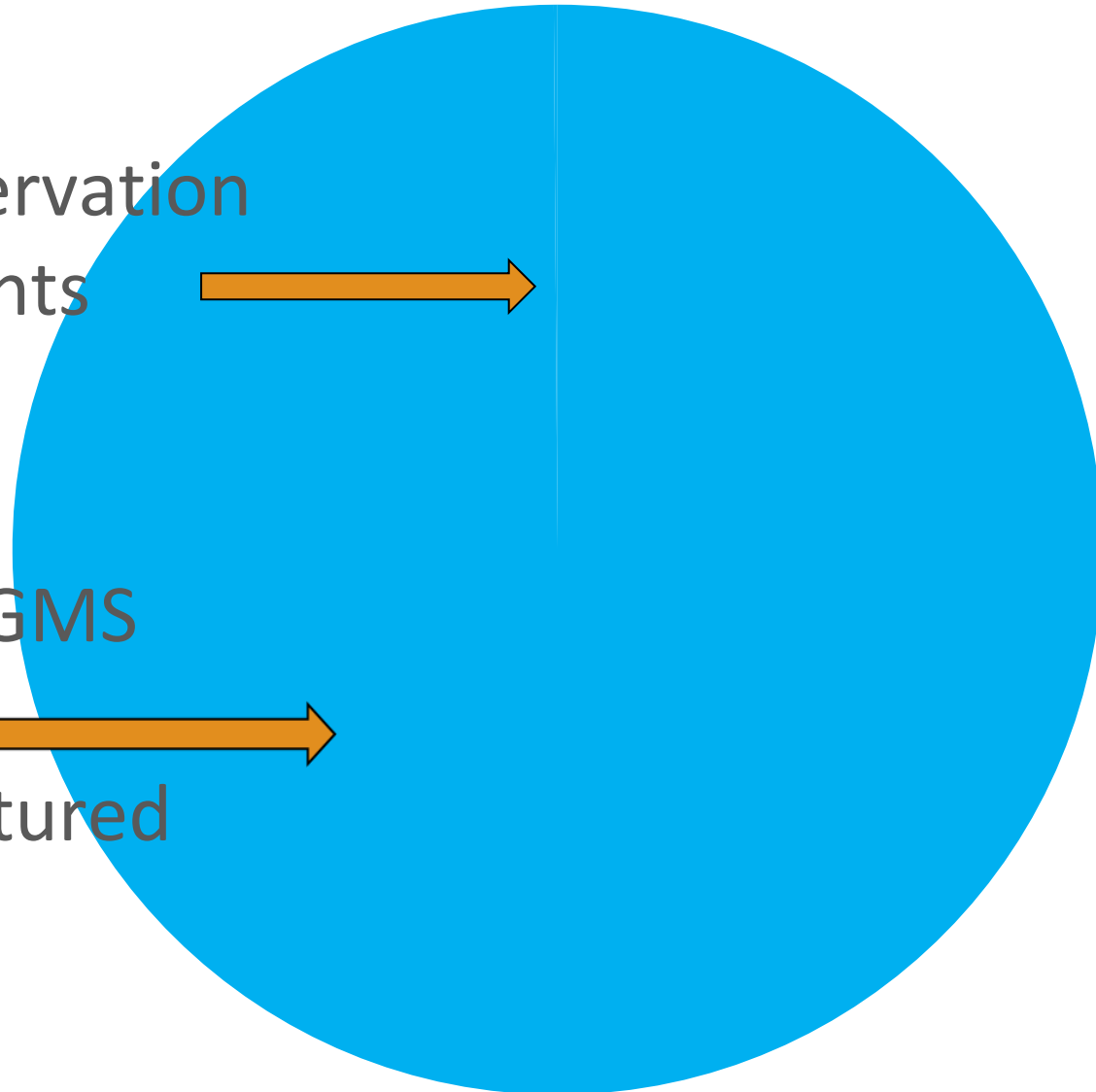
A typical 250 bed hospital will have about 9 million HH opportunities per year...
if you did 2500 direct observations per quarter or 10,000 per year that would only represent 0.1% of the total as a sample size...

How Much HH Are You Seeing with Direct Observation?

Direct Observation
10,000 Events
Captured



Electronic GMS
9,200,000
Events Captured



Hawthorne Effect

Srigley et al, 2014 – 300%

Scheithauer et al, 2009 – 275%



A Better Way –

A Vision for the Ideal

Dr. Elaine L. Larson, Associate Dean for Research and Professor of Pharmaceutical and Therapeutic Research, Columbia University School of Nursing

- CDC Hand Hygiene Guideline
- WHO Hand Hygiene Guideline
- Joint Commission Monograph On Hand Hygiene Adherence
- HOW2 Co-Author
- Editor of AJIC
- Obtained \$ 1.2 MM AHRQ Grant To Study Outcomes using DebMed GMS (June 2012) over four years



The Ideal According to Elaine Larson

(Video Clip Available Upon Request)

The Ideal Measurement System

- Electronically measure hand hygiene episodes (**numerator**)
- Knowledge of how many hand hygiene opportunities (**denominator**)



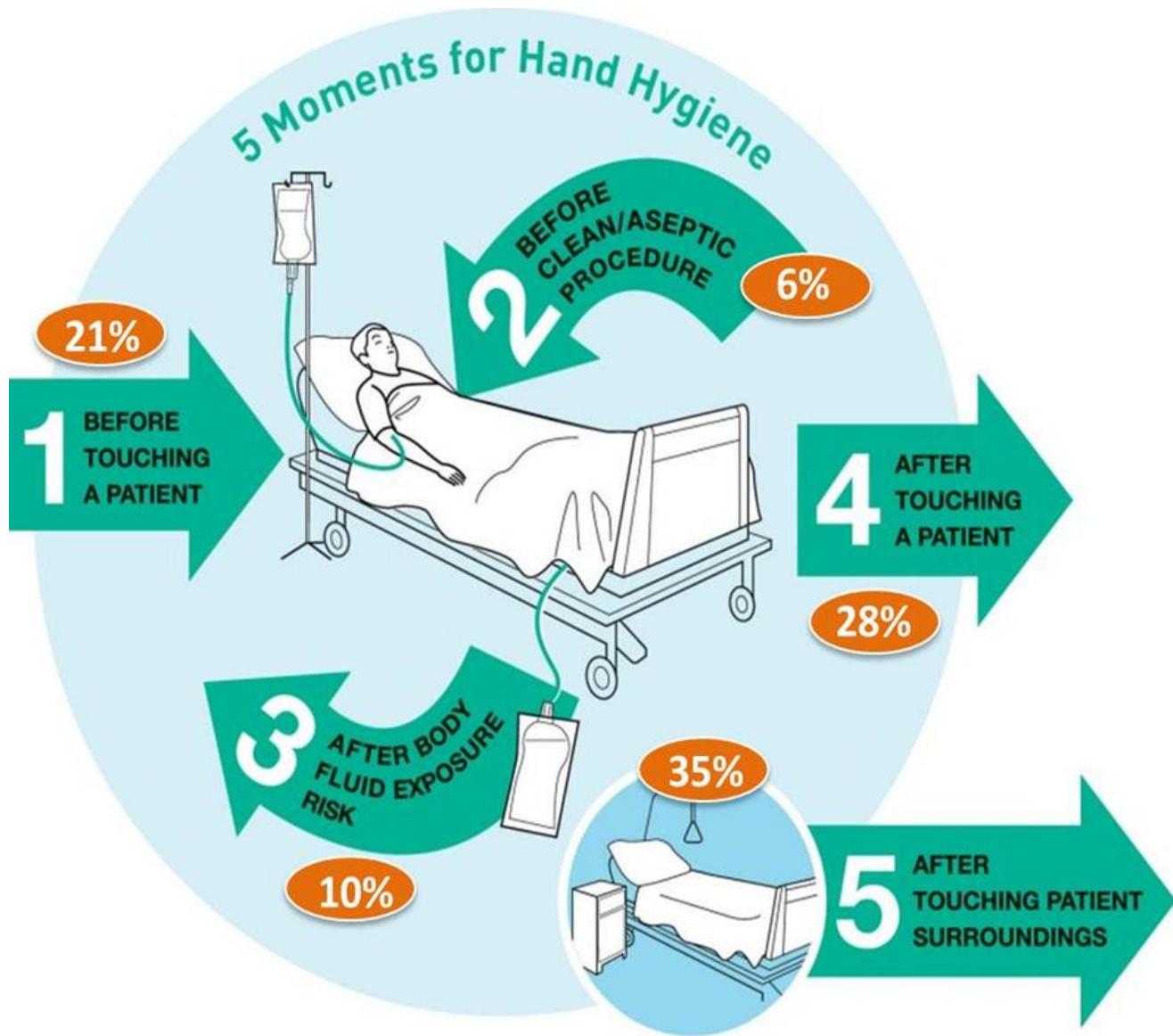
Electronic Systems – Two Basic Approaches

Individual Monitoring

- Tag and Track Individuals (encourages “gaming”)
- 2 Moment Reports Only
- Creates a potential liability – what do you do with repeat offenders?
- Accuracy at HHE capture can be lacking
- Very costly

Individual monitoring systems (such as systems that require badges or similar devices to be worn by healthcare workers) are limited in that they can only capture before and after (Moments 1 and 4) – thus cannot measure to the highest clinical standard – WHO 5 Moments (approximates CDC Guideline)

Measuring only in and out (Moments 1 and 4) will fail to give information on more than 50% of the total HH opportunities. *The HOW2 Benchmark Study* demonstrated that only 49% of all opportunities are Moments 1 and 4.

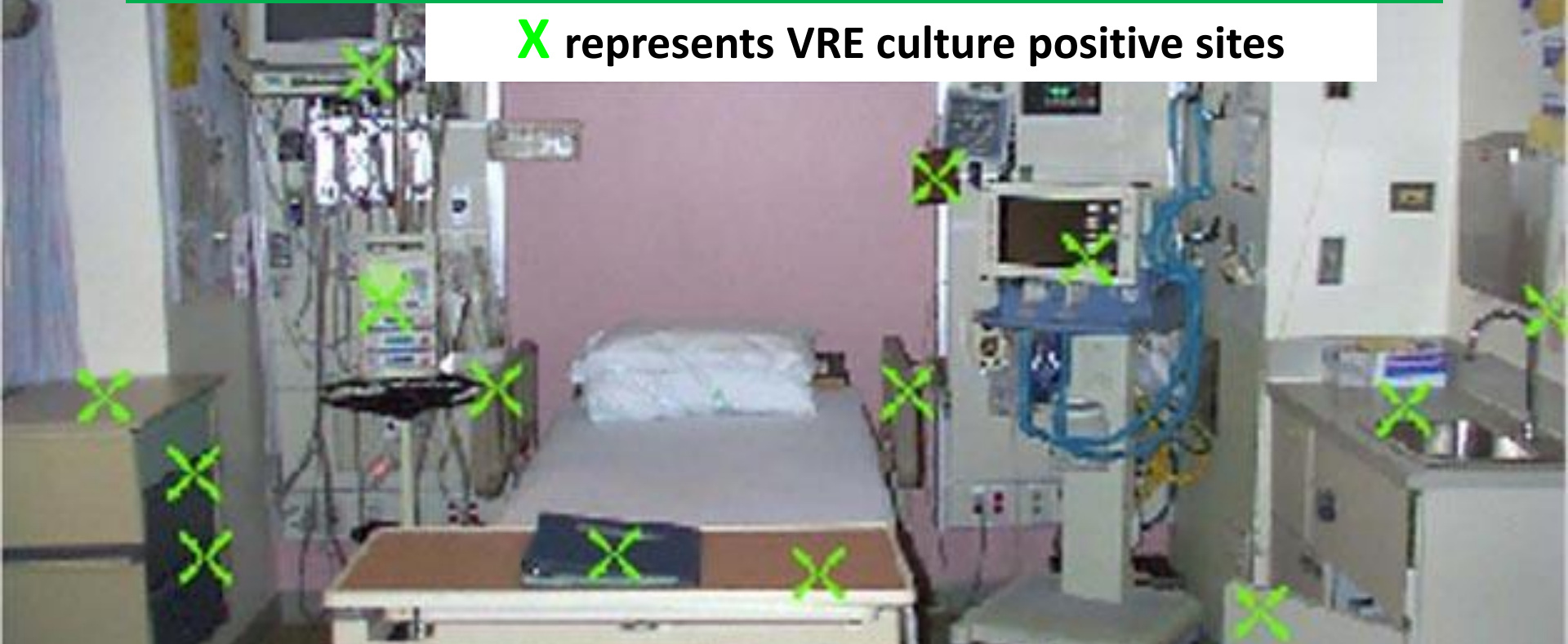


World Health Organization. WHO Guidelines for Hand Hygiene in Health Care. Geneva: World Health Organization; 2009.

Data from The HOW2 Benchmark Study, AJIC, Feb 2011 Steed et al.

The Inanimate Environment Can Facilitate Transmission

X represents VRE culture positive sites



Contaminated surfaces increase cross-transmission

Abstract: The Risk of Hand and Glove Contamination after Contact with a VRE (+) Patient Environment. Hayden M, ICAAC, 2001, Chicago, IL.



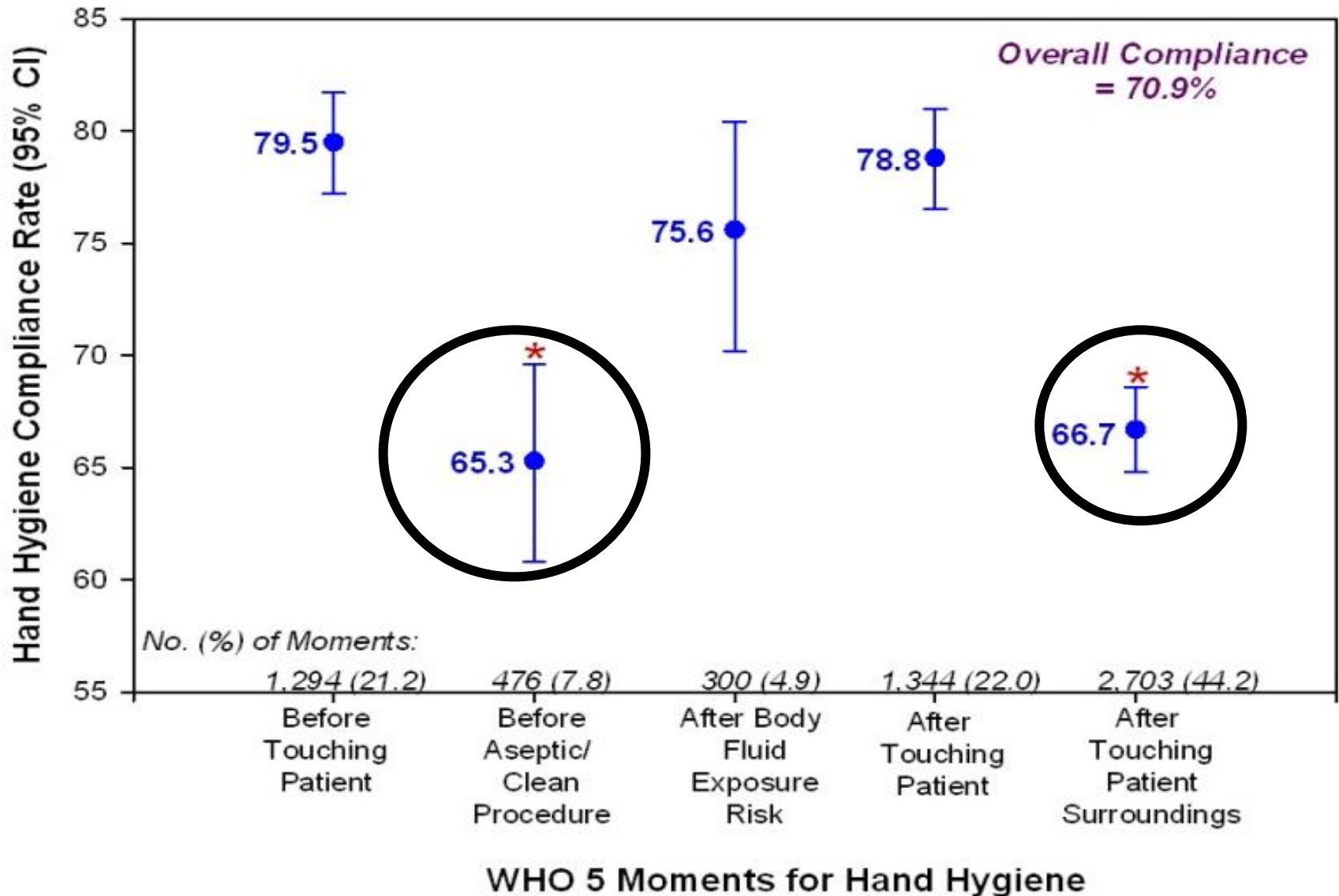
And compliance on the individual moments can vary significantly so if you want a true picture of compliance you must measure based on the 5 Moments



In and Out Measurement DOES NOT
APPROXIMATE WHO 5 Moments

Hand Hygiene Video-Monitoring Compliance Rates on Research Study Unit by the WHO 5-Moments for Hand Hygiene

N=26 patients, 6117 Moments (Dec '11 to Dec '12)





Further, their accuracy is questionable.

In Accuracy of a radio frequency identification (RFID) badge system to monitor hand hygiene behavior during routine clinical activities Pineles LL et al in 2014 showed that as many as 50% of hand hygiene events may not be captured by this type of system.



Additionally, healthcare workers are quite opposed to being monitored with badges.

In Healthcare Personnel Perceptions of Hand Hygiene Monitoring Technology Katherine Ellingson, PhD Philip M. Polgreen, MD et al state that “overall, HCWs were far less tolerant of wearing a device that would collect the geographic and temporal locations of HCWs.”

The universal unease with location tracking stemmed from broad concerns about Big Brother to specific concerns about how the data would be stored, protected, and used





The Economics also disadvantage individual systems – individual monitoring systems typically have much higher costs than group monitoring systems that do not require expensive badges.



Group Systems



Elaine Larson stated the following at the APIC 2015 Conference on June 26 in Nashville:

“If goal is to create a team effort, shared ownership of the problem, and a culture of safety and change without shame and blame, consider unit or group-level feedback.”

Group Monitoring

- Focus is on Unit Based Performance Feedback (promotes teamwork and a just safety culture); published studies prove group feedback model can drive sustainable improvement
- Can report on all the WHO 5 Moments
- Highly accurate and reliable at HHE Capture
- Cost effective (80-90% less than individual systems)

The ability of the Unit to make sustainable changes can be quite powerful



This approach has been shown to be highly successful at helping to improve and sustain adherence.



A multi year study published in 2011 by Son, Chuck, Childers et al at the Memorial Sloan Kettering Cancer Center in NY demonstrated the power of group feedback in driving behavior and culture change



In the MSKCC Study - staff:

Discussed barriers to their Compliance and Success;

Set their own unit based goals;
and

Learned the WHO 5 Moments (which was recently adopted as new hospital policy to improve patient safety and set a higher standard of care)



The results: “Between **2006 and 2008, average institutional hand hygiene compliance held steady at 60 percent to 70 percent.** After the new program was launched in **2008, compliance reached 97 percent and has been maintained** at this level ever since.”

Conclusion



Group Monitoring Systems are

- Clinically Superior
- Economically Advantaged
- Better able to create
positive culture change



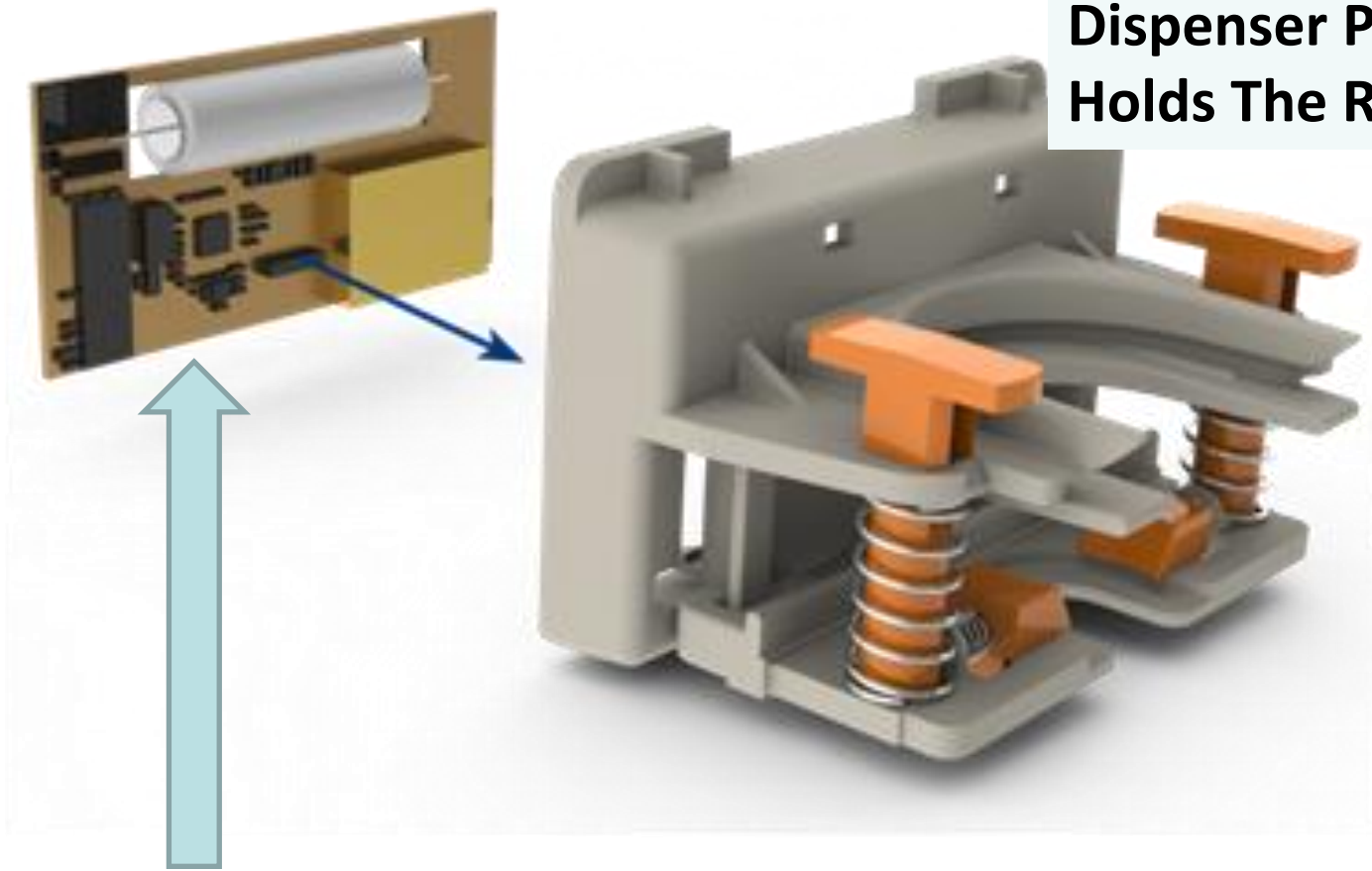
If the goal is to measure hand hygiene accurately and reliably at the highest clinical standard while driving sustainable improvement and culture change, the only way to achieve this is with an electronic Group Monitoring System capable of measuring based on the WHO 5 Moments for hand hygiene.



Group Monitoring Systems – How they Work



Capturing the Numerator



Dispenser Part that Holds The Refill Nozzle

Computer Chip with Multi Year Life Battery Captures HH Events and Transmits Rich Data to Facility Installed Receivers and Transmitters Is Embedded in the Dispensers



debmed
Engineering Hand
Hygiene Compliance

InstantFOAM HAND SANITIZER™



SANITIZER
desinfectante



Example of a Wireless Group Monitoring System Infrastructure



Dispensers with Computer Chips Capture 100% Of HH Events

Facility Installed Receivers and Transmitters Route Data To Off Site Servers Where Specialized Software Processes the Data

24/7 Access to an On Line Dashboard, Performance Reports and Raw Data



Calculating the WHO 5 Moments Denominator

– Evidence Based Methodology



It is now possible to reliably predict how many opportunities there are per patient day based on the WHO 5 Moments.

In *The HOW2 Benchmark Study*, Steed et al used the WHO's data collection methodology to estimate hand hygiene opportunities in general medical wards, intensive care units and emergency departments based on the WHO Five Moments for Hand Hygiene.

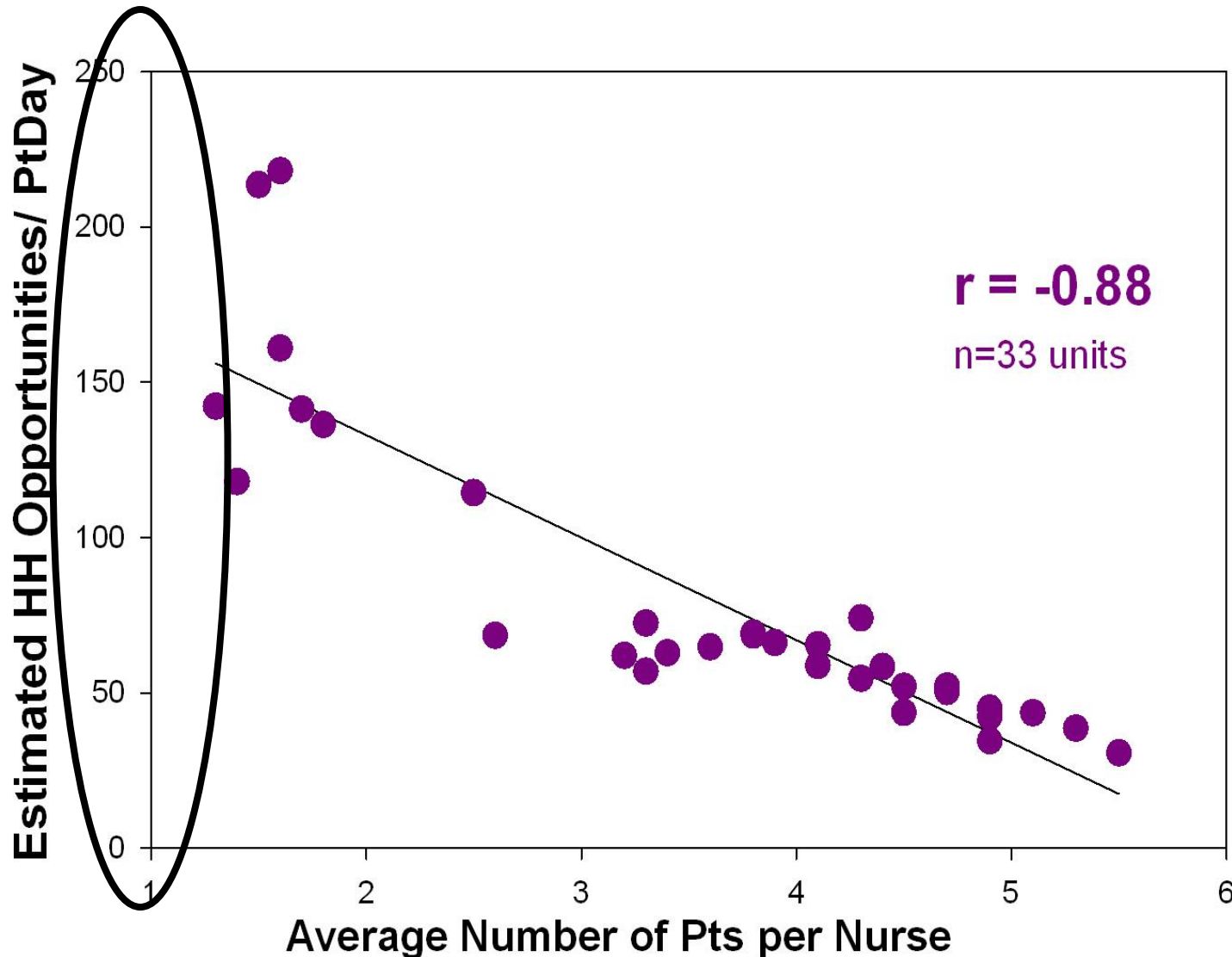


According to the study's conclusion, "these data can be used as denominator estimates to calculate hand hygiene compliance when product utilization [or hand hygiene event] data are available."

Further analysis of the HOW2
Data revealed a high correlation
between the Patient Nurse Ratio
and total Hand Hygiene
Opportunities Per Patient Day
for *any* hospital in patient unit –
based on 33 units in 5 hospitals

Calibrating Customized Denominators *debmed*

A high co-efficient of correlation between hand hygiene opportunities per patient day and patient/nurse ratio across 33 units in a variety of acute care in patient settings (N = 5 hospitals)





So it is now possible to pre determine the denominator (expected HHOs per patient day) for any hospital in patient unit as long as the Patient to Nurse Ratio for that unit (and daily census) is known



This methodology was validated
in a Video Validation Study
published in AJIC in June of 2014.

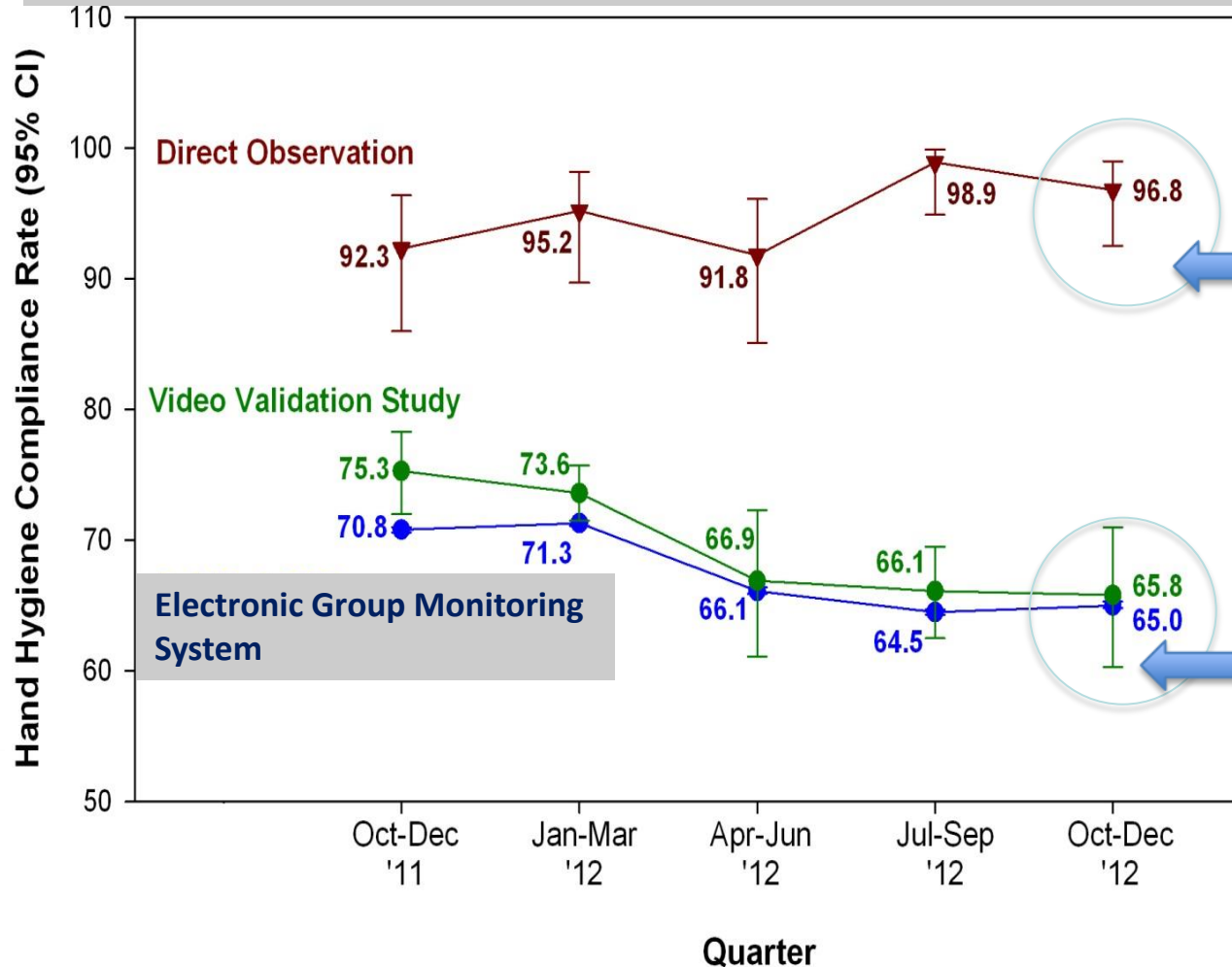
Validation Study



Accuracy Validated



**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 conclusion states “This study validates the HOW2 Benchmark Study and confirms that expected numbers of HHOs can be estimated from the unit’s patient census and patient-to-nurse ratio. These data can be used as denominators in calculations of hand hygiene compliance rates from electronic monitoring using the “Five Moments for Hand Hygiene” methodology.

Taken together, the *HOW2 Study* and the Video Validation Study demonstrate that accurate and reliable pre determination of denominators is possible based on the evidence based algorithm with a +/- 3% statistical accuracy vs up to 300% with DO –



What to look for when considering an Electronic Monitoring HHC System

A buyer's guide / check list of essential criteria to consider

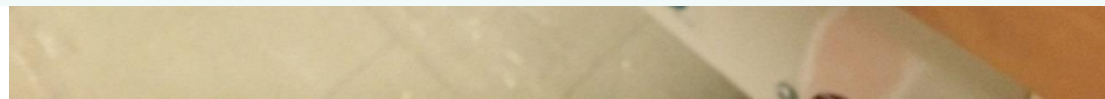


Electronic Monitoring Systems – Essential Selection Criteria

1. Real time compliance monitoring of both wall mounted and Point of Care Dispensers (in the Patient Zone) that capture 100% of hand hygiene events



Compliance at the Point of Care Within the Patient Zone – Lockable Pump Bottle Dispenser with Computer Chip Inside



Electronic Monitoring Systems – Essential Selection Criteria

2. Calculates compliance rates based on WHO 5 Moments for HH.

The algorithms to do so are based on peer reviewed evidence that has been validated with subsequent research

The WHO, in its *Save Lives: Clean Your Hands Newsletter of November 12, 2012*, recommended that electronic monitoring, when resources are available, should be the future approach to hand hygiene compliance monitoring provided that such systems are based on the WHO 5 Moments for Hand Hygiene.



Electronic Monitoring Systems – Essential Selection Criteria

3. Calculates compliance rates based on unit results (think “team”) and does not rely on individual monitoring of HCWs with badges



Electronic Monitoring Systems – Essential Selection Criteria

4. Provides real time compliance rates via unit level Dashboard accessible 24/7 via web – a stand alone system that is not dependent on hospital IT, WI FI network or RTLS/RFID infrastructure



Electronic Monitoring Systems – Essential Selection Criteria

“Must Have” Dashboard Functionality

Single Unit Dashboard – Shows Current Compliance and Total Events/Missed Events



GMS™ : Reports

Weekly Report : Daily HHCI : 2012/06/13 - 2012/06/19

HHCI REPORT FOR THE UNIT1 UNIT
COOLEY DICKINSON HOSPITAL

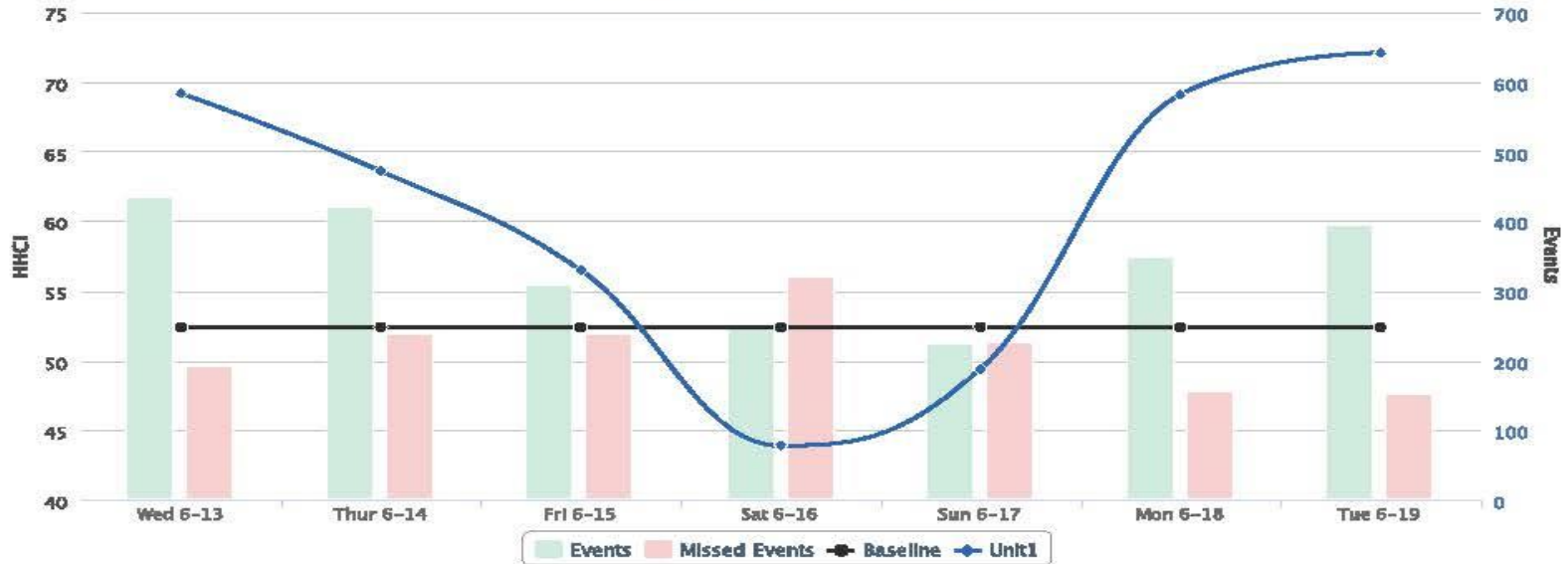
SNAPSHOT - UNIT1

HHCI Past 30 Days: 55.0

Events: 11,834

Missed HH Opps: 6,509

Hand Hygiene Compliance Unit 1



Highcharts.com

REPORT SUMMARY

Facility	Unit	Baseline	Current	Δ HHCI	HH Events	HH Opportunities	Missed HH Opps	Goal	Goal +/-
CDH	Unit1	52.4	60.6	+8.2	2,380	3,906	1,526	—	—

ABOUT YOUR REPORT

Attached is a Hand Hygiene Compliance report for Unit1 from Wednesday June 13, 2012 through Tuesday June 19, 2012. Unit1's Hand Hygiene Compliance Index has improved 8.2 points to 60.6 when compared to the previous week baseline of 52.4.

In addition to the line graph representing compliance there is a histogram detailing the Actual Hand Hygiene Events and Missed Hygiene Events associated with each day.

Single Unit Dashboard – Shows Current Compliance and Total Events/Missed Events



GMS™ : Reports

Weekly Report : Daily HHCI : 2012/06/13 - 2012/06/19

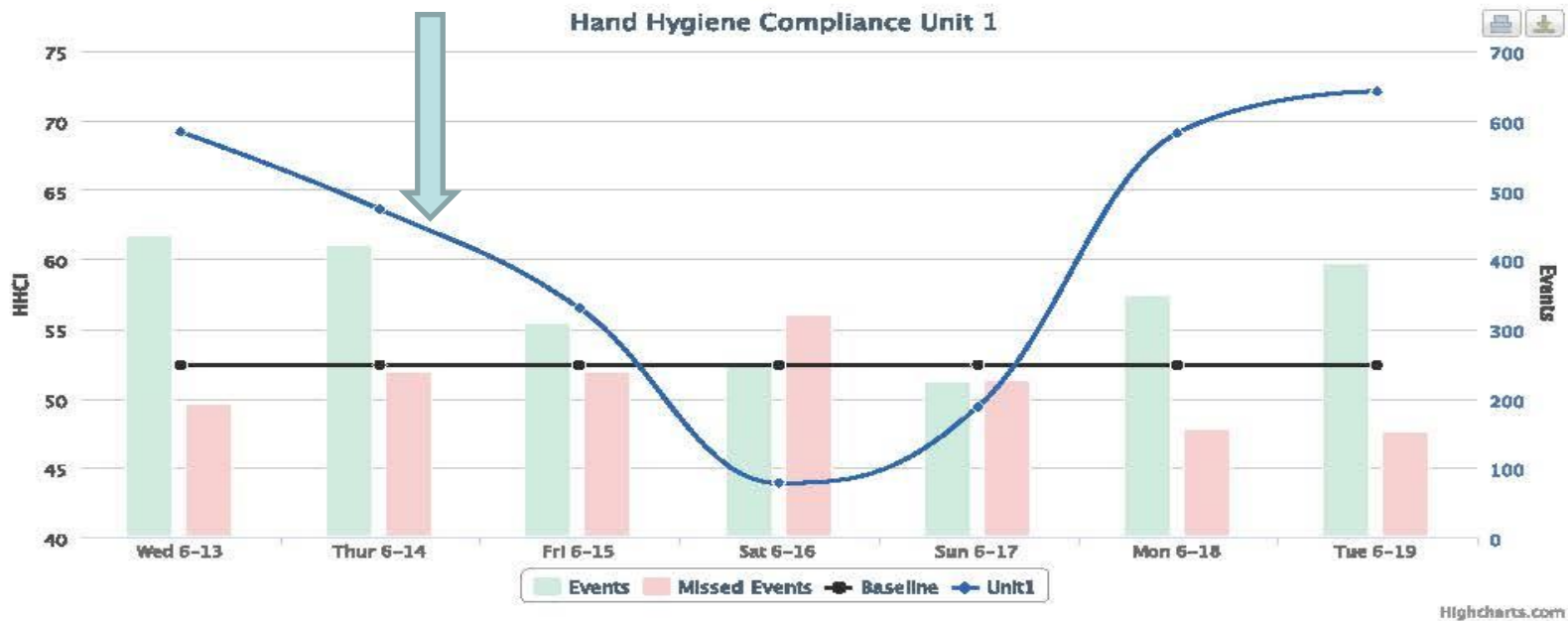
SNAPSHOT - UNIT1

HHCI Past 30 Days: 55.0

Events: 11,834

Missed HH Opps: 6,509

Trend Line with Data Points (Daily, Weekly Etc.)



REPORT SUMMARY

Facility	Unit	Baseline	Current	Δ HHCI	HH Events	HH Opportunities	Missed HH Opps	Goal	Goal +/-
CDH	Unit1	52.4	60.6	+8.2	2,380	3,906	1,526	—	—

ABOUT YOUR REPORT

Attached is a Hand Hygiene Compliance report for Unit1 from Wednesday June 13, 2012 through Tuesday June 19, 2012. Unit1's Hand Hygiene Compliance Index has improved 8.2 points to 60.6 when compared to the previous week baseline of 52.4. In addition to the line graph representing compliance there is a histogram detailing the Actual Hand Hygiene Events and Missed Hygiene Events associated with each day.

Single Unit Dashboard – Capable of Incorporating Unit Specific Goals



GMS™ : Reports

Weekly Report : Daily HHCI : 2012/06/13 - 2012/06/19

HHCI REPORT FOR THE UNIT1 UNIT
COOLEY DICKINSON HOSPITAL

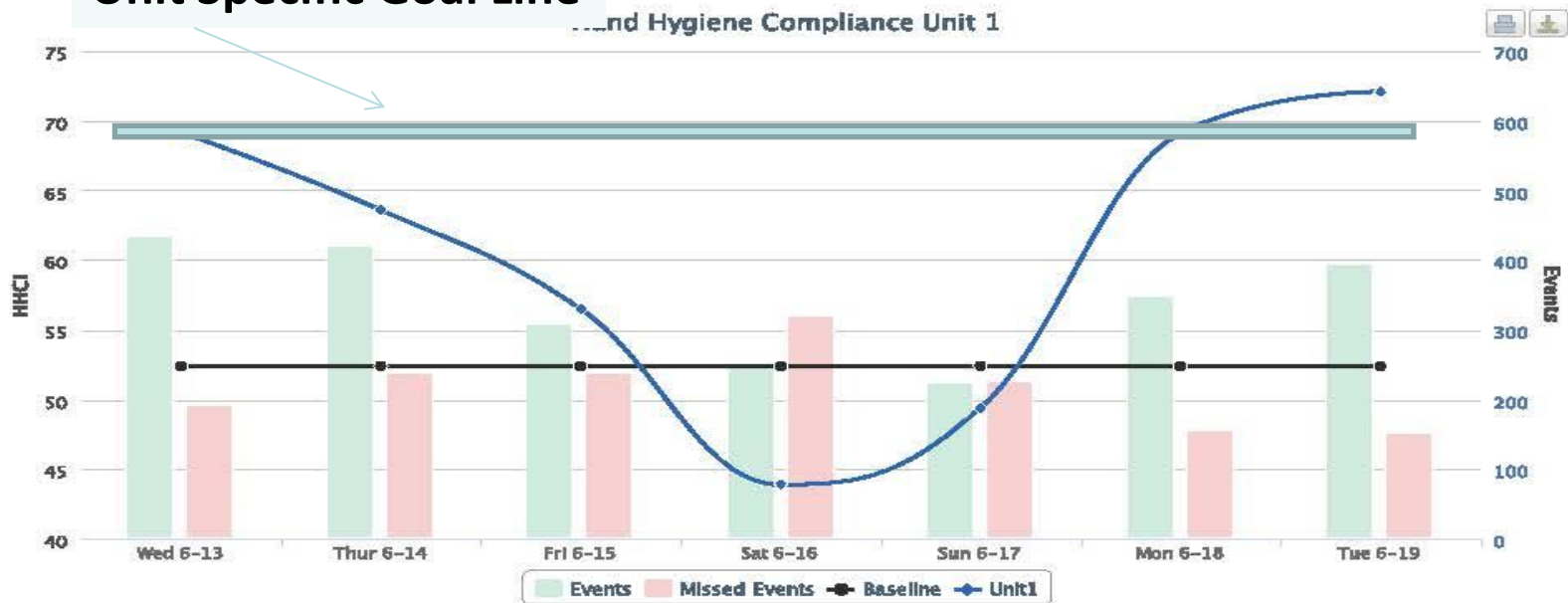
SNAPSHOT - UNIT1

HHCI Past 30 Days: 55.0

Events: 11,834

Missed HH Opps: 8,509

Unit Specific Goal Line



Highcharts.com

REPORT SUMMARY

Facility	Unit	Baseline	Current	Δ HHCI	HH Events	HH Opportunities	Missed HH Opps	Goal	Goal +/-
CDH	Unit1	52.4	60.8	+8.2	2,380	3,908	1,528	—	—

ABOUT YOUR REPORT

Attached is a Hand Hygiene Compliance report for Unit1 from Wednesday June 13, 2012 through Tuesday June 19, 2012. Unit1's Hand Hygiene Compliance Index has improved 8.2 points to 60.8 when compared to the previous week baseline of 52.4.

In addition to the line graph representing compliance there is a histogram detailing the Actual Hand Hygiene Events and Missed Hygiene Events associated with each day.

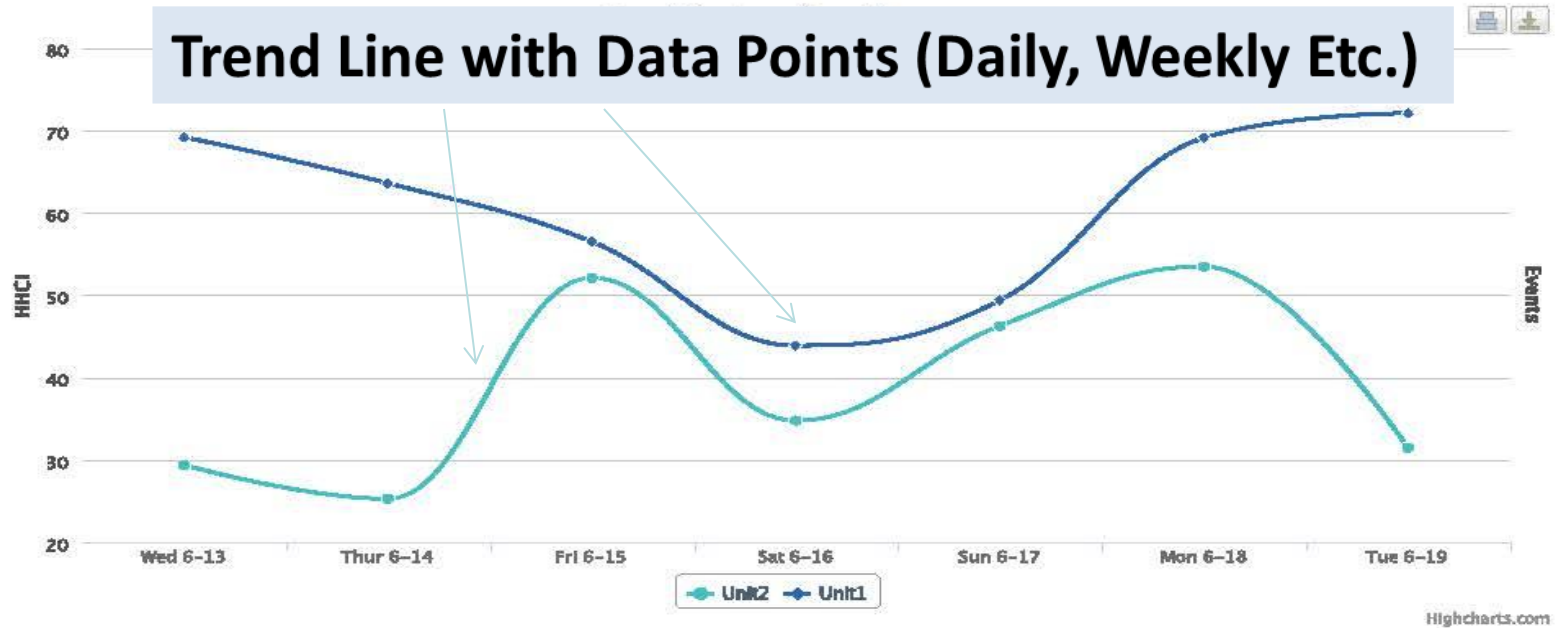
Two or more units/wards can be compared

GMS™ : Reports

Weekly Report : Daily HHCI : 2012/06/13 - 2012/06/19

HHCI REPORT FOR UNIT1, UNIT2 UNIT(S)

COOLEY DICKINSON HOSPITAL



REPORT SUMMARY

Facility	Unit	Baseline	Current	Δ HHCI	HH Events	HH Opportunities	Missed HH Opps	Goal	Goal +/-
GDH	Unit1	52.4	60.6	+8.2	2,380	3,906	1,526	—	—
GDH	Unit2	27.6	39.0	+11.4	743	1,911	1,168	—	—

ABOUT YOUR REPORT

Attached is a Hand Hygiene Compliance report comparing Unit1 and Unit2 from Wednesday June 13, 2012 through Tuesday June 19, 2012.

Unit1's Hand Hygiene Compliance Index has improved 8.2 points to 60.6 when compared to the previous week baseline of 52.4.

Unit2's Hand Hygiene Compliance Index has improved 11.4 points to 39.0 when compared to the previous week baseline of 27.6.

Custom Date Range Reports Can Be Easily Generated – Essential When There Is An Outbreak

GMS™ : Reports
daily HHCI : 2011/06/
MED SURG ICU
 Clason Memorial Hospital
 Facility: CMH Unit: M
 Report History: 2011-01-01 to 20

Legend:
 — Med Surg ICU
 — Unit Goal: 95%
 — Unit Baseline 85.5%

Advanced Graph Options

Interval:

From: To:

Hospitals:
 Add:

Units:
 1: Clason Memorial Hospital : Med Surg ICU
 Add:

 Clason Memorial Hospital : ICU
 Clason Memorial Hospital : Pediatric ICU

Overall HHCI:
 Calculated HHCI:
 Patient Survey:
 Direct Observation:

Report Summary

Facility	Unit	Baseline	Current	Δ HHCI(CR)	HH Events	HH Opportunities	Missed HH Opps	Goal	Goal +/-
CMH	MSICU	85.5%	89.2%	3.7%	11,718	13,134	1,416	95%	-5.8

Print Screen Option – Creates PDF That Can be Printed/Saved

Group Monitoring System

GMS™ : Reports

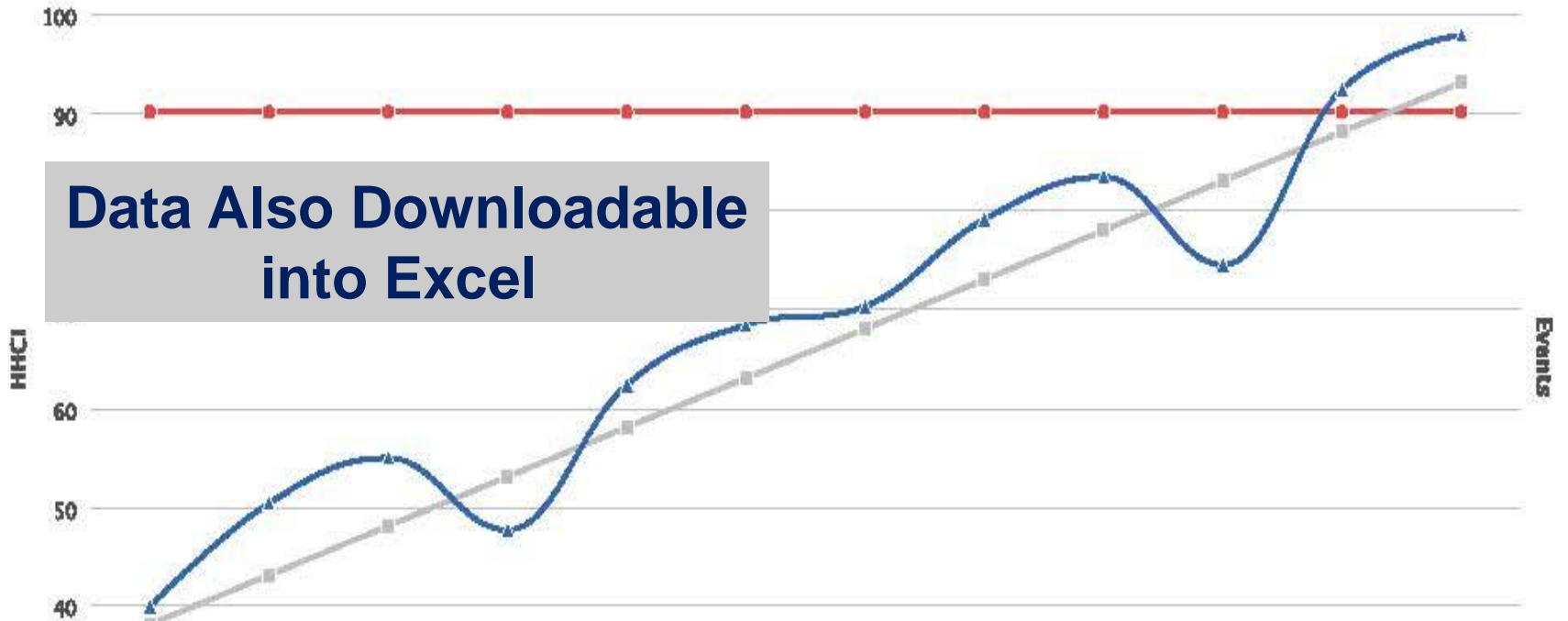
Previous Year : Monthly HHCI : 2011/01/01 - 2011/12/31

HHCI REPORT FOR THE MSICU UNIT

CLASON MEMORIAL HOSPITAL

SNAPSHOT - MSICU	
HHCI Past 30 Days	82.2
Events	42,241
Missed HH Opps	24,013

MSICU HHCI



Data Also Downloadable into Excel



Electronic Monitoring Systems – Essential Selection Criteria

5. Allows staff to “order” standard reports that arrive automatically via email on a fixed schedule so they can be immediately shared and acted upon



Electronic Monitoring Systems – Essential Selection Criteria

6. Monitors both soap and sanitizer hand hygiene events and aggregates them as “the numerator”



Electronic Monitoring Systems – Essential Selection Criteria

7. Allows you to drill down to see real time activations at the dispenser level (important for C. Diff. cases – need to see that soap versus sanitizer indications are being adhered to)

Displays soap vs. sanitizer usage by Dispenser – Essential When C. Diff to Drive The Right Behavior

GMST™ : Reports

Dispenser Event Report

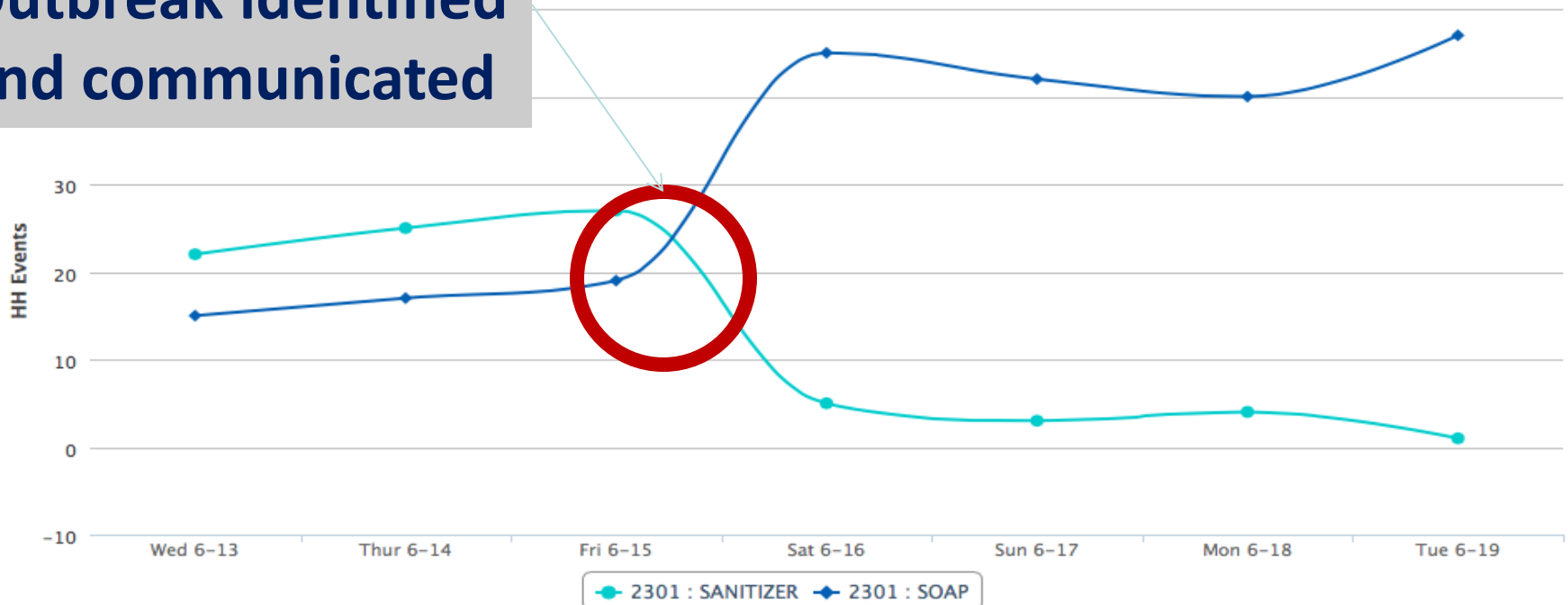
START DATE: 2012/06/13

END DATE: 2012/06/19

CLASON MEMORIAL HOSPITAL

Outbreak identified and communicated

Soap vs Sanitizer CDIFF Example





Electronic Monitoring Systems – Essential Selection Criteria

8. Provides multi modal improvement tool kit including a unit based check list for using the Dashboard at unit staff meetings

Performance Improvement Tool Kit

Key Elements:

Marketing & Communication | Training & Education | Reminder Tools | FAQ | Contact Us | f t in You Tube

Tools for Improvement:

Communicate, Educate and Reinforce to Improve Hand Hygiene Compliance

Quick Resource Access

Marketing & Communication
- Select -

Training & Education
- Select -

Reminder Tools
- Select -

Helpful Links

- WHO Clean Care is Safer Care
- CDC
- APIC
- DebMed®

Contact Us

becky.gooden@debmed.com
(704) 357-4258

2730 W. Tyvola Rd.
Suite 200
Charlotte, NC 28217

Marketing & Communication

Communicate your hand hygiene improvement initiative



Marketing & Communication

Training & Education

Train your team on hand hygiene best practices and the DebMed® GMS™



Training & Education

Reminder Tools

Implement reminder tools to maintain high compliance



Reminder Tools

Evidence Based Best Practice Implementation Guideline – Parallels the MSKCC Study

Unit based feedback model drives sustainable improvement



- ✓ Designate Unit HH Champions
- ✓ Share the data at huddles/handoffs
- ✓ Identify unit based obstacles and barriers
- ✓ Develop and agree on an action plan to remove them
- ✓ Agree on unit based improvement goals
- ✓ Repeat on an agreed upon time frame

Unit Leadership and Front Line Staff Engagement is an Essential Pre Condition for Success



Electronic Monitoring Systems – Essential Selection Criteria

9. Can be deployed with most major brands of hand hygiene products

External Detection Units Installed and capture all HH Events







Electronic Monitoring Systems

Essential Selection Criteria

10. An evidenced based ROI Tool can be loaded with your hospital's HAI data and demonstrate a positive return on investment based on elimination of non reimbursed extended LOS, 30 day readmissions and optimized Value Based Performance results



Electronic Monitoring Systems – Essential Selection Criteria

This enables you to make the sound & evidence based business case for adoption of the technology



Potential Financial Impact and ROI with Electronic Monitoring of HHC – An Example Follows - **a customized version can be created for your facility upon request:**



Real Life Example Pro Forma ROI using a Health Econometric ROI Calculator Developed by GFK International. First year demonstrates an \$830K return.

Return on Investment

HAI and your current hand hygiene monitoring solution cost your hospital \$10,774,178 per year.

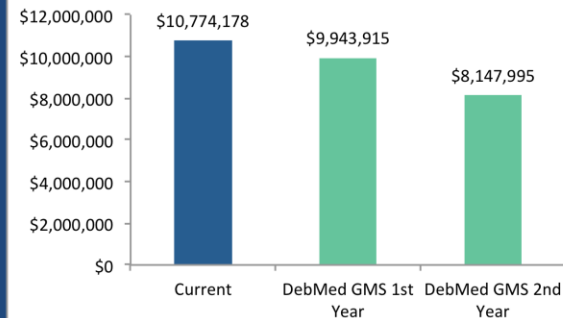
Cost of Hand Hygiene Monitoring	\$0	Direct Observation Calculator
Cost of DebMed GMS	\$190,800	
Hospital Costs Associated with Installation	\$9,540	
Total Cost of HAIs this year	\$10,774,178	

*With an investment of \$200,340 in the first year, a savings of \$830,264 may be achieved in the year following the implementation of the DebMed GMS.

*Over 5 years, a total investment of \$963,540 may yield a return on investment of \$13,602,323

	HAI + DO Costs	DebMed GMS Costs	Annual Savings from Baseline
Year 1	\$ 9,743,575	\$ 200,340	\$ 830,264
Year 2	\$ 7,957,195	\$ 190,800	\$ 2,626,183
Year 3	\$ 7,201,419	\$ 190,800	\$ 3,381,959
Year 4	\$ 7,201,419	\$ 190,800	\$ 3,381,959
Year 5	\$ 7,201,419	\$ 190,800	\$ 3,381,959
TOTAL		\$ 963,540	\$ 13,602,323

Total Cost for HAIs and Compliance Monitoring*



*Results assume 20% cost of Direct Observation when DebMed GMS is implemented as some staff time may still be used.

Assumes HHC going to 75% from 60% & HAIs being reduced from 3.69 to 2.9 per 1000 bed days in first year and moderate engagement with the data/tools

Impact of The Electronic GMS

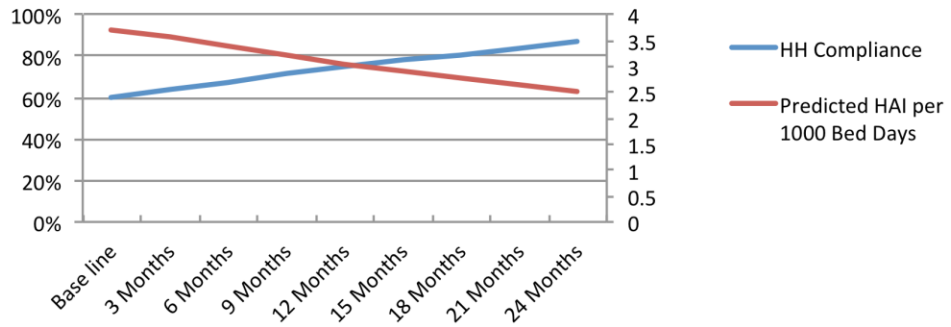
At your hospital with 477 beds and 80% occupancy, adopting the DebMed GMS should improve hand hygiene compliance from 60% to 75% in the first year and increase to 86.5% by the end of the second year, reducing the rate of HAIs per 1000 bed days from 3.69 to 2.51 over 2 years.

The Link Between Hand Hygiene Compliance and HAIs

The Effect of the DebMed GMS System on Hand Hygiene Compliance

- High Engagement
- Moderate Engagement

Projected Hand Hygiene Compliance and Rate of HAIs Over 12 Months





Anything less than these criteria, will not accomplish the aim – improving hand hygiene compliance, reducing HAIs, improving patient safety and eliminating excessive and unnecessary costs.



“Based on our research – the new and real gold standard is Electronic Group Monitoring Based on the WHO 5 Moments for Hand Hygiene utilizing evidence based pre determined denominators. This is the best approach to measuring HHC and the research proves it.”

Thomas Diller, MD – CMO Christus Health System



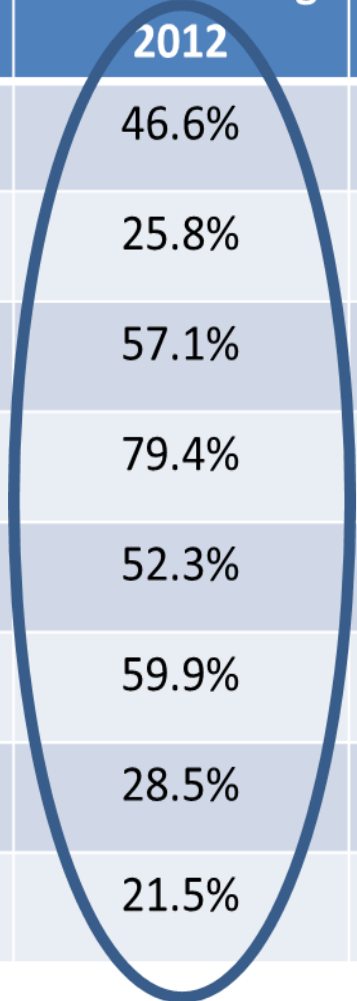
**The goal is progress &
improvement, not perfection –**

**Here are some examples of user
experiences with Group Monitoring
Technology installed and implemented
in their facilities**

Western MA Community Hospital



Unit	Baseline Dec. 2011-Aug. 2012	Current Sept. 2012-Feb. 2013	Percent Change	Percent Increase
North 4	46.6%	53.5%	6.9%	14.8%
West 4	25.8%	33.5%	7.7%	29.9%
West 3	57.1%	62.6%	5.5%	9.6%
North 3	79.4%	86.9%	7.5%	9.4%
West 2	52.3%	62.9%	10.6%	20.3%
CCU	59.9%	70.7%	10.8%	18.0%
West 5	28.5%	30.1%	1.6%	5.6%
Childbirth	21.5%	24.1%	2.6%	12.1%



Western MA Community Hospital



Unit	Baseline Dec. 2011-Aug. 2012	Current Sept. 2012-Feb. 2013	Percent Change	Percent Increase
North 4	46.6%	53.5%	6.9%	14.8%
West 4	25.8%	33.5%	7.7%	29.9%
West 3	57.1%	62.6%	5.5%	9.6%
North 3	79.4%	86.9%	7.5%	9.4%
West 2	52.3%	62.9%	10.6%	20.3%
CCU	59.9%	70.7%	10.8%	18.0%
West 5	28.5%	30.1%	1.6%	5.6%
Childbirth	21.5%	24.1%	2.6%	12.1%

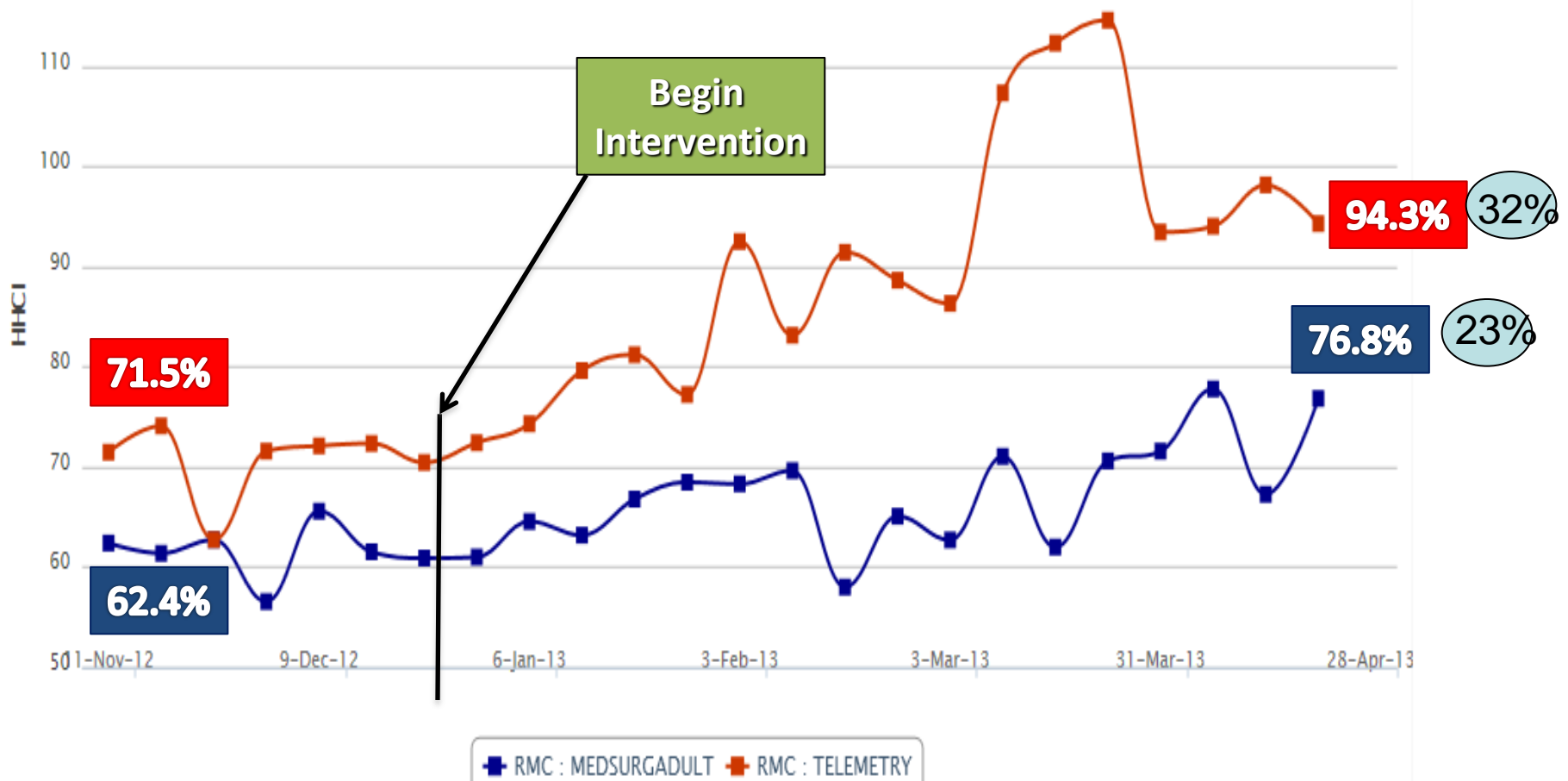
Results with HH Champions and High Engagement



Advanced Report History: 2012-11-12 to 2013-05-01(weekly: MEDSURGADU TELEMETRY)

[Email This Report](#) [Printer Friendly](#)

Chicago Area Hospital Results



Results with HH Champions and High Engagement



HHCI: 08-Feb-2014 to 25-Mar-2014 (daily points)

Units: GMCL-ICU

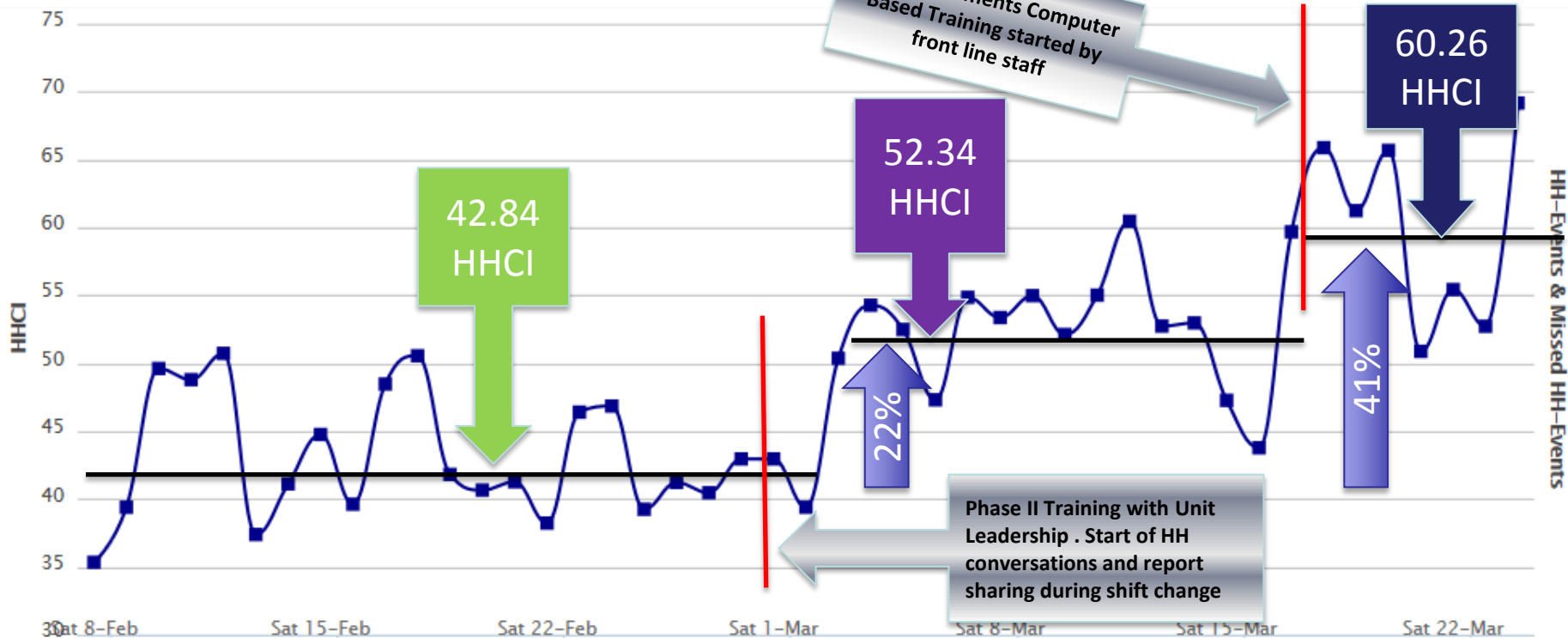
Atlanta, GA Area Hospital Results

HHCI = Hand Hygiene Compliance Index

Advanced

Advanced Report History: 2014-02-08 to 2014-03-25(daily: ICU)

Email This Report Printer Friendly



Results with HH Champions and High Engagement



DebMed® GMS™

Hand Hygiene Compliance
Group Monitoring System

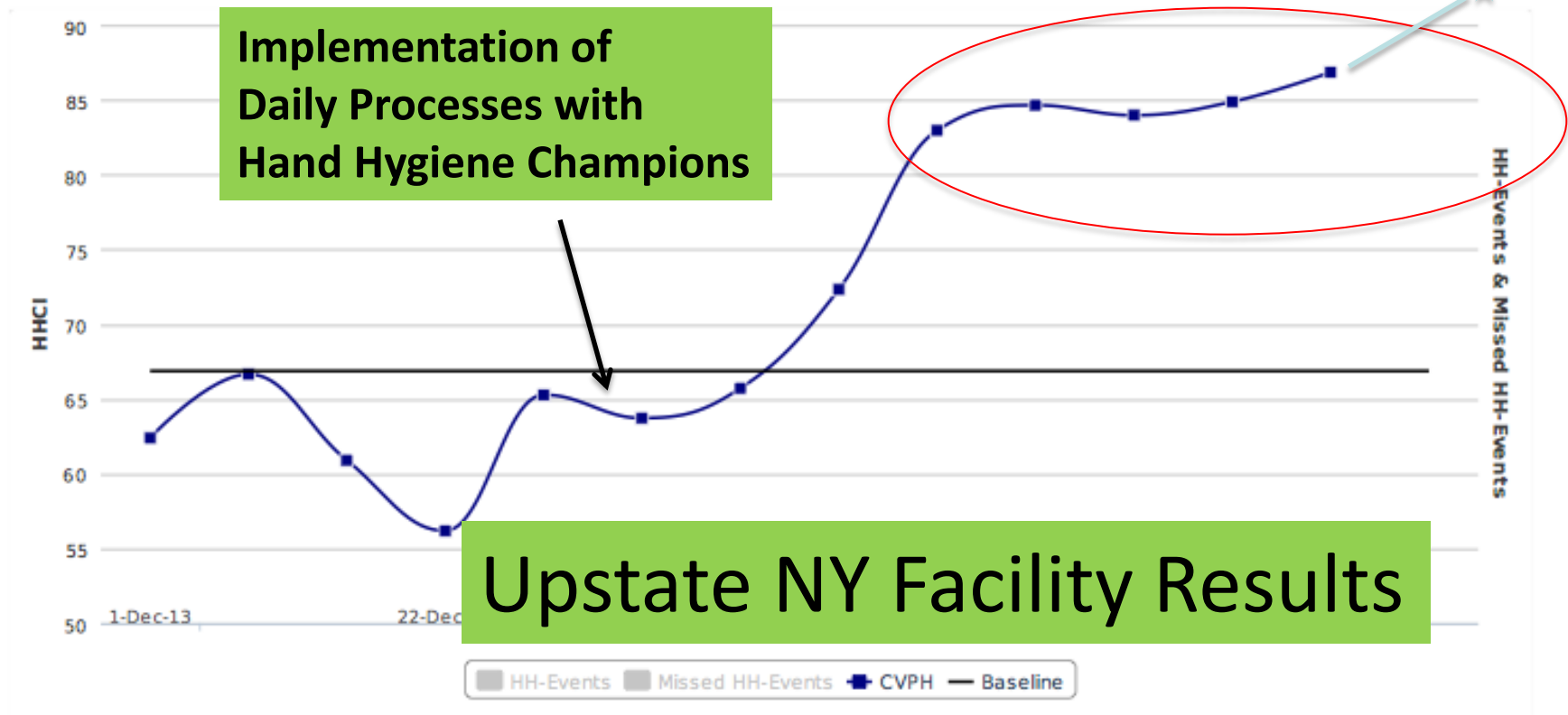
Example of How Data Denial
Can Be Overcome

91% as of
3/5/14

HHCI: 01-Dec-2013 to 02-Mar-2014 (WEEKLY points)

Facilities: CVPH-CVPH

Units:





Clinical Study with A Group Monitoring System

Study was conducted at Greenville Memorial Hospital (GMH), a 746-bed teaching hospital in Greenville, SC on 23 of their units with a total of 647 beds, or 87% of the total that had both electronic hand hygiene compliance index data and MRSA surveillance data between July 1, 2012 and March 31, 2015



Greenville Health System

Seven hospitals in Greenville, SC,
USA

Research Team

- Dr. Tom Diller, VP of Quality & Patient Safety (Now CMO for Christus Health)
- Connie Steed, IP and PI for the HOW2 Study
- Dr. Bill Kelly, Epidemiologist at GHS
- Dr. Dawn Blackhurst, Epidemiologist and Biostatistician at GHS (not pictured)
- Other IPs at GHS

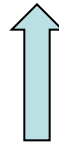


Clinical Study with a Group Monitoring System

IP Leadership was a driving force at implementing the use of group monitoring data along with transition to a WHO 5 Moment standard of care and safety culture

The Unit Leadership and Front Line staff were fully engaged with use of the Hand Hygiene Compliance Index (HHCI) data to drive improvement in their behavior.

Summary of Study Results (Pre Publication)

 **HHCI Rates increased in total for all units by 25.5%**
from 54.9% to 68.8%

This result has a high statistical significance* ($p = < 0.001$)

 **MRSA Rates decreased in total for all units by 42.8%** from .381
HAIs to .267 HAIs per 1000 patient days

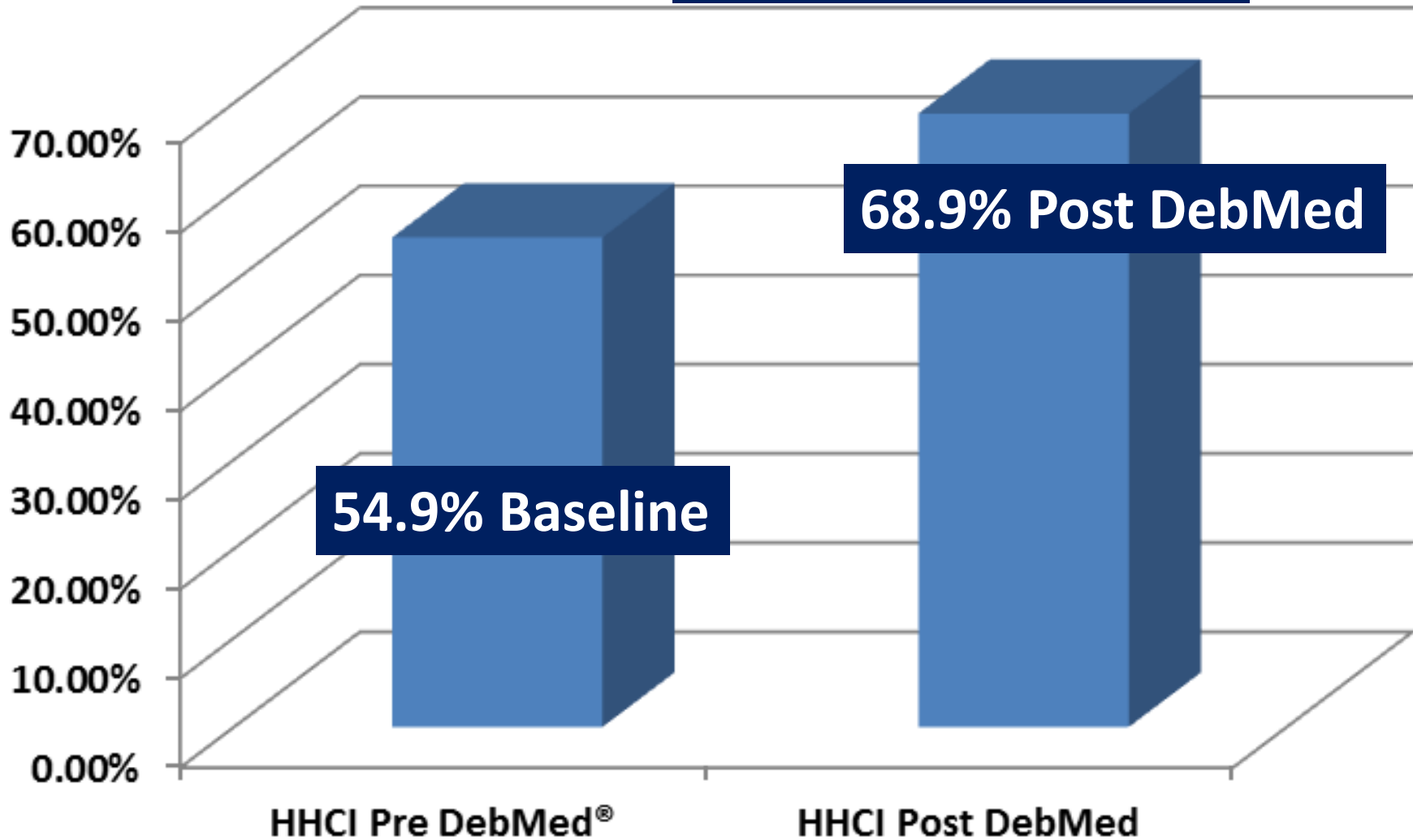
This result has a high statistical significance ($p = 0.014$)

\$ 433,644 in excess costs were avoided

*Anything less than 0.05 is statistically significant

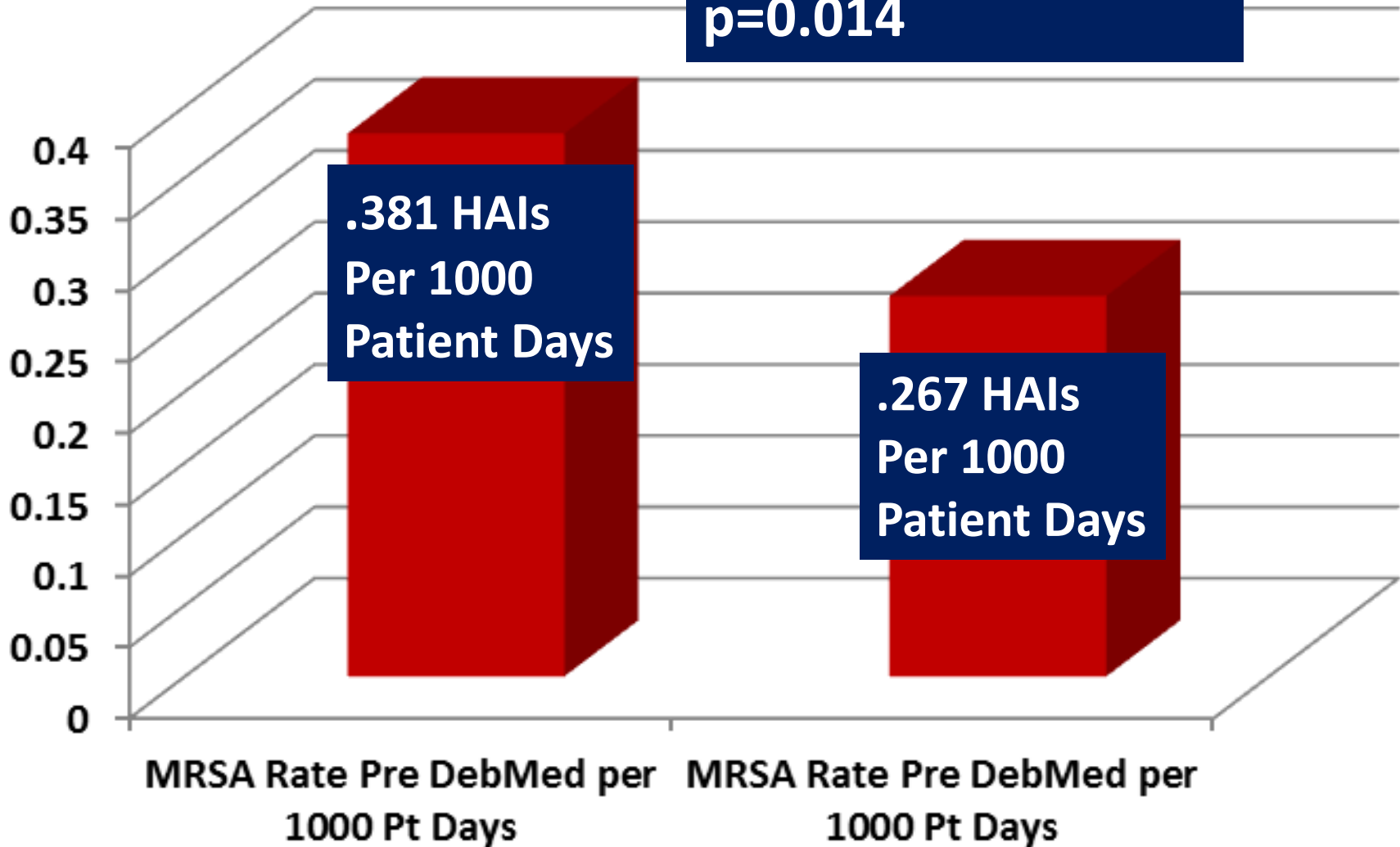
HHCI Growth

HHCI Growth = 25.5%
P=<0.001



MRSA Reduction

**MRSA Rate
Reduction = 42.8%
p=0.014**

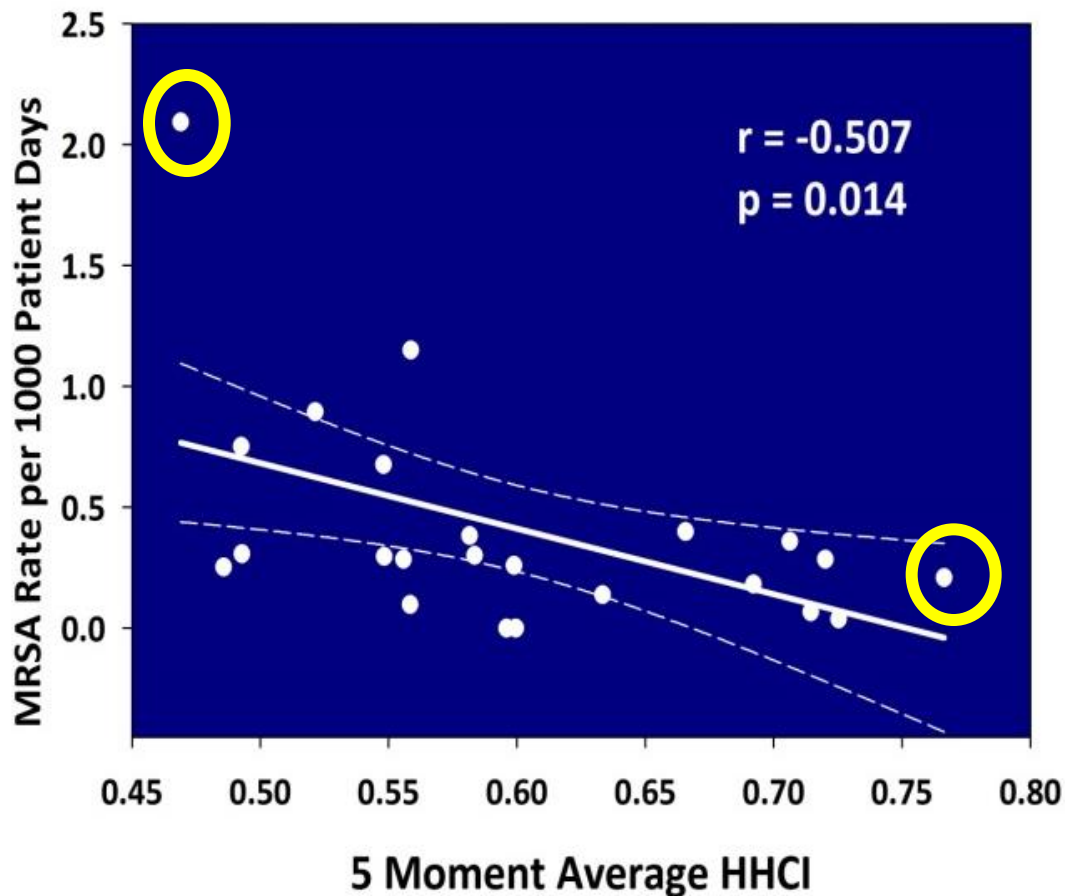




The Study Proves that:

1. Higher rates of HHCI are associated with lower rates of MRSA
2. Greater improvement in HHCI is a driver of lower MRSA rates
3. Financial savings come from both the elimination of additional costs for care AND avoidance of excess LOS and the lost revenue associated with those days

1. Units with higher 5 Moment HHCI had lower overall MRSA rates

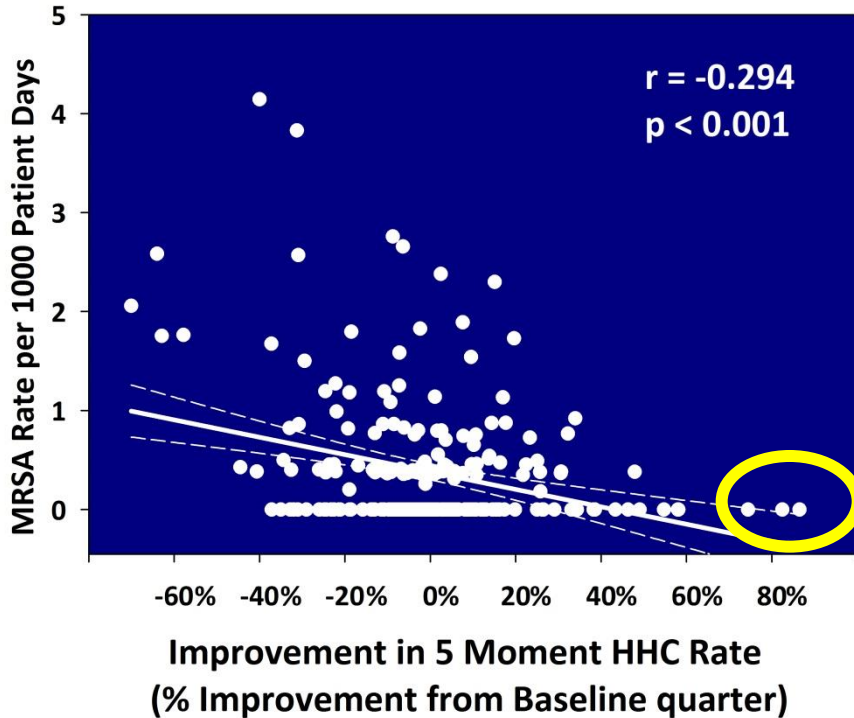


Conclusion: As the HHCI increases, MRSA decreases

Each circle is a unit's data point for the overall study timeframe (July '12 to Mar '15) (N=23 units)

Note: Solid line is regression line, dashed line is 95% confidence interval for regression line

2. Units with the greatest improvement in HHCI had the lowest rates of MRSA.



Conclusion: As the HHCI improves, MRSA decreases

Each circle is a unit's quarterly data point change from its baseline quarter (N=263 unit quarters)

Note: Solid line is regression line, dashed line is 95% confidence interval for regression line



3. MRSA HAIs That Were Prevented = 24

During the post-intervention period (beginning 4/2014 and ending 3/2015) we would have predicted 81 MRSA infections if rates had stayed the same from the pre-intervention period.

However, we experienced only 57 during that period – meaning we prevented 24 infections on the 23 units.



\$433,644 in Excess Costs Were Avoided As a Result of Their Prevention

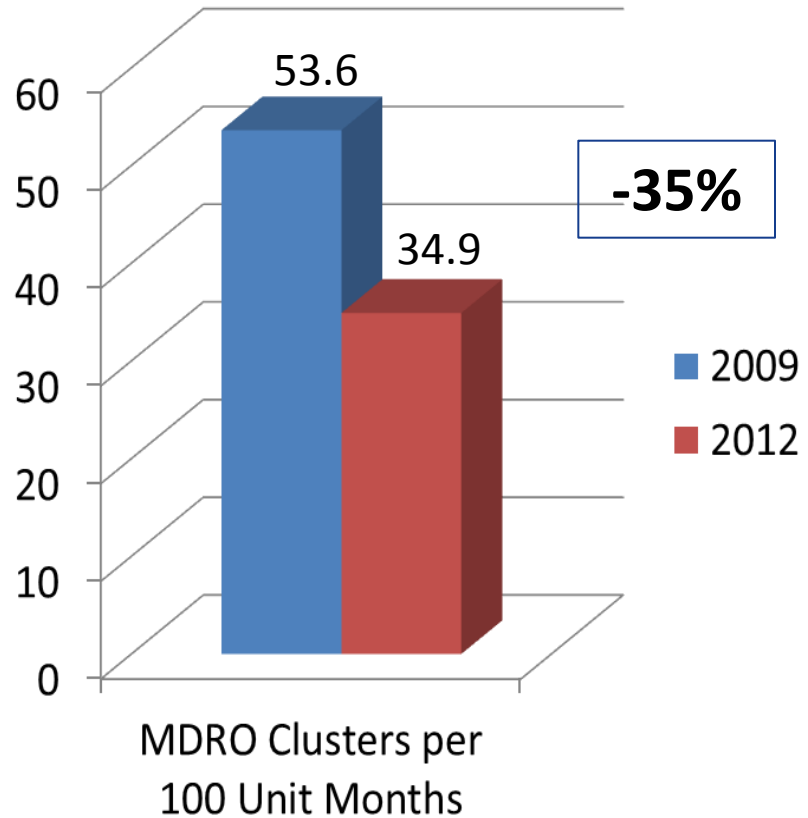
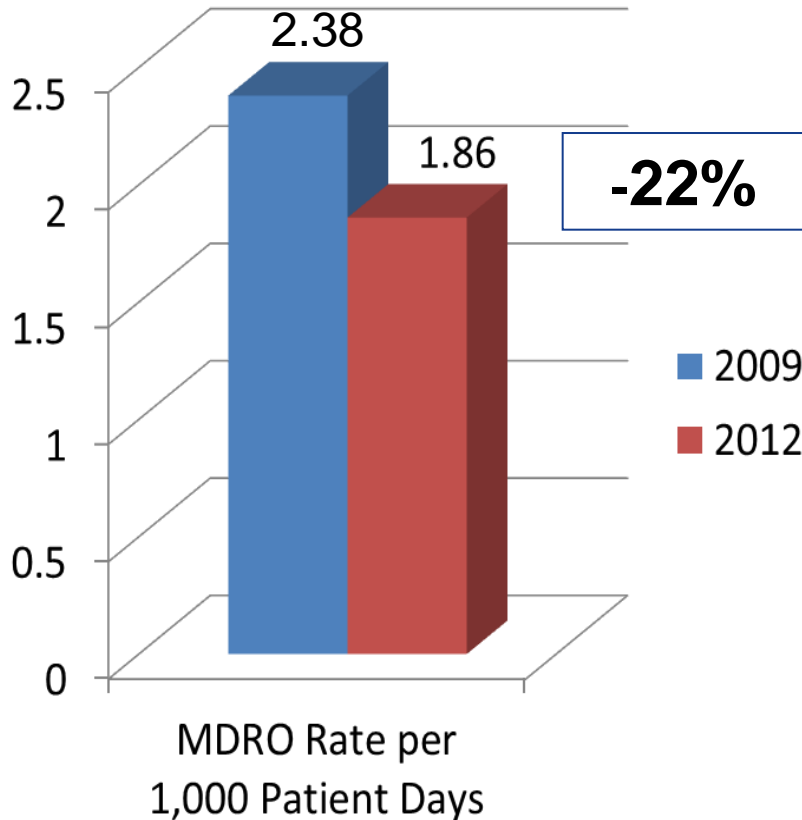
The actual excess care costs avoided were \$8668 per patient or \$208,032 total

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)

HAI Reductions



Rates of MDROs and MDRO clusters declined significantly from 2009 – 2012. During this time, the WHO Five Moments for Hand Hygiene standard was implemented and the Electronic Group Monitoring System was fully installed in 2011.

Displays soap vs. sanitizer usage by Dispenser – Essential When C. Diff to Drive The Right Behavior

GMST™ : Reports

Dispenser Event Report

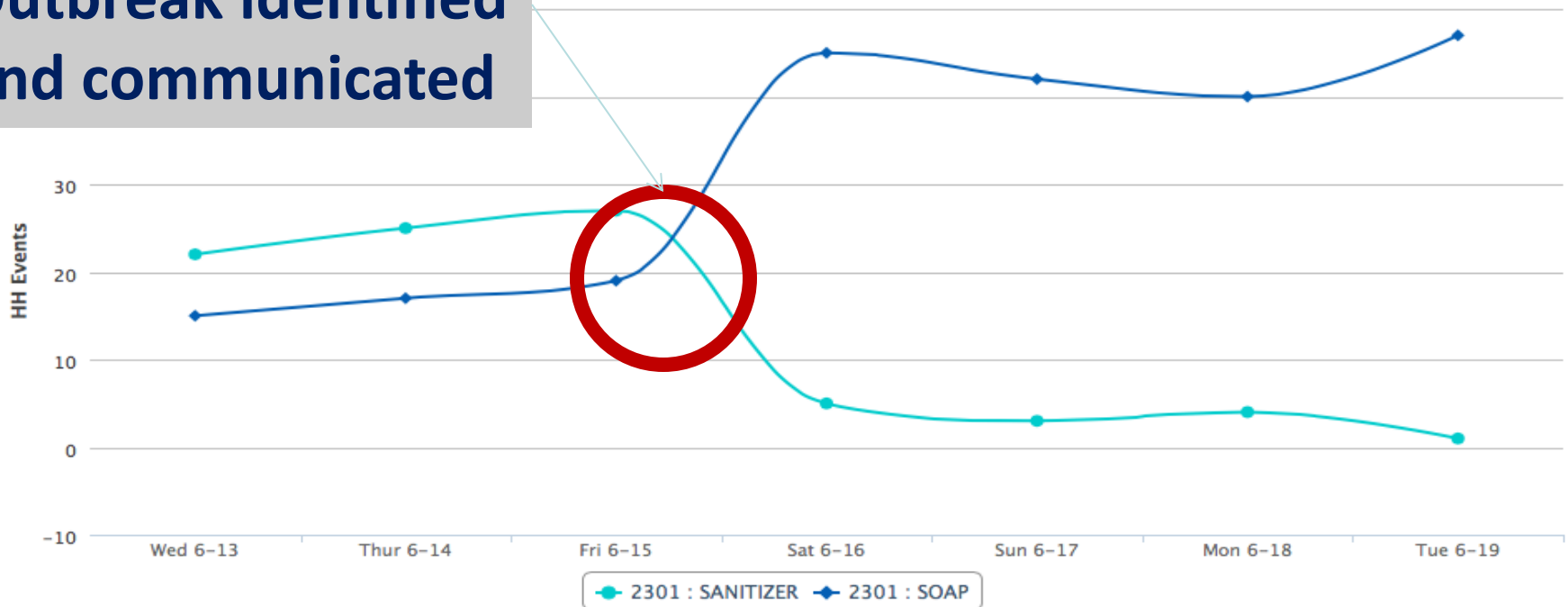
START DATE: 2012/06/13

END DATE: 2012/06/19

CLASON MEMORIAL HOSPITAL

Outbreak identified and communicated

Soap vs Sanitizer CDIFF Example



Innovative Use of Electronic Hand Hygiene Monitoring to Control a *Clostridium difficile* cluster on a Hematopoietic Stem Cell Transplant Unit

Natasha Robinson BSN RN, Sue Boeker BSN RN CIC, Connie Steed MSN RN CIC, William Kelly, MD
Greenville Health System, Greenville SC



Introduction

Issue: Hematopoietic Stem Cell Transplant (HSCT) patients are at a greater risk of acquiring *Clostridium difficile* infections (CDI) due to immunosuppression, bioterapy, and chemotherapy treatments. An increase CDI rate on a 32 bed unit in July 2013 prompted the Infection Prevention (IP) team to investigate. The HSCT unit experienced 6 CDIs (infection rate=7.03/10,000 patient days) during July 2013 an increase from months prior where the average CDI ranged from 0-1 infections per month.

Project: A component of CDI surveillance evaluated electronic hand hygiene dispenser events and whether an antimicrobial soap or alcohol based hand sanitizer was used. Alcohol sanitizer dispensers were labeled "do not use" in rooms with patients on enteric precautions. Other control measures included monitoring frontline staff compliance with enteric precautions, hand hygiene and equipment disinfection with real time feedback, formal education and ongoing communication of the unit's CDI experience and CHG bathing.

Results: Electronic hand hygiene dispenser activation data revealed staff used alcohol sanitizer 60% of the time and soap and water 40% of the time for CDI patients on enteric precautions. Soap versus sanitizer use for patient on enteric precautions is normally 100% for soap and 0% for sanitizer. Lack of appropriate hand hygiene practices may have contributed to transmission of CDI. Direct hand hygiene observation data revealed decreasing hand hygiene compliance from 96.9% in FY2012 to 77.4% in FY2013. Implementation of control measures resulted in increased hand hygiene compliance to 93.9% and the CDI rate decreased to 2.38/10,000 patient days.

Lesson Learned: Utilizing electronic data that identified the hand cleaning product used facilitated identification an opportunity for improvement related to appropriate product utilization. Communication of these data enabled improvement in the use of the correct product and in overall hand hygiene compliance. Innovative uses of electronic hand hygiene monitoring and ongoing staff communication were contributing factors in reducing CDI on the HSCT unit.

Project

- Lab-ID CDI patients were placed on a line list and surveillance was done to determine if infections were hospital acquired or community acquired.
- CDI surveillance looked at Lab-ID culture dates, patient location, and medications (i.e. antibiotics and proton pump inhibitors).
- Electronic hand hygiene monitoring of Lab-ID CDI patients was utilized to compare soap and water versus alcohol based hand sanitizer data.
- Infection Prevention along with volunteer staff conducted direct observations of frontline staff compliance with enteric precautions, hand hygiene, and equipment disinfection with real time feedback.
- Formal education was also provided at the unit's staff retreat with special emphasis on enteric precautions, hand hygiene and cleaning/disinfection of shared medical equipment (i.e. glucometers, pulse oximetry, and Suresigns vital sign machines).



Results

- Electronic hand hygiene dispenser activation data revealed staff used alcohol sanitizer 60% of the time and soap and water 40% of the time for CDI patients on enteric precautions.
- Soap versus sanitizer use for patient on enteric precautions is normally 100% for soap and 0% for sanitizer.
- Direct observations made by infection prevention and volunteers showed inconsistency with hand hygiene, PPE, and disinfection of shared patient care equipment.
- Direct hand hygiene observation data revealed decreasing hand hygiene compliance from 96.9% in FY2012 to 77.4% in FY2013.
- Lack of appropriate hand hygiene practices may have contributed to transmission of CDI.
- Implementation of control measures resulted in increased hand hygiene compliance to 93.9% and the CDI rate decreased to 2.38/10,000 patient days.

	FY2012	FY2013	After Implementing CDI Control Measures
Hand Hygiene compliance	96.9%	77.4%	93.9%
LAB-ID CDI	0	6	2
CDI RATE	0	7.03	2.38

Table 1. Hand Hygiene Monitoring vs. CDI Rate

Lessons Learned

- Electronic monitoring of hand hygiene can eliminate the



It's your choice now...

**Until now – you did not have a choice...DO
was the gold standard...**

**But with 5 Moment Group Monitoring
Systems - electronic monitoring will become
an imperative – not an option**

Suggested Reading

White Paper:

Influencing Leadership – Creating Credibility, Gaining their Trust & Getting What You Want *A Strategic Road Map for Infection Prevention Professionals*

By Steed and Alper



Book:

Influencer – The New Science of Leading Change

By Joseph Grenny et al.

<http://www.amazon.com/Influencer-Science-Leading-Change-Edition/dp/0071808868>



Thank you!

Questions?

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