



ELECTRONIC HAND HYGIENE COMPLIANCE MONITORING

“SHOULD WE ADOPT OR NOT?”

Presented by:
Grayson Martin, Founder
HyResults, LLC

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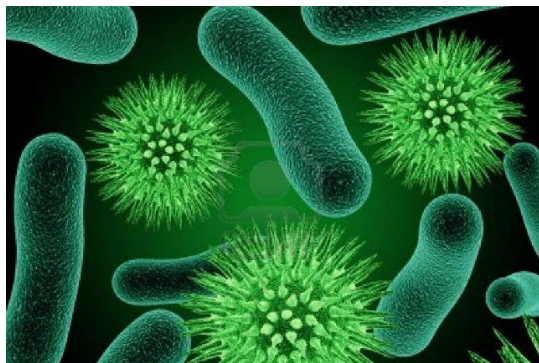
Grayson Martin is the founder of the consulting firm HyResults. She has a 15 year history of leading breakthrough innovation teams primarily in the bioscience sector. She has worked both with entrepreneurial start up companies as well as global \$Billion Corporations to launch new products and technologies into the market.

Grayson became involved with electronic hand hygiene monitoring technologies in 2008 when she led the development and launch of one of the new emerging EHHCM technologies.

Over the past 6 years she has been instrumental in understanding the needs of acute care facilities and Infection Preventionists to develop the tools to improve hand hygiene compliance and to monitor the companies involved in this sector.

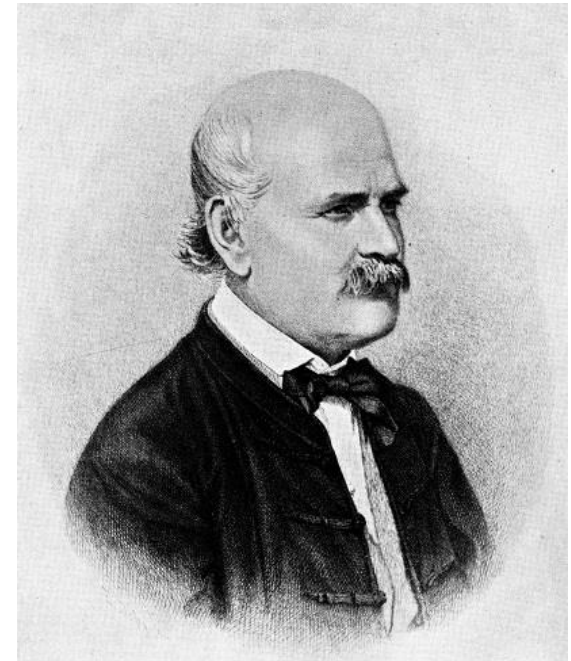
Learning Objectives

1. Describe the economic impact of improved hand hygiene compliance on patient safety, patient outcomes and patient satisfaction.
2. Describe the challenges of existing monitoring methodologies to determine hand hygiene compliance rates.
3. Describe the three categories of companies that are bringing electronic hand hygiene compliance (EHHCM) monitoring to market.
4. Describe the focal points of consideration in assessing HHCM technologies.



A Historical Perspective On Hand Hygiene- “The Savior of Mothers”

- **Dr. Ignaz Semmelweis (1818-1865), Physician, Entrepreneur.**
- **Fatal puerperal fever ranged from 5-30% in the maternity clinic at the Vienna General Hospital.**
- **1847 Introduced hand washing with chlorinated lime solutions for interns which reduced the death rate from puerperal fever to 1-2%.**
- **For almost 40 years his hypothesis which focused on cleanliness was ridiculed, ignored or rejected by the medical community in Austria and Europe.**
- **Current medical theory at the time was that no one element ie. “cleanliness” could provide such a dramatic change in outcomes.**
- **The Tipping Point- Louis Pasteur (1822-1898) developed the Germ Theory of Disease which offered a theoretical explanation for Semmelweis’s findings.**



How Does Hand Hygiene Compliance Impact Health Care Today?

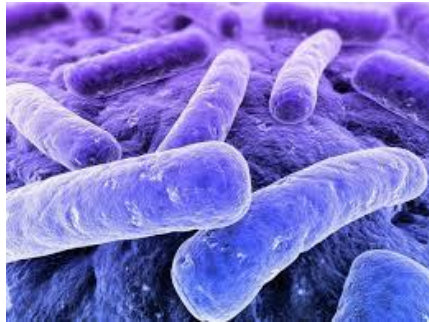
➤ Each year in the United States:

- An estimated one in twenty five patients that enters a hospital will contribute to the 1.7 million Healthcare Acquired Infections (HAI's) per year..

1.7 Million HAI's ¹

- These HAI's cost the healthcare industry between \$36-\$45B per year. This number does not include:

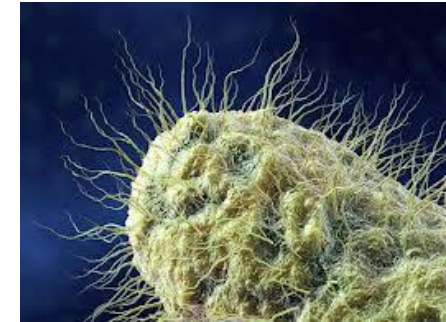
- Legal actions taken against the hospital (50%?).
- Non reimbursement from CMS for low Patient Satisfaction Scores.
- Increases to insurance premiums due to HAI rates.



\$36-\$45B In Expense ²

Direct Costs
Indirect Costs
Intangible Cost

Over 99,000 Deaths ³



Most HAI's (50%+?) Are Due To Inadequate Hand Hygiene ⁴

"Most " Defined As: Greatest In The Amount of Degree"

Regulatory/Influential Groups- Requirements and Recommendations

➤ **HHCM *requirements* are set by:**

- Joint Commission
 - Target Solutions Tool
- Center for Medicare and Medicaid Services (CMS)

➤ **HHCM *recommendations* are set by:**

- Center for Disease Control (CDC)
- World Health Organization (WHO)
 - Save Lives Clean Your Hands campaign
- Public Interest Groups

➤ **Patient Safety Organizations (87 in U.S.)**

- Listed at www.pso.ahrq.gov



Current Methodologies For Measuring Compliance

- The “Gold Standard” of Direct Observation.
- Tracking of Soap/Sanitizer Usage.
- Patient Surveys.



The Challenges Facing the Observation Method

- Observations are too small a statistical sample (<1-3% of all hand hygiene opportunities of HCW's).
- The Hawthorne Effect will influence compliance.
- Decision to alert for a non compliant event.
- Few analytical tools for the data captured.
 - iScrub Lite
 - Apple iPhone/iPod Touch application
 - Record observations which are emailed to a file for analysis
 - Free (Apple iTunes Store)



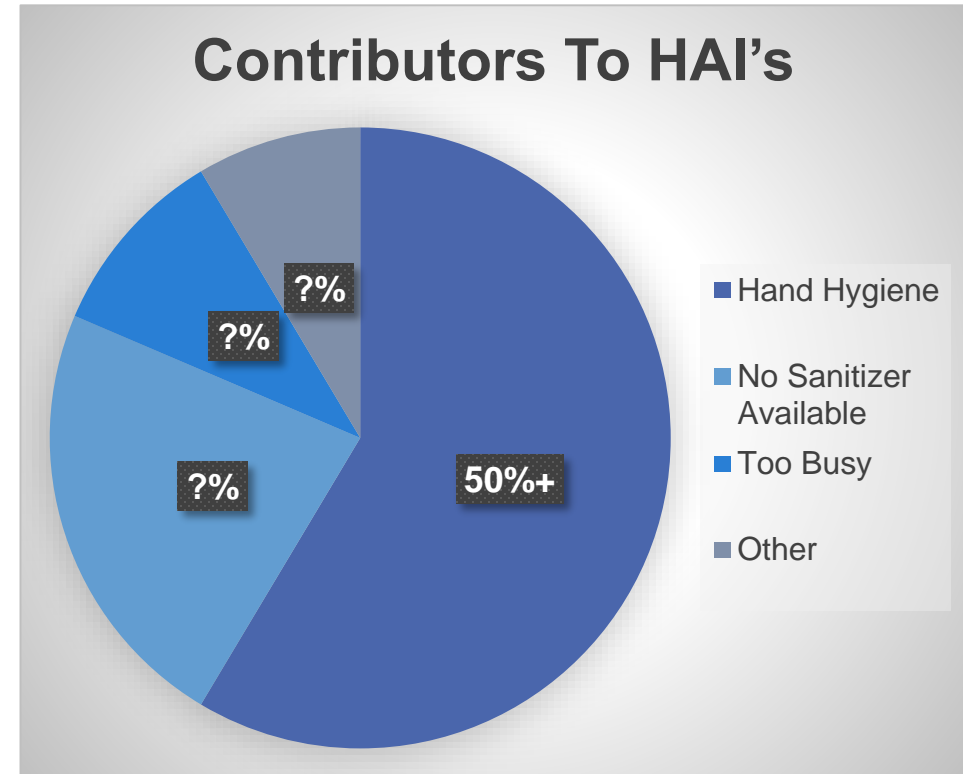
Challenges Of Monitoring Product Consumption

- Does not capture missed opportunities
- No differentiation between HCW's and Visitors
- Does not account for variation in the amount of product used per individual.
- Does not account for spillage.



Let's Do The Math...

- **HAI's Cost the US Health Care Industry On Average \$40B Year**
- **50%+ are associated with non compliant hand hygiene = \$20B Year**
- **5700 Acute Care Facilities In the US = Average of \$3.5M per facility**



Innovation Begins...Technologies Designed To Improve Hand Hygiene Compliance

➤ Three business sectors enter the EHHCM arena in 2008-2015

(32+ companies)

➤ Real Time Locating System (RTLS) Companies

- Core competencies are in tracking assets, patients, and health care workers, and patient flow. (Hill Rom)

➤ Soap/Sanitizer Companies

- Core competency in soap and sanitizer products typically utilizing proprietary dispensers (GoJo)

➤ Electronic Hand Hygiene Compliance Companies

- Core competency in Electronic Hand Hygiene Compliance Monitoring (Proventix)

➤ Additional technologies to augment EHHCM



How Do You Go About Improving Hand Hygiene Compliance- A Multimodal Strategy

The WHO Multimodal Hand Hygiene Improvement Strategy Benchmark:

- **The Strategy Components**
 - System Change
 - Training and Education
 - **Evaluation and Feedback**
 - Monitoring hand hygiene practices while providing performance and results feedback.
 - EHHCM can provide not only real time feedback alerts and summary shift or time frame compliance data.
 - **Reminders In The Workplace**
 - EHHCM Electronic Marquis can post real time compliance data
 - Institutional Safety Climate



What Are The Barriers To EHHMC Adoption?

- The belief that the observation method is accurate and demonstrates >90% compliance.
- There is no return on investment (ROI).
- Lack of evidence based studies.
- No time to drive the process of evaluation.
- Other projects take priority.
- No regulatory requirement to adopt EHHCM.
- Is the “Infection Control Voice” always heard?
- Conservative Corporate Culture- late adopters.
- Defining your “Tipping Point”?



How Do Each Of These Technologies Differ From One Another

- Who are you monitoring?
- What zone do you want to monitor?
- What type of alerts do you want?
- How timely is the data?
- How is the system powered?
- What is involved in the installation process?
- How does the system transmit data?
- Where is the data processed?
- Back end reporting and messaging.
- OSHPD- (California Office of Statewide Planning and Development) Considerations for installation.



Who and What and Where Do You Want To Monitor?

Who:

- General Population Including Visitors
- HCW's as a group only
- Individual HCW's
- Visitors- Individual or Group
- Patients

What:

- 5 WHO Moments
- Assets
- Quality of the Hand Hygiene Event

Where:

- High Risk Areas
- Low Risk Areas



What Zone Do You Want To Monitor?

- Facility
- Unit
- Room
- Bed
- Patient
- Device



What Types Of Alerts Do You Want?

- None
- Audio
- Visual- LED Lights
- Vibration
- Ability To Alerts Off
- Visible To Patients
- Real Time To Management
- Other Functionalities- Assist
- Patient Information



How Timely Is The Data?



- **Real Time**
 - Allows for real time compliance rates to be viewed.

- **Data transmitted when in proximity to the hub.**
 - Data is transmitted wirelessly when badge is within range of the capture device.

- **Data transmitted when device is docked.**
 - Data is transmitted to the network only when the device is docked at the end of shift.

How Is The System Powered?

➤ **Battery**

- Battery operated devices are typically easy to install.
- Software monitors when batteries are low.
- More labor involved in maintaining the devices.

➤ **Power over Ethernet (PoE)**

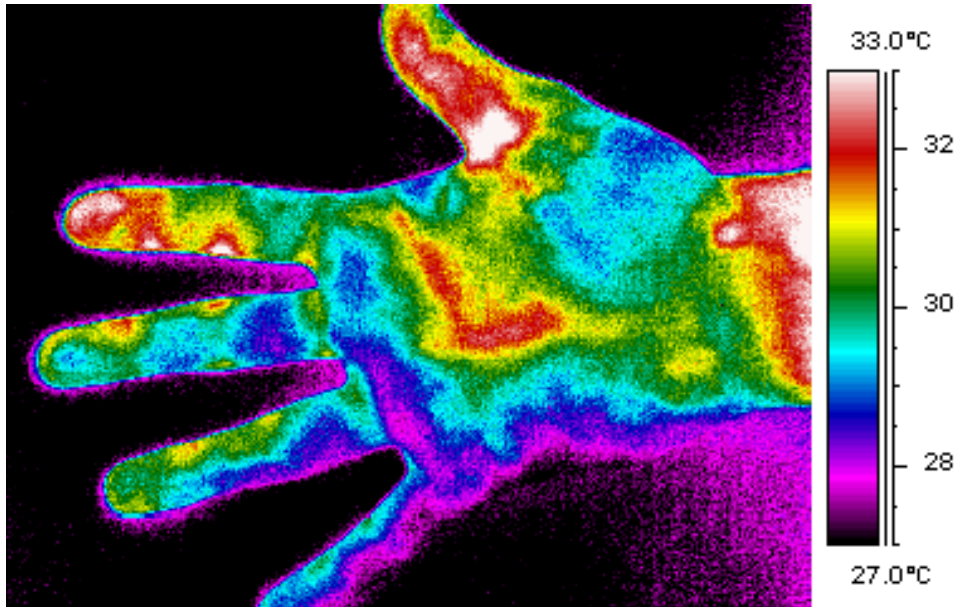
- The device is powered by a PoE cable that also transmits data
- More expensive installation if PoE cables are not available in the correct location.
- Minimal maintenance once installed.

➤ **Electrical Outlets**

- Very easy installation if available.
- Can be expensive if outlets are not available in the correct location.



What Types Of Technologies Are Used?



- **RFID- Radio Frequency Identification**
- **Infrared- Detects heat**
- **Ultrasound- Utilizes sound waves**
- **Vision- Video Observation or Algorithms**
- **Wi-Fi- Wireless Data Transfer**

How Does The System Transmit and Store Data?

➤ **Data Transmission**

- Power Over Ethernet (PoE)
- Wi-Fi
 - Proprietary
 - Existing Hospital System

➤ **Data Storage**

- Hospital Server
- Dedicated Server
- Cloud

- **Collaborate with IT to ensure there is no interference with other systems.**



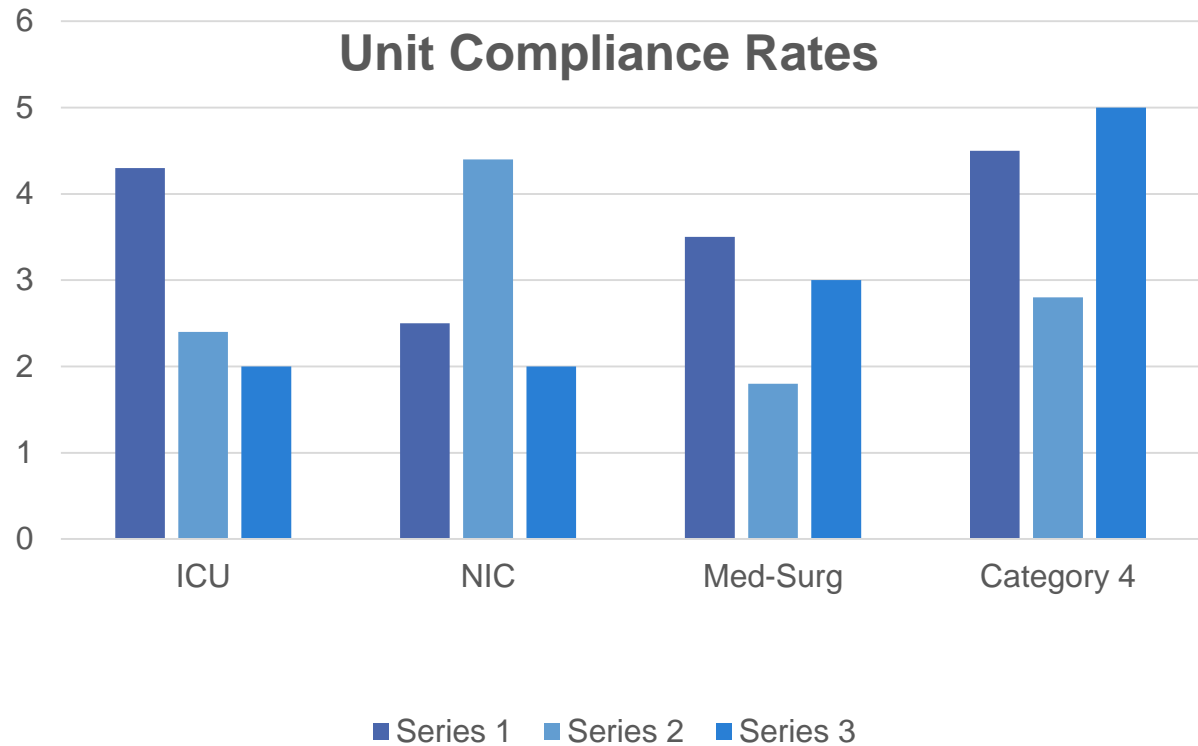
What Is Involved In The Installation Process?



- **Include your facility Design and Construction team.**
- **Is the facility located in California- OSHPD Compliance**
 - Freer Manual
- **How are devices affixed to surfaces?**
- **If power (PoE or electrical outlet) is not available what is the cost and timeframe for installation?**
- **Is the area currently occupied with patients?**
- **What is the equipment installation time per room?**
- **Is there a time necessary for calibration?**
- **What IT interfaces need to be built?**
- **Which individuals do you want to track?**

Reporting And Messaging

- **Standard Reports**
- **Custom Reports**
- **Customized emails to individuals**
 - Congratulate over achievers
 - Encourage/retrain under achievers
- **Visibility to historical trends**
- **Track success of messaging programs**



How Can EHHCM Technologies Drive Change?

- **Accurately capture up to 95% of all hand hygiene opportunities.**
- **Get a baseline on actual compliance with a large statistical sample.**
- **Capture unbiased data to measure against performance metrics.**
- **Provide real time alerts as reminders for hand hygiene compliance.**
- **Reinforce training with compliance data.**
- **Identify individuals that are over achievers and those that need additional training.**
- **Provide infection control tracking for outbreaks.**
- **Helps create and sustain improved hand hygiene compliance to improve patient outcomes.**
- **Modular approach**

How Can The Infection Control Team Drive Change?

➤ **Build A Compelling Plan for Hand Hygiene Improvement Through Technology**

➤ Include measures on:

- Quality
- Cost- Return on Investment Model(s)
- ECHHM can accelerate the improvement process of compliance

➤ **Define the Process**

➤ Outline the steps in evaluating and selecting an EHHCM technology

➤ **Define the Measures of Success**

➤ Metrics that can be clearly measured in an appropriate timeframe.



The Decision Making Process- It Takes A Village

- Infection Control
- Chief Financial Officer
- Chief Operating Officer
- Chief Executive Officer
- VP Quality and Safety
- Chief Medical Officer
- Epidemiology
- IT
- Nursing
- Facilities
- Purchasing
- Design and Construction
- Human Resources (Unions)



Build A Business Case For EHHCM

- **Clearly identify the problem**
 - Possible Solutions
 - Desired Outcome
- **Obtain agreement with key administrators**
 - That they support the project
 - Identify the key personnel and departments affected
 - Identify critical costs and factors included in the analysis
- **Determine the annual costs**
- **Determine what costs can be avoided**
 - Effect of length of stay
 - Reduced readmissions
 - Morbidity and mortality
 - Cost of the infection



Build A Business Case For EHHCM

➤ Highlight the benefits of EHHCM

- Reductions in HAI's can lead to:
 - Cost efficiency
 - Cost reduction
 - Revenue enhancement- Patients are discharged sooner allowing for additional revenue from new patients
 - Balance sheet improvements

➤ Calculate the financial impact

- Up front costs should be subtracted from the cost savings to show total economic impact

➤ Include intangible benefits

- Reduced malpractice suits
- Higher satisfaction scores
- Improved reputation in the community

➤ Make your business case

➤ Continue to collect outcome data and costs



The Financial Case For EHHCM- Sample ROI Model

Hand Hygiene Compliance Monitoring (HHCM) ROI Model 1- All HAI's	Confidential			
Variables	Input Data			
Hospital Name				
ROI Calculator based on reducing HAI's that cost on average \$23,226 each based on Table 7- Range of per patient cost estimates based on 2007 CPI for Inpatient hospital services				
Reported Cases		992012 Reported c.diff		
Cost incurred to Hospital per HAI Event (USD)(1)	\$	23,226		
Percent of Preventable HAIs		50%		
Total Annual Cost of HAIs	\$	2,299,374		
Total Annual Cost of Preventable HAIs	\$	1,149,687		
% of hospital patients that use Medicare/Medicaid		46%estimated		
Expected Number of Patients with Preventable HAI		50		
Total Savings From Reduced HAI (USD) due to HHCM	\$	1,149,687		
Total Medicare/Medicaid savings due to HHCM	\$	528,856.02		
Total # of Staffed Beds		330		
HHCM Module/Room	\$	60		
HHCM Annual Cost	\$	237,600		
Total Annual Savings	\$	291,256		
(1)Table 7: Annual Aggregate direct medical hospital patient costs by site of infection	Author- R. Douglas Scott II, Economist, Division of Healthcare Quality Promotion National Center for Preparedness, Detection, and Control of Infectious Diseases, Coordinating Center for Infectious Diseases, Centers for Disease contro and Prevention, March 2009			
Range of per patient cost estimates based on 2007 CPI for Inpatient hospital servcies. \$20,549 - \$25,903 Average \$23,221	Range of total cost using CPI for Inpatient hospital services (Billions) \$35.7 - \$45.0			

Testing An EHHCM Technology(s)

- Many companies will agree to a “Try and Buy” Model
- Select a unit 15-20 beds (High Risk?)
- Establish metrics to be measured.
- Establish feedback communications.
- Set the time frame.
- Establish a base line compliance rate.
- “Turn the system on”- Implement messaging.
- “Turn the system off”- Determine if compliance rates decline.
- Update ROI model.



To Adopt Or Not- The Ben Franklin Approach

- Known for his common sense, Ben Franklin developed the balance sheet methodology for making yes/no decisions.
- Based on the arguments for (Yes) and against (No) and the Importance Factor (IF) (HyResults Addition)
- The decisions become obvious.

Yes	IF 1-10	No	IF 1-10
1. HAI Rates	10	1. Currently Installing EMR	8
2.		2.	
3.		3.	
4.		4.	
5.		5.	
Total Score	78	Total Score	40

Thank You!



It's Simple. Washing Hands Saves Lives.

www.hyresults.com

info@hyresults.com

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