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BUILDING BRIDGES BETWEEN INFECTION PREVENTION/EPIDEMIOLOGY, SCIENTIFIC R&D, MANUFACTURING AND REGULATORY/COMPLIANCE

vol. 3 no. 1

Environmental Hygiene: Trends from the Medical Literature

+ Infection Prevention: Sharps Injuries in 2020

+ Journey To Save Lives Through Science-Based Cleaning

By Paul Alper

Electronic Monitoring Systems: A Strategic Approach to Next-Generation System Selection

In 2009, the Joint Commission published its *Monograph on Hand Hygiene Adherence (Measuring Hand Hygiene Adherence: Overcoming the Challenges)* which recommended that measurement of hand hygiene behavior and staff feedback was essential to reduce the risk of healthcare-associated infections (HAIs). However, at the time as stated by the publication, the only ways available to measure hand hygiene were "observation, product measurement and surveys."

We know now that these are very poor approaches when it comes to accurate and reliable measurement. Visual observation is biased and typically overstates compliance by up to 300 percent (Srigley, et al. 2014, among other studies); product measurement lacks an accurate denominator (how much product should have been used? It's impossible to know with any accuracy) and surveys are just biased opinions.

We have come a long way since then. At the time of the publication of the monograph, electronic monitoring systems were just coming into being and hitting the market. The systems were based on a variety of technologies and none were ideal:

- RFID (radio frequency identification devices) integrated with RTLS infrastructure (real time locating system) can have a significant up front expense and are subject to signal attenuation and thus inaccurate capture of hand hygiene events
- Alcohol-detection based systems work okay for sanitizer but what about hand hygiene events accomplished with soap and water? Further, they typically require physically holding one's hands close the badge which is a potential human factors/workflow concern
- Group only systems – we know now that individual healthcare worker data & feedback is essential to driving sustainable behavior change
- A variety of other individual monitoring systems that only provided in and out data vs. The WHO 5 Moments standard

But as we enter 2021, the next generation of e-monitoring is emerging – systems that are based on near-field magnetic induction (NFMI). While most of us have never heard of NFMI (I didn't until a few months ago), many of us use it in our everyday life, as it's the same technology that enables keyless starting of one's car. Many of today's "key" fobs use NFMI to detect whether you are inside or outside of the car and this centimeter level proximity sensitivity enables keyless starting of your car as long as you are in a certain zone.

As an inventor of one of the early-generation monitoring systems with four issued patents, I was thoroughly impressed when I "got under the hood" of this new generation of systems and learned how capable they were of accurate and reliable measurement of either standard of compliance – both "in and out" or the WHO 5 Moments for hand hygiene. A real advance in systems design and thinking. When you factor in the economics and the fact that NFMI can cost anywhere from 50 percent to 80 percent less than RFID/RTLS, alcohol detection and group only systems, you have a real game-changer.

Here are the five things you need to know about NFMI:

1. NFMI has centimeter vs. meter* level accuracy of RFID technology – enables proximity to bed/patient zone monitoring accuracy (supports the WHO 5 Moments standard).
2. NFMI signals pass through the human body where RFID signals are absorbed by the body potentially resulting in understated compliance rates – enables data accuracy in which front line staff will have confidence.
3. NFMI is ultra-low power enabling devices with multi-year battery life – routine battery replacement is not needed.
4. NFMI allows for the use of AI software integration – that makes the system "smart" in determining accurate compliance in the nuanced world of hand hygiene in a healthcare setting. Also helps eliminate the risk of "data denial" by staff
5. NFMI is low-cost technology with light infrastructure requirements – results in the most affordable, scalable and highest ROI hand hygiene monitoring technology available globally.

*Accuracy limit of most RFID systems

Essential Criteria/Considerations for an E Monitoring System: A Checklist for 2021

When evaluating electronic systems for measuring hand hygiene compliance in your organization, here is a check list of essential criteria and considerations:

❶ **Technology Platform:** The emerging state of the art technology is NFMI. But when considering other technology platforms, they should meet the criteria 2-9 that you deem essential for your facility. Of course, there are always trade-offs to be considered when it comes to must have features and your budget. So every facility has to decide for itself what works best within its safety culture and financial situation to find the best blend of clinical features for their individual budget.

❷ **Performance Standard:** The system should be capable of measuring both standards of hand hygiene performance – either the WHO 5 Moments or "In and Out"

❸ **Reporting Level:** Should be able to provide both group and individual level reporting

❹ **Communications Network Facility Support Requirements:** The system should be a totally stand-alone infrastructure – requiring no integration with hospital Wi-Fi, IT network etc.

❺ **Point of Care Reminders:** The system should have the ability to remind/intervene at the point of care and "rescue" potential missed opportunities.

❻ **Contact Tracing:** The system should be capable of contact tracing reporting.

❼ **C. diff Room Reporting:** The system should provide the ability to see both soap and sanitizer event trending so that real time feedback can be given to staff as to whether they are complying with the typical C. diff protocol - the switch to soap and water hand hygiene from alcohol-based hand sanitizer which does not kill C. diff spores.

❽ **Hand Hygiene Dispenser Requirements:** The system should be soap/sanitizer-brand agnostic and work with any brand of hand hygiene products.

❾ **Economic Model:** You will have to choose from a system with an up-front capital expense and on-going service costs or a subscription fee based agreement. When selecting a subscription fee based model, which can be the most cost effective in the long run, be sure the subscription fee covers all costs including, but not limited to: hardware infrastructure and installation, badges and badge administration, unlimited data access (option for either log-on or auto email push reports), staff training, maintenance and repair, battery refresh/replacement, 24/7 system integrity monitoring and on-going; unlimited access to help desk support.

It is so exciting to see new, disruptive technology offerings emerging. I recently spoke to an industry colleague and friend, Michael Mutterer (vice president of patient care and chief nursing officer at Silver Cross Hospital in New Lenox, Ill.) about what he was doing in terms of monitoring of hand hygiene compliance. Here is what he said: "We are really excited to be an early adopter of an electronic hand hygiene monitoring system based on near field magnetic induction or NFMI. It's the only technology that lets us monitor either the WHO 5 Moments OR in and out standards of care with accuracy that is far greater than RFID or RF based technologies that are quite frankly, now outdated. Lastly, it is the most affordable technology we have seen to date and that made it easy to cost justify to our financial leadership."

The time has come for hospital leaders to adopt what will likely be the best practice approach to optimizing hand hygiene: use e-monitoring technology for measurement and direct observation for coaching, feedback and obstacle elimination.

Hope this helps, and Happy New Year!

Let me know what you think and please send me your specific hand hygiene challenges, frustrations and nagging problems – I'll share ideas that might be of interest in this monthly column paul@next-levelstrategies.com. Connect with me on LinkedIn.

Paul Alper, BA, led the launch of PURELL®, invented the first electronic hand hygiene monitoring system proven to reduce infections while improving behavior and eliminating costs and is now the VP Patient Safety Innovation for Medline Industries, Inc. through an exclusive engagement with his consulting practice, Next Level Strategies, LLC.

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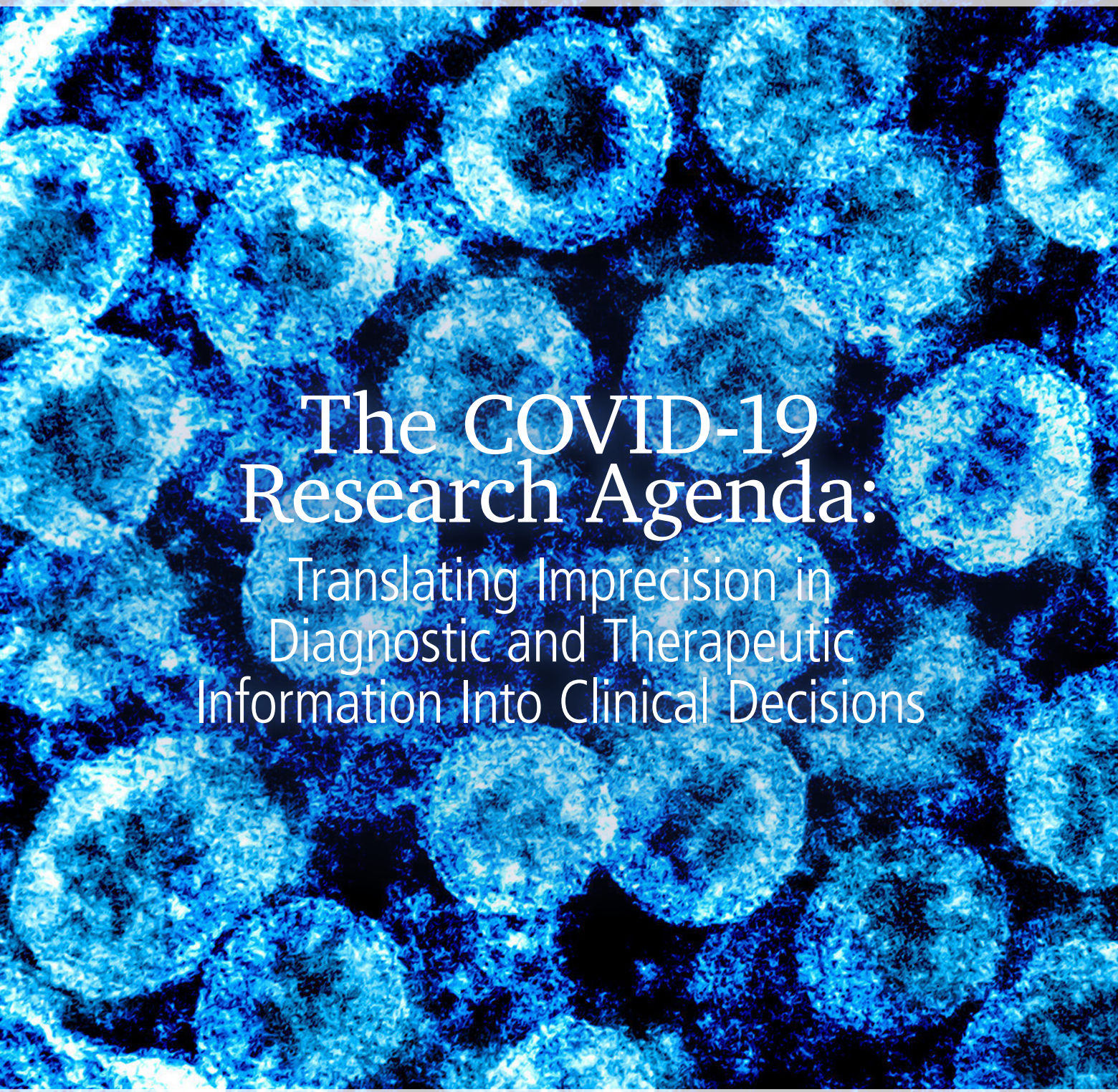

The COVID-19 Research Agenda:

Translating Imprecision in Diagnostic and Therapeutic Information Into Clinical Decisions

+ SARS-Co-V2 and Fomite Contamination and Clinical Risk: Real-World vs. Controlled Environments

+ Why a Tried-and-True Process is the Right Process for Our New Way of Doing Things

hand hygiene

By Paul Alper

Direct Observation vs. Electronic Monitoring: The Essential Evidence and Facts to Consider

Studies have shown that the combination of electronic monitoring for measurement with direct observation for coaching and intervention can lead to significant improvement in hand hygiene compliance.[3]

Many organizations including the Joint Commission, APIC, SHEA and The Leapfrog Group have guidelines and recommendations for hand hygiene compliance in acute care hospitals. Among them, The Leapfrog Group has established a leadership position by developing best practices for optimizing hospital hand hygiene (HH) performance and incorporating them into their evolving Hand Hygiene Standard. This Standard has five domains of performance that hospitals must meet:

- Training and Education
- Infrastructure
- Monitoring
- Feedback
- Culture

This column will address and focus on compliance monitoring, but to be clear, getting hand hygiene right to improve patient safety and drive the best possible outcomes requires meeting the performance and practice criteria for all five domains. While we will only consider in-patient units in acute-care hospitals, similar principles and approaches as described in this column would apply to emergency departments and out-patient units.

Many infection preventionists and C-suite leaders are facing the choice of the two options for measuring compliance —direct observation or a validated electronic compliance monitoring system that can capture both hand hygiene opportunities (HHOs) as well as hand hygiene events (HHEs). Regardless of how they measure compliance, the evidence suggests[1,2] that a hospital use direct observation for coaching and intervention, with the goal of identifying and removing barriers and obstacles to hand hygiene.

But when it comes to accurate, reliable and cost-effective measurement, which makes more sense? Studies have shown that the combination of electronic monitoring for measurement with direct observation for coaching and intervention can lead to significant improvement in hand hygiene compliance.[3]

There are five essential factors to consider.

1 **Direct Observation, The Hawthorne Effect and Data Quality:** It is well established that staff behave differently when being observed leading to overstatement of hand hygiene compliance by up to 300 percent.[4] This significant lack of accuracy and reliability can easily lead to staff and leadership complacency, putting patients at risk of avoidable harm. A validated electronic monitoring system can be capable of capturing virtually all hand hygiene opportunities and events, eliminating the risk of the Hawthorne Effect and generating data truly representative of all facility wide hand hygiene behavior 24/7.

2 **Observer Bias:** For hospitals using direct observation, they need to have a system for initial and recurrent training and validation of hand hygiene compliance observers which is essential to achieve inter-rater reliability. However, observers have been shown to be quite biased[5] and controlling for inter-rater reliability takes time, effort and practice. A validated electronic monitoring system eliminates the risk of bias and also precludes the need for the validation of the direct observers as they will only need to be deployed for coaching and intervention.

3 **Timeliness of Feedback.** Typically, a hospital does not provide feedback from direct observations for up to 30 days. To be truly actionable, feedback should be timelier. There are electronic monitoring systems that enable feedback on hand hygiene compliance rates in less than 24 hours, some with real-time alerts to prevent potentially missed events. Data from an electronic monitoring system combined with appropriate front line staff feedback has been shown to drive higher compliance, reduce infections, eliminate significant costs due to extended length of stay and additional patient care and have a positive impact on safety culture.[6]

4 **Sufficiency of Sample Size:** When direct observation is the only available method for monitoring hand hygiene compliance, many hospitals are setting a target of 200 direct observations or 1.7 percent of total hand hygiene opportunities per unit per month. There is, however, potentially a much larger and richer dataset to mine when one considers the estimated number of hand HHOs based on the HOW2 Study.[7]

This Chart illustrates the point:

TYPE OF UNIT/FACILITY	TARGET DIRECT OBSERVATIONS PER UNIT PER MONTH	ESTIMATED NUMBER OF WHO 5 MOMENT HHOs PER UNIT PER MONTH BASED ON THE HOW2 STUDY FOR IN-PATIENT UNITS
20 bed medical unit in a teaching hospital	200	42,960
10 bed ICU in a teaching hospital	200	53,640
20 bed medical unit in a small community acute care hospital	200	18,180
10 bed ICU in a small community acute care hospital	200	21,270

There are electronic monitoring systems available today that are capable of capturing virtually every HHO as well as HHEs, thus providing much more robust and actionable data. A 15-unit, 250 bed academic hospital would likely have an estimated 8.3 million total in-patient HHOs/year (assuming 100 percent occupancy; 200 medical unit beds and 50 ICU beds) based on the HOW2 Study. This could be a great source of rich insights for front line staff feedback

5 **The Economics of Direct Observation:** The cost of meeting the 200 direct observations per unit per month target for a 250-bed academic medical center with 10 medical units (20 beds each) and 5 ICUs (10 beds each) for in-patient monitoring alone could be over $76,000/year assuming a total cost, with benefits, of $55/hour for trained direct observers. This annual number would be significantly higher for a community hospital. There are electronic monitoring systems on the market with similar or lower costs per year that could provide much more timely, in-depth and actionable data.

When considering these factors and the goal of achieving 200 observations per unit per month, it becomes clear that, while either method can be used, direct observation has significant limitations while automated systems for monitoring hand hygiene compliance should be seriously considered for their robust clinical as well as economic benefits.

An important note, when making any decisions concerning achieving the Leapfrog Hand Hygiene Standard, hospitals should refer to the Leapfrog full-text version for complete information and decision support found here: Leapfrog Group 2020 Hospital Survey.[8]

Disclosure: Medline is a 2021 member of the Leapfrog Partners Advisory Committee and has a collaborative relationship with a company that offers electronic hand hygiene monitoring services.

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Protecting Healthcare Personnel:

Addressing Research Gaps, Strengthening Policies and Practice

+ Pandemic Fuels Many of ECRI's Annual List of Top Healthcare Hazards

+ COVID-19 Decision-Making in the Clinical Arena Relies on Ambiguity Reduction, Smart Use of Data

hand hygiene

By Paul Alper

Calculating the True Cost of 200 Direct Observations Per Unit Per Month in 7 Steps

The purpose of the study was, for the first time, to determine hand hygiene opportunities (HHOs) in 2 types of hospitals – teaching and community within three clinical areas: medical–surgical units, intensive care units and emergency departments.

With the Leapfrog hand hygiene standard requiring 200 direct observations per unit per month for inpatient units; up to 200 observations per month for emergency department units based on the number of visits per month and up to 200 observations per unit per month for areas where the monthly occupancy rate fluctuates[1] (e.g., PACU, outpatient units), many healthcare organizations are trying to calculate real the costs of direct observation as required to meet the standard.

Fortunately, there is an evidence-based calculation for the true cost of those 2,400 visual observations per unit per year based on the HOW2 (Hand Hygiene Opportunities Where and When) Benchmark Study,[2] published in *AJIC* in 2011.

The purpose of the study was, for the first time, to determine hand hygiene opportunities (HHOs) in 2 types of hospitals - teaching and community within three clinical areas: medical-surgical units, intensive care units and emergency departments. The study used trained direct observers, controlled for inter-rater reliability, to calculate the actual number of HHOs per patient day.

This column will focus on calculating the costs for in-patient areas. Because patient census in outpatient areas and emergency departments is so variable, we will use a conservative plus up factor estimate of 15 percent for these areas, but the data is there to do exact calculations based on your organizations actual statistics to gain that level of precision, should you wish to do so.

The study determined the number of HHOs in Adult Medical Units and ICUs (Table 1). Note that the study looked for WHO 5 Moment total HHOs but also broke the data down by moment, so we can calculate that "In and Out" HHOs in and Adult Medical unit equals 48.9 percent of the total.

From here, we just need to know the true, fully loaded cost for the staff doing the observations along with the total number of units and average bed counts for each and we can then calculate the cost per year of meeting the 200 visual observations per unit per month.

The following calculations are based on two real hospitals, a teaching hospital and a community hospital. The bed counts and labor costs were provided by senior nursing leadership. The calculations were done based on the "in and out" standard for measuring hand hygiene, as most hospitals are unable to conduct accurate visual observations for the WHO 5 Moments.

The Teaching Hospital

There are 328 medical unit beds in 19 units with an average of 17.3 beds per medical unit. There are also 54 ICU beds in six units with an average of nine beds per ICU. Their average cost for their nursing staff direct observers is $42 per hour with benefits.

Here is the calculation which you can easily re-create for your organization:

Medical Units

Step 1: Divide the HHOs per patient day of 35 by 24 to get the HHOs per patient hour, in this case = 1.5

Step 2: Multiply that by the average number of beds per medical unit, in this case 17.3, to get the HHOs per unit hour = 25.2.

TABLE 1 - HHOs per Patient Day in Multiple Settings

Hospital Type	WHO 5 Moment HHOs/Patient Day: Adult Medical Unit	WHO 5 Moment HHOs/Patient Day: Adult ICU	"In and Out" HHOs/ Patient Day: Adult Medical Unit	"In and Out" HHOs/ Patient Day: Adult ICU
Teaching Hospital	**71.6**	**178.8**	**35.0**	**87.4**
Community Hospital	**30.3**	**70.9**	**14.8**	**34.7**

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Summary Table		
Cost to Meet the 200 Observations Per Unit per Month Calculator	Teaching Hospital	Community Hospital
# Medical Units	**19**	**10**
# ICUs	**6**	**1**
Hourly Cost with Benefits	**$42**	**$42**
Cost Medical Units/Year	**$94,856.57**	**$153,454.16**
Cost ICUs/Year	**$23,057.60**	**$4,845.67**
Subtotal/Year	**$117,914.17**	**$158,299.83**
Estimated factor for ED, outpatient and other patient care areas + 15%	**$17,687.13**	**$23,744.97**
Grand Total/Year	**$135,601.30**	**$182,044.81**

Knowing the real cost of deploying professional, properly trained staff to meet the standard will help you accurately compare these costs to other options such as e–monitoring to assess which will provide the most robust, accurate, timely and actionable data for your organization.

Step 3: Divide that into 200 (the target direct observations per unit per month) to get the number of hours needed for 200 observations per unit per month = 7.9.

Step 4: Multiply that by 12 to get the total number of hours per year needed to achieve the standard for just the observations alone = 95.1; then multiply this by a + factor you think is reasonable for the administrative time to plug the calculations into a spread sheet, create reports, review and distribute them etc., we will use 25 percent for administrative and non-observational time required = 118.9 hours needed per medical unit per year to achieve the Leapfrog standard.

Step 5: Multiply this number of hours per year by the total number of medical units (19) by the rate per hour ($42) = $94,856.57 per year for the total cost of 200 direct observations per unit per month.

Step 6: Repeat these steps for the ICUs, and you find that the total cost per year to meet the standard = $23,057.60.

Step 7: Total these two amounts and add a plus up factor of 15% for outpatient areas, other patient care areas and EDs and you get a grand total of $135,601.30 per year.

The Community Hospital

Applying the same seven steps using the HHOs for the community hospital you will find that the total cost is $182,044.81 (due to fewer number of opportunities per hour, it takes much more time to capture the requisite number of observations thus the higher cost).

Knowing the real cost of deploying professional, properly trained staff to meet the standard will help you accurately compare these costs to other options such as e-monitoring to assess which will provide the most robust, accurate, timely and actionable data for your organization.

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Let me know what you think and please send me your specific hand hygiene challenges, frustrations and nagging problems – I'll share ideas that might be of interest in this monthly column paul@next-levelstrategies.com. Connect with me on LinkedIn. Also, please write to me for any help in creating your own calculator in Excel.

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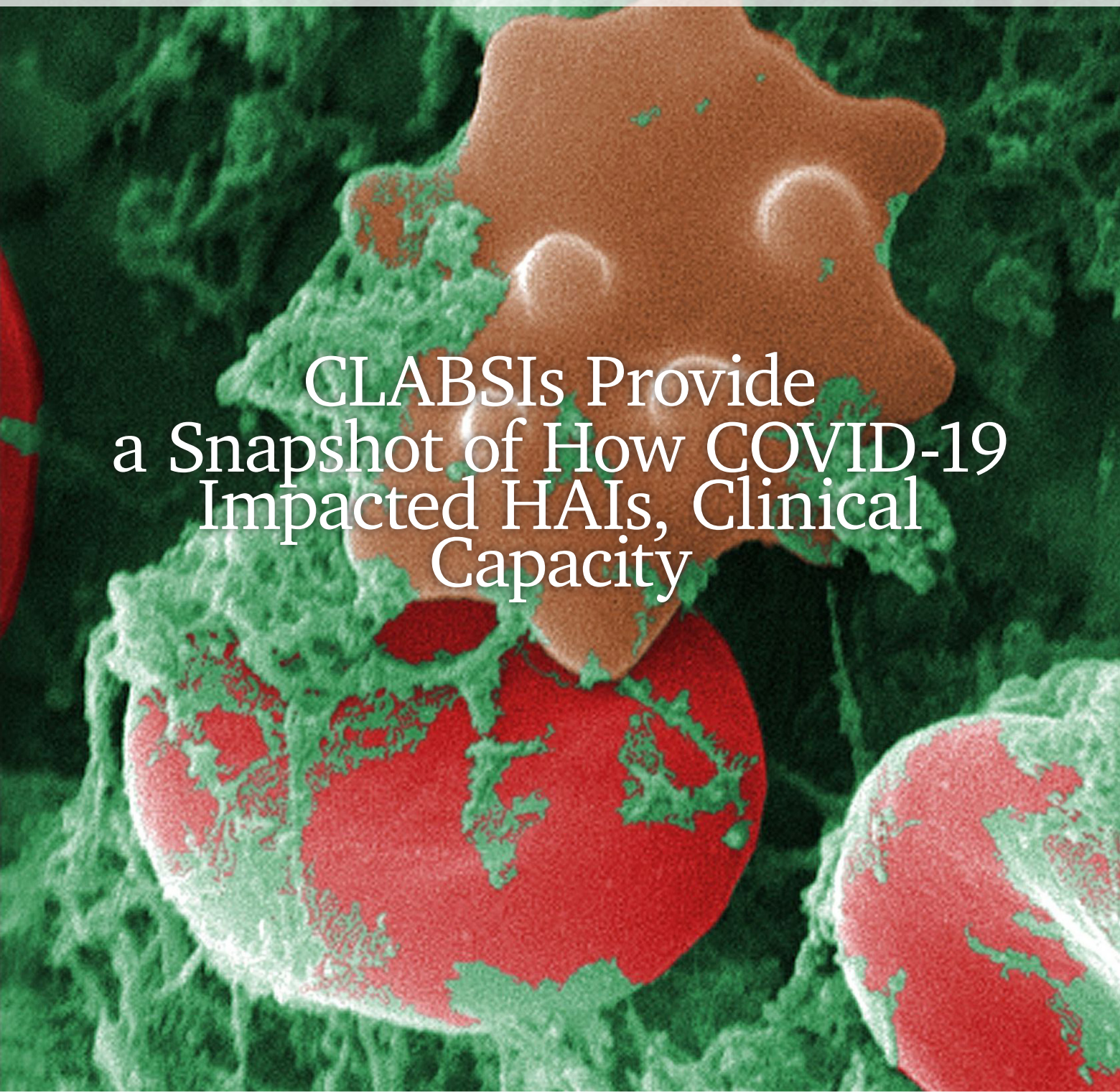

CLABSIs Provide a Snapshot of How COVID-19 Impacted HAIs, Clinical Capacity

+ Origins of Disease: On the Quest to End COVID-19, the Most Critical Question Yet May Be How SARS-CoV-2 Causes Illness

+ Value- and Science-Based Healthcare Evaluation and Purchasing

hand hygiene

By Paul Alper

Making the Business Case for Infection Control Technology

When I lecture infection preventionists on the latest approaches to optimizing hand hygiene performance, I typically open with a question, "Are you responsible for driving hand hygiene compliance improvement?" Usually everyone answers "yes." My follow-up gets the opposite response: "Do you have a discretionary budget and authority to spend it on a vetted technology, product or service you feel will help drive sustainable improvement in compliance?" Usually no one answers to the affirmative. This leads me to conclude that improvements in hand hygiene compliance require very sound arguments to convince leadership to allocate precious organizational resources. Here is a strategic framework to help you make the case for technology adoption and influence organizational leadership to buy in:

A. Be sure you can align your request with organizational priorities, keeping your eye on the best interests of the organization's community-at-large

- Is patient safety, high reliability, getting to zero harm a stated organizational goal? If yes, then align your request with how adoption will support and drive success with these organizational goals.
- How will adoption address obstacles to the ideal future state? Create a vision for achieving the ideal state as the end game that adoption will help realize.

B. Identify all clinical and economic key influencers/decision- making stakeholders and know what is important to them.

- Target each with simple messages that define how their interests will be served.
- Listen to any barriers/obstacles they raise and collaborate to remove or mitigate them to acceptable levels.

C. It's all about the math

- Get the evidence and math right. The following three-step process will help you do that.

1. Know your baseline: what are you doing today and what does it really cost?

Assuming you are doing direct observation (DO), you can calculate the true cost of DO based on the evidence based calculation as published in my March column. Using the 383-bed teaching hospital as an example, the total cost for DO for inpatient units was $117,914 per year.

2. Calculate the cost for the technology. Let's say the one you're looking at costs $300 per bed per year on a subscription basis; that comes out to $114,900 per year (plug in whatever number applies to the technology you are considering; include all costs including any costs for badges, maintenance, repair and battery replacement, if any).
3. Make a sound assumption for what the impact on HAIs will be and calculate the ROI. Let's look at two examples where electronic hand hygiene systems were implemented and had a positive impact on MRSA and C. diff rates, as these are infections known to be easily transmitted by the hands. Kelly, et al .[2] showed a 43 percent reduction in MRSA infections and estimated each avoided infection saved the hospital $18,083. In this instance, the savings amounted to $434,000, or $670 per bed per year. Robinson, et al. [3] showed a 66 percent reduction in the rate of C. diff but did not do any economic impact analysis. Zhang, et al. [4] estimate the incremental cost of a C. diff infection to be $25,000.

Eliminating just one MRSA and one C. diff infection could save more than $43,000 per year. Eliminating two of each would save more than $86,000. Using the data from the Kelly and Robinson studies as conservative baselines, how many MRSA and C. diff infections could you avoid by implementing an electronic hand hygiene compliance system (or any innovative technology for which you wish to make the business case)? Here is an example assuming just two MRSA and one C. diff infections are eliminated (cost avoidance = $61,166 per year):

Calculate the ROI dollars. For this example (set up in EXCEL for ease of use):

a) Technology Cost	Plug in annual cost of your contemplated technology here = $114,900
b) Cost of DO saved	Plug in current total annual cost of Direct Observation here = $117,914
c) HAI costs avoided	Plug in your estimated annual HAI impact savings here = $66,166
ROI (savings per year)= a-b-c	Calculate a-b-c to calculate your ROI (savings per year here) which should be a negative number as it represents savings = ($69,180)

Then, be sure to add in the additional operational benefits, if any, of the technology you are advocating for, such as provides accurate data; enables feedback to frontline staff; capable of real-time reminders at the point of care to prevent possible missed hand hygiene opportunities; supports our high reliability organizational goals; supports an enriched patient safety culture, etc.

No matter what technology or solution you are considering, this method for influencing leadership with a well document ed business case supported by the science, will help you strategically frame your request in a sound, evidence-led manner consistent with a value-driven, high-reliability organization.

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1. Srigley JA, et al. Quantification of the Hawthorne Effect in Hand Hygiene Compliance Monitoring Using an Electronic Monitoring System: a Retrospective Cohort Study. (2014) BMJ Qual Saf. 23, 974-80.

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Hand Hygiene at the Point of Care: Never More Important Than During a Pandemic

+ Needlestick Injuries in the Era of COVID-19: Institutional Controls Can Dictate the Safety Culture

+ Keeping Cost, Quality and Outcomes at the Heart of Healthcare Environmental Services Practices

hand hygiene

By Paul Alper

Hand Hygiene Best Practices for Dental Offices in the COVID-19 Pandemic

Over the past year we have provided up-to-date best practices for hand hygiene during the COVID-19 pandemic for acute-cute and long-term care settings. This month we will address an important setting, the professional dental practice, where persistent vigilance is also essential to ensure patients' and dental professionals' safety.

Proper hand hygiene is an effective way to help prevent the spread of infection between patients and dental professionals during both routine procedures and more invasive oral surgeries. The best way to help ensure that your team knows and follows proper hand hygiene practices is to provide effective ongoing education and training.

What does the Centers for Disease Control and Prevention (CDC), American Dental Association (ADA) and Occupational Safety and Health Administration (OSHA) say about Hand Hygiene in the Context of COVID-19 in Dental Offices? Table 1 below explains it all in detail.

Click to View

Table 1: Summary of guidance statements regarding placement of soap and alcohol-based handrub dispensers (ABHR) and personal carry-size ABHR in dental offices

Distilling the guidance down to a holistic hand hygiene approach for any dental practice, here is a practical guide for when to perform hand hygiene within a dental practice. We have included a table identifying each distinct area within a practice and what the optimized hand hygiene solution might look like in terms of product and dispensing system. Each is based on the latest CDC, ADA and OSHA guidance:

All staff should be trained on the WHO 5 moments for hand hygiene as well as how to both properly sanitize hands with an alcohol-based hand sanitizer and wash with soap and water. While the WHO 5 moments for hand hygiene are most commonly cited in the context of the hospital or post-acute setting, they are equally relevant to dental practices.

Dental professionals should perform hand hygiene:

- Before and after treating a patient
- After putting on, touching, or removing Personal Protective Equipment (PPE) or face coverings
- After handling personal devices such as cell phone, tablet, or computer keyboards
- Before and after personal tasks such as before eating and after using the restroom; taking breaks
- After touching surfaces or instruments in treatment areas with bare hands
- Anytime hands are visibly soiled or may have come into contact with blood or body fluids
- Before and after oral surgery procedures
- Before leaving the practice post shift

Table 2: What hand hygiene product and delivery systems should be used and where?

Practice Area	Hand Hygiene Solution (product + dispensing system)
Entryway	• Automatic dispenser on a stand, or wall mounted dispenser* with alcohol-based hand sanitizer (minimum 60% ethyl alcohol)
Check-in desk	• Automatic dispenser on a stand with alcohol-based hand sanitizer OR a table-top pump bottle of alcohol based hand sanitizer on desk/counter
Exam Room	• Wall mounted dispenser* with alcohol-based hand sanitizer outside the room • Wall mounted soap** dispenser* next to sink (if sink is present). • Alcohol based sanitizing wipes in a canister for patient use OPTIONAL
Oral Surgery Room	• Wall mounted automatic dispenser with alcohol-based surgical rub • OR Wall mounted automatic dispenser with chlorhexidine gluconate (CHG)-based surgical hand soap near sink
Restroom	• Wall mounted soap** dispenser(s)* at sink(s) • OR, If wall mounting is not an option, table top soap** in pump bottles should be available. • Wall mounted dispenser* with alcohol-based hand sanitizer near exit door • Also suggest hand towel dispenser near exit door to enable no contact with door upon exit
Additional rooms	• Automatic dispenser with alcohol-based hand sanitizer on a stand, or wall mounted dispenser* with alcohol-based hand sanitizer • OR, If wall mounting is inconvenient, table top pump bottles of alcohol based hand sanitizer should be available • Soap** dispenser(s)* if sink(s) is/are present • Alcohol based sanitizing wipes OPTIONAL
Check-out area	• Automatic dispenser on a stand, or wall mounted dispenser* with alcohol-based hand sanitizer • OR, table-top pump bottles with alcohol-based hand sanitizer on desk/counter if wall mounting is inconvenient and space is too tight for stands
Personal Carry Size to Ensure Compliance.	Consider providing 2-4 ounce size personal carry size bottles of alcohol-based hand sanitizer (or small packets, such as 20 count, of hand sanitizer wipes) to all staff with the training that hand hygiene should take place using wall mounted dispensers when convenient, but when not, to use the personal carry size.

*Automatic or manual as preferred

** Antibacterial or plain as preferred

Plain or Antibacterial Soap? What Percentage of Ethanol?

Except for pre-surgery hand hygiene, it is totally acceptable to use a plain lotion or foaming soap. Alternatively, an antibacterial lotion or foaming soap with benzalkonium chloride (BZK) or similar active may be selected. When selecting hand sanitizers and rubs for non-pre-surgery use, anything over 60 percent ethanol is acceptable although many providers are migrating to products with 70 percent and even 80 percent ethanol for the additional efficacy they can provide.

Here is an at-a-glance look at the Four Tiers of Hand Hygiene and which products are appropriate based on both clinical and economic considerations.

Table 3: Hand Hygiene Product Selection Guide

4 Tiers of Hand Hygiene Products	Clinical and Economic Profile	Sanitizer/Rub Targets	Soap Targets
Tier 1	Best economic option	At least 60% Ethanol Based Hand Sanitizer	Plain Lotion or Foaming Soap
Tier 2	Best blend of economic and clinical performance option	At least 70% Ethanol Based Hand Sanitizer	Antibacterial Lotion or Foaming Soap with BZK or similar active
Tier 3	Best clinical performance option	At least 80% Ethanol Based Hand Sanitizer	Antibacterial Lotion or Foaming Soap with CHG
Tier 4	Pre Surgical Hand Hygiene	At least 80% Ethanol Based Pre-Surgical Hand Rub with Appropriate Clinical Data	CHG Based Surgical Hand Scrub with Appropriate Clinical Data

The best way to help ensure that your team knows and follows proper hand hygiene practices is to provide effective ongoing education and training.

Hand hygiene consistency, diligence and vigilance are every day "musts" for any dental practice and adherence to the above recommendations should provide significantly reduced risk for the spread of infections, especially in today's pandemic environment.

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Paul Alper, BA, led the launch of PURELL®, invented the first electronic hand hygiene monitoring system proven to reduce infections while improving behavior and eliminating costs and is now the VP Patient Safety Innovation for Medline Industries, Inc. through an exclusive engagement with his consulting practice, Next Level Strategies, LLC.