



hand hygiene

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:

- 1 **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.
- 2 **Performance Standard:** The system should be capable of measuring both standards of hand hygiene performance – either the WHO 5 Moments or “In and Out”
- 3 **Reporting Level:** Should be able to provide both group and individual level reporting
- 4 **Communications Network Facility Support Requirements:** The system should be a totally stand-alone infrastructure – requiring no integration with hospital Wi-Fi, IT network etc.
- 5 **Point of Care Reminders:** The system should have the ability to remind/intervene at the point of care and “rescue” potential missed opportunities.
- 6 **Contact Tracing:** The system should be capable of contact tracing reporting.

7 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.

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

9 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.

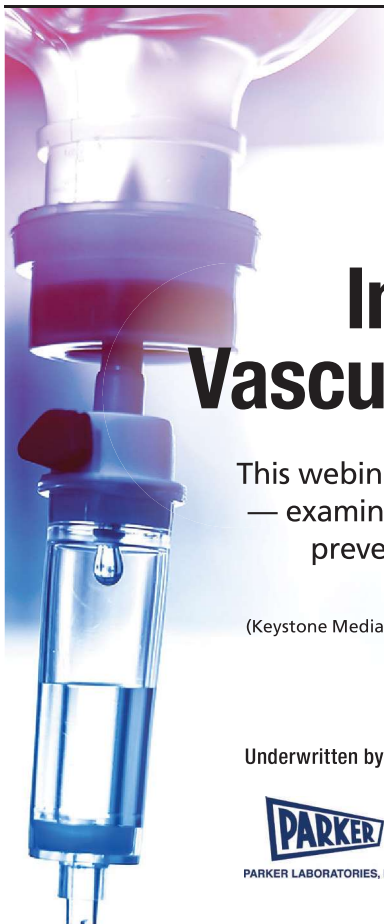
Here is what he said: "We are really excited to be an early adopter of an electronic hand hygiene monitoring system based on near field magnetic induction or NFMI. It's the only technology that lets us monitor either the WHO 5 Moments OR in and out standards of care with accuracy that is far greater 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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