WINTER 2018 • VOLUME 11 NUMBER 4

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A publication of the Association for Professionals in Infection Control and Epidemiology

Can real-time data drive hand hygiene improvements?

BY CHRIS HERMANN, PhD

Hospitals and clinics are increasingly embracing real-time data to improve patient safety, the patient experience, and other aspects of healthcare. Even today, data is still typically collected manually, collated, and then distributed in a report format, usually months later.[1] This makes responding to the data in a timely and meaningful way extremely challenging at best, and impossible most of the time.

Enter the Internet of Things (IoT [the interconnection via the internet of computing devices embedded in everyday objects, enabling them to send and receive data]) and big data. Buzzwords aside, these technological advancements are enabling the capture, analysis, and distribution of data in new and exciting ways, and they've had a particularly positive impact on patient safety.

Some electronic hand hygiene monitoring and reminder systems leverage technological developments. Smart wearables, such as badge reels, identify individual providers to track hand hygiene performance. Sensors on soap and sanitizer dispensers capture dispenses, as well as room entrances and exits. This data is analyzed in the cloud and can be leveraged in a variety of ways.

REAL-TIME FEEDBACK FOR IMMEDIATE ACTION

There is no longer a need to wait a month for the numbers to be crunched and a report generated by hand. Real-time data is, well, real-time. Certainly, it can still be used to go back in time and evaluate what happened in the past, but it's best utilized to view what's happening right now. In some cases, it can be used to predict the future. After all, the role of infection preventionists (IPs) should be to prevent infections and not just to compile after-the-fact spreadsheets.

Today, electronic hand hygiene technologies offer an in-the-moment reminder when a provider forgets to clean his or her hands. This reminder can take the form of a human voice, beep, vibration, or colored lights.

Some interventions go beyond the individual clinician level. And that leads to the future—predictive analytics. For example, if data shows low hand hygiene performance in a particular hospital room a few hours into a shift, an automatic message can be texted to the unit manager. That manager can immediately look into the issue behind the alert and make real-time corrections to improve hand hygiene performance. Some systems even know if a room houses a patient on isolation or with *Clostridium difficile (C. diff)*.[2] In these cases, by alerting a manager in real-time, they can take action to remedy a situation and, ideally, prevent a healthcare-associated infection (HAI) from spreading.

INCREASED STAFF PRODUCTIVITY

This is a new and profoundly more productive use of staff time compared to direct observation. If "secret shoppers" are conducting general observation, capturing everyone's hand hygiene performance while lurking in a hallway, that's not only an inefficient use of personnel; direct observation also systematically overestimates hand hygiene because it captures only a fraction of the entire data set. Observers typically can't

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A nationwide covert observation study using a novel method for hand hygiene compliance in health care. Wu KS, -Shen Chen Y, Lin HS, et al. *Am J Infect Control,* Vol. 45, Issue 3, p240–244.

Point of care hand hygiene—where's the rub? A survey of US and Canadian health care workers' knowledge, attitudes, and practices. Kirk J, Kendall A, Marx JF, et al. *Am J Infect Control,* Vol. 44, Issue 10, p1095–1101.

see inside patient rooms. And direct observation is subject to the Hawthorne Effect, in which clinicians are up to three times as likely to clean their hands when they know they're being watched (and they typically figure out they're being observed pretty quickly).[3]

Technology can capture every hand hygiene opportunity automatically, with no bias and without the Hawthorne Effect. Using automation to conduct routine tasks is nothing new: It is done in just about every industry around the world. But it is a fairly new development in many aspects of healthcare. Hospitals that allow electronic hand hygiene systems to do the heavy lifting of capturing hand hygiene data—and potentially reminding providers to clean their hands when they forget—free up substantial staff time from acting as secret shoppers.[2]

This doesn't mean that a human observer is no longer necessary. It makes sense to use people when nuances in behavior and judgment are needed. When a unit manager gets a real-time alert that hand hygiene is low in a *C. diff* room, for example, she should go observe and discover the root of the problem. It may be that the soap dispenser is broken or empty. Or perhaps the low hand hygiene rates have occurred from one nurse who was not aware that they needed to wash their hands after taking off gloves. Humans can obviously do this type of problem-solving far better than automation.

NEW OPPORTUNITIES

IoT sensors allow healthcare organizations to capture and analyze data that was not previously available. Now we can tell how well an organization is performing—and not just in terms of hand hygiene. By knowing which providers are in and out of which rooms, it is possible to identify which clinicians are the busiest. By measuring their behavior, we can identify and solve workflow issues so that everyone on the unit enjoys improved work efficiency. Often, improved hand hygiene goes hand in hand with this increase in efficiency.

POSITIVE BEHAVIOR CHANGES

Getting even the most well-meaning clinicians to clean their hands more frequently is a challenge. Behavioral change is hard. But real-time data and in-the-moment reminders can successfully change behavior, especially when the approach is positive and supportive rather than negative and punitive.[4] Behavior scientists have demonstrated time and again that the proverbial carrot works better than the stick.

For best results in changing behavior, hospitals should not simply install electronic hand hygiene technology and walk away. It is critical to host staff training as well as a data-driven process to manage expectations and ease everyone into the new approach. Team competitions and individual contests with prizes for the best performance—or most improved—can have a remarkable impact on both results and staff morale. With real-time data, it is possible for clinicians to know where they stand and if they are improving over time.

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Real-time data will drive hand hygiene improvements and, more importantly, decrease HAIs. Enhancing your hospital's digital footprint is an important first step toward improved patient outcomes. PS

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