

REAL-TIME LOCATION SYSTEMS FOR HAND HYGIENE

Written by Sandra Rasmussen, Vice President, Marketing and Commercial Operations, Sonitor Technologies, Inc. | February 13, 2017

Hand washing is one of the simplest ways to combat infection, yet hand hygiene compliance in healthcare settings remains low.

The story about hand washing in health care is short: hand washing is a simple, inexpensive way to prevent infections that have complex, costly implications. Yet healthcare workers (HCWs) clean their hands less than half of the times they should, according to the Centers for Disease Control and Prevention (CDC). Hand washing may be a simple fix, then, but it is nonetheless a difficult one to enforce.

Real-Time Location Systems (RTLS) provide actionable insights that support hand hygiene efforts. These systems track compliance more accurately than direct observation (DO), and have even been used to validate and quantify the "Hawthorne effect"—the change in behavior in response to observation—in hand hygiene initiatives based on DO.¹ These systems can even be configured to assist when hand hygiene efforts fail: combined with a live software platform, RTLS can chart the path of infection through a facility to identify vulnerable patients and HCWs.

Potential Consequences of Poor Hand Hygiene
The potential consequences for poor hand hygiene in health-care settings fall into three categories.

1. Implications for Individual Health:

HAIs are the most common adverse event experienced by patients during medical care: the CDC reports that, on any given day, one in 25 U.S. hospital patients has at least one healthcare-associated infection (HAI).

- Such infections are associated with downstream complications and prolonged hospital stays.²
- They can also result in fatalities. In 2011, over 700,000 hospital patients acquired infections during the course of care; 75,000 of those patients died during their hospitalizations.³
- Poor hand hygiene is a factor in the increasing number of *C. difficile* infections in the U.S.⁴ Hand washing is also instrumental to reducing methicillin-resistant *Staphylococcus aureus* (MRSA), which can lead to bloodstream infections, pneumonia, and sepsis.⁵

2. Avoidable Costs:

Poor hand hygiene translates into extra costs for the facility in terms of staff time and bed capacity (resources that are often already spread thin). Often, hospitals have to absorb these costs without hope of reimbursement: the Center for

Medicare and Medicaid Services limits the reimbursement available for hospitals to treat certain HAIs. Other initiatives have used penalties to get hospitals to improve patient safety. (One of these, the Hospital-Acquired Condition Reduction Program, cost more than 700 underperforming hospitals 1% of their 2015 payments).⁶

3. Implications for Public and Global Health:

Hand washing is critical to combating the looming public health disaster of antibiotic-resistant bacteria. Infections from these microbes have been described as "difficult, if not impossible, to treat," and they are on the rise.⁷

Ensuring Hand Hygiene: Past Initiatives

Public health organizations, healthcare regulators, and accreditation agencies understand the stakes involved. In 2009, the World Health Organization launched the "SAVE LIVES: Clean Your Hands" annual campaign.⁸ That same year the U.S. Department of Health and Human Services issued an action plan for eliminating health-care associated infections and the Joint Commission published the monograph "Measuring Hand Hygiene Adherence: Overcoming the Challenges."⁹ These organizations have been analyzing and refining these initiatives in the years since.

A New Weapon in the Arsenal

Before hospitals can ensure they are meeting critical hand hygiene guidelines, true rates of compliance must be known. Real-Time Location Systems have been shown to accurately record 100% of hand washing events in a simulated clinical environment, and have since been used to test other ways of evaluating compliance.¹⁰

In one study, RTLS provided an accurate measure of hand hygiene compliance by automatically recording hand washing events through cross-referencing the signals from tags attached to HCWs with others on sanitizer and soap dispenser levers. While other configurations are possible, the basic features of RTLS will likely prove critical to improving hand hygiene. Avoiding the inflated rates of compliance recorded in DO studies, RTLS instead delivers reliable, automated tracking of hand hygiene compliance in healthcare.

The consequences of absent hand washing or poor compliance have been broadcasted to HCWs through massive campaigns and reinforced in specific settings across the U.S. Compliance rates still remain strikingly low, and not because HCWs aren't aware of the dangers and costs, but because they simply do not recognize their own non-compliance. This data must be made plain—and now it can be.

REAL-TIME LOCATION SYSTEMS FOR HAND HYGIENE (CONTINUED)

1 "Quantification of the Hawthorne effect in hand hygiene compliance monitoring using an electronic monitoring system: a retrospective cohort study." *BMJ Qual Saf*. doi:10.1136/bmjqs-2014-003080.

2 <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.676.5983&rep=rep1&type=pdf>.

3 <https://www.cdc.gov/hai/surveillance/>

4 <http://www.mayoclinic.org/diseases-conditions/c-difficile/home/ovc-20202264>

5 <https://www.cdc.gov/mrsa/healthcare/index.html>

6 <http://www.modernhealthcare.com/article/20141218/NEWS/312189995>

7 <https://www.cdc.gov/handhygiene/>

8 <http://www.who.int/gpsc/5may/en/>

9 https://www.jointcommission.org/assets/1/18/hh_monograph.pdf

10 *BMJ Quality & Safety* qualitysafety.bmj.com *BMJ Qual Saf* doi:10.1136/bmjqs-2014-003080.