BACKGROUNDER

Automated Hand Hygiene Solution for the Reduction of Hospital Acquired Infections

Mirador HEALTH

Mirador Health Leverages Technology to Track Hand Hygiene Habits

Hospital Acquired Infections (HAIs) are the 5th leading cause of death in today's US hospital system, even though HAIs are highly preventable with proper hand hygiene. According to the World Health Organization, when good hand hygiene and other infection prevention and control (IPC) measures are followed, 70% of infections can be prevented.[1]

Even though hospitals continuously recommend and monitor hand hygiene protocols, adherence falls short resulting in a lack of reduction in HAIs.[2] It has been anecdotally reported that anywhere between 30% to 50% of healthcare providers in hospital settings do not properly sanitize their hands.

> **With good hand hygiene...70% of infections can be prevented**

Though secret shopper surveillance, anonymous audits, employee surveys and education efforts continue, high HAI rates persist. Health care providers and ancillary staff, for several reasons, are not compliant with better hand-hygiene practices. Why, then, hasn't a higher rate of compliance been reached, particularly in workplaces with abundant technology?

HAIs in the COVID-19 Era

On any given day, 1 in 31 hospital patients has at least one HAI.[3] In addition, The COVID-19 pandemic has contributed to an uptick in HAIs, particularly with ventilator-associated events (VAEs).[4]

> **On any given day, roughly 1 in 31 hospital patients has at least one HAI**

Current statistics estimate HAIs total 1.7 million instances yearly, resulting in 100,000 deaths and $29 billion in hospitals' direct annual medical costs.[5]

Challenges[6]

Low rates of staff and provider compliance with hand-hygiene recommendations point to complex underlying issues. These obstacles to proper hand hygiene include but are not limited to the following:

[1] https://www.who.int/news/item/06-05-2022-who-launches-first-ever-global-report-on-infection-prevention-and-control
[2] https://pubmed.ncbi.nlm.nih.gov/20088678/
[3] https://www.cdc.gov/hai/data/portal/index.html
[4] https://www.cdc.gov/hai/data/portal/covid-impact-hai.html
[5] https://www.cdc.gov/hai/pdfs/hai/scott_costpaper.pdf
[6] https://www.cdc.gov/mmwr/PDF/rr/rr5116.pdf

Observed risk factors for poor adherence

- Physician status ("Omo Syndrome," or the perception that one's hands are cleaner than they are[7])
- Working in an intensive-care unit
- Wearing PPE (gowns/gloves), which may impact self-perception of cleanliness
- Automated sinks may truncate recommended handwashing time or fail to sense users properly
- High number of opportunities for hand hygiene per hour of patient care
- Chafing and or cracking on hand skin from continuous sanitizing, allergic reactions

Self-reported factors for poor adherence

- Frequent handwashing can cause irritated, dry skin
- Inconveniently located sinks or handwashing stations in short supply
- Too busy/insufficient time
- Understaffing/overcrowding
- Patient needs take priority
- Hand hygiene interferes with healthcare worker relationships with patients
- Behavior not modeled by colleagues or superiors
- Skepticism regarding the value of hand hygiene
- Low risk of acquiring infection from patients

Additional perceived barriers to proper hand hygiene

- Lack of active participation in hand-hygiene promotion at individual or institutional level
- Lack of institutional priority for hand hygiene
- Lack of administrative consequence for noncompliance or pro-active reward for compliance

In environments where clinical staff are stressed, understaffed, and often pulled in many directions, there are multiple factors complicating simple adherence.

Informational Campaigns

Clinician-Facing

Center for Disease Control[8]

The CDC's Healthcare Infection Control Practices Advisory Committee (HICPAC) has issued Core Infection Prevention and Control Practices for Safe Care Delivery in All Healthcare Settings.

These practices include guidance for healthcare personnel and instructing hand hygiene (soap and water and/or an alcohol-based hand sanitizer) in various clinical indications.

CDC practices indicate that "an alcohol-based hand rub is preferred over soap and water in most clinical situations due to evidence of better compliance compared to soap and water."

Also included in the practices are guidance for healthcare facilities, which a heavy burden for compliance at the institutional rather than the individual level. This burden, however, must still be

[7] https://pmj.bmj.com/content/77/903/16
[8] https://www.cdc.gov/handhygiene/providers/guideline.html

translated to direct action at the facility, departmental, and individual level to achieve great compliance and reduce HAIs.

World Health Organization[9]
Globally, some findings and recommendations support specific efforts and supplies when it comes to hand hygiene practices.

Patient-Facing[10]
While healthcare professionals carry the heaviest responsibility for the transmission of HAIs, patient safety campaigns aim to reach patients and those closest to them. This guidance underscores that "regular hand cleaning is one of the best ways to remove germs, avoid getting sick, and prevent spreading germs."

Financial Costs of Poor Compliance
The average cost of battling HAIs lies around $15k per event,[11] with annual expenses totaling well into the billions. Beyond the practical cost of treating these situations when they arise, 100,000 deaths are attributed yearly to HAIs.[12]

Adding complexity to the true cost of HAIs is the potential for additional penalties. For instance, the Centers for Medicare & Medicaid Services (CMS) can shave off entire percentage points from its annually contributed revenue[13] for institutions that receive low scores.

The average cost of battling HAIs lies around $15k per event

Lost revenue, poor publicity, and patient death are all potential outcomes, but for institutions that prioritize a comprehensive hand hygiene practice these are largely preventable results.

As evidenced by the campaigns above, combined with many others at local and institutional levels, clinician *awareness* is often not the hurdle to overcome. Instead, compliance, particularly in a setting with staffing shortages, is key to cutting down on HAI transmission.

Technology & Hand Sanitization Compliance
The CDC has indicated that convenience and reduced skin irritation may factor into a higher adoption rate of alcohol-based hand sanitizers than soap-and-water washing stations. In addition, speed and reliably consistent efficacy may also contribute.

While hand hygiene surveillance poses many barriers in healthcare settings, tracking these behaviors has become increasingly feasible with technological advancements.[14] There lies an opportunity between stronger adoption of hand-sanitizer-dispensing stations and an increased ability to track individual healthcare workers' behaviors when interfacing with these technologies. As a result, clinicians can provide higher-quality, safer care to patients that is more hygienic and thus benefits the bottom line.

[9] https://www.who.int/publications/i/item/9789241597906
[10] https://www.cdc.gov/HAI/patientSafety/patient-safety.html
[11] https://www.cdc.gov/hai/pdfs/hai/scott_costpaper.pdf
[12] Mirador Solutions Overview sales sheet
[13] https://www.hfmmagazine.com/articles/2132-hand-hygiene-goes-high-tech
[14] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8663600/#ref11

"Automated systems can increase hand hygiene compliance because they make a tedious chore quicker and more fun, as well as thorough and more uniform than a manual 'splash-and-dash' approach commonly used by rushed healthcare workers," states a 2009 article from *Infection Control Today*.[15] When combined with tracking for individual employees, such systems can help hospitals, skilled nursing environments, and surgery centers to improve compliance and accountability.

The Mirador Technology Solution

Automated hand sanitizing dispensers are not a new solution to the above compliance issues. But tracking use in healthcare environments can be challenging. Considerations must include whether dispensers are used at each opportunity, when and where oversights occur, and whether dispensation to specific workers can be followed, as opposed to just the frequency of device usage.

Mirador Health offers a solution with real impact and easy implementation. Logistical intelligence and Bluetooth technology are built into each Mirador Guardian™ dispenser, with BLE caregiver ID badges scanned at each use to monitor, track, and report real-time hand sanitization events.

Mirador technology combines the ease of hand-sanitizing stations with the technology to gather rich data about their use, ensuring life-saving compliance. A user-friendly dashboard collects real-time data on hand hygiene workflow behaviors, calculates compliance and missed opportunities, and strategically pinpoints where corrective action is required at an individual, team, department, or healthcare system level. Information can be made anonymous, and equipment monitoring is also reported.

Whether stronger efforts must be made at the institutional level, or individual behavior needs correction, Mirador makes tracking and compliance easy. The Mirador sanitizing solution is alcohol-based solution that is soft on hands, absorbs quickly, and meets all regulatory requirements. Having listened to what obstacles prevent consistent hygiene compliance, Mirador's solution addresses clinician feedback and oversight challenges.

Moving Forward

Research shows that the more consistently healthcare workers receive feedback about their hand hygiene practices, the more likely they are to improve their habits.[16] By providing user-friendly stations and customizable data, technology addresses hand hygiene behaviors and yields healthier outcomes. Providing actionable data, reducing HAIs, and increasing returns: technology can help the industry to achieve these goals.

[15] https://www.infectioncontroltoday.com/view/technology-aids-hai-prevention
[16] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8663600/#ref11