



How to Choose an Automated Hand Hygiene Awareness System

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Every patient interaction starts with a hand hygiene opportunity (HHO).

Every HHO is a chance to visibly demonstrate commitment to safety and quality.

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Executive Summary

The causal relationship between hand hygiene behavior and health-care-acquired infections (HAIs) has been well established over decades of study. Furthermore, every patient interaction starts with a hand hygiene opportunity (HHO) that represents a chance to demonstrate a commitment to safety and quality of care that the patient and family members can immediately see. HHOs also provide an opportunity to reduce the liabilities and costs resulting from HAIs. A mid-size hospital has more than 10,000 HHOs every day.

For these reasons, the prevailing standard of care already requires that hospitals actively monitor and promote hand hygiene compliance (HHC) among healthcare workers. Nevertheless, most hospitals rely on outdated and inefficient methods for monitoring and controlling this important process, with actual compliance levels estimated at anywhere between 30% and 60%¹, despite internally generated numbers that suggest higher compliance rates for accreditation purposes. Effectively measuring and controlling a process of this magnitude and importance requires the assistance of technology.

Today, healthcare providers have access to new tools and technologies to assist them with hand hygiene monitoring and awareness. As these HHC systems become established in healthcare settings, they will establish a new standard of care. The best solution for any hospital will depend on a number of factors, perhaps most importantly the hospital's management culture and goals regarding patient safety and quality of care.

This white paper provides a brief discussion of the core system functions and other considerations that factor into selecting a technology-enabled HHC system to achieve your goals. In subsequent articles, other topics such as the technology aspects of different HHC systems, the cultural and management challenges of adopting a system, and the results that can be achieved with HHC systems will be addressed.

Core System Functions

Four *Core System Functions* are relevant to a HHC system. The “Four R’s” of a HHC system are the system’s ability to **Record, Report, Remind, and Reassure**.

Record

While all systems gather and store information related to the hand hygiene process, the type, volume, and granularity of recorded information varies greatly from system to system. Better data collection, with more details, generally results in more robust reporting capabilities and better, more actionable insights.

It’s important to consider the varying approaches HHC systems take to recording information:

- **Is the system capable of recording data at the individual level or is it limited to recording aggregate group activity.**

Driving individual accountability requires a system capable of recording data at the individual user level. A system generally identifies a user by a device that travels with the person (e.g., badge, tag, etc.). Any system that supports data recording at the individual level can also support group monitoring by aggregating user data into defined groups. Individual data can also be “blinded” if needed to overcome cultural barriers to adoption. Group monitoring systems are not capable of recording data at the individual level and gather data that reflects aggregate activity attributable to all users. The amount of actionable information is reduced accordingly.

- **Is the system capable of recording discrete HHOs or does it record information that indicates average activity levels.**

Systems that record discrete HHOs generally do so by recording the entry of healthcare workers into a patient care area. This provides a rich data set for analytical purposes.

The alternative is to record information that relates to average activity in an area over a period of time, such as total usage of sanitizer products or bed occupancy. These data may be useful for monitoring trends over time but provide limited insight into individual patient interactions.

Report

All HHC systems provide reporting, but capabilities vary greatly depending on the type of data they record.

Some important considerations regarding the reporting function are:

- **What is the granularity of the data?**

Most infection control professionals are interested in data that supports understanding hand hygiene activity at the unit, room, shift, job classification, or individual level. This information, its availability, and the reduction in workload provided by useful reports is an important feature.

- **Does the system provide automated alerts and reports?**

The alternative to logging onto a system to retrieve data is to automatically receive reports on a scheduled basis. Busy managers often prefer this method of delivery, and the method can also be extended to individual users. Similarly, some reporting systems are capable of detecting specific events or conditions and providing an alert to a system user for actionable follow-up.

- **Does the system support custom reports and analysis?**

Understanding hand hygiene behavior goes beyond tracking basic compliance. The ability of the system (and the service provider) to generate customized reports and support complex behavioral analyses to yield actionable insights is an important feature that provides long-term value. HHC data can often be used for other analytical purposes as well.

Remind

A relatively small subset of HHC systems feature the ability to intervene at the point of care to prompt a hand hygiene event using an audible, visual, and/or tactile reminder. *Research shows that systems incorporating a reminder function are the most effective at driving and sustaining hand hygiene behavior.* Most HHC systems do not provide a reminder function

A reminder function is a good way to help busy healthcare workers maintain safe hand hygiene practice. Some relevant capabilities of a reminder function include:

➤ Workflow integration

No hand hygiene system is capable of knowing a worker's intent when entering a patient care area or what the worker may have touched while in the patient's environment. Deciding when to prompt the user with a reminder is determined by rules and settings for the system. Given the complex workflows that generally characterize acute healthcare, it is important to minimize workflow disruption and alarm fatigue by identifying and accommodating common workflow patterns. The ability to adapt system behavior to local unit-level workflow conditions and policy objectives is an important consideration when implementing a reminder-based HHC system. In some cases, settings can also be tailored for different user groups when appropriate.

➤ Identifying potential cross-contamination situations

No HHC system is capable of knowing that a worker is vectoring a harmful pathogen from one patient area to another. However, some HHC systems are capable of recognizing in real-time that a worker has moved from one patient care area to another without performing hand hygiene and can alert the user accordingly.

➤ Accommodating C.-diff hygiene protocols

All HHCs are not the same; for example, a different hygiene procedure applies in a room containing C. diff.

In some cases, a HHC system can recognize these exceptions and remind healthcare workers that a different protocol is in effect.

Reassure

A reassurance function provides the opportunity to communicate a commitment to patient safety and quality with every patient interaction.

The presence of a HHC system represents a considerable investment in patient safety and quality of care. Since every patient interaction starts with an HHC, selecting a HHC system with a *reassurance* function provides the opportunity to demonstrate this commitment prominently to patients and family members with every interaction, thousands of times per day in an average sized hospital.

All systems that incorporate a reassurance function require the healthcare worker to wear a badge. In order to be effective, the badge needs to be worn consistently and properly, and the badge should provide a prominent, visible indication of HHC to the patient indicating compliance or lack thereof. Patient education and marketing are also important to maximize the benefits of providing this reassurance to the patient.

Other Considerations

In addition to the capability of a HHC system to deliver core system functions, decision makers need to take into account a number of additional considerations when evaluating their options and goals for a HHC system. These include:

➤ Underlying Measurement & Validation Technologies

The methods and technologies a HHC system uses are inherently linked to the capabilities, usability, and integration requirements of the system. These methods and technologies will be reviewed in detail in a subsequent white paper: *Overview of Technologies and Methods for Hand Hygiene Monitoring Systems.*

► **Cultural Adoption & Sustainability**

Hand hygiene affects a broad range of healthcare workers across many functional areas. Adopting and sustaining a hand hygiene system requires effort and commitment on the part of leadership and management. Some of these challenges and best practices are discussed in a subsequent white paper: *Implementing and Sustaining Hand Hygiene Monitoring Systems: Management Challenges and Best Practices*

► **Installation Requirements**

Some systems require invasive installations (generally wiring or retrofitting of fixtures), while some systems are battery operated and need no permanent modifications to the facility for installation. The installation burden impacts both the initial setup cost and the amount of disruption staff and patients experience.

► **Maintenance Obligations**

All HHC systems require some level of ongoing maintenance, and vendors generally provide some level of ongoing maintenance as part of system acquisition. When comparing systems, it is important to understand the expected ongoing maintenance costs as part of the total value proposition

► **Technology/Equipment Obsolescence**

Technology will evolve along with how a hospital may use its HHC system over time. A capital purchase of equipment is generally a long-term commitment to the current state. Some HHC systems are provided as a “service” whereby the hospital does not make a capital equipment purchase, and the vendor manages technology and equipment obsolescence.

► **IT Systems Integration**

All systems require some level of data connectivity to move data to/from the hardware. Systems can differ, however, in the degree to which they need access to, or integration with, hospital IT infrastructure, including networks, servers, and databases.

► **Workflow Integration**

Although behavioral change is a goal of all HHC systems, it is generally not desirable to significantly alter the workflow of healthcare workers. For example, requiring workers to visit a specific location to validate a hand hygiene event can adversely impact adoption and sustainability.

► **Changes to Dispensers or Soap/Sanitizer Products**

Dispenser-based systems will generally require a retrofit or replacement of existing dispensers. In some cases, selection of a system can impact the selection of sanitizing products. Some systems are neutral to the choice of sanitizer product and will integrate with any dispenser technology.

Conclusion

Electronic Hand Hygiene Systems are on their way to becoming the standard of care in healthcare, and a solution is available that will work for every hospital.

It is important to recognize that no HHC system is a panacea that can single-handedly transform hand hygiene behavior and patient safety culture within a hospital.

When coupled with strong management leadership and a sustained culture of accountability, however, an electronic HHC system is a powerful tool to drive high levels of HHC and a visible focus on patient safety.



About The Author

Kevin Wittrup is CEO and managing director of BIOVIGIL Hygiene Technologies, based in Ann Arbor, Michigan.

BIOVIGIL is an entrepreneurial company dedicated to developing and deploying technology-based solutions to improve HHC, reduce HAIs, and improve patient safety.

BIOVIGIL technology uses a small personnel badge with an onboard chemical sensor to register hand hygiene events.

The badge will intervene at the point of care, when applicable, to remind the user to perform a hygiene event and also provide a status indicator in the form of a colored hand to reassure patients. Data is stored on the badge and forwarded to a cloud-based software application at the end of every shift.

BIOVIGIL offers its technology to hospital clients as part of a complete service package that includes installation, setup, customization, and ongoing maintenance.

- ▶ More information at:
<http://biovigilsystems.com>

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