Implementing An Electronic Hand Hygiene Group Monitoring System: Meeting the Challenges
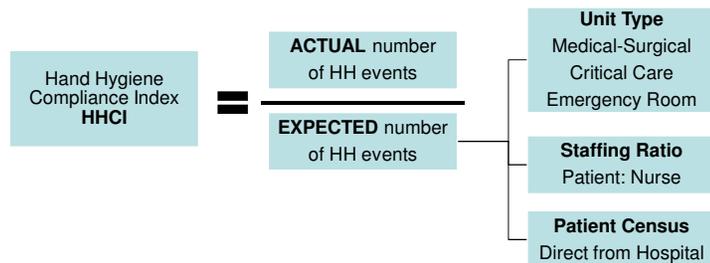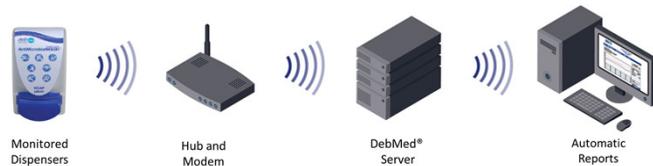
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Issue

- Hand hygiene (HH) compliance may improve when healthcare workers (HCW) receive feedback about their HH rates.[1]
- Infection Preventionists monitor and report HH rates as part of their infection prevention plan. [2]
- HH compliance monitoring is resource-intensive and can yield erroneous results if not carefully done.[3]
- Electronic HH group monitoring systems (GMS) are promising[4]
  - Less affected by biases inherent in self-reporting and direct observation
  - Require fewer person-hours than observation
  - More precise than product usage measurement
- The World Health Organization (WHO) has identified *5 Moments* or opportunities for HH during direct patient care.[5]
- Research has demonstrated a strong correlation of HH opportunities with unit type and staffing ratios.[6]

Project

We implemented a GMS at a 140-bed non-profit acute care community hospital in Massachusetts.

Monitored Dispensers — Hub and Modem — DebMed® Server — Automatic Reports

$$\text{Hand Hygiene Compliance Index HHCI} = \frac{\text{ACTUAL number of HH events}}{\text{EXPECTED number of HH events}}$$

Unit Type
Medical-Surgical
Critical Care
Emergency Room

Staffing Ratio
Patient: Nurse

Patient Census
Direct from Hospital

Results

- Overall, the Hand Hygiene Compliance Index (HHCI) for 5 medical-surgical units, the critical care unit, and the emergency room combined was significantly higher after the GMS feedback compared to before (mean difference = 4.9% compliance, SD = 4.3, paired t = 3.06, p = 0.02).
- We faced several challenges during implementation of the GMS. (See Table 1.)
- The staff, research team and vendor worked collaboratively to find workable solutions to the challenges.

1. Ivers N, Jamtvedt G, Flottorp S, et al. Audit and feedback: effects on professional practice and healthcare outcomes. *Cochrane Database Syst Rev.* 2012;6:CD000259.
2. The Joint Commission. *Measuring Hand Hygiene Adherence: Overcoming the Challenges.* Oakbrook Terrace, IL: The Joint Commission;2009.
3. Boyce JM. Hand hygiene compliance monitoring: current perspectives from the USA. *Journal of Hospital Infection.* Oct 2008;70 Suppl 1:2-7.
4. Boyce JM. Measuring healthcare worker hand hygiene activity: current practices and emerging technologies. *Infect Control Hosp Epidemiol.* Oct 2011;32(10):1016-1028.
5. World Health Organization. WHO Guidelines on Hand Hygiene in Healthcare. 2009.
6. Steed C, Kelly JW, Blackhurst D, et al. Hospital hand hygiene opportunities: where and when (HOW2)? The HOW2 Benchmark Study. *Am J Infect Control.* Feb 2011;39(1):19-26.

Table 1. Challenges in Implementing an Electronic Hand Hygiene Group Monitoring System

Challenges	Examples	Solutions
Determining the number of expected HH events	- There was no benchmark for some types of units (e.g., psychiatry). - The critical care unit housed a mix of intensive care patients and medical-surgical patients. - Initial estimates of nurse staffing were not precise	- For units where the HHCI did not fit the patient population, compliance data were reported as events per patient hour or events per patient visit. - Using an average of actual nursing hours rather than an estimate yielded a more accurate compliance index.
Obtaining accurate census data	- Census data originated in multiple administrative systems. - Patients who were pre-scheduled for admission were counted in the census hours before actually arriving on the unit. - Distinct subunits existed within one geographic unit.	- The vendor worked with the hospital's Information Technology Department to establish and revise direct feeds of census information. - Unit reports were adapted to include or exclude specific dispensers or geographic areas as appropriate.

Engendering confidence in the GMS	- HH rates reported by the GMS were lower than those previously reported based on direct observation.
	- HCW were unfamiliar with the WHO 5 Moments for HH.
	- Information about the GMS was slow to reach some groups of HCW.
		- Managers and staff were trained regarding
		  - How the GMS works
		  - How the expected events denominator was developed and validated
		  - How to read and interpret the reports
		- HCW preferred the automated system, despite initial shock at lower compliance rates.
		- An illustration of the WHO 5 Moments was posted as a screen saver on hospital computers.
		- Night supervisors were enlisted to disseminate and discuss the HH compliance reports with night staff.

Utilizing the data to drive improvement	- Managers had difficulty interpreting the reports. - HH improvement was one of multiple competing institutional priorities.	- The reports were reformatted for clarity. - Generic tips for HH improvement were included in the reports each month.
Trouble-shooting technical glitches	- Some dispensers did not transmit HH event data. - Dispensers could not transmit from some radiation therapy rooms.	- The vendor checked all dispensers and replaced non-functioning transmitters.

Lessons Learned

- A substantial investment of human capital is required to fully adopt a GMS.
- A team of champions is needed to communicate information about the GMS, answer questions, engender confidence in the automated data, optimize use of the data for improvement, and troubleshoot problems.
- Administrative and vendor support is essential to successful implementation of a GMS.
- HCW and managers accustomed to HH being monitored at room entry and exit need to be trained on the WHO 5 Moments.
- Data reported as events per patient visit or per patient hour may be more meaningful to HCW than the HHCI.
- Further research is needed to validate the number of HH opportunities (expected events) in multiple settings with different patient populations.

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