

Novel Technology Enhances Patient Safety through Improved Hand Hygiene Compliance

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Background:

Hand-hygiene compliance is time consuming and difficult to measure. The gold standard method of staff observation returns inflated compliance rates that offer little insight beyond the direct observations and are not easily generalizable. Observations can be affected by observer bias and by changes in behavior based on the knowledge of being observed. Studies¹ of hand hygiene based upon manual observation indicate that average hand hygiene compliance rates for healthcare workers are 38.7%. The link between hand-hygiene and infection has been well established in the literature and is widely accepted as one of the primary and most effective methods to prevent the spread of healthcare acquired infections². Novel technologies that ease the burden of data collection and provide robust real-time data are essential to a comprehensive program to improve hand hygiene compliance.

Methods:

With the aim of improving hand hygiene compliance, Proventix nGage[®] hand hygiene monitoring system was installed in the Neurosurgical Intensive Care Unit (NeICU). A two-phase pilot was done; baseline period from July – September 2012 and intervention period from October – December 2012. During the baseline period, the system was tested, validated, and rates of compliance were recorded. The staff received basic hand hygiene education and information about the system in July. During the intervention phase, leadership increased their involvement, unit level goals were set, and data with individual compliance rates were posted daily. One-on-one education was provided on the expectations for hand hygiene and the specifics of the system. An accountability campaign began including incentives awarded to the “top complier” each week. Data was given to the ancillary departments and directors monthly.

Discussion/Conclusions:

Using the electronic hand-hygiene system enabled real-time data collection allowing education centered around lapses in compliance. The robust data per person, for the entire time worked, allowed staff to be held accountable for individual performance and behavior. Using incentives for high compliance fostered a non-punitive culture. The combination of accountability and incentives had a dramatic impact on the compliance rates. Peer pressure, competition, continuous feedback, collaboration and a non-punitive culture supported by leadership were key to this successful program. The correlation between compliance and infection will be explored.

Results:

Compliance rates during the baseline period averaged 23.31%. After the accountability campaign, NeICU experienced a 117% improvement in hand hygiene compliance with an average compliance rate of 50.55% ($p < .0001$). Due to the significant improvements, the project was extended another 3 months. The compliance rate has increased another 13% to a compliance rate of 56.99% ($p < .0001$). See Figure 1.

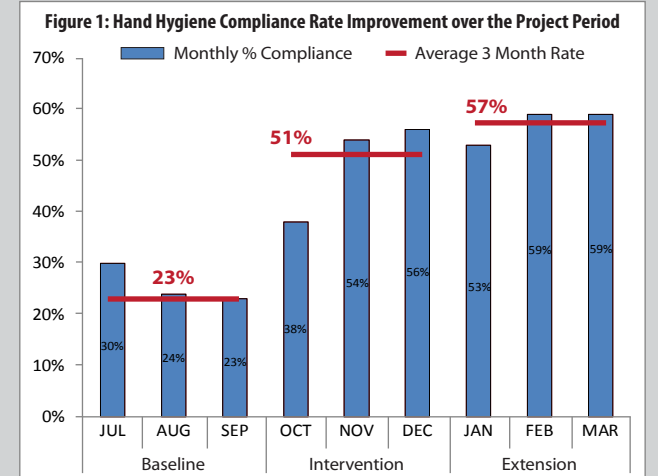
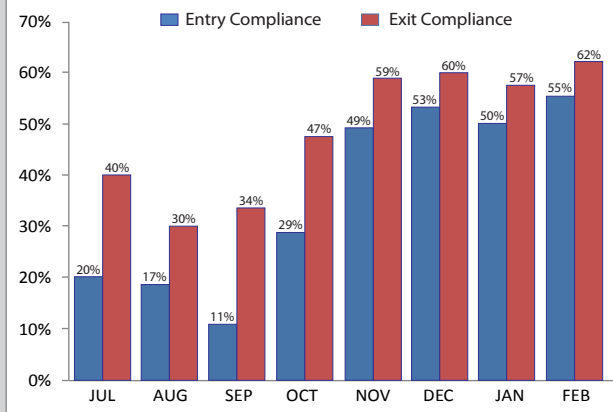
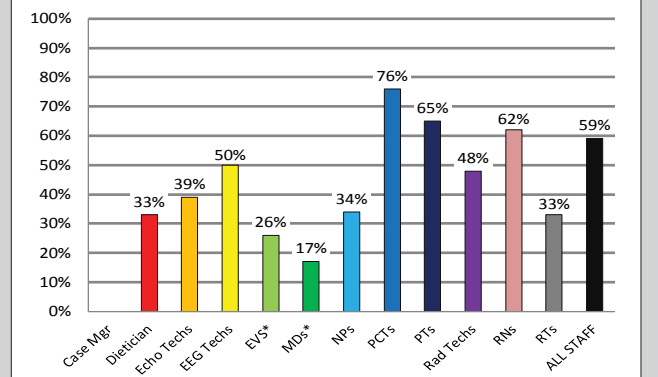


Figure 2: Hand Hygiene Compliance upon Room Entry vs. Room Exit



Using the system, we were also able to measure entry and exit compliance separately. Gold standard methods and the baseline period show that entry compliance is traditionally lower than exit compliance. With the interventions, we were able to decrease that gap so that entry and exit compliance rates are more closely aligned. See Figure 2.

Figure 3: Hand Hygiene Compliance by Provider Type for March 2013



*Environmental Services (EVS) staff have issues with their workflow and how the system records the data. We are working with the system to improve this. It has also been an issue at other sites using the system. MDs have been slow to improve and we are working with a new MD Champion to educate the MDs on how the system works and to improve their numbers.

A paired-samples t-test to compare hand hygiene compliance rates for badged employees who were present from August 2012 through January 2013 was done. There was an aggregate 100.8% hand hygiene compliance increase for these employees ($p < .0001$). The compliance rates for March 2013 per provider type can be seen in Figure 3.