As expected, several challenges were encountered, but as pointed out in the results, "the staff, research team and vendor worked collaboratively to find workable solutions to the challenges." Therefore, it is evident that successful implementation will take collaborative effort, but statistically significant improvement can be achieved when such collaboration is in place.

ROLE OF THE WHO'S MY 5 MOMENTS FOR HAND HYGIENE

Ward et al point out that while the use of the WHO's My 5 Moments for Hand Hygiene standard is widespread among hospitals, most electronic monitoring systems on the market only capture hand hygiene activity related to moments 1 and 4 (before and after touching a patient). However, this only applies to the badge-based systems in which health care workers have to wear badges or sensors integrated with soap and sanitizer dispensers to detect whether or not compliance occurred at moments 1 and 4. Steed et al[9] in the HOW2 Benchmark Study used the WHO's My 5 Moments for Hand Hygiene data collection methodology to estimate hand hygiene opportunities in general medical wards, intensive care units, and emergency departments.

According to the study's conclusion, "these data can be used as denominator estimates to calculate hand hygiene compliance when product utilization data are available." There are group-based electronic hand hygiene monitoring systems on the market today that use this method of predetermining evidence-based denominators and therefore calculate compliance based on the WHO's My 5 Moments for Hand Hygiene standard. This study and these types of systems were not mentioned by Ward et al in their review.

Further, a follow-up validation study used video monitoring to validate the HOW2 Benchmark Study results. In their study, Diller et al[10] demonstrated the accuracy and reliability of the HOW2 benchmarks. Their conclusion states the following: "This study validates the HOW2 Benchmark Study and confirms that expected numbers of HHOs can be estimated from the unit's patient census and patient-to-nurse ratio." These data can be used as denominators in calculations of hand hygiene compliance rates from electronic monitoring using the My 5 Moments for Hand Hygiene methodology. Taken together, the HOW2 Benchmark Study and the video validation study demonstrate the accuracy and predictive values of a group-based monitoring system that uses denominators based on these studies. Additionally, Ward et al point out potential issues with hard-wired systems, but they do not take into account that there are systems on the market that are totally stand alone and do not require either hard wiring or integration with real-time locating systems or hospital Wi-Fi.

CONCLUSION

Contrary to the authors' statements about the ability to calculate compliance rates based on the WHO's My 5 Moments for Hand Hygiene, with the publication of the video validation study it has been demonstrated that accurate, reliable, and validated hand hygiene compliance rates based on the WHO's My 5 Moments for Hand Hygiene can be achieved with commercially available electronic monitoring systems using software that calculates predetermined denominators based on the 2 studies.

Therefore, when all of the most recent research is considered, it is possible to select and implement an electronic hand hygiene compliance monitoring system that uses evidence-based algorithms to provide compliance rates based on the WHO's My 5 Moments for Hand Hygiene. Further, when used in conjunction with proven behavior change models, such systems can help drive sustainable improvement. Clearly more research is needed, and it will likely be undertaken at an accelerating rate.

Regardless of which method a hospital chooses, at the end of the day it will take accurate data plus high engagement on the part of hospital and unit leadership and frontline staff to see improvement in hand hygiene compliance. Similar to a gym membership, there is no quick solution. It only works if you consistently use the tools provided: you will get out what you put in.

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Varicella seroprevalence among health care workers

To the Editor:

We would like to discuss the recent article by Kang et al.[1] Kang et al noted that "the self-reported varicella history did not accurately predict immunity, especially for individuals who have negative or uncertain varicella history"[1] and "serologic screening

before vaccination was more cost-effective than universal vaccination."[1] In fact, self-reported history is a simple technique for case inclusion for vaccination. Based on the previous report by Wiwanitkit, in cases where medical personnel reported "a previous infection history," it is usually reliable.[2] Another alternative method that might be cost-effective is asking for self-reported history and then doing further serologic screening in cases with uncertain history or without previous infection history before vaccination should be studied.

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Impact of catheter-associated urinary tract infection bundle on other health care–associated infections

To the Editor:

We read with great interest the article by Sulis et al[1] about the effect of the ventilator-associated pneumonia (VAP) bundle on the rates of other health care–associated infections in a long-term acute care hospital setting. In the study they showed that after introduction of a VAP bundle, the incidence rates of VAP gradually declined as did the incidence rates of bacteremia, vancomycin-resistant enterococci, and methicillin-resistant *Staphylococcus aureus* colonization or infection rates.[1] It triggered us to investigate the impact of other infection control measures, such as the central line bundle and catheter-associated urinary tract infection (CAUTI) bundle, on different types of health care–associated infections (HCAIs). Our recent study proved that the rate of CAUTI in a neurosurgery (NS) intensive care unit (ICU) can be reduced to zero after implementation of a prevention care bundle.[2] However, we did not evaluate the possible effect of the CAUTI bundle on other HCAIs, including VAP and central line–associated bloodstream infections (CLABSIs). Therefore, we conducted this study to disclose the impact of CAUTI bundles on the rates of HCAI, VAP, and CLABSI.

This study was carried out in an NS ICU at a regional teaching hospital that has 10 adult ICU beds and 1 intensivist. Since August 2013, the CAUTI care bundle was implemented in the entire ICU. The bundle includes several components, including hand hygiene, ensuring that there are indications for urinary catheter insertion, use of an aseptic technique by trained health care providers, maintenance of a sterile closed drainage system, keeping the drainage bag below the level of the bladder, daily review of the indications for urinary catheter, early removal of unnecessary catheters, and avoiding routine changing of catheters or drainage bags.[2] In addition, no other infection control measure was changed during the study period.

CAUTI, VAP, CLABSI, and HCAI were defined according to Centers for Disease Control and Prevention's National Healthcare Safety Network guidelines.[3,4] Outcomes including CAUTI per 1,000 catheter days, VAP per 1,000 ventilator days, CLABSI per 1,000 catheter days, and HCAI per 1,000 inpatient days were measured. To evaluate the impact of bundle care on the rate of CAUTI, VAP, CLABSI, and HCAI over time, we divided the study time into 2 parts, including the preintervention period (January 2012-July 2013) and postintervention period (August 2013-July 2013).

During the 1-year postintervention period, there was a total of 7 episodes of CAUTI, and the catheter utilization rate was 0.85. The rate of CAUTI was 2.23 per 1,000 catheter days. In contrast, the rate of CAUTI during the 18-month preintervention period was 3.2 per 1,000 catheter days. For VAP, the incidence rate declined from 3.69 per 1,000 ventilator days in the preintervention period to 2.90 per 1,000 ventilator days in the postintervention period. For CLABSIs, the incidence rate declined from 2.08 per 1,000 catheter days in the preintervention period to 1.92 per 1,000 catheter days in the postintervention period. For HCAIs, the incidence rate declined from 7.30 per 1,000 inpatient days in the preintervention period to 4.91 per 1,000 inpatient days in the postintervention period.

In this 2.5-year study, we confirmed that CAUTI in the NS ICU can be prevented after implementation of a prevention care bundle in spite of a high catheter utilization ratio as found in our previous study.[2] Furthermore, we also disclosed the positive impact of the CAUTI bundle on the rate of VAP, CLABSI, and HCAI. Because we did not change other infection control measures in addition to the CAUTI bundle during the study period, our findings suggest that the decline of the rate of other HCAIs may be the change of culture and clinical practice after implementation of the CAUTI bundle. After the introduction of the bundle care and continuing education, all of the team member better understand the importance of infection control practice and pay more attention to the prevention of HCAIs.

In conclusion, the impact of the CAUTI bundle may not only limit the rate of CAUTI and may also affect the rate of VAP, CLABSI, and HCAI in the ICU.

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