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Seasonal Variation in Bare-Below-the-Elbow Compliance

To the Editor—The increasing risk of pathogen transmission within the hospital setting continues to be a challenge for hospital infection prevention programs striving to reduce hospital-acquired infections. While healthcare providers' hands and medical devices are widely accepted sources of pathogen transmission, recent studies indicate that healthcare attire could potentially contribute to transmission as well.[1] In the United Kingdom, the practice of bare below the elbows (BBE) has been adopted to decrease the potential risk of cross transmission between healthcare attire and patients.[2] Furthermore, experts from the Society for Healthcare Epidemiology of America suggest BBE in the inpatient setting as an infection prevention adjunct based on biological plausibility.[3]

At Virginia Commonwealth University Health System (VCUHS), BBE is recommended in the inpatient setting to facilitate hand hygiene and to limit cross transmission of pathogens via contaminated apparel. BBE requires all healthcare providers to wear short sleeves and to avoid wristwatches, bracelets, neckties, or white coats at the bedside. Although BBE has been an infection prevention recommendation since January 2009 at VCUHS, compliance assessment began in May 2014. We explored the correlation between BBE compliance and average monthly climate temperature.

This study was performed at an 865-bed, urban, academic medical center with 8 intensive care units and 25 non–intensive care units. In May 2014, trained hand-hygiene observers began measuring BBE compliance among healthcare providers. Healthcare providers were considered compliant with BBE if they wore short sleeves or rolled up their sleeves and avoided wearing wristwatches, bracelets, neckties, and white coats during patient encounters in the inpatient setting. Compliance was recorded as presence or absence of BBE at the bedside, but specific reasons for noncompliance were not documented. We compared monthly BBE compliance to the average local monthly climate temperatures from May 2014 through September 2015. Temperatures were obtained from an online weather source (www.accuweather.com). The relationship between BBE compliance and local climate temperatures was assessed using a correlation analysis software (SAS version 9.4, SAS Institute, Cary, NC).

Over the 16-month study period, 46,832 patient encounters were observed in the inpatient setting. The overall compliance

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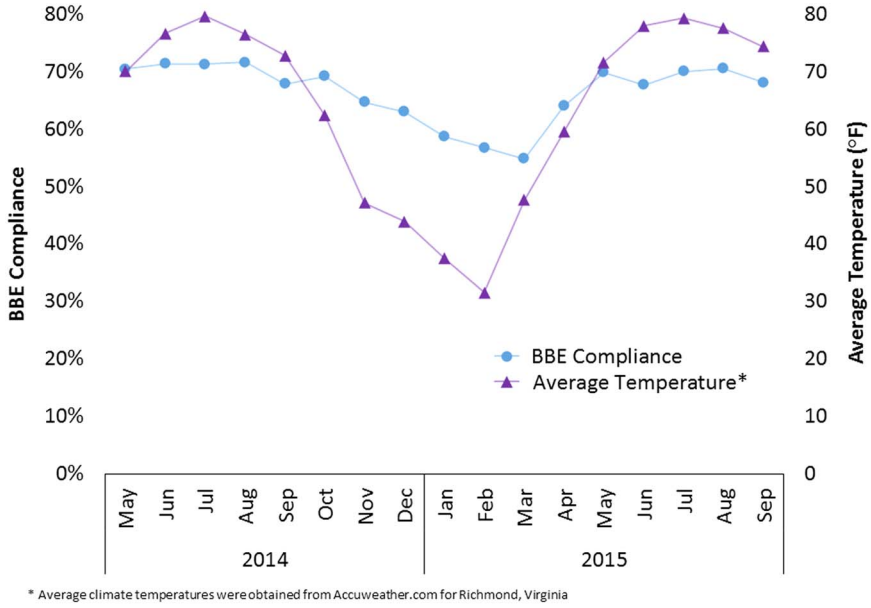

FIGURE 1. Bare Below the Elbow Compliance and Average Climate Temperature

for BBE was 68% (monthly range, 55%–72%). BBE compliance varied by provider type. Nurses had an average BBE compliance of 70%, and physicians averaged 49% BBE compliance. Figure 1 depicts BBE compliance and monthly average climate temperatures. Monthly climate temperature and BBE compliance were highly correlated ($r = 0.89$), with compliance decreasing as seasonal temperature decreased. Inpatient ambient temperatures are maintained between 21.1°C and 23.9°C (70–75°F) year-round at VCUHS.

A strong correlation between BBE compliance and monthly climate temperature suggests that BBE compliance decreases during colder months when healthcare workers tend to wear long sleeves. To our knowledge, this is the first report documenting variation in BBE practice based on seasonality. Barriers to BBE adoption were studied by Pellerin et al.[4] Although the majority of survey respondents in this study felt that white coats probably played a role in pathogen cross transmission and that the absence of a white coat had little impact on professionalism and self-esteem, the ongoing use of white coats by providers was driven by the need for pockets for storage.[4] In our institution, white coats for physicians and surgeons have since been supplanted by lined, black, logoed nylon vests that can be easily wiped down. In addition, the vests fit snugly so that they do not contact the patient when performing an exam, and they provide warmth.

Hospitals advocating BBE as an infection prevention adjunct should be mindful of potential seasonal variation in compliance and should encourage all healthcare workers to practice BBE year-round. Adequate storage areas for removable outerwear is an important facilitator for maximal BBE adherence. In addition, availability of compliant garments, such as vests, will further sustain adoption of BBE practice. Staff reminders may facilitate ongoing compliance despite seasonal transitions. Finally, indoor ambient temperature must be optimized and maintained at a comfortable range to promote BBE practice during all seasons.

We add to the body of literature on the implementation of BBE as an infection prevention adjunct and report seasonal variation in BBE adoption. All BBE compliance assessments were completed by trained members of the institution's hand-hygiene monitoring program. The limitations of this study include the lack of detail regarding reasons for observed BBE noncompliance; this could have been due to the presence of long sleeves, bracelets, or watches below the elbow. However, the only component of BBE expected to change with temperature was sleeve length. Compliance with BBE by gender was not collected, thereby limiting the ability to discern attire differences between males and females in response to changing seasonal temperatures. In addition, the study was performed at a single healthcare system and the results may not be generalizable; specifically, compliance may differ by climate and geography.

Bare below the elbows is a simple, low-cost intervention to decrease the risk of bacterial transmission in inpatient units. Adoptability of BBE varies based on seasonal variation. Healthcare worker comfort should be considered in policies recommending BBE, optimal alternate attire options to ensure comfort must be provided, and indoor ambient temperatures must be optimized to promote this practice.

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Catheter-Associated Urinary Tract Infection: Utility of the ICD-10 Metric as a Surrogate for the National Healthcare Safety Network (NHSN) Surveillance Metric

To the Editor—Catheter-associated urinary tract infections (CAUTIs) are the most common healthcare-associated infection (HAI), accounting for one-third of infections acquired in hospitals in the United States.[1] The National Healthcare Safety Network (NHSN) methodology for detecting CAUTI employs active surveillance with standardized definitions applied by infection preventionists and is currently considered the gold standard for surveillance.[2] However, NHSN surveillance typically requires utilizing trained infection preventionists to perform surveillance that is relatively labor intensive. Several studies evaluating the surveillance CAUTI using administrative codes from ICD-9-CM (*International Classification of Diseases, 9th Revision, Clinical Modification,* code 996.64) revealed that the ICD-9 code performed poorly. [3–7] ICD-10-CM was implemented on October 1, 2015,[8] and to date, no study has evaluated it for the detection of CAUTI.

The purpose of this study was to compare CAUTI data abstracted via ICD-10-CM to NHSN surveillance data to determine the utility of the ICD-10 code as a surrogate for the NHSN CAUTI metric.

All patients medical records with the ICD-10-CM code related to CAUTI (T83.51XA, infection and inflammatory reaction due to indwelling urinary catheter, initial encounter) were retrieved via the Vizient (formerly University Healthcare Consortium) database at the University of Iowa Hospitals and Clinics for the period October 1, 2015, through September 30, 2016. Data from NHSN surveillance were identified for the same period. Cases detected by either method were compared. Using NHSN as the gold standard, the sensitivity and positive predictive value of the ICD-10-CM code metric were calculated.

CAUTI was considered present on admission (POA) if the NHSN urinary infection criterion occurred during the following period: the day of admission to an inpatient location (calendar day 1), the 2 days before admission, or the calendar day after admission (calendar day 2). CAUTI was considered an HAI if the NHSN site-specific infection criterion occurred on or after calendar day 3 of admission to an inpatient location (where the day of admission was calendar day 1).[9] Infection events identified by ICD-10-CM were subsequently characterized as HAIs by applying the NHSN date criteria to more directly compare the 2 metrics.

We identified 46 CAUTI cases via active surveillance using the NHSN criteria. For the same period, there were 58 cases of CAUTI according to the ICD-10-CM metric. Of these 58 ICD-10-CM–coded cases, only 1 case (1.7%) was detected via NHSN criteria; all discordant cases were reviewed to confirm that they did not meet NHSN criteria. The sensitivity of the ICD-10-CM code metric to identify CAUTI was 1.7% (95% CI, 0.3%–9.1%) and the positive predictive value was 2.2% (95% CI, 0.4%–11.3%). When the POA cases were eliminated using the NHSN criteria, 41 cases of ICD-10 CAUTI remained. This adjustment led to a sensitivity of 2.4% (95% CI, 0.4%–12.6%) and positive predictive value of 2.2% (95% CI, 0.4%–11.3%) (Table 1).

We further analyzed the CAUTI ICD-10-CM cases to determine why they did not meet NHSN criteria. Among these

TABLE 1. ICD-10-CM Diagnosis Codes and NHSN CAUTI Criteria Analysis Results After Removal of ICD-10 Present on Admission Cases[a]

		ICD-10		
	CAUTI Cases	Positive	Negative	Total
NHSN	Positive	1	45	46
	Negative	40	Not evaluated	
Total		41	45	

NOTE. ICD-10-CM, *International Classification of Diseases, 10th Revision, Clinical Modification*; NHSN, National Health Safety Network; CAUTI, catheter-associated urinary tract infection.
[a]The sensitivity of the ICD-10-CM code metric to identify CAUTI was 2.4% (95% CI, 0.4% to 12.6%).

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