


## Letter to the Editor

# Steps toward zero central-line–associated bloodstream infections (CLABSIs) in a long-term acute-care hospital: Multidisciplinary teamwork, a prevention bundle, education, and audits

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*To the Editor*—Central-line catheters are often required to effectively treat patients at long-term acute-care hospitals (LTACHs), where patients frequently present for long-term antibiotics or chemotherapy treatments. These patients may also require multiple blood draws and administration or monitoring of fluids, and all of these treatments and procedures can require central lines.<sup>1</sup> One of the risks of inserting and maintaining a central line is the development of a bloodstream infection. Central-line–associated bloodstream infections (CLABSIs) are preventable and potentially deadly infections that have significant consequences including increased mortality, prolonged hospitalization, and increased healthcare costs.<sup>2</sup> The purpose of this quality improvement project report is to describe the process we implemented that achieved our goal of zero CLABSI events at our LTACH from June through December 2020.

### Methods

To reduce CLABSI events, an ongoing action plan was created that entailed establishing multidisciplinary teamwork, central-line insertion and maintenance bundle elements, auditing, and caregiver education.

### Multidisciplinary teamwork

The LTACH chief nursing officer, clinical services manager, infection preventionists, champion nurses, nurses, and physicians met to establish a task force and to develop a CLABSI prevention action plan. They met to discuss every CLABSI case to determine prevention techniques and recommendations. Each member of the task force had a different role in preventing CLABSI events and therefore contributed different ideas and methods of implementation.

### Bundle elements

CLABSI prevention bundle elements are steps in central-line insertion and maintenance that are required to achieve best

results. The Association for Professionals in Infection Control and Epidemiology has stated lists that proper bundle compliance for line insertion entails hand hygiene, use of maximal barrier precautions, optimal insertion site, preparing the site with chlorhexidine gluconate (CHG), and placing a sterile, transparent dressing over the insertion site.<sup>3</sup> For line-maintenance elements, this protocol includes daily review of central-line need, CHG bathing, dressing changes every 7 days, and use of a CHG patch or disc under dressings.<sup>3</sup>

### Audits

Monthly audits of central-line insertion compliance and maintenance bundle element compliance are conducted by the LTACH leadership and are validated by an infection preventionist. Audits are conducted from chart reviews, direct observations, and nurse interviews for each bundle element and results are recorded in an Excel checklist (Microsoft, Redmond, WA). Baseline audits were observations collected in April 2020; the CLABSI prevention action plan was implemented in May 2020 and follow-up audits were collected in June 2020.

### Caregiver education

Computer-based education for nurses and line inserters on all the bundle elements is first required at orientation for new employees, then annually thereafter. From the baseline audits, we determined that CHG preparation and bathing, maximum barrier use, and hand hygiene needed to be emphasized in caregiver education. We hosted a required skills fair for all nurses that covered these topics. Continuous education is promoted by the CLABSI champion nurses.

### Results

From January through May 2020, our LTACH had 7 CLABSI events. The CLABSI reduction plan was implemented in May, and from June through December 2020 we had zero CLABSI events. Our SIR value in the first quarter of 2020 was 3.75; in the second quarter the SIR was 3.16; and in the third and fourth quarters the SIRs were zero. Our CLABSI rates from January through May 2020 ranged from 1.98 to 4.52, and from June through December this rate remained zero.

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Total compliance for central-line bundle insertion and maintenance elements was 79% at baseline and 97% after implementation of the CLABSI prevention plan. Results from the baseline and post-intervention audits for line insertion elements found compliance regarding indication for line insertion to be 90% (9 of 10 patients) at baseline and 100% (10 of 10 patients) after the intervention. Compliance with optimal insertion site remained at 100% (10 of 10 patients). Compliance with maximum barriers, hand hygiene, and CHG prep were observed for 10 of 10 patients at baseline and for 10 of 10 patients after the intervention. As for line maintenance elements, compliance with daily assessment of need at baseline was 90% (9 of 10 patients) and 95% (61 of 64 patients) after the intervention. Compliance with CHG bathing occurred in 0 of 10 patients at baseline and increased to 59 (92%) of 64 patients after the intervention. Compliance with dressing changes every 7 days was 100% (10 of 10 patients) at baseline and 92% (59 of 64 patients) after the intervention. Lastly, CHG patch or disc use occurred in 8 (80%) 10 patients audited at baseline and 63 (98%) of 64 patients after the intervention.

## Discussion

Our results showed improvements in reducing our CLABSI events in 2020. After 1 month of implementing the CLABSI prevention plan, our CLABSI rates decreased and remain at zero for the rest of the year. In addition, the overall compliance with line insertion and maintenance bundle elements increased an average of 18%. Compliance with line insertion elements improved or was maintained at 100% from baseline. Notably, after the intervention, all insertion elements had 100% compliance. As for line maintenance elements, compliance with daily assessment of line need, CHG patch or disc use, and CHG bathing all improved. An alternative product to CHG was used for bathing before the intervention, so compliance for this element was 0% at baseline. After the CLABSI prevention plan was implemented, compliance was 93%, making it our biggest improvement.

From retrospective chart review of CLABSI events in 2020, all occurred >5 days after insertion. According to The Joint Commission, this finding suggests that lapses in infection prevention in line maintenance occurred rather than lapses in insertion techniques.<sup>4</sup>

We were able to reduce CLABSI events at our LTACH to zero after implementing an ongoing plan comprising multidisciplinary teamwork, central-line insertion and maintenance bundle elements, caregiver education, and audits. More research is needed to determine the direct effect of each part of the CLABSI prevention plan on reducing rates. This experience demonstrates the potential impact of these prevention elements when combined.

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# Ventilated patient headboards in the postanesthesia care unit as an alternative to universal preprocedural severe acute respiratory coronavirus virus 2 (SARS-CoV-2) testing

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*To the Editor*—The Infectious Diseases Society of America (IDSA) recommends preprocedural severe acute respiratory syndrome coronavirus virus 2 (SARS-CoV-2) testing prior to major surgery only to prevent adverse patient outcomes,<sup>1</sup> as long as personal protective equipment (PPE) is readily available for all participating

healthcare workers. In reality, testing is conducted much more broadly. Consequences of such testing include costs and inconvenience incurred by patients and postponement of necessary procedures due to either a positive test (which may represent remote infection) or inability to obtain timely results.

One concern that has made scaling back universal preprocedural testing difficult is the potential for transmission of the virus between patients in the postanesthesia care unit (PACU), which is nearly always an open unit. To address this specific issue while allowing for a reduction in otherwise unnecessary preprocedure testing in patients who were low risk for adverse postprocedure

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