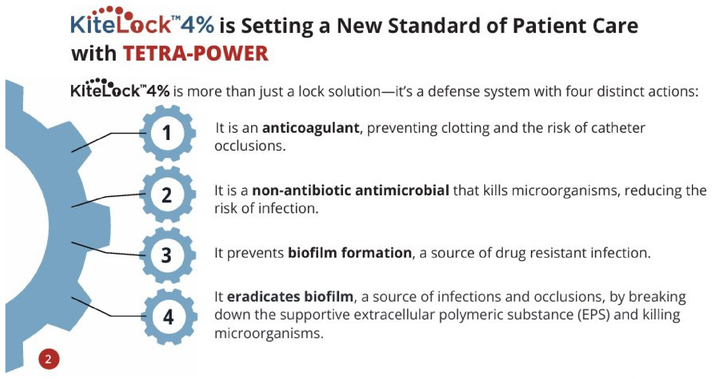
CHEO

Breaking the Chain of Infection: KiteLock® as a Strategy to Reduce Central Line Associated Bloodstream Infections

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Background

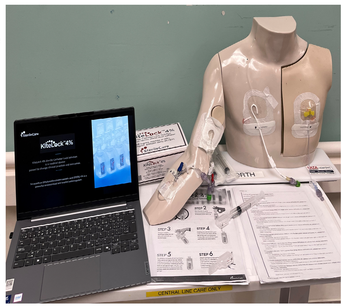
- Central line-associated bloodstream infections (CLABSIs) occur when germs enter the blood stream through a central line, and can be a serious, life-threatening infection impacting inpatients and outpatients.
- The inpatient Hematology/Oncology/Nephrology unit (4North) has historically experienced the highest rate of CLABSI at CHEO, due to the high prevalence of central venous access devices and the immunocompromised status of patients.
- **CLABSI is preventable**. CHEO has established prevention practices used when caring for patients with central lines. Adding more tools to our practices would help meet our yearly goal of a 5% reduction in CLABSI rates, and Solutions for Patient Safety (SPS) goal of a 20% CLABSI rate reduction in 2025-2030.
- In July 2025, we initiated the trial of **KiteLock® 4%** as the locking solution for central lines instead of heparin in high-risk Hematology, Oncology, Dialysis, and selected Medical Day Unit (MDU) patients to supplement existing prevention strategies.



Source: Sterile Care Inc.

Methods

Study Design. A prospective quality improvement trial was conducted to evaluate the use of KiteLock® instead of the standard heparin solution to lock central lines in hematology, oncology, dialysis and high-risk MDU patients.



Participants. All eligible patients with central lines on target units received KiteLock®, with an opt-out participation approach. Patients who received at least one lock with KiteLock® were included in the analysis.

Analysis. Monthly CLABSI rates were continuously tracked. Rates were compared Pre vs Post trial.

Education. On-site, walk-around "huddle-style" education sessions were conducted for nursing staff in all clinical areas providing care to pediatric Hematology, Oncology, and Dialysis patients, including 4N, MDU, Dialysis, OR, PACU, ED, 4W, PICU, and Medical Imaging.
Virtual sessions were held with nurse educators, physicians, and nurse practitioners to raise awareness of the practice change, review indications for use, and support consistent implementation across all units.

Results

During the trial, there were 201 patients who received at least one central line lock with KiteLock® and 135 patients in our program did not use KiteLock during the trial period. The data was stratified and analysed by Inpatient and Outpatient groups as well as Non-Mucosal Barrier (non-MBI) and Mucosal Barrier (MBI) CLABSI groups.

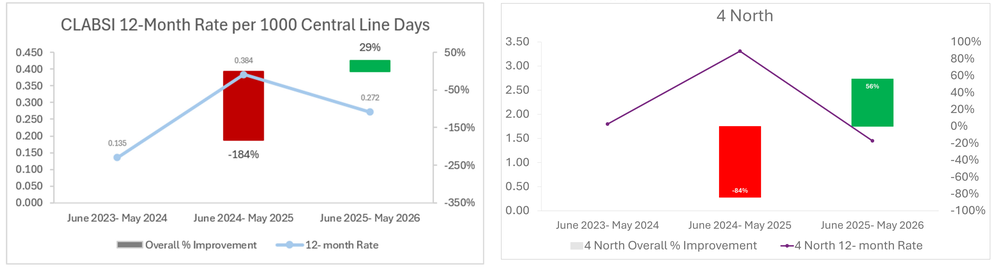


Fig 1. The KiteLock® group accounted for 75% of the central line days in the trial period (June 2025- May 2026). During this period, there was a 29% decrease in the overall 12-month CLABSI rate for the combined inpatient and outpatient population compared to the same period in the previous year. For the inpatient group from **4North**, there was a **56% decrease** in the 12-month CLABSI rate. This was also the lowest CLABSI rate seen since surveillance was initiated and reported in 2017. Includes both KiteLock and Non-KiteLock groups.

Fig 2. Over the trial period, there was a 45% decrease in the MBI CLABSIs 12-month rate. This is important as these types of CLABSIs are difficult to prevent even with strict adherence to all current preventative measures. The **MBI CLABSI sub-group saw a 72% decrease in the 12-month rate** compared to the previous 12-month period. The Outpatient group saw a 4% decrease in it's overall 12-month rate and in the Non-MBI and MBI group.

Patient Safety Impact

Central line complications are costly, resource-intensive, and contribute to patient morbidity and mortality. Antimicrobial lock solutions such as KiteLock® 4% may reduce these burdens compared with heparin through fewer infections, fewer catheter-related complications, and lower total costs (Pliakos et al., 2019; Gattini et al., 2024).

There were 10 fewer CLABSIs during the KiteLock® trial compared to the previous 12-month period.

10 fewer CLABSIs is associated with (Source - SPS Value Calculator):
- **1 life saved**
- **$1,148,637.72 and 190 hospital days saved that would have otherwise been dedicated to intensive CLABSI care**



Data Limitations
- Limited surveillance and tracking of CLABSI attributed to MDU prior to January 2025
- Unknown underlying diagnoses or immune status distribution in each group
- Inconsistent and non-verified KiteLock ® use throughout the trial:
  - 2 patients returned to heparin from KiteLock ® due to temporary burning sensation when KiteLock ® instilled
  - Some patients had their central lines before the trial began, converting from Heparin to KiteLock ® at the start of the trial with unknown length of time with heparin

Discussion

Implementation of KiteLock® was associated with **a reduction in CLABSI rates**, with **10 fewer CLABSIs** observed compared with the previous 12-month period.
- Improvements were particularly notable within the inpatient 4 North population.
- CHEO's Hem/Onc CLABSI rates during the trial also compared favorably with national and SPS benchmarks.

Despite the data limitations, the overall decline in infection rate observed during the trial suggests that **KiteLock® provides both clinical and economic benefits**, particularly given the substantial healthcare costs and patient burden associated with CLABSI events.

Future Direction

The next phase of this initiative will focus on the organization-wide adoption of KiteLock® as the standard of care for all central venous access devices across inpatient units and community care settings at CHEO. Expanding implementation across care environments will support a consistent approach to central line maintenance and infection prevention throughout the patient journey.

Ongoing data collection and continued collaboration with the CHEO Research Institute will help evaluate the long-term impact of KiteLock® on CLABSI rates and further our understanding of factors that contribute to infection risk in outpatient and community settings. Future evaluation will also explore central venous line replacements related to infection, thrombosis, occlusion, and other complications to identify additional opportunities to improve central line outcomes and patient experiences.

As this work advances, we aim to strengthen partnerships with patients and families by sharing project outcomes, lessons learned, and progress related to CLABSI prevention. Engaging patients and caregivers in knowledge sharing will promote transparency, support informed participation in care, and help ensure improvement efforts align with the needs and experiences of those we serve.

Through continued interdisciplinary collaboration, data-driven decision-making, and knowledge dissemination, we aim to further reduce CLABSI risk, improve patient outcomes, and contribute to the growing evidence base for central line infection prevention. Sharing our findings locally and nationally will support the adoption of best practices across CHEO and the broader Canadian pediatric healthcare community.

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- **IPAC Team** – CLABSI surveillance and monitoring
- **Nurse Educator** group for helping with KiteLock ® training in other departments providing care to Hem/Onc/Dialysis patients (ED, OR, Medical Imaging, 4West, and PICU)
- **CHEO Procurement Team and PESC**

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