

# Sustaining Improvements in CLABSI Reduction in a Pediatric Cardiac Intensive Care Unit

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## Background

Central line-associated bloodstream infections (CLABSI) are a major source of hospital-acquired infections and are associated with increased morbidity, mortality, and costs. Studies have demonstrated that implementing bundle strategies reduce CLABSI rates. In pediatrics, the Children's Hospitals' Solutions for Patient Safety (SPS) CLABSI bundle guidelines are followed by over 135 children's hospitals and has also been shown to reduce CLABSI rates across network hospitals.

## Objective

This quality project aimed to reduce the rate of CLABSI in a pediatric cardiothoracic intensive care unit (CTICU) by implementing 4 new interventions to the existing CLABSI bundle.

## Methods

- 1. Sequential Cleaning:** Implemented in April 2019, involves scrubbing the needleless connector/hub with an alcohol scrub device for the defined period (Site Scrub - 10 seconds of a twisting motion, alcohol prep pad - 15 second scrub with a 5 second dry) before *any* connection. The nurse repeats the scrub before each line entry (each connection of a flush, medication, or tubing).
- 2. K-Card Audits:** K-Cards (Figure 1) were implemented in April 2019 to audit CLABSI bundle compliance. A unit-based nurse in a clinical leadership role randomly selected a bedside nurse of a patient with a central line and performed the CLABSI K-Card audit.
- 3. Central Line Utilization and Entry (CLUE) audits:** Bedside nurses tracked central line entries for every patient for a 24-hour period once a month from June 2019-October 2020. Each nurse completed a tracking sheet (Figure 2) to document all line entries for the 12-hour shift and recorded the purpose of the line entry. The results increased awareness regarding the number of line entries per patient per day and guided discussion to reduce line entries and remove unnecessary lines.
- 4. Simulation to Perfection:** Biannually, CTICU nurses undergo simulation training of central line dressing changes, cap changes, and sterile line set up, which is called "simulation to perfection". In September 2019, line access was added to ensure the correct technique and appropriate timing of each needleless connector scrub. The unit nurse educator/clinical leader observes the simulations and provides feedback during and after the performance validation.

### Key Driver Diagram

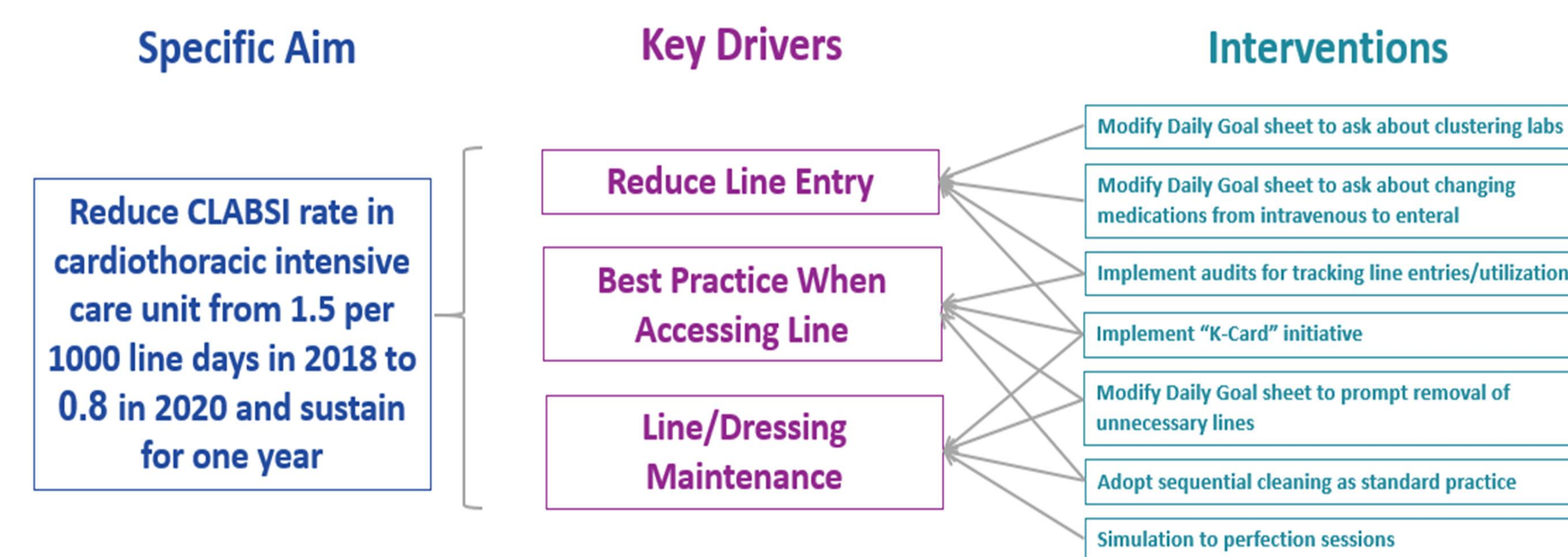


Figure 2

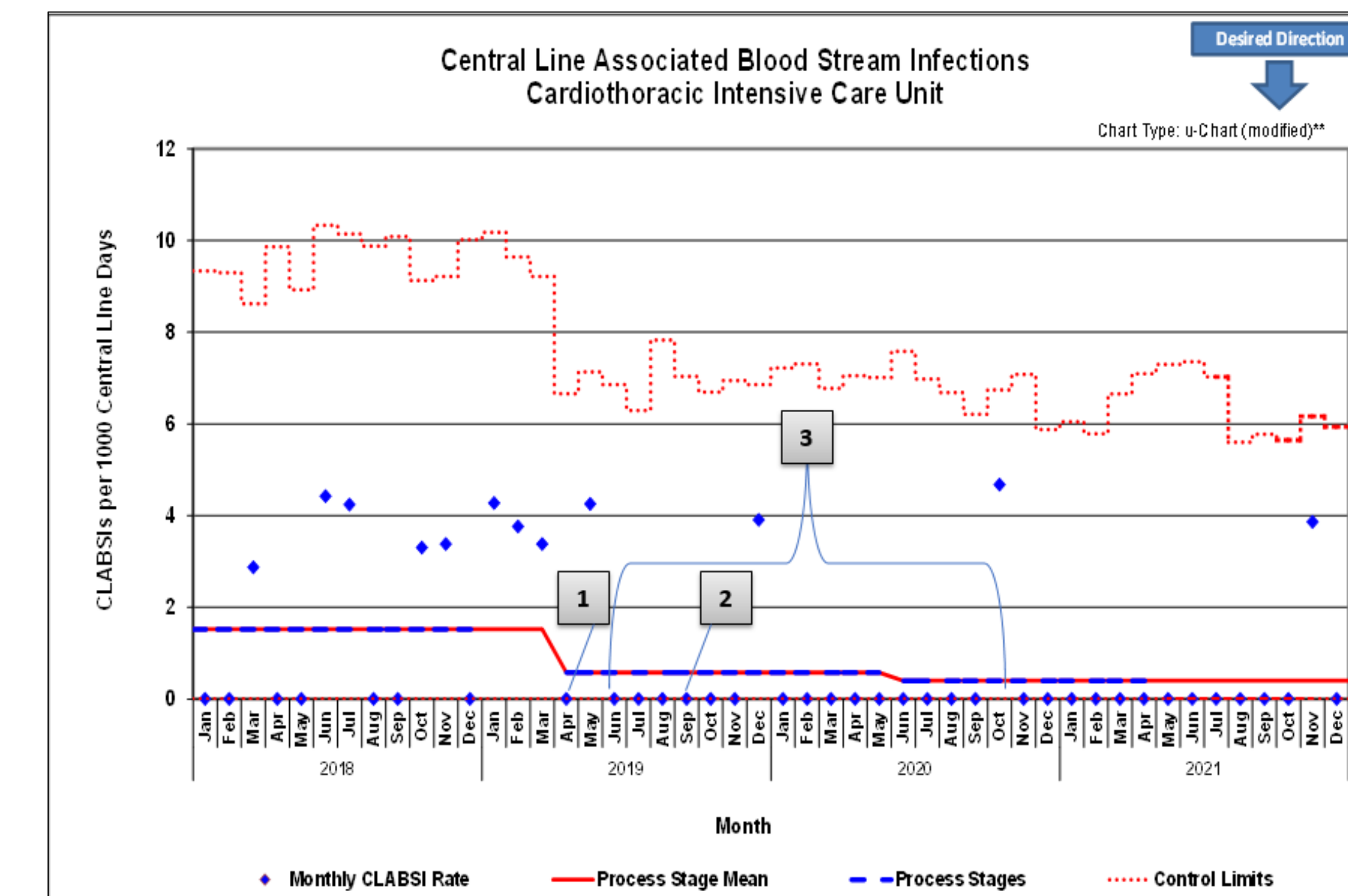
Central Line Entry Data Collection form										Date					
Line types	(circle all that apply)									CVL	PICC	RA	UVC	ECMO	Other
Line entries for LAB draws (put an X through the next # each time you make a line entry into any CVL for a lab draw only)															
1	2	3	4	5	6	7	8	9	10						
11	12	13	14	15	16	17	18	19	20						
All other line entries (put an X through the next # each time you enter any CVL for any reason other than a lab draw i.e med, blood return check, syringe change, line change) Sequences are 1 entry----flush,med,flush,med,flush =1															
1	2	3	4	5	6	7	8	9	10						
11	12	13	14	15	16	17	18	19	20						

Figure 1

CLABSI Bundle K-card	
Observation: Identify an RN caring for a patient with a central line and together answer all questions.	
1. Daily Goals: YES or NO	
	Ask if line necessity, consolidation of line entries, site integrity, & mechanical issues were discussed on rounds today. If rounds have not occurred, was it discussed the previous day or passed in report?
2. Central line dressing: YES or NO	
	Ask the RN if the central line dressing is clean/dry/occlusive and secured appropriately. Visually confirm the dressing is clean/dry/occlusive and secured appropriately.
	Ask the RN to show you where the dressing change date is documented in the medical record and not past due.
	Ask them the purpose of the Dressing Change Bundle Checklist.
	Ask them when they should complete the checklist.
3. IV Tubing: YES or NO	
	Ask the RN to show you that all IV tubing is dated appropriately & not past due. Answer "Yes" if the line is not in use.
	Are alcohol port protectors present on all luer injection sites?
4. Needleless connector: YES or NO	
	Ask the RN to show you where the needleless connector change date is documented in the medical record and not past due.
5. Line access observation: YES or NO	
Observe RN complete the steps below when entering the line or have RN simulate the procedure	
	Hand Hygiene performed & clean gloves worn <u>immediately</u> prior to entering line
	Sterile drape used.
	Alcohol port protector removed & Hub scrub done prior to entering line.
	Hub scrubs prior to <u>EVERY</u> entry into the central line.
	Maintains aseptic technique throughout procedure
6. Bath: YES or NO	
	Ask the RN if the patient received an age-appropriate bath. Confirm that it was documented. (CHG Exclusions: <2months, allergy, medication interaction)

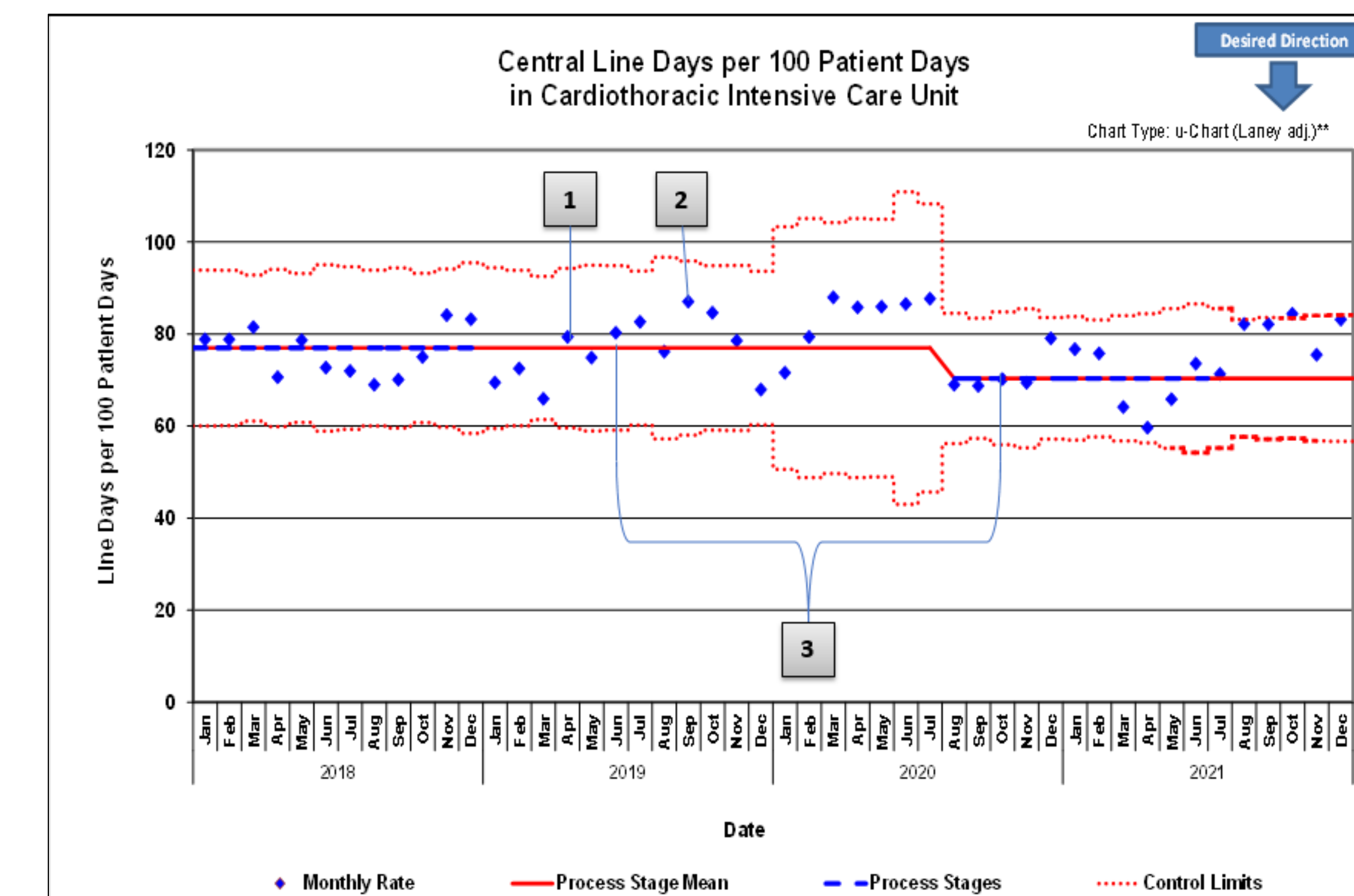
## Results

The implementation of the four interventions led to a decrease in the CLABSI rate from 1.52 per 1000 central line days in 2018 to 0.37 per 1000 central line days in 2020, sustained through 2021.



Baseline: 2018  
Interventions:  
1. Sequential Cleaning and K-card Audits (Apr 2019)  
2. Line Access/Maintenance Simulation (Sep 2019)  
3. Central Line Utilization and Entry (CLUE) Audits (Jun 2019 – Oct 2020)

There was also a reduction in adjusted central line days, from 77 to 70 central line days per 100 patient days. There was over one year between CLABSI from Oct 2020-Nov 2021.



## Conclusions

We believe that our 4 interventions were key components to reducing CLABSI in our CTICU. Sequential cleaning, K-Card audits, CLUE audits, and Simulation to Perfection served to bring appropriate use and care of central lines to the forefront of the minds of the CTICU staff, making every team member a CLABSI-reduction champion.