

Journey to Zero CLABSI and a Reduction in Device Utilization With a Dedicated Vascular Access Team

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INTRODUCTION and PURPOSE

Central line-associated bloodstream infections (CLABSI) result in countless deaths and millions in added healthcare costs each year.

Catawba Valley Medical Center (CVMC), a 258-bed community hospital, experienced increased CLABSI rates beginning in 2020 and maintained higher infection rates post-pandemic when compared to pre-pandemic rates. Additionally, they saw consistently higher than expected utilization of central lines each month per the National Healthcare Safety Network (NHSN) standardized utilization ratio (SUR).

Competing responsibilities for Infection Prevention and frontline staff created barriers to sufficient observation and compliance monitoring, making it difficult to identify trends and implement any real change.

As a focused improvement effort, senior leadership supported a proposal submitted by leadership from the Critical Care Unit (CCU) and Infection Prevention (IP) to implement a dedicated Vascular Access Team (VAT) to manage insertion and maintenance of adult peripherally inserted central catheters (PICC) and midline catheters.

PROPOSAL FOR VAT

SBAR for CVMC Vascular Access Team (VAT)	
Situation	Medical Surgical Nursing Departments have identified multiple challenges related to vascular access: 1. Patients receiving multiple sticks. 2. Inconsistencies with practice and line management which may lead to an increase in complications such as phlebitis, thrombophlebitis, thrombosis, and central line-associated bloodstream infections (CLABSI). 3. Multiple calls to CCU Charge Nurse and Nurse Anesthetist for IV access. 4. Inappropriate access based on patient assessment. 5. Physician concerns related to vascular access requests after business hours.
Background	CVMC has had 8 total CLABSI in 2021 and has already had 4 in 2022 (as of 2/28/23). In reviewing these CLABSI, a trend has been identified to determine a cause. See CLABSI Graph attached. No structured process to evaluate documentation of vascular access lines. Variations in management and documentation of vascular access lines. High number of requests for PICC lines after normal business hours. Many of these requests could have been addressed during normal business hours. CCU midline team implemented. However, requests for midlines may not be available due to high turnover of qualified staff and change nurse not available due to workload in CCU. Current process for obtaining vascular access could result in multiple IV sticks. See Current Process (with Midline Team) attached.
Assessment	VAT coverage would be provided 7 days per week for approximately 8 hours per day. Assess vascular access needs of each new patient which would include a review of vascular IV medications that may require specific vascular access. Assist with difficult IV access resulting in less sticks per patient and after-hour consults outside of emergency. See Vascular Access Implementation algorithm attached. Develop and implement protocols and policies related to vascular access. Develop and implement education related to vascular access insertion and maintenance. Complete all dressing changes for central line devices and arterial line. Collect and review data specific to the vascular access program. Evaluate for trends and complete "deep dives" if CLABSI occurs. 1.8 FTE (2.0 from IP and 1.0 from Infection) have been allocated for use to start the VAT. Begin a vascular access team with two full-time RN's and one registered/diaper RN to assist in caring, weaning, PICC and midlines. This department will require hiring 1.8 FTE and working 2.0 FTE to make the schedule every trial weekend.
Recommendation	

VAT was approved and three Registered Nurses were hired, two full-time and one PRN. After completion of training, the VAT was implemented in late September 2022.

TEAM MEMBERS



From left to right: Stacey Martin, BSN, RN, CCRN; Barbi Mills, BSN, RN, VA-BC; Niki Hilton, BSN, RN, VA-BC

VASCULAR ACCESS TEAM OBJECTIVES

Outcome Goals

- CLABSI Reduction
- Reduction in Standardized Utilization Ratio (SUR)

Process Goals

- Routine maintenance rounds to assess for prevention bundle compliance
- Provide patient specific care – the right line at the right time

IMPLEMENTATION – CENTRAL LINE MAINTENANCE

In 2023, the VAT completed 2,633 line audits. Rounding data is reported to the Device Infection Prevention Team and trends are analyzed by the team during the monthly meeting.

Month	Number Central Line Pt's audited	Dressing NOT C/D/I?	Unscheduled Dressing Changes	Tubing not Labeled	Caps not in place	CHG sign not on door	not charted correctly	Rounds completed	End of Day ML count	End of Day CVC Count
January	250	25	24	92	11	39	29	29	15.7	13.3
February	270	32	46	94	29	78	41	28	15.0	11.7
March	266	32	29	73	21	60	60	39	16.2	16.1
April	262	40	35	70	13	64	38	27	14.0	11.1
May	250	14	10	82	18	57	53	37	12.2	14.2
June	198	15	11	79	10	55	42	39	11.4	11.1
July	278	21	27	97	18	62	42	27	12.6	14.8
August	204	22	20	74	19	66	61	21	10.7	15.5
September	229	15	16	44	6	30	23	28	7.1	13.7
October	177	23	16	68	10	47	40	24	9.8	16.4
November	146	9	8	51	3	21	33	14	8.7	16.8
December	103	13	11	37	1	21	32	18	9.0	16.3
Year avg:	219.4	21.8	21.1	71.4	13.3	50.0	41.2	26.4	11.9	14.2

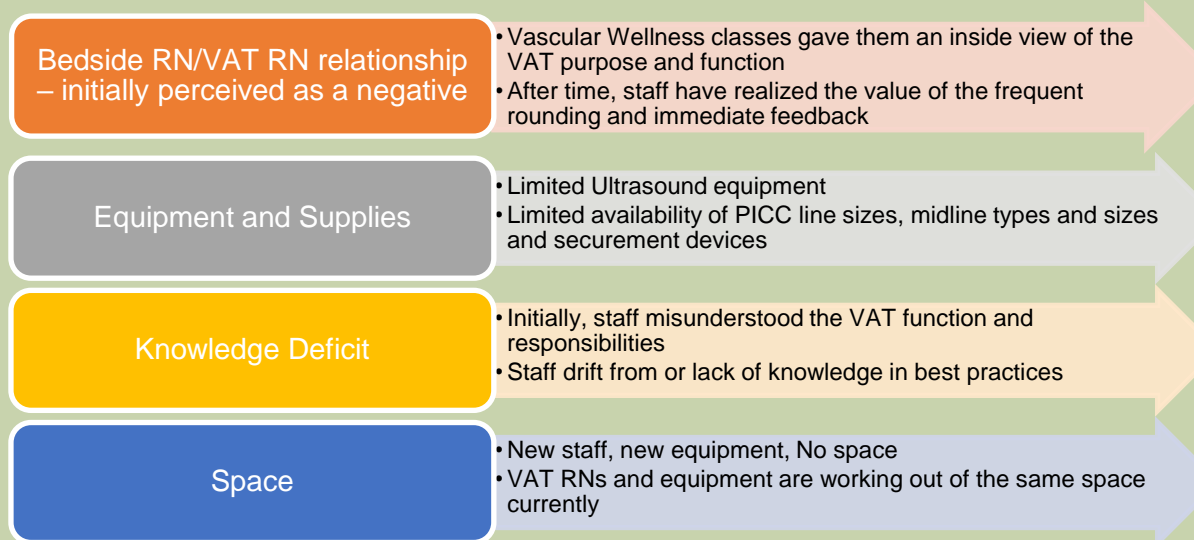
Prior to implementation of the VAT, Infection Prevention and departmental leadership were responsible for line audits. The number of audits completed ranged from 15-30 per month house-wide, due to competing responsibilities and multiple rounding requirements.

IMPLEMENTATION – LINE INSERTIONS

In 2023, the VAT had 6,220 total patient visits for evaluation of vascular access needs. They attempted 257 PICC line insertions with a 95% success rate. In addition, the VAT was able to identify 653 patients who were appropriate for midline insertion versus PICC insertion. The VAT experienced a 97% success rate with insertion of midlines, thereby effectively decreasing central line utilization overall.

Total Visits	Successful PICC Insertions	Un-successful PICC Insertions	Successful midline Insertions	Un-successful midline Insertions	Successful Accucath Insertions	Un-successful Accucath Insertions	PIV Visit	US Guided Lab draws	Port Access	CorTrak Insertions	CorTrak Repositions	Dressing Changes	Cap change/flush	Cathilo / Declothing / Troubleshooting
6220	244	13	633	20	176	14	131	16	37	74	16	406	5160	238

IMPLEMENTATION – BARRIERS

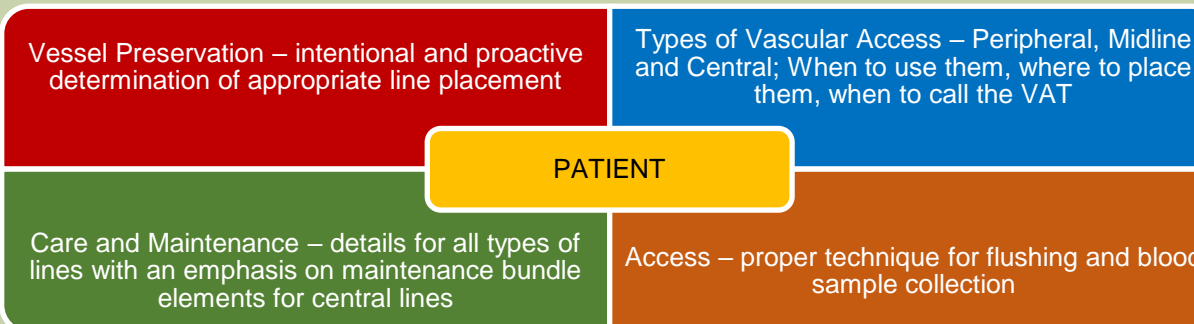


EDUCATION

Shortly after VAT inception, gaps were identified in general nursing knowledge around central lines, the importance of appropriate line insertion and maintenance bundle elements.

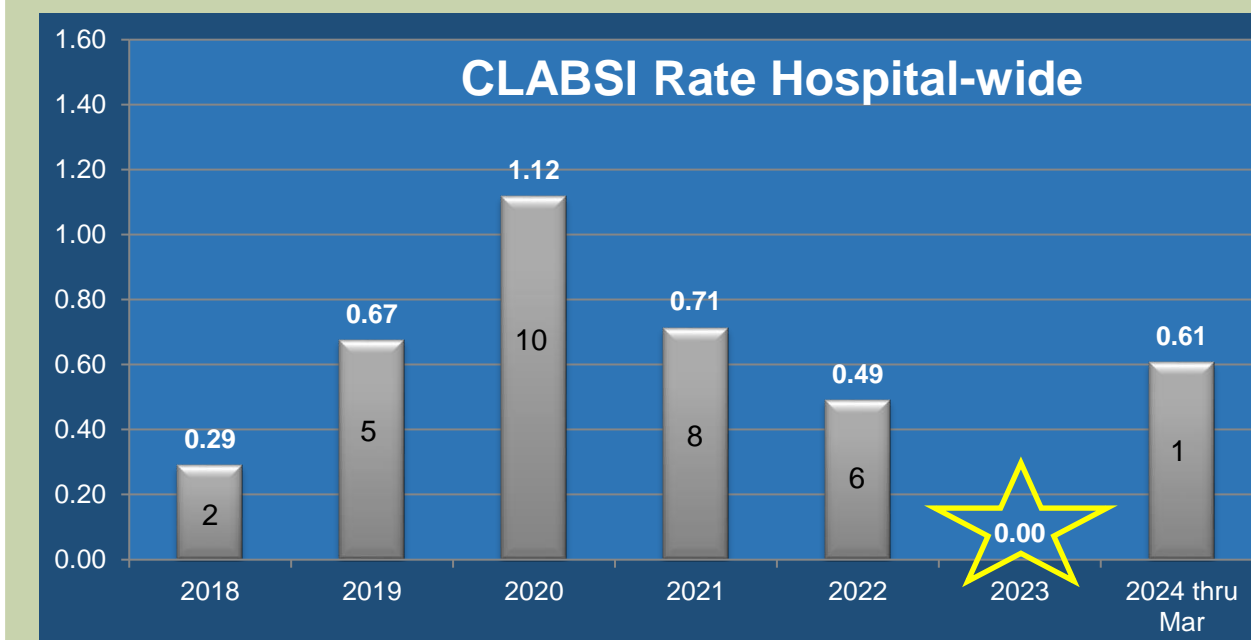
To bridge this gap, the VAT developed educational content and held a required Vascular Wellness course for all nurses. This same course is now taught each month to all newly hired nurses.

Basic content outline for the Vascular Wellness course:



OUTCOME REDUCED CLABSI INCIDENCE

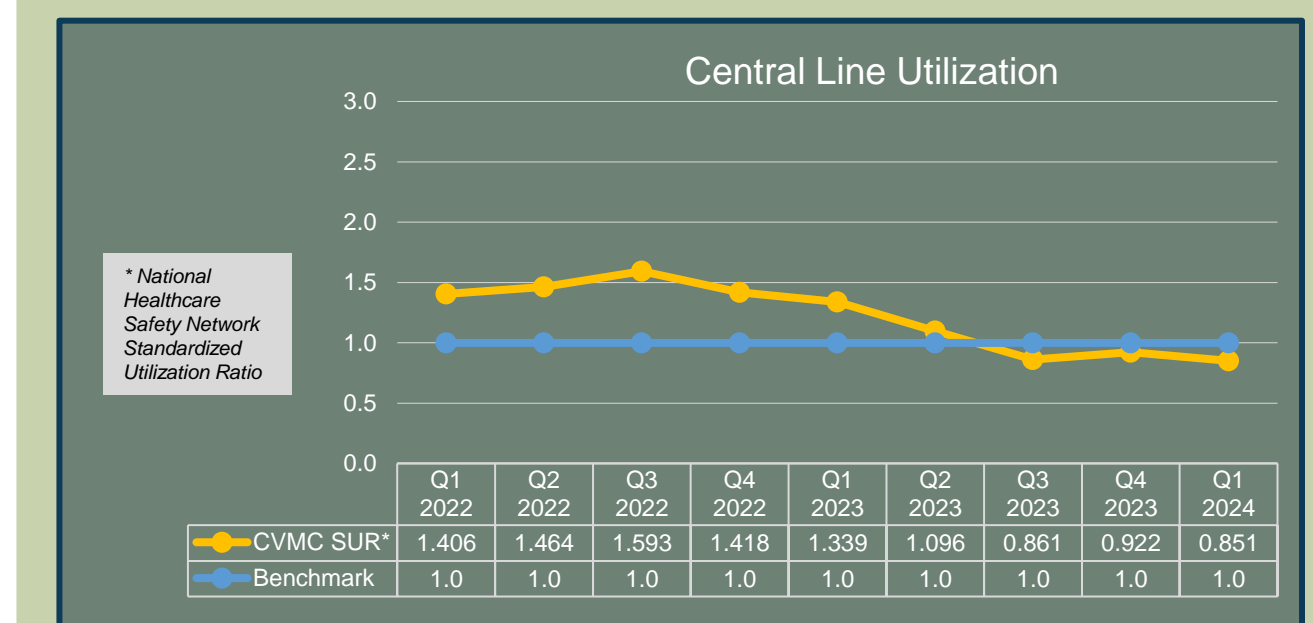
CVMC experienced ZERO CLABSI in their adult patient population for an organizationally unprecedented 509 days from 10/6/2022 – 2/27/2024. They continue to see a sustained low incidence in CLABSI with only one CLABSI YTD 2024.



OUTCOME - REDUCED CENTRAL LINE UTILIZATION

CVMC struggled for years with "overuse" of central lines, consistently measuring above the expected rate for device utilization. The VAT has been able to steadily reduce utilization since their implementation, finally realizing a house-wide SUR below 1 for the first time by Q3 2023, a reduction of 46% in 12 months from Q3 2022 - Q3 2023. In Q1 2024, CVMC experienced their lowest SUR since the organization has been tracking that data.

***National Healthcare Safety Network (NHSN) Standardized Utilization Ratio (SUR) = # Observed device days / # Expected device days



SUMMARY

Keys to Success

- Use the data – there is no denying real numbers that show increase incidence of infections and device utilization over time, despite efforts to improve
- Find the right team members – Passion for patient care and vascular access needs to be evident in the chosen candidates
- Sufficient training – take the time to complete thorough initial training with an expectation of certification within a short timeframe
- Utilize your vendor resource – they are the experts in their products

Spread and Sustainment

- A proposal was submitted and approved for a third full-time VAT RN in April 2024
- Opportunities for expansion to the Neonatal Intensive Care Unit are being explored

LESSONS LEARNED

- Be Persistent
- Key stakeholders must agree on the expectations and goals of the team
- Start small, show success and justify growth

DISCLOSURE and CONTACT INFORMATION

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Nothing to Disclose