



Standardizing Central Vascular Access Device Maintenance in our ICUs

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Background

- Daily care and maintenance of vascular access devices varied between our four ICUs and even from shift to shift on each ICU. This variation in practice made it difficult to comply with OHSU CLABSI Bundle Prevention Policy.
 - CLABSI events in OHSU's intensive care units totaled twelve occurrences in 2020
- CLABSI increases patient morbidity and mortality and increases hospital length of stay and cost. Reducing CLABSI occurrence is important to promote patient safety in our ICUs.

PICO(T) Question

In a critical care setting, will boosting CLABSI Prevention Bundle Compliance (I) among MICU RNs (P) decrease incidence of CLABSI (O) in our MICU as compared CLABSI rate in OHSU's other three ICUs (C)?

Strength of Evidence

CLABSI Prevention Bundle Intervention	Strength of Evidence of intervention
Q4H SITE ASSESSMENT	V
Q4H DRESSING ASSESSMENT	V
FLUSHED Q SHIFT	I, V
#CM EXPOSED DOCUMENTED Q SHIFT	V
DRESSING CHANGE	II, III, V
CHG BATH Q DAY	I
LINEN CHANGED Q DAY	V
TUBING CHANGE	I, II, IV, V
CAP CHANGE	IV

Strength of the Body of Evidence	Evidence Description*
I	Meta-analysis, systematic literature review, guideline based on randomized controlled trials (RCTs), or at least 3 well-designed RCTs.
I A/P	Evidence from anatomy, physiology, and pathophysiology references as understood at the time of writing.
II	Two well-designed RCTs, 2 or more multicenter, well-designed clinical trials without randomization, or systematic literature review of varied prospective study designs.
III	One well-designed RCT, several well-designed clinical trials without randomization, or several studies with quasi-experimental designs focused on the same question. Includes 2 or more well-designed laboratory studies.
IV	Well-designed quasi-experimental study, case-control study, cohort study, correlational study, time series study, systematic literature review of descriptive and qualitative studies, or narrative literature review, psychometric study. Includes 1 well-designed laboratory study.
V	Clinical article, clinical/professional book, consensus report, case report, guideline based on consensus, descriptive study, well-designed quality improvement project, theoretical basis, recommendations by accrediting bodies and professional organizations, or manufacturer directions for use for products or services. Includes standard of practice that is generally accepted but does not have a research basis (eg, patient identification). May also be noted as Committee Consensus, although rarely used.
Regulatory	Regulatory regulations and other criteria set by agencies with the ability to impose consequences, such as the AABB, Centers for Medicare & Medicaid Services (CMS), Occupational Safety and Health Administration (OSHA), and state Boards of Nursing.

**Sufficient sample size is needed with preference for power analysis adding to the strength of evidence.*

Evidence Summary

- OHSU's CLABSI Prevention Bundle is based on the best evidence-based practice recommendations available at this time.
- Literature review indicates that organizations with high compliance with CLABSI Prevention Bundle have lower incidences of CLABSI. (I)

Action Plan

Jan 2021:

MICU RNs were given a baseline knowledge survey to assess understanding of CLABSI Prevention Bundle and Vascular Access Flushing Policy

150 shifts of vascular access device charting were audited to assess baseline compliance with CLABSI Prevention Bundle

March 2021:

CLABSI Standard Work was created and presented to MICU RNs at a staff meeting.

MICU RNs used the CLABSI Standard Work to self audit their daily maintenance and care of vascular access devices on MICU.

Chart audits were performed weekly to investigate if CLABSI Prevention Bundle compliance improved after CLABSI Standard Work education was delivered.

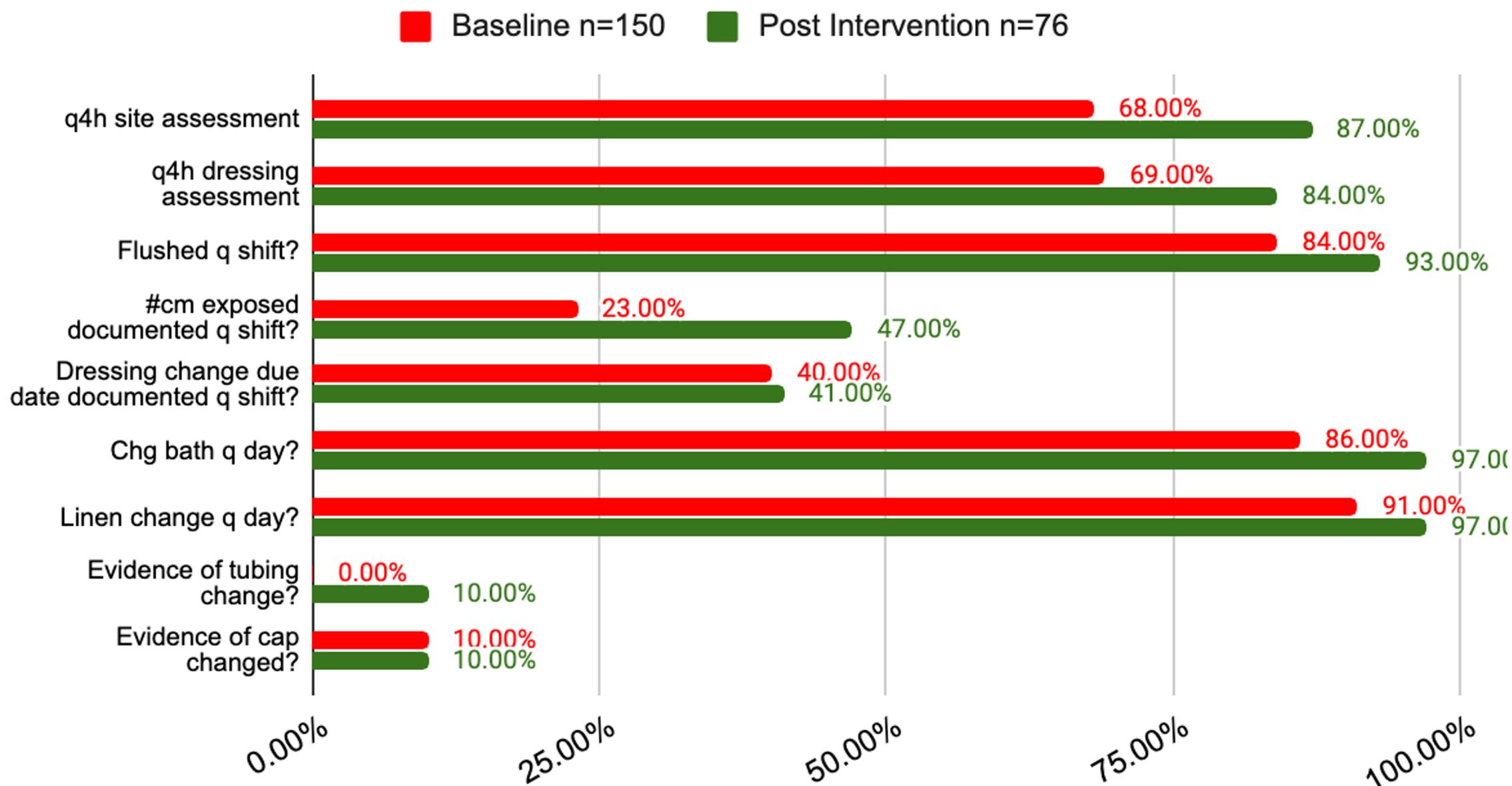
May 2021:

MICU RNs repeated the CLABSI Bundle Prevention knowledge assessment survey

Project Metrics

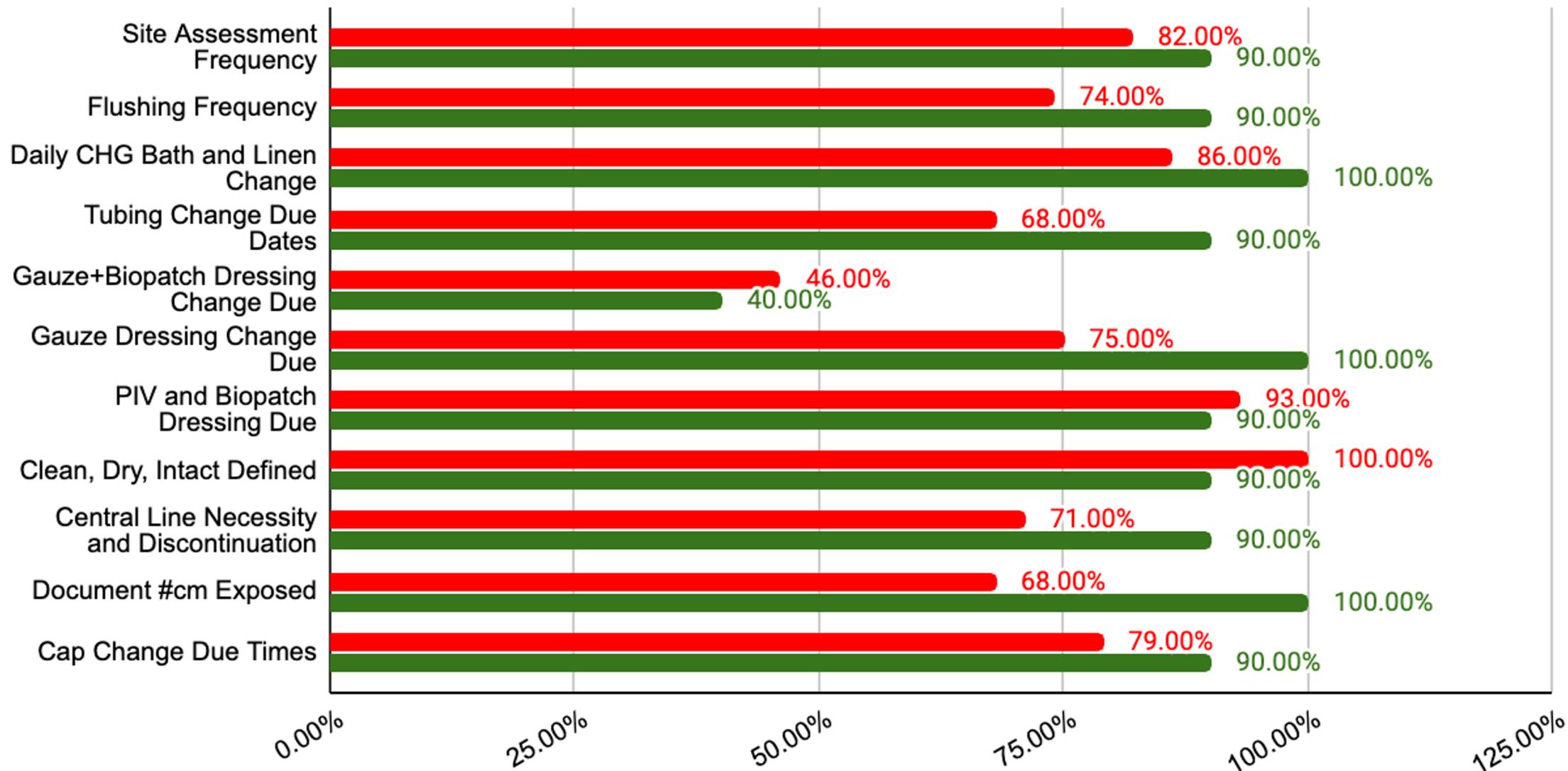
	Metric	Operational Definition	Source of Data	Data Collection Frequency	Data Aggregation (frequency & level of analysis – unit, pt. pop)	Feedback Plan (to what stakeholders, & when)
PROCESS	Compliance with each of the 9 aspects of the CLABSI Prevention Bundle and Vascular Access Flushing Policies	% of shifts demonstrating compliance via chart audit	Chart Audits	Weekly	Weekly % Compliance compared to MICU baseline audit	Weekly audits posted on a whiteboard in the MICU, Bimonthly emails sent to MICU staff
	Staff RN knowledge of 11 aspects of the CLABSI Prevention Bundle and Vascular Access Flushing policies	% correct answers to knowledge assessment	Knowledge Assessment	Pre and Post Intervention	Pre and Post Intervention aggregated by % correct	Post Intervention reporting of results
OUTCOME	Improvement in compliance with the CLABSI Prevention Bundle and Vascular Access Flushing policies	# Aspects Improved ----- Total # Aspects	Chart Audits	Weekly	Weekly % Compliance compared to MICU baseline audit	Weekly audits posted on a whiteboard in the MICU, Bimonthly emails sent to MICU staf
	Increased % correct on Knowledge Assessment	% Correct pre intervention compared to % correct post intervention	Knowledge Assessment	Pre and Post Intervention	Pre and Post Intervention aggregated by % correct of each item	Post Intervention reporting of results

CLABSI Prevention Bundle Percent Compliant



CLABSI Prevention Knowledge Assessment % Correct

■ Pre-Intervention n=29 ■ Post-Intervention n=10



Results

MICU demonstrated improvement in compliance on 8 of 9 metrics of the CLABSI Prevention Bundle through chart audits.

MICU demonstrated improvement in knowledge regarding 8 of 11 metrics as demonstrated by the Pre-Intervention and Post-Intervention Knowledge Assessments.

Return on Investment

Cost of Change		Benefit of Change		
Supplies: Primary IV tubing \$4.25ea Average Jan 2021 usage \$1057.19 Average April 2021 usage \$1184.69	\$128		Baseline	Post
		One-time reduction (supplies, labor, equipment)	\$	\$
		Ongoing reductions (supplies)	\$	\$
Equipment:	\$	Increased revenue (e.g., higher patient volumes, reduced LOS or readmissions)	\$	\$
Labor costs: using RN average payrate effective 07/01/2021 \$55.80 multiplied by 450 total RNs in Critical Care Cluster	\$25,110	Prevention of complications* CLABSI cost est \$48,105/occurrence 12 occurrences in 2020 in Critical Care Cluster	\$577,260	\$0
Other costs:	\$	Other	\$	\$
Subtotal	\$25,238	Subtotal	\$577,260	\$0
OVERALL RETURN ON INVESTMENT		\$552,022		

Challenges

Challenges encountered:

- Due to high MICU acuity, there were many non MICU RNs on the unit as well as float pool RNs. These RNs did not attend the staff meeting where the project was initially presented, and thus did not consistently capture the importance of the CLABSI Standard Work document the charge RNs discussed during our pre shift meetings.
- Not all MICU RNs were self motivated to update their practice to reflect the most up to date evidence-based interventions.
- MICU is experiencing the highest acuity of patients ever seen due to the global pandemic, thus the test patient population is more susceptible to CLABSI

Limitations:

- Time: Two months is not much time to cause behavioral change on a medical ICU in the midst of a global pandemic.
 - CLABSIs are rare events. It takes a considerable length of time to impact CLABSI rate. Literature supports a high correlation with bundle compliance and reduced clabsi. Bundle compliance used as proxy to CLABSI rate.
- Bedside RNs may not see the results of their behavioral change of increased Bundle compliance immediately. High reliance on early adaptors to bring about sustained change.
- Project intervention initiated the week AFTER the CLABSI posted in MICU in March 2021. CLABSI rate is not a reflection of post intervention results. Post intervention CLABSI rate not yet published to OHSU site.

Implications for Practice

- Consolidating two OHSU policies onto one page and reviewing the steps with staff did boost CLABSI Prevention Bundle compliance and reduced shift to shift variation in management of these central vascular access devices.
- The next step is to present these results to the Critical Care Cluster Practice Council. My hope is that the CLABSI Standard Work will be accepted into our OHSU Policy Manual and each of our four ICUs and our Critical Care Float Pool RNs will be given education on CLABSI Standard Work.

Conclusion

One-on-one review of the CLABSI Standard Work and Knowledge Assessment proved to be more effective at building staff buy-in than relying on self-audits alone.

Standardizing daily management of central vascular access devices based on OHSU's CLABSI Prevention Bundle and Vascular Access Flushing policies should reduce overall CLABSI rate in our ICU setting.

Questions & Discussion

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