Increased Burden of CLABSI/CAUTI During COVID Pandemic and Recovery Using an "Anatomy" Model of a HAI

Savanna Stout, MPH, MBA, CPHQ, CPPS, CIC, Cathy Paulus, MSN, RN-BC, CIC, FAPIC, Northwestern Medicine Central DuPage Hospital

Background & Methods

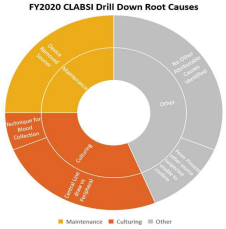
BACKGROUND – Central line-associated blood stream infections (CLABSI) and catheter-associated urinary tract infections (CAUTI) are preventable healthcare-associated infections (HAI). With ongoing CAUTI/CLABSI improvement efforts, Central DuPage Hospital achieved targeted performance of CAUTI/CLABI events and publicly reported Standardized Infection Ratios (SIR) during FY19 and during pre-COVID FY20.

Beginning March 2020, the emerging COVID pandemic created an unprecedented burden on patient care delivery that included higher acuity patients, stressed staffing models, and disruption in the PPE Supply Chain. Consequently, CAUTI/CLABSI events increased requiring urgent mitigation strategies to reverse the trend and to work towards desired performance.

METHODS – Early in the pandemic, the surge of patients, particularly those with COVID-19 infection, were influencing CAUTI and CLABSI events. Reviews from these events were synthesized to organize the findings in a manner that could help glean high-level insights on how to reduce occurrences. Our analysis revealed common categories of opportunity for device related infections: insertion, maintenance, and culturing. These categories were further granulated by completing drill-downs on all HAI events and collating the repeated drifts in identified best practices. The categorized opportunities and practice drifts were assembled into the "anatomy" of a CAUTI/CLABSI model. Beginning August 2020, this model was used to address best practice drifts, ultimately, prioritizing interventions that would have the greatest impact on the overall outcomes.

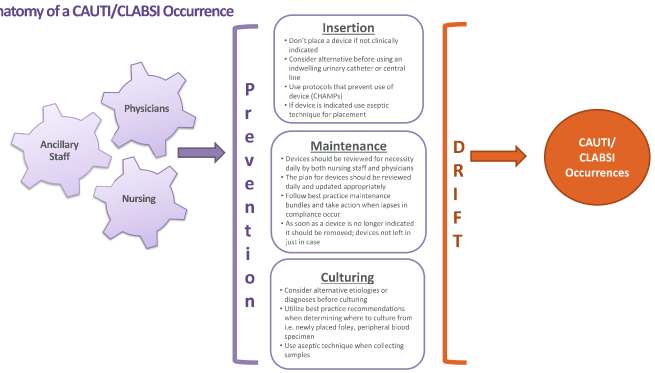
FY2020 CAUTI Drill Down Root Causes

FY2020 CLABSI Drill Down Root Causes



Methods - Tools

Anatomy of a CAUTI/CLABSI Occurrence

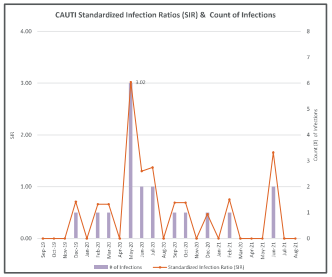


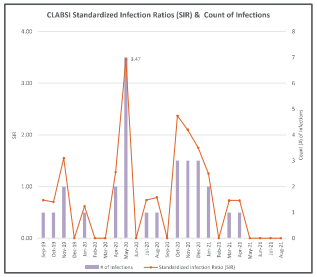
Strategic Interventions

Prevention	Action	Impact	
		CAUTI	CLABSI
Insertion	Management of Acute Urinary Retention Protocol Order Set Implemented	X	
	Back to the Basics Education: Device Necessity & Alternatives	X	X
Maintenance	Back to the Basics Education: Daily Review of Device Necessity and Prevention Practices Bundle	X	X
	Multiphase Device Necessity Rounds: • All adult inpatient units confirmed/reconfirmed have plan for 7 days/week review of devices • Restarted multi -disciplinary rounds in critical care • IP completes device rounds spot checks • Re-engineered CSC Device Discussions	X	X
	IV Therapy/Critical Care (CC) to collaborate on appropriate central line necessity and removal		X
	Expectations of Care for Agency Nursing/Float that includes CAUTI/CLABSI Prevention	X	X
	CHG bathing for all adult inpatients with central lines	X	X
Culturing	Blood Culture Order Re-Design with Guidance for Specimen Source Collection		X
	Phlebotomy Leadership Collaboration/Phlebotomy Focus Groups		X
	Back to the Basic Education: Culture Appropriateness	X	X
	Redistributed Best Practice Blood and Urine Culturing Tip	X	X
	Critical Care UA and Hold	X	
	Adult Culture Guidance Algorithms (Blood and Urine)	X	X
	End of Life Considerations	X	X

Results

At the start of FY19 (September 2019 through February 2020) prior to the first surge of COVID-19 patients, the hospital performance with CAUTI/CLABSI events was at or better than target. During this period, there were 2 CAUTIs (SIR = 0.23) and 4 CLABSIs (SIR 0.56). During the first surge (March 2020 through July 2020) of COVID patients there was a 450% increase in CAUTI events raising the SIR from 0.23 to 1.33. Additionally, there was a 100% increase in CLABSI events resulting in an increase in CLABSI SIR from 0.59 to 1.27. A downward trend of both CAUTI and CLABSI SIR (0.34, 0.83) was seen post application of the CAUTI/CLABSI model through our current performance period (August 2020 through July 2021).





Discussion

The impact of the COVID-19 pandemic added to the HAI burden. Caring for patients during an emerging pandemic can result in drift from known best infection prevention practices. Early recognition of special causes influencing patient care can aid in performance recovery. The increase in device-related infections prompted our facility to quickly analyze information from these HAIs and develop a strategic model to prioritize interventions and improve performance. This model continues to be used to sustain the improvement gains. Furthermore, the combination of the model and associated interventions formed a recovery plan that can be re-implemented should there be a significant increase in HAI events in the future.

References:
- Patel P, Walker-Lastinger L, Dudeck M, Rika L, Kahar D, Edwards J, Pollock D, Benin, A. (2021). Impact of COVID-19 pandemic on central line-associated blood stream infections during the early months of 2020, National Healthcare Safety Network, Infection Control & Epidemiology, Mar 15:1-4. doi:10.1017/ice.2021.108.
- McMullen K, Smith S, Rahimian T. (2020). Impact of SARS-CoV-2 on hospital acquired infection rates in the United States: Predictions and early results, American Journal of Infection Control, 48(11):1406-1410.doi: 10.1016/j.ajic.2020.06.209

Nothing to Disclose