

Introduction

After a stroke, urinary dysfunction and subsequent urinary tract infection (UTI) are estimated to be approximately 20%. Increased post-void residual (PVR) is a risk factor for UTI. Literature review revealed 53% of stroke patients have increased PVR. Early identification of urinary retention through measurement of PVR, followed by subsequent intervention may lead to reduced UTIs (Journal of Neuroscience Nursing, 2020). The incidence of HAUTI/CAUTIs increased on the Neuro Unit at Lake Cumberland Regional Hospital (LCRH) from 2019 to 2020. After studying root-cause analyses for the cases, a commonality was identified; the majority of UTIs were initially admitted for stroke.

Methodology

Using PDSA methodology, research was conducted and a plan for intervention to reduce incidence of HAUTI/CAUTIs in stroke patients was developed and spearheaded by the Neuro Unit Based Council. In order to reduce urinary tract infections (UTIs) in the stroke patient population, the main focus of the project was to develop a bladder scanning protocol for early identification of urinary retention. The protocol was framed using an algorithm approach. Stroke patients received an initial bladder scan immediately following the first void after admission. Each patient received a second scan within eight hours. Repeat bladder scanning was performed every eight hours until the postvoid residual was less than 100 milliliters (mL) for two consecutive scans. If the postvoid residual continued to be greater than 100 mL, interventions such as bladder training and use of cholinergic medications to stimulate urination were utilized.

Project Team



Postvoid Residual Algorithm

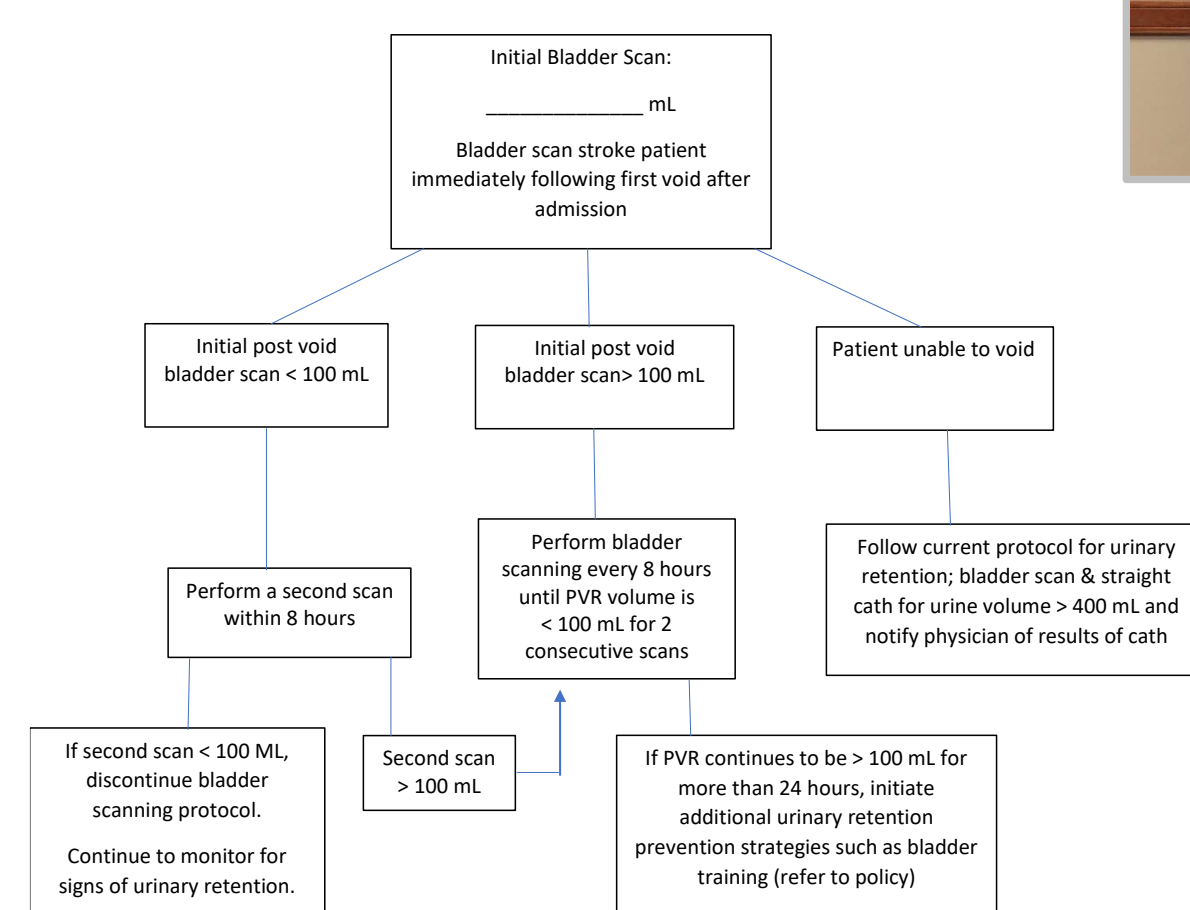


Figure 1. Postvoid Residual Algorithm.

Process Measures & Outcome Data

During a five-month time period from January 1, 2021 through end of May 2021, 46% of stroke patients participating in the project had increased postvoid residual, putting them at greater risk for development of a urinary tract infection. Of those patients, 31% received subsequent intervention to facilitate bladder emptying. As a result, there were zero urinary tract infections reported in this patient group.

Results

31% of patients that demonstrated urinary retention via bladder scanning subsequently received intervention to facilitate bladder emptying. As a result, there were **zero** urinary tract infections reported in this patient group. Incidentally, Neuro Critical Care also had a 35% reduction in foley catheter utilization rates.



Table 1. Incidence of urinary retention and subsequent intervention

	# of patients bladder scanned	# patients with urinary retention	# receiving intervention
January	6	3	1
February	8	4	1
March	8	5	1
April	5	2	0
May	8	2	2

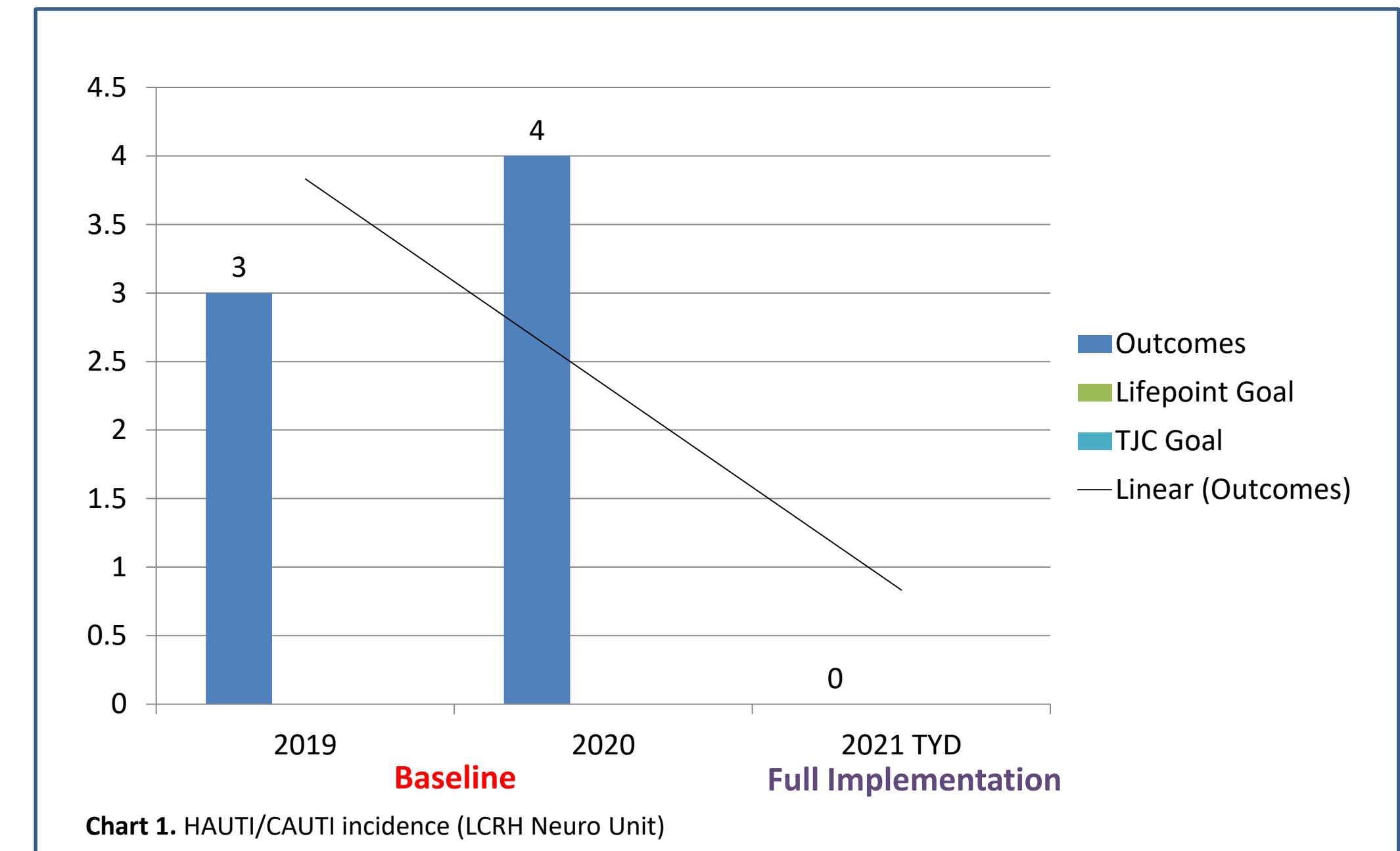


Chart 1. HAUTI/CAUTI incidence (LCRH Neuro Unit)

Discussion & Reliability

To ensure reliability, performance had to be hardwired. An initial project barrier was the human factor. Nursing was utilizing flow sheets with the bladder scanning algorithm. To elevate the project along the hierarchy of sustainability, automation and computerization was integrated. The Postvoid Residual Algorithm process was added to the electronic charting system and was automatically reflexed to the daily intervention screen upon admission of a stroke patient. This automation mitigated risk of failing to identify patients that met this project criteria.

Conclusion: Sustainability & Next Steps

To ensure sustainability, automation and computerization will be maintained, and new staff members will be educated and trained to use the process. This algorithm may also be adapted to other patient populations, such as patients with spinal injuries or congestive heart failure that consequently develop urinary retention and subsequent increased risk of urinary tract infection.

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References

1. Journal of Neuroscience Nursing, 2020