



# Mission ~~Impossible~~: Achieving Zero CAUTIs in the NeuroIntensive Care Unit Using A Patient-Centered, Interdisciplinary Team Approach

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## INTRODUCTION

Catheter-associated urinary tract infection (CAUTI) is the most common health-care associated infection accounting for > 560,000 nosocomial infections annually (Gould,2016). According to the Center for Disease Control, CAUTIs are also a leading cause of secondary blood stream infection resulting in approximately 13,000 deaths annually. The neurocritical care population is especially at risk for CAUTI development related to cognitive, motor, and sensory deficits. NeuroICU's goal was to eliminate CAUTIs, defined as a rate of zero. With initial efforts (2008-2012), CAUTI rate was reduced from 13.1 to 4.0/1000 catheter days (Titsworth et al, 2012). In February, 2016 NeuroICU launched a patient-centered quality improvement effort to further reduce CAUTIs. The algorithm employed was designed for RNs to assess the necessity of the urinary catheter based on a set of criteria. If the criteria was not met, RNs were educated to encourage voiding Q4hr and monitor post void residual (PVR) or bladder volume (BV).

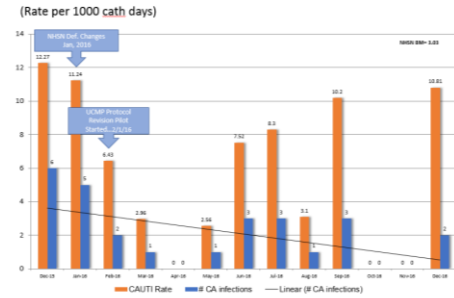
## METHODS

- NeuroICU Interdisciplinary Comprehensive Unit Safety Program (CUSP) performed an extensive literature review of evidence-based best practices specific to management of urinary catheters. A urinary catheter management algorithm (UCMA) was revised to better fit the needs of the neurocritical care population, including:
  - Assessment of, and interventions for, acute and chronic retention
  - Decreased frequency for voiding & bladder scan assessments to every 4 hrs
  - Revision of urinary catheter utilization criteria (e.g. postop monitoring and hemodynamic instability > 24hrs where intake/output is actively used to drive interventions)
  - Unstable spinal fracture
  - Patient/family request during end-of-life/palliative care
  - Early fecal containment for patients requiring indwelling catheter and incontinence of stool
- Formal didactic interdisciplinary education was performed prior to protocol implementation
- NeuroICU's interdisciplinary leadership conducted daily rounds to evaluate necessity and management of indwelling urinary catheters. Individual medical records were reviewed as part of routine rounding prior to collaboration with interdisciplinary team to determine the best clinical regimen for urinary management.
- Routine quality data was collected during daily rounds and analyzed per month to determine process and outcome opportunities and successes.
- Protocol data results and root cause analysis were shared with the workgroup on a monthly basis and just-in-time education was performed as variances were identified.

## RESULTS

- After 12 months of implementation:
- Compliance with use of the UCMA was greater than 95%
  - Catheter utilization was reduced from 60% to 24%

## NeuroIntensive Care Unit- CAUTI Trends



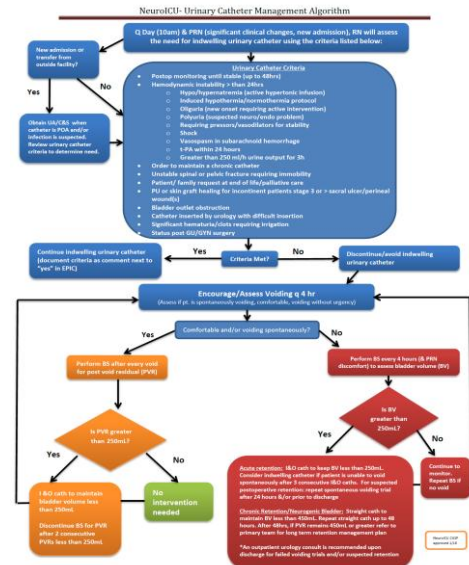
After approximately one year, urinary catheter related infections and use of catheters were reduced indicating that the revised interventions were successful. Due to decreased utilization, the CAUTI rates were inversely increased. However, the overall goal was to decrease the number of urinary catheter related infections and this was achieved as demonstrated by the graphics above.

## CONCLUSIONS

Implementing a neurocritical care patient-centered, interdisciplinary urinary catheter management algorithm significantly impacted urinary catheter utilization, number of catheter associated urinary tract infections, and unit culture. Sustaining these gains and transforming the culture on the unit while challenging, are possible and paramount to achieving CAUTI rates of zero and improved patient outcomes. Continual review of the process and outcomes will assist with these aims.

## REFERENCES

- Gould CV, Umscheid CA, Agarwal RK, et al. Guideline for prevention of catheter-associated urinary tract infections 2009. *Infect Control Hosp Epidemiol* 2010; 31:319.
- Titsworth, W., Hester, J., Corraia, T., Reed, R., Guin, P., Williams, M., Archibald, L., Layon, A.J., Mocco, J. Reduction of catheter associated urinary tract infections among neurosurgical intensive care unit patients: A single institution's success. *Journal of Neurosurgery* 116 (4), 911-920. Also published online January 6, 2012; DOI: 10.3171/2011.11.JNS11974.



## NeuroIntensive Care Unit- Urinary Catheter Utilization

