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# Project #73: Implementation of a Multi-Faceted Approach to Reduce Catheter Associated Urinary Tract Infection (CAUTI)

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# Implementation of a Multi-Faceted Approach to Reduce Catheter Associated Urinary Tract Infection (CAUTI)

HFH-Detroit CAUTI Team

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## AIM

By December of 2022, Henry Ford Health (HFH) -Detroit inpatients requiring an indwelling urinary catheter will be less likely to develop a Catheter Associated Urinary Tract Infection (CAUTI), by decreasing annual CAUTI occurrence to 3 or less (66% decrease from 2021) utilizing a multifaceted quality improvement approach.

## PLAN

Urinary Tract Infections (UTIs) are a very common and impact about 150 million people worldwide annually (Werneberg, 2022). Per Lo et al., (2014) and the Centers for Disease Control and Prevention (CDC), up to 75-80% of the complicated UTIs in the United States are due to indwelling urinary catheters. Per the CDC, approximately 15-25% of patients have an indwelling catheter during their hospitalization. CAUTIs continue to be the most identified healthcare associated infection (HAI) and can often lead to other HAI including blood stream infections. Costs related to avoidable CAUTIs are estimated to cost $115 million to $182 billion annually (Werneberg, 2022).

Henry Ford Health-Detroit (HFH-Detroit) initiated a CAUTI Prevention Team in 2012. This multidisciplinary team includes physician champions from urology and infection control, infection prevention specialists, and nursing representatives (leaders and bedside staff) from administration, inpatient departments, emergency department, and surgical services. The team was tasked with identifying opportunities and driving bedside practice to decrease catheter utilization and CAUTIs. The CAUTI team recognized the need to further improvements in practice regarding indwelling catheters. Although the number of CAUTIs decreased over time from 89 (2015) to 15 (2020) there was still opportunities to decrease patient harm. Identification of high impact actions that could be sustained was vital to the overall goal of decreasing indwelling catheter usage and CAUTI prevalence. Through 2021 and 2022, three main initiatives were introduced including the Urine Culture Hard Stop (UCHS), the Urinary Catheter Alleviation Navigation Protocol (UCANP), and adding male external catheters to meet the team's goal of decreasing CAUTI occurrence to 3 or less per year.

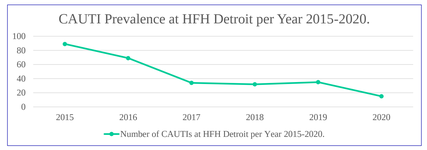


Figure 1. CAUTI Prevalence 2015-2020

## DO (INTERVENTIONS)

**Urine Culture Hard Stop (UCHS)**

In March of 2021, the UCHS was introduced. This initiative aimed to reduce inappropriate culturing and treatment with antibiotics for colonization and asymptomatic bacteremia. In addition to being important to help decrease CAUTI rates, this initiative also supported efforts regarding antibiotic stewardship. The need for a decrease in inappropriate prescribing of antibiotics is recognized as an important initiative by both the CDC and the World Health Organization (WHO) (Michael et al, 2014; Ventola, 2015). UCHS was encountered when a provider placed an order for a urine culture in the following:

- Patient who has had a catheter in place for longer than 2 calendar days
- Patient who has had a catheter discontinued in the previous 2 days

If the provider had ruled out all other sources of fever, he/she could contact the hospital Infection Control Medical Director to request an override to collect the urine culture specimen.

**Male External Urinary Device**

In 2019, the female external urine collection system was added to unit stock to help alleviate indwelling catheter usage in female patients. In 2021, the need was identified to find a similar product for male patients. The male external urine collection systems appeared to work more effectively and have decreased impact to skin integrity than the historical condom catheter.

Multiple devices were reviewed and piloted from July to September on several units to determine the most effective device. In December of 2021, following the pilots, a product was selected and added to hospital par stock further decreasing the need to utilize indwelling catheters.

**Urinary Catheter Alleviation Navigation Protocol (UCANP)**

In 2020, a work group was formed to investigate opportunities to increase the autonomy of the nurse in addressing urinary retention post indwelling catheter removal. The workgroup was tasked with developing a protocol providing guidance regarding urinary retention/inability to void following indwelling catheter removal to decrease catheter re-insertion. The UCANP protocol was developed.

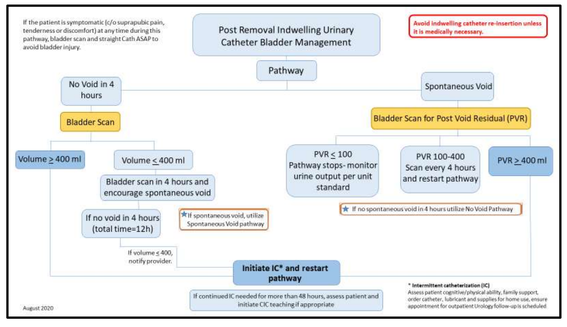


Figure 2. UCANP Protocol (initial draft used through pilot and roll-out)

## DO (INTERVENTIONS CONT…)

**Urinary Catheter Alleviation Navigation Protocol (UCANP) cont..**

Beginning in December 2020, the protocol was piloted on five units. During the pilot period a total of 173 patients were included. Per Jamil et al. (2022), catheter reinsertion rate was 16% during the pilot, compared to 21% and 27% for the historical cohorts, ($P$ = .02). The mean number of catheter day's during the study was 1.4 days, compared to 9.5 and 5.6 days in the historical cohorts ($P$ = .004) and catheter hours (OR 1.010 95% CI 1.005 – 1.015 $P$ < .0001.) were determined to be a predictor of catheter reinsertion (Jamil et al., 2022).

Due to the positive results of the pilot, the decision was made to spread the UCANP protocol throughout the hospital. Project management support was provided to the CAUTI workgroup from hospital and nursing administration. Due to the intensity of the education for both nursing and providers and auditing for compliance, the protocol was rolled out in a phased fashion from May of 2021 through March of 2022.

## CHECK

**URINE CULTURE HARD STOP**

UCHS success was reviewed through the culture utilization rate over time. In the monthly CAUTI meetings in 2021 and 2022, barriers were discussed. Calls received and approvals for cultures (and why they were approved) were discussed by the Infection Control Medical Director. This information continued to be shared periodically with leadership and physicians. To monitor success of the UCHS, the culture utilization rate was reviewed monthly with continued incremental decreases in culture rate noted.

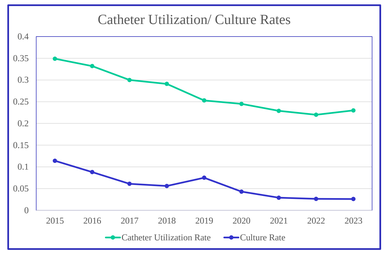


Figure 3. Catheter Utilization / Culture Rates 2015-2023

**Male External Urinary Device**

Overall positive feedback was received regarding the addition of the male external device. Usage of the product was monitored in collaboration with supply chain and the vendor. The overall catheter utilization rate was monitored in addition to product usage with continual decline in utilization rates (see above graph).

**UCANP**

Positive results were noted following the hospital wide roll-out of the UCANP protocol. To ensure continued compliance to the UCANP protocol, data analytics was engaged and a UCANP dashboard was developed (see below) showing an increase over time in the number of UCANP orders and opportunities noted per unit for leaders to monitor. Tier 2 Foley Removal Policy was updated to include UCANP in 2022.

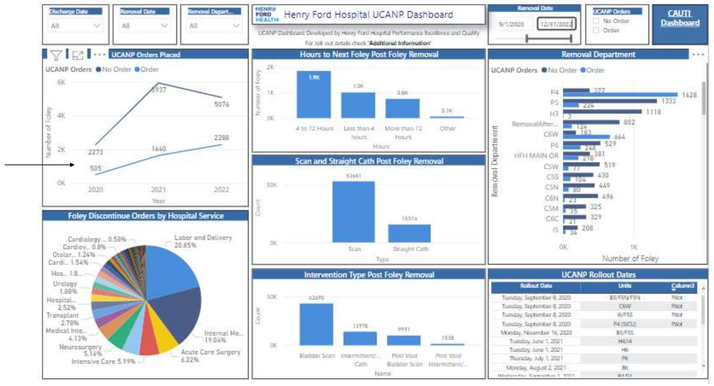


Figure 4. UCANP Dashboard, demonstrating steady increase of UCANP orders form 2020-2022

## MEASURES

**CAUTI RATE/COUNT**

Development of a timeline allowed for tracking over time of progress being made as the three individual initiatives were rolled out. A reduction in CAUTI rate was noted following the UCHS implementation. The reduction was further improved as the UCANP protocol was rolled out across the hospital.

| 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|
| 1.09 | 0.62 | 0.28 | 0.03 | 0.12 |

Figure 5. CAUTI Rates from 2019 – 2023

## MEASURES (cont…)

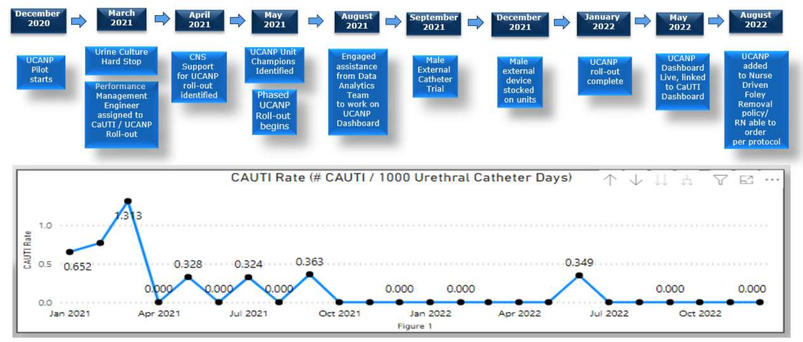


Figure 6. CAUTI Reduction Project Timeline

Following the implementation of the three measures identified, there were noteworthy improvements noted in the CAUTI counts/rate. The initiatives resulted in exceeding the aim of the project with only one identified CAUTI in 2022. These initiatives have been able to be sustained over time and resulted in meeting the project aim and CAUTI HFH Detroit goal in 2023 with 3 overall CAUTIs. Even with the increased acuity of patients in a tertiary-quaternary teaching facility, HFH-Detroit met the aim of this project in achieving the hospital CAUTI goal and sustained gains made over a three-year period.

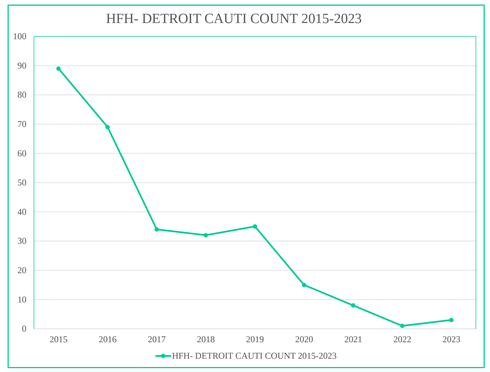


Figure 7. HFH-Detroit CAUTI count

## ACT: SUSTAIN AND SPREAD

In August 2022 following implementation of the UCANP protocol, the Tier 2 Nurse Driven Catheter Removal policy was updated to incorporate the UCANP protocol. Through the System CAUTI team, the work completed on the UCHS and the male external urinary device was spread Systemwide. Currently, there is a System workgroup developing a Tier 1 Nurse Driven Catheter Removal/ Bladder Management policy to incorporate the UCANP protocol. The protocol was updated to accommodate all System hospital needs. Once the Tier 1 policy is completed, there will be opportunities for improvements to the UCANP order set in EPIC. There was also a pilot/change of the male external device in 2023 Systemwide. Continued System CAUTI collaboration has led to increased use of these initiatives resulting in the highest quality and safest care provided to patients.

These actions were shared as a best practice during the Joint Commission survey at HFH –Detroit in 2023. The initiatives have also been shared to other hospitals nationally who were looking for assistance in improving their CAUTI prevalence.

## References

Jamil, M.L., Wurst, H., Robinson, P., Rubinfeld, I., Suleyman, G., Pollak, E., Dabaja, AA.(2022). Urinary catheter alleviation navigator protocol (UCANP): Overview of protocol and review of initial experience. *Am J Infect Control*, *50(1)*, 81-85. doi: 10.1016/j.ajic.2021.06.019.

Lo, E., Nicolle, L.E., Coffin, S.E., et al. (2014). Strategies to prevent catheter-associated urinary tract infections in acute care hospitals: 2014 update. *Infect Cont Hosp Epidemiol*, *35(5)*:464–479. doi:10.1086/675718

Michael, C.A., Dominey-Howes, D., Labbate, M (2014). The antimicrobial resistance crisis: causes, consequences, and management. *Front Public Health*., 2:145. doi:10.3389/fpubh.2014.00145

Ventola, C.L. (2015). The antibiotic resistance crisis: Part 1: Causes and threats. *Pharm Therap*., *40(4)*:277-283. PMID: 25859123; PMCID: PMC4378521.

Werneburg, G.T. (2022). Catheter-Associated urinary tract infections: Current challenges and prospects. *Research and Reports in Urology*, *2022(14)*, 109-133. DOI:10.2147/RRU.S273663