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Effectiveness of the PureWick External Urinary Collection Device in a Long-Term Acute Care Hospital: A Program Evaluation

Charlotte Sheppard

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School of Nursing Duquesne University

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Signed Dr.Manjulata Evatt DNP, MSN,RN,CMSRN

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Abstract

In December 2017 a 77 bed Long Term Acute Care Hospital (LTACH) added PureWick External Urinary Collection Devices (ECD) to their Hospital Acquired Infection (HAI) Bundle. The PureWick ECD is utilized in the female patient population when urinary management is necessary and can be achieved without an indwelling urinary catheter. The PureWick ECD is a flexible wick like external catheter that allows for collection of urine through the hospital wall suction system. A program evaluation was performed relative to a program beginning in January, 2018 through September 2020 to determine if the implementation of the PureWick ECD reduced the catheter associated urinary tract infections (CAUTI) rate and indwelling urinary catheter utilization rate, as well determining if the PureWick ECD continued to be utilized and recorded in the electronic healthcare record (EHR) consistently. Through review of quality improvement records data was obtained to compare CAUTI rates and indwelling urinary utilization rates prior to and after the implementation of the PureWick ECD in January 2018. Data revealed CAUTI rates decreased while utilization rates initially decreased but over time, coinciding with the addition of hospital beds, increased. Through review of the electronic health record (EHR) data was collected to identify consistency that the PureWick was utilized and memorialized in the EHR. Findings suggest that staff inconsistently documented use of the PureWick ECD. Recommendations for continued surveillance for the development of indwelling urinary catheter utilization, CAUTI rates and education regarding recording within the EHR PureWick ECD use. PureWick is an effective alternative urinary management device to reduce CAUTI rates.

Keywords: External urinary catheter, external collection device, CAUTI rates, urinary tract infection, indwelling catheter, catheter utilization rates, PureWick

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Background and Significance

Hospital acquired infections (HAIs) are a known risk to the inpatient population. Urinary tract infections (UTIs) are the most common infection developed. Nearly 15-25% of patients in an acute care setting utilize an indwelling urinary catheter at some point during their hospitalization and are therefore at a heightened risk for developing a UTI (Advani & Fakih, 2019). Roughly 70-80% of UTIs occur in individuals utilizing indwelling urinary catheters, and therefore are referred to as catheter associated urinary tract infections (CAUTIs) (Wang et al., 2019).

The National Safety Network (NHSN), the most frequently utilized HAI surveillance system, defines a CAUTI as an infection that results in a positive urine culture collected after the individual has had an indwelling urinary catheter in place for two or more days (NHSN, 2021). Catheter associated urinary tract infections and bacteriuria is linked to morbidity and mortality where it has been estimated that more than 13,000 deaths per year are associated with UTIs (NHSN, 2021). According to the Centers for Disease Control and Prevention (CDC) approximately 17% to 69% of CAUTIs are preventable which indicates that nearly 380,000 infections and 9000 deaths related to CAUTIs could be avoided (CDC, 2019).

Beginning in 2008 reimbursement of the patient care for facility acquired urinary tract infections was drastically altered. Consequently, reducing hospital acquired CAUTIs is more important than ever because many of the costs associated with UTIs are absorbed by the hospital. It is estimated that the attributable cost of CAUTIs, for non-critical hospitalized patients, can be $1756 per patient and in critical care patients, up to $10,197 (Hollenbeak & Schilling, 2018).

This program evaluation occurred at Long-Term Acute Care Hospital (LTACH) in west-central Florida. The LTACH was a 50-bed facility between 2017 and 2019, adding an additional 27 beds in October 2019. Patients with chronic critical illness are routinely admitted to (LTACHs). The LTACH is an extension of the traditional acute care hospital (ACH) and a necessary resource to meet the increasingly complex needs of the patient population. A patient being admitted to an LTACH has previously resided in an ACH within one of their intensive care units and/or has had prolonged time spent on a mechanical ventilator. In order for an LTACH to qualify for Medicare reimbursement they must also meet the same Medicare conditions as an ACH, making quality indicators equally as important to LTACHs (Medpac, 2018). In order to achieve optimal financial reimbursement, the Medicare patient must have an average length of stay greater than 25 days, wherein the ACH Medicare patient's average length of stay is approximately five days. Based on information obtained at Florida Health Finder, this LTACH's average length of stay in 2018 was 25.49 days (Agency for Health Care Administration, 2018). As a result of the extended length of stay there are more opportunities for exposure to organisms that can lead to urinary tract infections as well as additional complications and costs associated with care and treatment of this vulnerable population.

In 2002, The Joint Commission established its National Patient Safety Goals (NPSG) to address safety concerns and assist with accrediting acute care hospitals. In 2011 a NPSG was developed to address the reduction of HAIs and by 2017 that seventh NPSG was updated to include directives to reduce the use of indwelling urinary catheters (R3 Report, 2016). In response to the updated NPSG this LTACH implemented a new device at the end of 2017 to incorporate into their HAI bundle as an alternative to indwelling urinary catheters, a PureWick External Collection Device (ECD). The PureWick ECD is a device for female patients that

require urinary management. The incidence of CAUTIs in females is greater than males because of the lack of alternatives to indwelling urinary catheters as well as the female anatomy wherein the urethra in females is shorter compared to males (Warren et al., 2020). Until the advent of the PureWick ECD there was no accurate means of monitoring a female's urine output other than the indwelling urinary catheter.

Purpose of Program Evaluation

Post LTACH implementation of the PureWick ECD, which has been consistently in use since December 2017, a program evaluation was conducted to determine if the PureWick ECD was an effective intervention that showed consistent and improved outcomes. The program evaluation evaluated and analyzed data relative to indwelling catheter utilization and CAUTI rates pre PureWick ECD implementation in December 2017 with the same rates subsequent implementation of the PureWick ECD. For the third quarter of 2017 the CAUTI rate was 2.3 per 1000 catheter days with an indwelling urinary catheter utilization rate of 0.38 (Organization Report, 2017). The target CAUTI rate is under 2.0 and indwelling urinary catheter utilization rate target is below .39.

Review of Literature

An electronic literature search utilizing CINAHL, PubMed, Google Scholar, and ProQuest was conducted. The search yielded 14 articles, 10 of which specifically addressed ECDs, six of which were specific to female devices, and one specifically addressed PureWick ECDs. There were additional articles that addressed the male ECD which is commonly referred to as a condom catheter. The articles spanned 2013 through 2020 and ranged from level III to V with good to high quality ratings based on the Johns Hopkins Nursing Evidence-Based Practice Evidence Level and Quality Guide.

Gray, Skinner and Kaler (2016) found that utilizing ECDs in urinary management bundles is a viable and necessary option to improve patient outcomes and reduce costs associated with CAUTIs. Specifically, Gray Skinner and Kaler (2016) found that an economic analysis determined that $5.7 billion could be saved if only 20% of hospital acquired infections were reduced. It was also determined that the initial investment of an ECD system, in a urinary management bundle, outweighed the cost of a CAUTI.

Five of the 14 articles provided strong evidence that indwelling urinary catheter utilization rates were reduced with the use of external collection devices. Based on a one-year project, beginning in 2017, Dublyn and Episcopia (2019) found that implementing an external collection device, in women, reduced indwelling urinary catheter utilization rates from 15.7% to 10.7%. Mueller (2019) found that there was a statistically significant reduction in indwelling catheter utilization rates based on the retrospective evaluation of a 394 acute care bed hospital occurring in 2018. Eckert et al. (2020) found that indwelling urinary catheter use was reduced after implementing a female external collection device in 2015. The pre device utilization rate for indwelling urinary catheters was 31.7% and by 2017 the rate was 26%. Kuzow et al. (2019) found that utilizing PureWick ECDs, over a 40-month time period, reduced the indwelling urinary catheter utilization rate from 70.5% to 64.1%. The most recent study conducted by Warren et al. (2020) found a reduction in indwelling urinary catheter utilization rates across all units from 0.16 to 0.14 with a more significant decrease in indwelling urinary catheter utilization rates in the intensive care unit with a decrease from 0.46 to 0.35.

There is limited research relative to utilization of alternative devices for indwelling urinary catheters in females. The study conducted by Warren et al. (2020) analyzed the largest sample size to date with greater than 222,000 patient days and was based on a hospital-wide

program. In this study it was determined that there was a decrease in CAUTI rates that coincided with increased use of external collection devices (Warren et al., 2020). They were unable to confirm a relationship between the two. Mueller (2019) also found that there was no significant reduction in CAUTI rates within the study of a 394-bed acute care hospital but felt the reduction in indwelling urinary catheter use warranted implementing use of an external urinary collect device.

One of the earliest studies by Grigoryan et al. (2014) found that the automatic switching from an indwelling catheter to an external catheter did not yield microbiological support to do so. The study found that samples collected from ECDs had a higher organism count than samples collected from indwelling urinary catheters. The higher organism count were predominately gram-positive organisms which is typically associated with perineal flora and calls into question the reliability of the method utilized to collect samples (Grigoryan et al., 2014).

In summary, the literature identified gaps and issues with reporting CAUTI rates, collecting urine samples in ECDs, and accurate data collection related to catheter utilization rates. The literature confirms that there are occasions that indwelling urinary catheter utilization and CAUTI rates decreased when external collection devices are utilized. The literature also supports a need to establish alternative approaches to urinary management in an attempt to reduce CAUTIs and establish proper protocols to collecting urine samples while these devices are in use.

Theoretical Frameworks Driving Improvement

The rationale for implementing this practice change was a result of modifications made to the National Patient Safety Goals (NPSGs). The NPSGs are developed by Joint Commission that serve as the foundation for an objective assessment process that can aid health care organizations

in measuring, assessing, and improving their results. The standards concentrate on critical patient care and organization functions that are essential to delivering secure, high-quality care (The Joint Commission, n.d.). The new practice of utilizing an external collection device was determined by hospital administration, with collaboration from their education specialist, to be an alternative to indwelling urinary catheter use. The goal of implementing this new device was to reduce indwelling urinary catheter utilization, thereby reducing catheter associated urinary tract infections (CAUTIs).

This program was evaluated utilizing the W. K. Kellogg Foundation Evaluation Guide which describes a framework wherein evaluation type, approaches, and the methodology is identified. W.K. Kellogg Foundation cites that this type of evaluation investigates whether the strategy implemented achieved the desired outcome (2017). In this program evaluation the type of evaluation utilized was an outcome evaluation and focused on if CAUTIs and indwelling urinary catheter utilization rates were consistently reduced after implementation of the PureWick ECD. In this program evaluation a "System-Oriented Evaluation" approach was utilized. A System-Oriented Evaluation, as per W.K. Kellogg Foundation, is one where the program is seen as a part of a system and sub system that affects the organization's ability to achieve its goals (2017). Finally, in relation to evaluation methodologies utilized in this program evaluation, which will focus on quantitative methods through data collection and case studies.

Actor Network Theory

The sociotechnical model to be utilized in assessing the impact of technology on this Program Evaluation-will be the Actor-Network Theory (ANT). Sociotechnical perspectives have been utilized in healthcare in an attempt to positively impact healthcare outcomes. As Cresswell, Worth and Sheikh (2019) noted "the underlying assumption underpinning the introduction of

information technology (IT) in healthcare is that improvements of information flow will translate into improved quality of care" and consequently, over time, technology, healthcare and humans have become increasingly intertwined (p. 1). To conceptualize the relationship between humans and technology the Actor Network Theory (ANT) considers that the world consists of networks which may include many actors (Cresswell et al., 2010). In this program evaluation all of the stakeholders were considered actors of the network.

In attempting to address the problem of CAUTIs in the LTACH, a network of actors exists and must be investigated collectively and individually. The technology utilized included reports generated from the electronic healthcare record (EHR) that identify the frequency of PureWick ECD use and appropriate use of associated healthcare bundles. The main actors in this network include the healthcare provider(s), the patient(s), the IT professionals, and clinical data management staff. The healthcare providers' use of the PureWick ECD was evaluated through analysis of reports generated from the EHR to ensure the device is being appropriately and consistently memorialized in the record. The patients are the key stakeholders as their utilization of the device and urinary infection rates were monitored.

Description of Program Evaluation

The purpose of the program evaluation at this Long-Term Acute Care Hospital (LTACH) is to determine if the implementation of PureWick ECDs reduced CAUTI rates and indwelling urinary catheter utilization. The PureWick ECD is a system that includes a soft flexible external catheter that wicks away urine and collects it into a cannister that is connected to the hospital wall vacuum (PureWick Corporation [PureWick], 2017).

After collaborating with the organization's education specialist, four aims were developed. The first Aim of this program evaluation was to evaluate the impact of implementing

PureWick ECDs on indwelling urinary catheter days. The objective of this aim was to determine if the total indwelling catheter days prior to implementing PureWick ECDs is affected in any manner after beginning use of the PureWick ECD.

The second program evaluation aim was to evaluate the impact of implementing PureWick ECDs on reducing CAUTIs. The objectives for this aim included examining and analyzing CAUTI rates pre PureWick ECD implementation versus post PureWick ECD implementation.

The third aim of this program evaluation was to evaluate the effectiveness of PureWick ECD on the overall urinary tract infection (UTI) rate. This established if the rate of UTIs is affected when a PureWick ECD is implemented. The objective of this aim is to measure the UTI rate in patients using the PureWick ECD.

The final aim of this program evaluation was to evaluate the consistency in using the PureWick ECD within the HAI Bundle and proposing recommendations. The objective of this aim was to analyze the consistency in which the staff utilizes the PureWick ECD within the HAI Bundle and likewise memorializes its use in the EHR.

Overview of Methodology

Program Evaluation

According to The Step-by-Step Guide to Evaluation by W.K Kellogg Foundation quantitative methods of data collection are utilized to determine what changes were brought in by organization's strategies, initiative or program (2017). In this program evaluation retrospective quantitative data was collected to provide descriptive statistics as well as observations made and recorded. The Kellogg model describes observations as quantified data through structured recording of actions, or inactions of participants in an evaluation (2017).

Based on the W.K. Kellogg Step-by-Step Guide to Program Evaluation a logic model identifying the inputs, activities, outputs, and outcomes was constructed for this project (see Appendix A: Logic Model). The logic model included inputs from the education specialist, nursing, and support staff, the EHR the PureWick ECD and data collected from the quality improvement committee. Initial, intermediate and long-term outcomes were identified with a reduction of CAUTI rates, utilization of indwelling catheters and feedback provided to the hospital relative to compliance with memorializing PureWick ECD use in the EHR.

Based on the type and approach of the program evaluation, as well as the Logic Model, the following evaluation questions have been created:

1. What changes has the PureWick ECD program caused or contributed to at this LTACH?
2. How did the PureWick ECD program cause or contribute to the changes in CAUTI and indwelling urinary catheter utilization rates at this LTACH?
3. How is the PureWick ECD utilized at this LTACH?
4. How is the PureWick ECD program going to be sustained at this LTACH?

Types of data collected

The pre PureWick ECD implementation period consisted of the 11 months prior to December 2017. This 11-month period served as a baseline for comparison to the CAUTI and indwelling urinary catheter utilization rates collected after implementation of the PureWick ECD. The post implementation period included the period beginning January 2018 through the third quarter of 2020, which was the data available at the time of the program evaluation. The data was collected by the hospital Quality Improvement Department through reviews of the EHR and provided in a Nursing Dashboard and Executive Report Card spreadsheet. The following

factors were identified: Patient days, indwelling urinary catheter days, indwelling urinary catheter utilization rates and CAUTI incidence. Patient days are defined as the number of days patients were present in the LTACH during the study period. The utilization rate was calculated based on the number of urinary catheter days divided by patient days x 100. The CAUTI rates were per 1000 catheter days and considered if an indwelling urinary catheter had been in place for two or more days and a urine culture returned with no more than 2 species or organisms and at least one organism with $\geq 10^5$ colony forming units per milliliter (CFU/ml).

In addition to obtaining the historical data to analyze the efficacy of the PureWick ECD data was collected through the EHR to determine consistency of use and documentation of the device. The EHR was reviewed to determine if the nursing staff were documenting the PureWick ECD in the location within the EHR as directed by the policy and procedure. The policy and procedure direct staff to create a dynamic group to note use of the PureWick in the section of the EHR titled “lines and tubes”. Review of several patient EHRs revealed PureWick dynamic groups were being added to the “genitourinary assessment” portion of the EHR rather than, or in addition to, the “lines and tubes” section. In collaboration with the IT department and data management staff a report was expected to be developed to isolate the two cells within the EHR where staff typically addressed the PureWick ECD. At the conclusion of this program evaluation the IT department had yet to produce the report.

In addition, relevant data was collected for all female patients over a 24-hour time frame. The data included identification of two locations within the EHR that nurses memorialized this device and one location where the patient care technicians recorded their care relative to the device. The findings of this chart review were placed within a spreadsheet to track and trend the consistency of using the PureWick ECD (see Table 1: 24-Hour Female Data Collection).

Collaboration with the Central Supply Department also returned data displaying the average number of PureWick ECDs purchased each month. And finally, the pharmacy department was able to provide information relative to the number of patients being treated for a UTI over the 24-hour period of 6/9/2021.

Results and Findings

Indwelling Urinary Catheter Utilization Rates

The target range for indwelling utilization rates is ≤.39. Review of the data prior to implementation of the PureWick ECD revealed a mean indwelling utilization rate of .33, a median of .33 and a standard deviation of .05. The post PureWick ECD implementation period revealed a utilization rate mean of .37, median of .36 and standard deviation of .04. The data was analyzed and placed on a box & whisker plot as well as a mixed bar and line (see Figure 1: Indwelling Catheter Utilization Rate Pre-Post PureWick). The analysis and demonstrative representation revealed that over time the indwelling utilization rate increased from its pre PureWick ECD period.

The addition of 27 hospital beds to this facility in October 2019 could be a potential explanation for this unanticipated finding. Based on the collected data there is an inability to determine if the spike in indwelling urinary catheter utilization was a consequence of the additional beds, which included six additional intensive care unit (ICU) beds and 21 progressive care unit (PCU) beds, or a lack of using the PureWick ECD. The addition of these beds increased the patient acuity and possibly affected the indwelling urinary catheter utilization rates. Additionally, beginning in March 2020 the COVID-19 pandemic presented and resulted in a

higher acuity of patients' being admitted to this LTACH. It is possible this higher acuity patient population also resulted in an increased need for utilizing indwelling urinary catheters.

Catheter Associated Urinary Tract Infections (CATUIs)

The data suggests that implementing the PureWick ECD has coincided with a reduction in the CAUTI rates at this LTACH. The target range for CAUTI rates is ≤2.0. Review of the data prior to implementation of the PureWick ECD revealed a mean CAUTI rate of 3.1, a median of 2.9 and a standard deviation of 1.83. The post PureWick ECD implementation period revealed a CAUTI mean of 1.25, median of 1.1 and standard deviation of 1.27 which represents a reduction in CAUTI rates. The data was analyzed and placed on a box & whisker plot as well as a mixed bar and line (see Figure 2: CAUTI rate pre-post PureWick). The analysis and demonstrative representation revealed that over time the CAUTI rate decreased from its pre PureWick ECD period.

Purewick ECD Effectiveness

Review of 33 female patient charts, over a 24-hour period revealed that two patients were being treated for UTIs. Both patients suffering from UTIs utilized an indwelling urinary catheter (see Figure 3: 24-Hour Female Urinary Method). Historical data could not be obtained to determine the UTI rate in non-indwelling urinary catheter patients, or patients' using the PureWick ECD, as the facility did not maintain that information. According to the CDC, although a UTI associated with a PureWick ECD would be considered a device associated infection, CAUTI rates reported to NHSN only include those related to the use of an indwelling urinary catheter. (CDC guidelines – updated 6/9/2019).

Consistency of the PureWick ECD Use

Analysis of the EHR revealed that staff does not consistently document use of the PureWick ECD or the frequency in which the wick is being changed. Of 33 female patient charts analyzed, 18 utilized the PureWick ECD. Four documentation processes were analyzed to determine if staff, nurses and PCTs, documented use of the PureWick ECD appropriately. First, a dynamic group was to be opened in Cerner under lines and tubes, then reference to changing the wick would need to be noted at least once per shift by the nurse. The nurse also was to note the method of urinary elimination under the genitourinary assessment as PureWick ECD. The PCTs had a separate part of the EHR where toileting was memorialized and use of the PureWick ECD likewise noted. In the current practice, PCTs do not have a field where they can note the changing of the wick.

Review of the 18 EHR records revealed that documentation for only four patients met all four documentation processes necessary to demonstrate a complete and accurate record. Four patients had a nurse note urinary method of elimination was the PureWick ECD, had a dynamic group opened, two changes of the wick over 24 hours and the PCT documented the device as the means for toileting. Seven patients had zero wick changes over 24 hours and six had just one wick change over 24 hours. It is noteworthy that the documentation conducted by the PCT revealed they were most consistent as they appropriately documented on 15 of the 18 patients.

According to the central supply department at this LTACH 1,440 wicks are ordered per month. On average, based on the number of wicks ordered by the central supply department, approximately 46 wicks are used per day. In the 24-hour period, the documented record showed only 16 wicks were utilized. Had all 18 patients had their wick replaced, just once per shift, that would account for 36 wicks, which is consistent with the number utilized on average per the ordering pattern of this LTACH.

Limitations

The specific population (LTACH female patients) was a project limitation. This limitation affects the ability to generalize these findings to other patient populations. Additional limitations include the lack of data available to analyze UTI rates in patients not utilizing indwelling urinary catheters as well as the ability to separate the existing data between male and female patients.

Summary, Conclusion and Recommendations

From the collected data it is evident that the CAUTI rates had an overall reduction after the implementation the PureWick ECD while the indwelling urinary catheter utilization rates increased over time. It is noteworthy that in quarter 3 of 2019, which corresponds to an increase in indwelling urinary catheter utilization rates, this hospital added an additional 27 beds, 10 of which were intensive care unit beds and 17 that were progressive care unit beds. The increase in hospital beds, and the higher acuity patients could account for the increased utilization of indwelling urinary catheter utilization as this patient population would warrant close monitoring of urinary output. An additional reason for the increase in indwelling urinary catheter utilization could be the increased patient acuity presenting in early 2020 as the COVID-19 pandemic began to affect the patient population. A combination of increased beds and increased complexity of the patients, coupled with newly hired nursing staff is likely a reason for the increased indwelling urinary catheter utilization rates. The data also suggests that the PureWick ECD is not consistently recorded in the EHR and changes of the PureWick ECD are not being memorialized as expected.

While the CAUTI rate decreased, the indwelling catheter utilization rate increased over time, therefore it would seem that there is evidence to recommend continuing the PureWick ECD

component of this facility's HAI bundle. It would be strongly recommended to include both CAUTI and utilization rates in pre-shift huddles to inform the staff that these quality indicators are being monitored. In response to the increase in utilization rates it would be beneficial to provide updated staff training on the nurse driven protocol for removal of indwelling urinary catheters. Additionally, it would be beneficial to analyze the frequency in which male ECDs are being utilized.

It would be beneficial to update the policy and procedure relative to the HAI bundle that includes the use of the PureWick ECD. Currently the policy and procedure direct staff to open a dynamic group for the device in lines and tubes and does not address, a clear documentation section where nurses should chart if the PureWick ECD is changed throughout the shift. Additionally, there is no directive within the policy and procedure regarding the PureWick ECD in the genitourinary assessment, yet there is a dropdown located in that portion of the EHR to address the device. Finally, considering the data that revealed PCTs are most consistent in their documentation of the patient's method of urinary elimination it should be considered to have the policy allow for PCT's to note PureWick ECD changes in addition to their notation of urinary output methods.

Efforts should be considered to improve the charting irregularities identified relative to use of the PureWick ECD noted during the audit of the EHR. The improvement plan should include ensuring the use of the PureWick ECD is consistently documented between the licensed nurses as well as the PCTs. The charting irregularities could be addressed through a quality improvement initiative where data management team members conduct chart audits to monitor compliance of the PureWick ECD as defined in the policy and procedures.

Feedback from stakeholders is an important element of a program evaluation (W.K. Kellogg Foundation, 2017). It would be beneficial to obtain feedback from the nurses, PCTs and patients regarding use of the PureWick ECD. The PCTs and nurses could provide insight as the frequency that the PureWick ECD is being changed and why it is not being documented in a consistent frequency. With the challenge associated with COVID-19 and facility requirements no patient interviews could be conducted. Soliciting information from this valuable stakeholder could assist in striving for future improvement in the use of the PureWick ECD.

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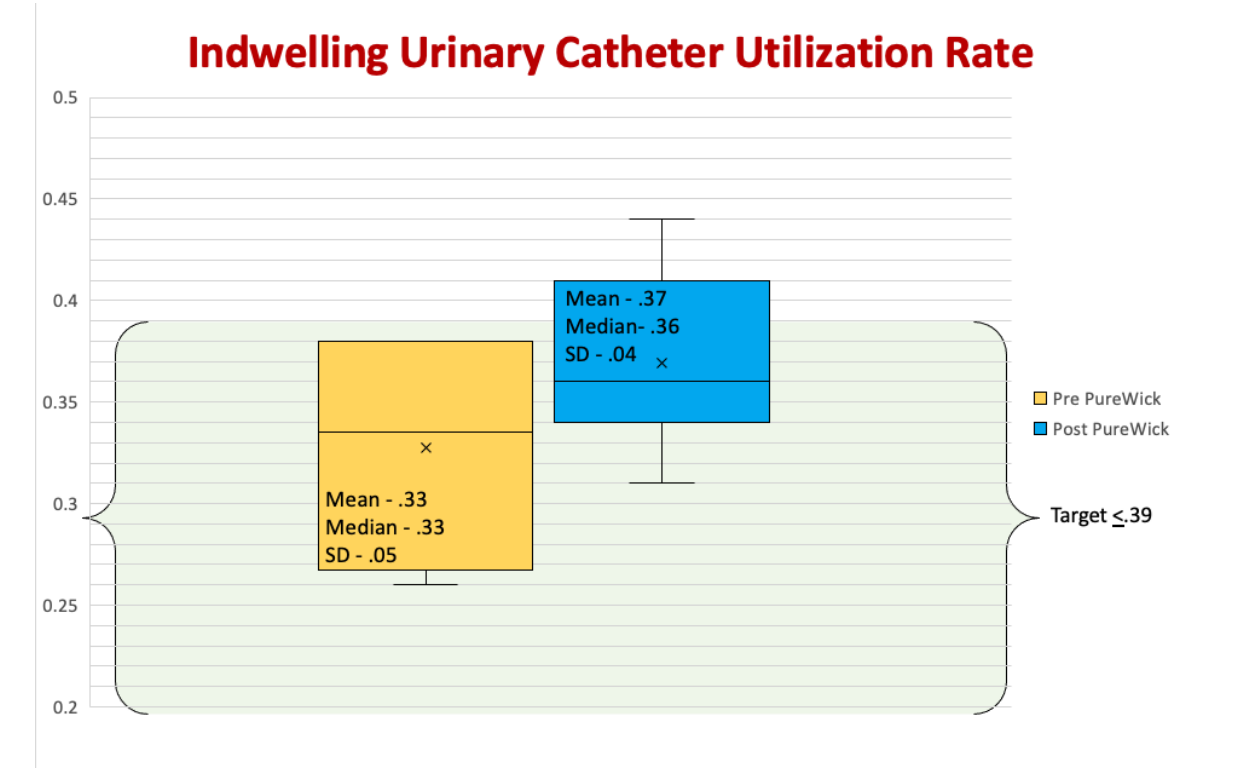
Table 1: 24-Hour Female Data Collection

Room #	Age	PureWic	Details per GU Assessment	Was Dynamic Group open in Lines	Was PureWick Changed	PCT Care / Toileting	Meet Charting Requirements	
119	65	YES	Method - ECD x 2	Yes	x2	ECD / Incontinent	YES	
121	76	YES	Method - ECD x 2	Yes	x0	ECD / Bedside commode		
123	83	YES	Method - ECD x 2	Yes	x1	ECD		
124	75	YES	Method - ECD x 2	Yes	x1	ECD		
129	85	NO	Incontinent	For Indwelling	N/A	Indwelling		
201	78	YES	Method - ECD x 2	Yes	x2	ECD / Bedside commode	YES	
203	73	YES	Continent	Yes	x2	ECD / Bathroom		
205	72	NO	Continent	N/A	N/A	Bathroom		
206	61	YES	Method - ECD x 2	Yes	x1	ECD / Bedside commode		
207	70	YES	Method - ECD x 1	Yes	x1	ECD / Incontinent		
216	59	NO	Indwelling	For Indwelling	N/A	Indwelling		
218	64	YES	Method - ECD x 1	Yes	x0	ECD		
219	61	YES	Method - ECD x 2	NO	x0	ECD / Incontinent		
220	70	NO	Continent	N/A	N/A	Bathroom		
221	68	YES	Incontinet x 2	Yes	x0	Incontinent		
223	63	YES	Method - ECD x 1	Yes	x0	ECD		
225	67	YES	Method - ECD x 1	Yes	x0	ECD		
226	48	NO	Indwelling	For Indwelling	N/A	Indwelling		MDRO - UTI
227	49	NO	Continent	N/A	N/A	Bathroom		
228	20	NO	Continent	N/A	N/A	Bed pan		
14	81	YES	Method - ECD x 2	Yes	x2	ECD / Incontinent	YES	
16	43	NO	Continent	N/A	N/A	Bedside commode		
18	74	NO	Incontinent	N/A	N/A	Incontinent		
23	78	YES	Method ECD / Continent	Yes	x0	Conntinent / Bathroom		
24	67	NO	Nephrostomy	For Indwelling	N/A	Ostomy		
26	73	NO	Indwelling	For Indwelling	N/A	Indwelling		UTI
101	84	NO	Suprapubic	For Indwelling	N/A	Indwelling		
102	68	NO	Continent	N/A	N/A	Bathroom		
104	65	YES	Method - ECD x 2	Yes	x1	ECD / Bed pan		
107	61	YES	Method - ECD x 2	Yes	x2	ECD / Incontinent	YES	
109	76	NO	Indwelling	For Indwelling	N/A	Indwelling		
110	77	YES	Method - ECD x 2	Yes	x1	Incontinent / Ostomy		
112	86	NO	Indwelling	For Indwelling	N/A	Indwelling		

Figure 1: Indwelling urinary catheter utilization rates pre-post PureWick



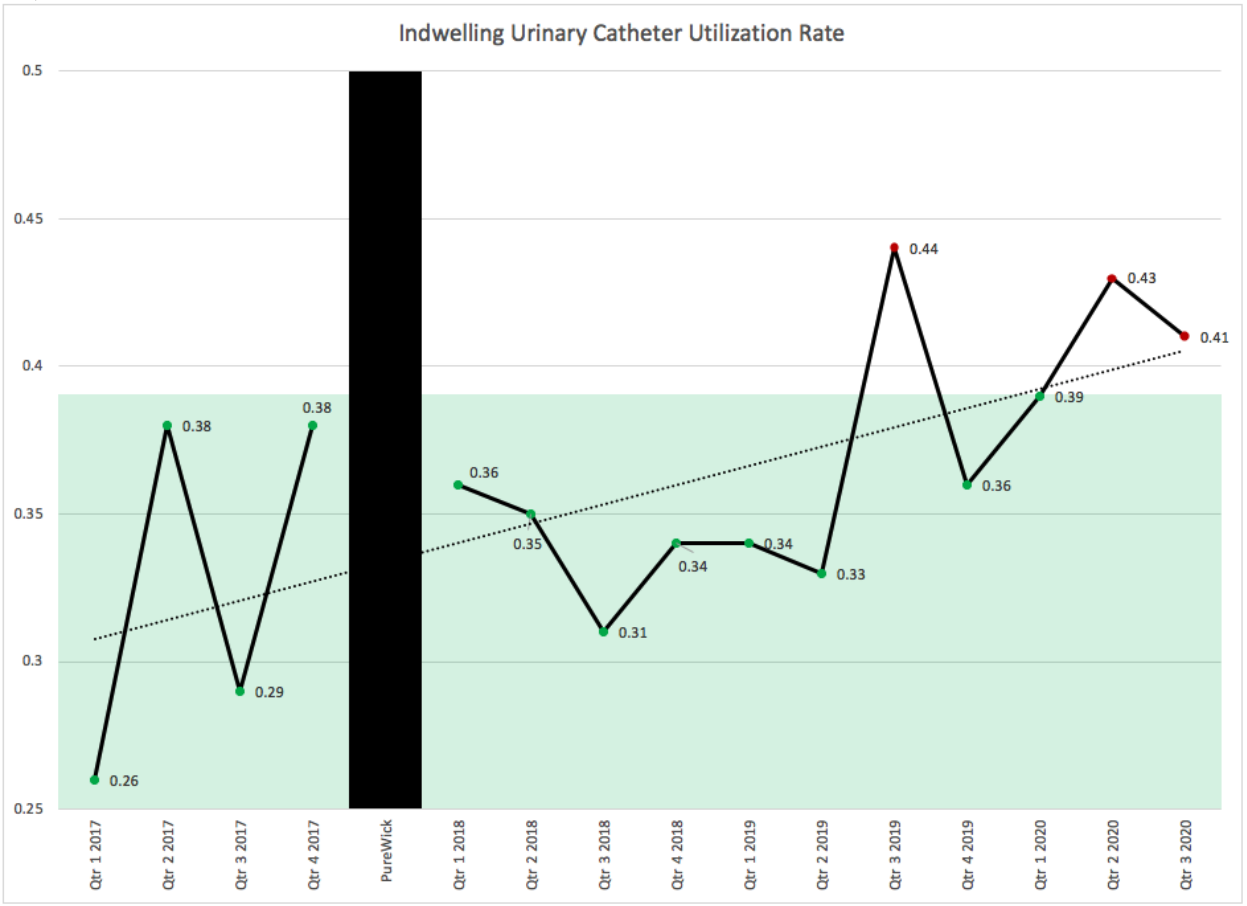


Figure 2: CAUTI rates pre-post PureWick

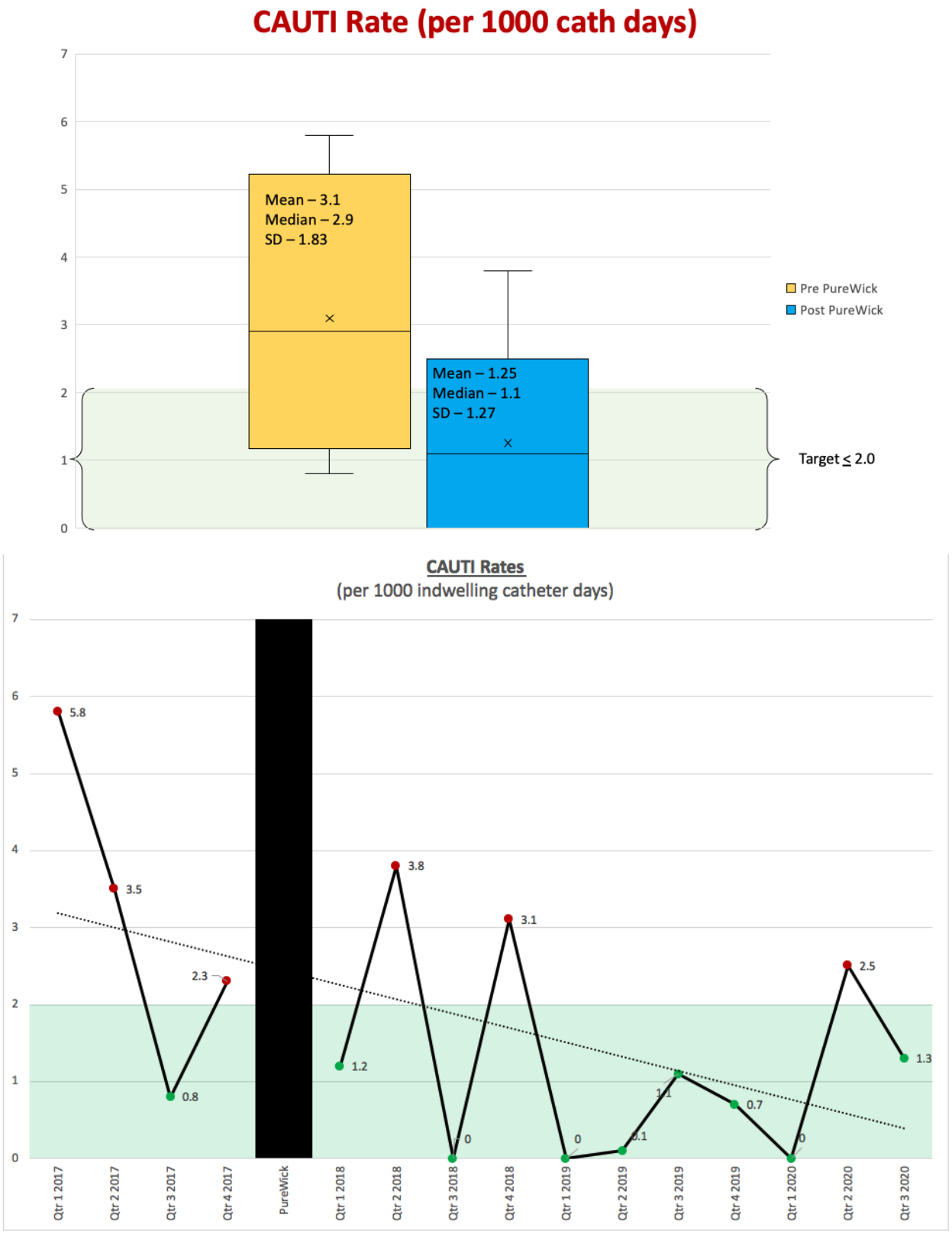
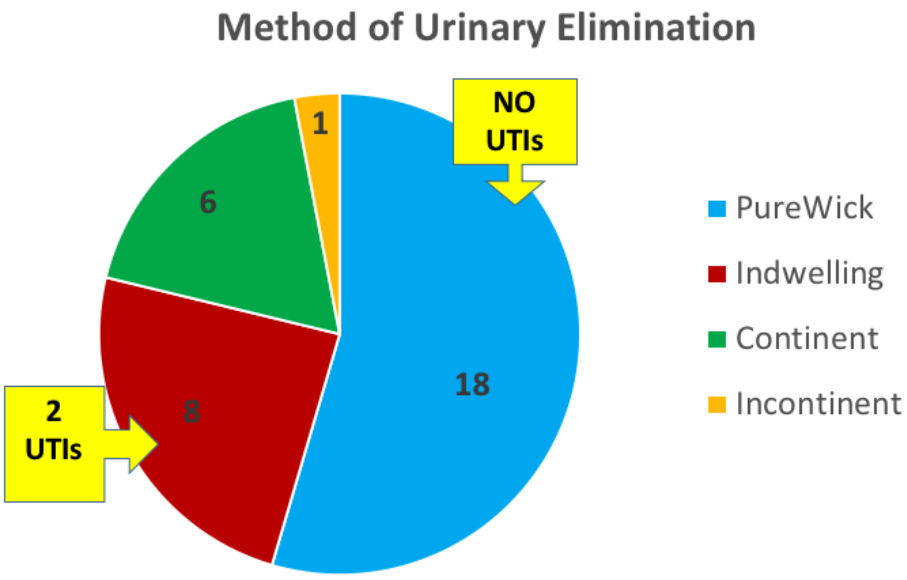


Figure 3: Method of Urinary Elimination



Appendix A

Logic Model

<table>
<tr><th colspan="4">LOGIC MODEL</th></tr>
<tr><td colspan="3">Program Implementation</td><td>Intended Outcomes</td></tr>
<tr><td>Inputs</td><td>Components/Implementation Activities</td><td>Outputs</td><td rowspan="2"><u>Initial Outcome:</u>
Identify staff utilization of PureWick ECD

<u>Intermediate Outcome:</u>
Reduced indwelling catheter utilization rates

Consistent use of PureWick ECD

<u>Long Term Outcome:</u>
Continued reduction in indwelling catheter utilization rates and use of PureWick ECD

Reduced CAUTI rates

Feedback to hospital of consistency PureWick is utilized & recorded in EMR.</td></tr>
<tr><td>Education Specialist

Time

Nursing and Support Staff

Electronic Medical Record

QI Data Collection Tools (Nursing Dashboard and Executive Report Cards)

PureWick External Collection Device system</td><td><u>Work Flow</u>
- Develop criteria for PureWick ECD use
- Develop procedure for PureWick ECD use
Education
- re: HAI/CAUTI rates
- Training inservices
- Designate onsite resource
Resources
- Partner with supplier to identify primary rep
Data
- Collect UR of Indwelling catheter use
- Collect CAUTI rates
- Collect frequency PureWick ECD is utilized</td><td>Creation of P&P relative to PureWick ECD

Creation of staff training material inclusive of staff competency check off

Identify PureWick ECD as primary resource

Describe pre & post PureWick ECD indwelling UR & CAUTI rates

Describe consistency that PureWick ECD is recorded in EMR</td></tr>
<tr><td colspan="2"><u>Assumptions</u>:
- Staff will be able to apply PureWick ECDs
- CAUTI rate in men will not be affected therefore effect of Hospital CAUTI rates will be limited to females</td><td colspan="2"><u>External Factors:</u>
- Some patients will refuse PureWick ECD
- Some patients may not be appropriate for use of PureWick ECD</td></tr>
</table>

Note: Developed based on the W.K. Kellogg Step-by-Step Guide to Program Evaluation (2017) The step-by-step guide to evaluation. http://ww2.wkkf.org/digital/evaluationguide/view.html#p=1