

# Addressing the risk of CAUTI without the catheter

**Carmen R. Davis MSN, RN, CCRN, CNS-BC**  
Clinical Nurse Specialist and Consultant

**Terrie Beeson, MSN, RN, CCRN, ACNS-BC**  
Clinical Nurse Specialist and Consultant

26239

## Disclaimers

- Consultant for Sage Products LLC, now part of Stryker

26239

## Objectives

- Discuss etiology of CAUTI development and gaps in current practice
- Review steps of implementation of catheter avoidance and prompt removal initiatives

26239

## CAUTI Prevalence and Incidence

- One of the most common healthcare acquired infections (HAIs)- nearly up to 40% of all HAIs<sup>1</sup>
- 70% urinary catheter associated HAIs; up to 95% in the intensive care setting<sup>1</sup>
- Approximately 20% of hospital patients have urinary catheter at some point in their stay
- Risk for bacteremia with indwelling catheter increases 3-10% per day

1. Saint, S., Kowalski, C., Kaufman, S., Hofer, T., Kauffman, C., Olmsted, R., Forman, J., Banaszak-Holl, J., Damschroder, L. and Krein, S. (2008). Preventing Hospital-Acquired Urinary Tract Infection in the United States: A National Study. *Clinical Infectious Diseases*, 46(2), pp.243-250.

2. Chenoweth, C., Gould, C. and Saint, S. (2014). Diagnosis, Management, and Prevention of Catheter-Associated Urinary Tract Infections. *Infectious Disease Clinics of North America*, 28(1), pp.105-119.

26239

## Associated CAUTI Costs

- Catheter associated urinary tract infections (CAUTIs) are associated with increased morbidity, mortality, and costs
  - Inpatient ICU charges to Medicare up to \$10,000
  - Inpatient non-ICU charges to Medicare up to \$1700
  - 2009 annual cost estimated \$340 million; today annual cost nearing 1.7 billion
- Specific patient impact---
  - Discomfort r/t to mild signs of infection
  - Potential urethral trauma
  - Embarrassment
  - Lack of antibiotic stewardship
  - Pyelonephritis
  - Urosepsis leading to potential death

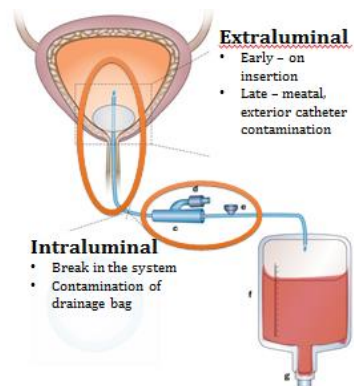


Hollenbeak, C. and Schilling, A. (2018). The attributable cost of catheter-associated urinary tract infections in the United States: A systematic review. *American Journal of Infection Control*, 46(7), pp.751-757.

26239

## Etiology of CAUTI Development

- Extraluminal
  - Contamination by direct contact during insertion
  - Organisms travelling upward from perineum by capillary action in the thin mucous film adjacent to the external catheter surface
- Intraluminal
  - Microorganisms gaining access via reflux to the catheter lumen from break of closed drainage or contamination of urine in the collection bag



Maki, D. (2001). Engineering out the Risk of Infection with Urinary Catheters. *Emerging Infectious Diseases*, 7(2), pp.342-347. Tambyah, P., Halvorson, K. and Maki, D. (1999). A Prospective Study of Pathogenesis of Catheter-Associated Urinary Tract Infections. *Mayo Clinic Proceedings*, 74(2), pp.131-136.

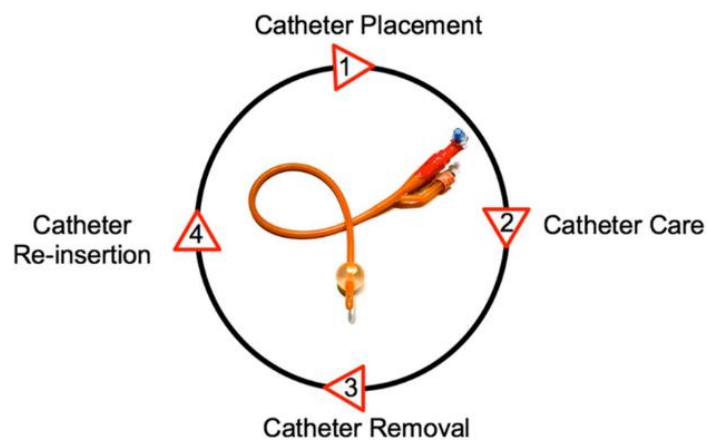
26239

## Practice Recommendations

- SHEA/IDSA Practice Recommendation (2014)
  - [http://www.icpsne.org/SHEA%202014%20Updated%20CAUTI%20Prevention%20Guidelines%20\(1\).pdf](http://www.icpsne.org/SHEA%202014%20Updated%20CAUTI%20Prevention%20Guidelines%20(1).pdf).
- APIC Guide to Preventing Catheter Associated Urinary Tract Infections (2014)
  - [http://apic.org/Resource/\\_/EliminationGuideForm/0ff6ae59-0a3a-4640-97b5-eee38b8bed5b/File/CAUTI\\_06.pdf](http://apic.org/Resource/_/EliminationGuideForm/0ff6ae59-0a3a-4640-97b5-eee38b8bed5b/File/CAUTI_06.pdf).
- CDC CAUTI Guideline (2009)
  - <https://www.cdc.gov/infectioncontrol/guidelines/cauti/index.html>.
- ANA CAUTI Prevention Tool
  - <http://nursingworld.org/ANA-CAUTI-Prevention-Tool>.
- AHRQ Toolkit for Reducing Catheter-Associated Urinary Tract Infections in Hospital Units (2014)
  - <https://www.ahrq.gov/professionals/quality-patient-safety/cusp/index.html>.
  - CUSP Toolkit
  - Team Steps

26239

## Disrupting the Life Cycle of the Urinary Catheter



Meddings, J. and Saint, S. (2011). Disrupting the Life Cycle of the Urinary Catheter. *Clinical Infectious Diseases*, 52(11), pp.1291-1293.

26239

## **Practice Recommendations: Before Insertion**

- Bedside commode/bedpan, urinal, or breathable or other absorbent under pads
- Bladder scanner
- I&O catheterization
- External catheters- male and female

26239

## **Indications for Use**

- Insert indwelling urinary catheters (IUC) only for appropriate indications
  - Patient has acute urinary retention or bladder outlet obstruction
  - Need for accurate measurements of urinary output in critically ill patients
- Perioperative use for selected surgical procedures:
  - Urologic surgery
  - Anticipated prolonged duration of surgery (IUC should be removed in PACU)
  - Anticipated to receive large volume infusions or diuretics during surgery
  - Need for intraoperative monitoring of urinary output
- To assist in healing of open sacral or perineal wounds in incontinent patients
- Patient requires prolonged immobilization (unstable spine, multiple traumatic injuries)
- Comfort in end-of-life care

26239

## Practice Recommendations: Insertion

- Verify appropriate indication to place indwelling catheter
- Placement of indwelling urinary catheters by trained, dedicated personnel
  - 2 person placement
  - Evaluation resources- companies available to assist with this
  - Checklists for redundancy and to verify technique- simple vs complex
- Good system for documenting in the EMR

26239

## Practice Recommendations: Maintenance

### Urinary Catheter Bundle

Properly secure after insertion to prevent movement and urethral traction

Maintain a sterile, continuously closed system

Replace catheter and collecting system when breaks in system occur

Maintain unobstructed flow (below bladder, no dependent loops)

Employ routine hygiene

For examination of fresh urine, by collecting urine from the needleless sampling port with sterile syringe after cleansing port with disinfectant

Obtain larger volumes of urine for special testing aseptically from drainage bag

26239

## Practice Recommendations: Removal

- Implement institutional policies and protocols to aid in early removal/unnecessary catheters that may include but not be limited to the following:
  - Daily review of necessity (via huddles or inter-professional rounds)
  - Electronic reminders in the electronic medical record
  - Nurse directed catheter removal
  - Develop protocol for management of post-op urinary retention
    - Nurse directed I&O procedures
    - Bladder scan use
- Consider alternatives

26239

## External Management Systems



26239

## Challenges with External Urine Collection Devices

### Female

- Limited options
- Materials used in development of early devices used rubber and were held in place with belts and straps
- Other previous devices had inserts into the vagina
- Systems that used adhesive barriers on the labia

### Male

- Skin irritation and maceration
- Difficult to keep the condom from falling off/retraction of the penis or decrease size
- Ischemia and penile obstruction/tightness
- Adherence: requires securement on the shaft & adhesive mechanisms are challenging

Gray, M., Skinner, C. and Kaler, W. (2016). External Collection Devices as an Alternative to the Indwelling Urinary Catheter. *Journal of Wound, Ostomy and Continence Nursing*, 43(3), pp.301-307.

Pieper, B. and Cleland, V. (1993). An External Urine-Collection Device for Women. *Journal of Wound, Ostomy and Continence Nursing*, 20(2), pp.51-55.

26239

## External Female Management System: PrimaFit™


- How does it work?
  - Easy connection for suction tubing
  - Gentle silicone adhesive to help keep device in place
  - Soft fabric to help wick away moisture and divert urine from the skin
  - Flexible spine that contours patient anatomy and maintains shape for duration of use
  - Tapered end cap fits in perineal area to secure device in position



26239




# Our Story



An Innovative Technique for Managing Female Urinary Incontinence in Acute and Critically Ill Women


Terrie Beeson MSN RN CCRN ACNS-BC and Carmen Davis MSN RN CCRN CNS-BC

Indiana University Health, University Hospital



### Introduction

Reducing the usage of urinary catheters is the leading prevention approach to decreasing hospital acquired urinary infections. Without a catheter some females may have urinary incontinence leading to sequelae of problems such as infection, skin injury, pain/discomfort, loss of dignity. Therefore prudent alternatives are needed for female urinary incontinence management. The purpose of this evaluation was two-fold: 1) to determine device functionality and to solicit ideas for device improvement 2) to explore workflow impact on nursing practice with use of a urine management system in acute and critically ill women.



### Methods

Data collection surveys were developed by content experts and distributed to nursing staff who utilized the device in one of four designated units in a tertiary academic medical center. The first survey was a five item Likert scale evaluation with a narrative section for comments on how to enhance the device wear and utilization. The second survey was a device utilization and experience survey created to examine nursing practice. This included 10 multiple choice items targeting initiation and management of device usage.

PRODUCT EVALUATION (13 RESPONSES)	Agree	N/A	Disagree
1. This product helped to manage female urinary incontinence.	100%	0%	0%
2. This product was easy to place on a female patient.	100%	0%	0%
3. This product stayed in place.	100%	0%	0%
4. This product had minimal leakage.	92%	0%	8%

### Results

In the first survey, 100% of 13 nurses surveyed agreed that "This product helped to manage female urinary incontinence." Other nursing staff reported that the device was effective in maintaining skin integrity. There were a total of 40 responses for the second survey, utilization and experience. 100% of the nurses documented appropriate urine collection and overall appropriate management of the device.

PRODUCT UTILIZATION & EXPERIENCE SURVEY (40 RESPONSES)	Yes	No
Have you ever observed any skin injuries or pressure injuries from the use of the collection device?	92.5%	7.5%
If frequent stooling is an issue, would you use a collection device in conjunction with bowel management devices?	95%	5%

### Conclusions

These findings suggest use of a urine management system as a viable alternative for female urinary incontinence in a broad range of patient sizes and body habits, thus reducing the need for an urinary catheter. Increased nursing and patient satisfaction resulted as the urine management system was often requested from patients.

### References

Prevention, CDC. Urinary Tract Infection (Catheter-Associated Urinary Tract Infection (CAUTI) and Non-Catheter Associated Urinary Tract Infection (UT-CAUTI) in Long-Term Care Settings. *System Infection/UTIs: Evidence Centers for Infection Control and Prevention*. 2017.

Gray M. Reducing catheter-associated urinary tract infection in the critical care unit. *Adv Crit Care Nurs*. 2012;27(4):25-35. doi: 10.1097/CCN.0b013e31824188b3[PubMed] [Full Text] [Epub Date].

Gray M, Beecher D, Stoll SE, et al. Incontinence-associated dermatitis: a comprehensive review and update. *J Wound Ostomy Continence Nurs*. 2012;29(1):61-74. doi: 10.1097/WON.0b013e31824188b3[PubMed] [Full Text] [Epub Date].

Wentz J, Senechal A. Prevalence of incontinence and associated skin injury in the acute care population. *J Wound Ostomy Continence Nurs*. 2007;24(1):24-30. doi: 10.1097/WON.0b013e318027050a[PubMed] [Full Text] [Epub Date].

Bass CC, Matheson MG, Grunich D, et al. Incidence and Predictors of Incontinence-Associated Skin Damage in Nursing Home Residents With Bowel-Outlet Incontinence. *J Wound Ostomy Continence Nurs*. 2017;34(2):165-71. doi: 10.1097/WON.0000000000000201 [PubMed] [Full Text] [Epub Date].

### Acknowledgements

Indiana University Health, University Hospital, ICU, SPO, MICU, & MICU/ICU  
 The preparation of this poster was supported in part by funding provided by Sage Products, LLC.

26239

# The Impact

Pre/Post Comparison Using Female External Device		
	Before	After
CAUTI Incidence	2.55	0.7
SIR ratio	1.395	0.381
Indwelling Catheter Days		↓ 9%

26239

## **Building the Case for Use of Alternatives**

- CAUTI reduction
- Decreased urinary catheter (device) days
- Patient satisfaction
- Clinician satisfaction
- Reduce incontinence associated dermatitis incidence

26239

**What should you do to get started?**

26239

**Questions?**

Thank you!

26239

**stryker**



**FocusRN**  
Created for nurses, by nurses.

For more information and  
educational opportunities  
please visit our website!

**FocusRN.Stryker.com**

26239