

How I Do It: PureWick female external catheter: a non-invasive urine management system for incontinent women

Alex Uhr, MD,¹ Lydia Glick, BS,¹ Suzanne Barron, CRNP,¹ Jillian Zavodnick, MD,² James R. Mark, MD,¹ Patrick Shenot, MD,¹ Alana Murphy, MD¹

¹Department of Urology, Thomas Jefferson University Hospital, Philadelphia, Pennsylvania, USA

²Department of Internal Medicine, Thomas Jefferson University Hospital, Philadelphia, Pennsylvania, USA

UHR A, GLICK L, BARRON S, ZAVODNICK J, MARK JR, SHENOT P, MURPHY A. How I Do It: PureWick female external catheter: a non-invasive urine management system for incontinent women. *Can J Urol* 2021;28(3):10669-10672.

Catheter associated urinary tract infections (CAUTIs) are common hospital-acquired infections and remain a significant medical and financial challenge to the healthcare system. Despite this risk, incontinent women

may require prolonged catheterization to accurately monitor urine output and prevent skin breakdown. The PureWick Female External Urinary Catheter is a promising non-invasive urine collection system for use in incontinent women that may help reduce CAUTI rates, maintain skin integrity, accurately quantify urine output, and avoid extra healthcare costs.

Key Words: catheter associated UTI (CAUTI), urinary incontinence, female external collection device

Introduction

Catheter associated urinary tract infections (CAUTIs) are commonly reported in literature and remain a significant medical and financial burden on the

healthcare system.¹ Up to 80% of hospital-acquired infections may be attributed to an indwelling urethral catheter, and up to 16% of inpatients will require a catheter at some point during admission.^{2,3} One economic analysis attributed the cost per CAUTI in the United States to range from \$589-\$1007.⁴ Significant preventative efforts have been made to address this problem. Proposed strategies focusing on indwelling catheter avoidance include programmed reminders to discontinue catheters, nursing-driven initiatives for catheter removal, and external urinary collection

Accepted for publication April 2021

Address correspondence to Dr. Alex Uhr, Department of Urology, Thomas Jefferson University Hospital, 1025 Walnut Street, Suite 1100, Philadelphia, PA 19107 USA



Figure 1. Components of the PureWick system include the wick external catheter and a vacuum station with a collection canister. **A)** Depicts the external catheter. **B)** Shows the device with all components assembled. Image courtesy of C.R. Bard, Inc.

devices.^{5,6} Despite infection risk, incontinent women may require prolonged catheterization to accurately monitor urine output and prevent irritation dermatitis. External urinary collection devices have long been used in males, but have been less successfully utilized in female patients. As a result, incontinent females without an indwelling catheter are more prone to skin irritation and breakdown, burning, itching, or infection.⁷

The PureWick Female External Catheter (C. R. Bard, Inc, Covington, GA, USA) is a non-invasive urine collection system designed for incontinent women that allows urine evacuation from the skin to avoid irritation and stores it in a collection canister for quantification. This article serves as an introduction to urologists for this novel device.

Method and technique

The PureWick urine management system is indicated for incontinent women as an alternative to indwelling

catheterization to collect urine. It is contraindicated in patients with urinary retention who require traditional catheterization.⁸ Benefits include the ability to use the system in a variety of positions, including while recumbent, on one's side or seated - making it ideal for patients with a range of mobility constraints. The complete device consists of a soft and flexible wick external catheter, a portable vacuum station to be used if wall suction is unavailable, and a collection canister, Figure 1.

Instructions for use consists of 6 steps:⁹

Setup

1. Connect collection canister to wall suction and set to a minimum of 40 mmHg continuous suction. If using at home, connect canister to portable vacuum station.
2. Connect the wick external catheter to the collection canister.

*The quick setup guide is depicted in Figure 2.

Placement

3. Perform perineal care and assess skin integrity. Separate legs, gluteus muscles, and labia. Palpate pubic bone as anatomical marker.

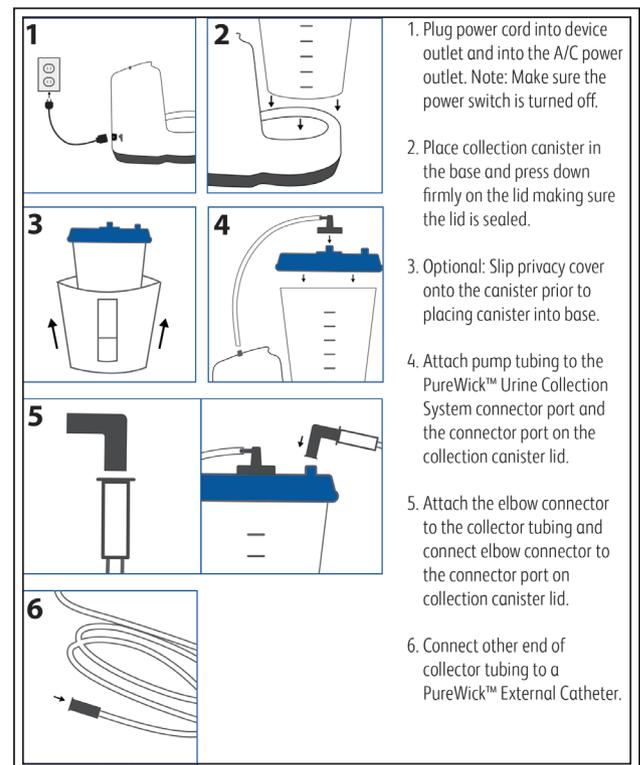


Figure 2. PureWick quick setup guide. Image courtesy of C.R. Bard, Inc.

4. With soft gauze side facing patient, align distal end at gluteal cleft. Gently tuck soft gauze side between separated gluteus and labia. Make sure wicking material is touching skin. Slowly place legs back together.

Removal and maintenance

5. Fully separate the legs, gluteus, and labia. To avoid potential skin injury upon removal, gently pull the catheter directly outward. Ensure suction is maintained while removing to avoid urine backflow.
6. Replace every 8-12 hours or if soiled with feces or blood as needed. Assess skin integrity with each change.

Helpful tips

It is important to consider several procedural elements when using this system. To minimize skin injury, avoid pushing or pulling the collection tip against the skin during removal or placement, and never insert the tip into the body. Avoid use with a bedpan or other device as this may impede optimal functioning. Mesh underwear may be useful for securing the device in certain patients. Assess device placement regularly to ensure proper functioning and safety, as well as skin integrity.^{8,9}

Conclusion

CAUTIs are common causes of hospital-acquired infections and remain a challenge to manage, both medically and financially. In many cases, these are preventable infections and alternatives to indwelling catheterization can reduce the infection risk. In men, the use of external urinary drainage systems has shown efficacy in reducing CAUTI rates. Saint et al compared men managed by an indwelling catheter to men using an external catheter and reported a lower hazard ratio for bacteriuria or symptomatic UTI (hazard ratio – 4.84; 95% confidence interval = 1.46-16.02).¹⁰ However, although the use of non-invasive catheters in men has been validated, review of external drainage in women is less robust. One study found significant reductions in the rate of indwelling catheter use, as well as female CAUTIs, following introduction of the Purewick device for urinary management.¹¹ Our institution is collecting data on CAUTI rates after the introduction of this device. More research is required to address this intervention in women, but any avoidance of indwelling catheterization would be expected to decrease the rate of CAUTI, and Saint et al's data in males suggests patient harm can be avoided as well. In incontinent women, the risks of prolonged catheterization must be weighed against the

risks of urinary leakage, particularly skin irritation and dermatitis. The PureWick system is a novel external urine collection device that may help reduce CAUTIs in women, and simultaneously maintain skin integrity in this population. Importantly, although there may be benefit from keeping incontinent patients dry, there is also potential for pressure related injuries. For this reason, we recommend nursing and physician education on product use, as well as regulatory evaluation by nursing staff to ensure skin integrity is maintained.

In addition to increased patient morbidity and even mortality, CAUTIs have a significant financial impact on the health system. Tran and Rodrigue performed a cost-benefit analysis of using PureWick at a single institution in 12 incontinent female patients. They reported the average cost per CAUTI per patient to be about \$1000, and the cost of incontinence bed pads to be about \$4.38 per day compared to total cost of using PureWick per day to be about \$23.82. The potential cost savings per day per patient was about \$994.20.¹² While this is a small study, it carries significant implications and more large scale data is required to explore this benefit. In the same study, 67% of patients felt the device was comfortable, and 0.8% had significant leakage despite using the device, and no patients had skin injuries or breakdown related to the device.¹²

PureWick Female External Catheter is a promising non-invasive urine collection system for use in incontinent women that may help reduce CAUTI rates, maintain skin integrity, and avoid extra healthcare costs in both the inpatient and outpatient setting. At our institution, patients find the device comfortable and nurses find it easy to use, leading to rapid adoption throughout the hospital. □

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