A Literature Review on Pericare for the Prevention of CA-UTI


The researchers conducted an open (not blinded), nonrandomized experimental study in three ICUs of one National University Hospital in Korea between April 1, 2008 and July 31, 2008. The goal of this research was to compare bacteriuria rates of 4 different perineal cleansing agents to determine the best agent to use in an ICU to prevent CAUTI. The agents used for perineal care were: soap and water, 10% povidone-iodine, skin cleansing foam (Menalind) and normal saline. Each ICU trialed each type of agent during the study period.

Inclusion criteria were: female patients over 20 years old admitted to the neurosurgical, emergency, or medical ICU during the study period; had a negative urine culture prior to the study, no urinary catheter on admission or had a catheter inserted in the Emergency Dept of the study hospital within 12 hours of admission, and had a baseline urine culture. Ninety-seven patients qualified for this study. The researchers developed a protocol for all aspects of catheter insertion, care, and maintenance with input from the ICU Nurse Managers. ICU nurses provided daily perineal care with the assigned agent per protocol. Patients with fecal incontinence were cleansed as needed with the same agent. After controlling for confounding variables, there wasn’t any statistical difference of catheter associated bacteriuria between soap and water, skin cleansing foam, 10% povidone-iodine, and normal saline.

Conclusion:
The authors concluded that this study supported previous studies that indicated there is a “lack of evidence to recommend any particular antiseptic or antimicrobial solutions, ointments, or creams for perineal care”.

Limitations of this study are: small study population, exclusion of male patients, conducting this study in only one hospital, bacteriuria (NSHN 2008 surveillance definition) as an endpoint since CAUTI may not follow bacteriuria, and urine samples weren’t collected from patients who died or were transferred to another facility. These limitations may affect generalizability. Lastly, the small study population does not seem sufficient to identify the true amount of bacteriuria in the population.


The purpose of the study was to examine the effect of using silver sulfadiazine cream for catheter care on CAUTI using bacteriuria as the endpoint. Silver sulfadiazine (Silvadene) cream was chosen due to the use of this antimicrobial topical agent for burns, the broad spectrum of microorganism activity, and associated low toxicity/adverse events.

The inclusion criteria were: patients with a closed urinary drainage system hospitalized at a 470 bed community teaching hospital from Nov 1985 through April 1986.

The indwelling urinary catheters were inserted by nursing staff at this institution and a culture was collected at the time of insertion and daily after insertion. Research assistants collected a meatal swab within 24 hours after catheterization. Growth of bacteria or yeast constituted a positive meatal culture. Pts were randomly assigned to receive either the Silvadene cream or no meatal treatment. The care nurses were aware of what treatment the patient was receiving (not blinded). Protocol meatal care, which required twice daily application of Silvadene cream, was implemented after the meatal culture.

The exclusion criteria were: suprapubic tube, meatal culture not obtained within 24 hours of insertion, catheter duration < 24 hours after treatment randomization, positive or absent initial urine culture, incorrect treatment randomization, or patient request.
The total study population consisted of 696 patients, with 332 in the Silvadene cream group and 364 in the no treatment group. The researchers estimated that two groups of patients of 5333 each would be needed to detect a 14% reduction in catheter associated bacteriuria.

**Conclusion:**

There was not a statistically significant difference in the development of catheter associated bacteriuria between the Silvadene cream group and the no treatment group of patients.

**Limitations** of this study include: study conducted at only one hospital, too small of a population studied to detect a difference between the two mental care groups, and using bacteriuria as an endpoint (may or may not progress to CAUTI).


The goal of this randomized, controlled, unblinded trial was to determine the effect of mental care using a polyantibiotic cream (Neosporin) on bacteriuria from November 1981 to April 1982. The patients were randomized to receive either Neosporin cream or standard mental care per hospital policy. The study team visited catheterized patients and applied the Neosporin cream three times per day, while the care nurses provided the standard care. The usual mental care consisted of removing debris from the catheter during daily bathing.

A total of 747 patients were included in this study, with 383 receiving the Neosporin cream and 364 receiving standard care. All adult patients admitted to the study hospital with closed indwelling urinary catheters during the study period were potential candidates for study participation. Exclusion criteria were: allergy to any component of the cream; bacterial growth from the initial urine sample on day 1; non-urethral route of catheterization; or duration of catheterization less than 48 hours. Care nurses inserted all urinary catheters and collected initial and daily urine cultures. The two groups of patients were similar related to age, gender, antibiotics received while the catheter was in place, underlying medical or surgical illness, and frequency of isolation of gram negative bacilli and/or enterococcus from the urethral meatus swab.

The authors analyzed the data using four different definitions of bacteriuria: >10^3 cfu/ml of any microbial species, > 10^5 cfu/ml of GN bacillus and/or enterococcus, >10^3 cfu/ml of GN bacillus and/or enterococcus, and >10^5 cfu/ml of any microbial species.

**Conclusion:**

Regardless of which definition was used when the data was analyzed, the authors did not find a statistically significant difference in bacteriuria acquisition between the treated and untreated groups of patients.

**Limitations** of this study are: study conducted in one community teaching hospital, various catheters were used on patients in this study, although the authors stated that the majority of catheters were 16 F silicone coated latex. These limitations may affect the generalizability of this study. Additionally, the researchers used bacteriuria as an endpoint, although UTI may not follow bacteriuria.


This author completed a review of the literature and concluded that cleansing with an antimicrobial agent is not supported by the current evidence. In addition, this author makes the point that too frequent or vigorous cleaning or using an antimicrobial may cause tissue damage that further compromises the patient and promotes infection.

This article is a reanalysis of data collected during two separate studies assessing the effect of meatal care agents on bacteriuria. The authors defined bacteriuria as $> 10^3$ cfu/ml with gram-negative bacilli or enterococci. Inclusion criteria for both studies were: adult patients with a urethral catheter remaining in place for more than two days, urine culture collected within 24 hours of catheter insertion and daily while the catheter remained in place, were included in the study. Both studies were randomized, non-blinded experimental trials of a meatal care agent: 1) twice daily application of povidone-iodine (Betadine) solution and ointment (Jan – May 1976; 2) daily use of green soap and water (Jan – May 1978). In both studies, the patients were randomized to receive treatment provided by a study team member or to standard care, which was provided by the care nurses.

**Conclusion:**

Even though the data was analyzed using multiple statistical tests, the researchers concluded that using either treatment actually increased the occurrence of bacteriuria in the populations studied.

**Limitations:** One study limitation is that the studies were conducted at only one hospital, which can affect generalizability. The study population in the povidone-iodine study was 394 with 200 patients randomized to the general care group and 194 randomized to the treatment group. In the green soap study, a total of 452 patients met the study criteria, with 229 randomized to the green soap group and 223 randomized to the standard care group. The authors didn’t state the assumptions made at the outset of the studies, however, based on previous meatal treatment articles reviewed, the study populations were most likely not large enough to detect a difference caused by the treatment. Lastly, the authors used bacteriuria as an endpoint. However, bacteriuria may or may not lead to CAUTI.


This was a non-blinded, randomized study of 130 patients who were divided into 5 groups. Twenty five patients either received a once daily application of 9% povidone - iodine, a twice daily application of 9% povidone - iodine, a once daily application of 4% chlorhexidine gluconate, or a twice daily application of 4% chlorhexidine gluconate. Thirty patients had no intervention. Inclusion criteria were as follows: immunocompromised ICU patients receiving broad spectrum antibiotics, an indwelling urinary catheter and a negative urine culture before catheterization. All patients were receiving broad spectrum antibiotics for infections other than UTIs. Bacteriuria was defined as 105 cfu/L of one microbial species. Mixed growth cultures were criteria for exclusion. In addition to weekly urine cultures meatal cultures were obtained on days one, five, and 10 before meatal care occurred.

All study patients were found to have positive meatal cultures with Candida species being the predominate isolate. Bacteriuria developed in 16 of the patients receiving antiseptic agents and in 3 patients in the control group. As with the meatal isolates the most common cause of bacteriuria was Candida species.

**Conclusion:**
The authors concluded that the use of antiseptics to clean the periurethral area provided no benefit in decreasing the rate of bacteriuria.

**Limitations:** the study population was too small to provide enough information for 5 meatal care groups and was conducted in only one hospital. Additionally, the researchers used bacteriuria as an endpoint, although UTI may not follow bacteriuria.

This article described results of an electronic survey conducted to examine urinary catheter care practices at 75 acute care hospitals in the Nurse’s Improving the Care of Healthsystem Elders (NICHE) system. NICHE is a national program of the Hartford Institute for Geriatric Nursing. The survey was performed in 2009 with 75 hospitals from 29 states and Canada responding. Routine urethral meatal care was performed daily at 43% of the hospitals, twice daily in 25%, and 3 times daily in 16%; 16% of respondents reported performing routine care only as needed. Soap and water was used for meatal care by 56% of respondents. 24% performed routine personal hygiene with various products (e.g. bath in a bag or personal care cloths with dimethicone) and 20% used an antiseptic product. Only 59% of hospitals reported that policies existed for urethral meatal care.

Conclusion:
The authors concluded from survey findings that meatal care practices vary widely among hospitals, many differ from published guidelines and that hospital policies do not always reflect current practice.

Limitations of the survey include that the sample was nonrandom, only NICHE hospitals were surveyed which may not be representative of hospitals nationwide, and processes were self reported.


A systematic literature review was summarized in this article where 6 studies focusing on meatal care for the prevention of CA-UTI were identified.

Conclusion:
The authors concluded that meatal care utilizing antiseptic solutions, ointments, or creams is not better than providing routine meatal care as a part of perineal hygiene. Additionally, 2 of the studies suggested that antiseptic application may slightly increase risk.


This article reviewed and compared published guidelines for the prevention of catheter associated urinary tract infections from 1980 -2010.

Eight guidelines were compared with all but one recommending that special meatal care should not be performed. That one guideline recommended against the use of meatal creams or ointments.

Considerations for validity/comparison when reviewing these studies:

- Bacteriuria was used rather than CAUTI definitions to determine rates of infection
- Meatal care varied in frequency provided and agents studied
- All but two studies (Jeong et al. and Koskeroglu et al.) examined the effect of one agent versus routine care rather than comparing several agents against routine care.
- Population sizes were small in all studies but one. Studies are underpowered except for Classen et al.
- All of the studies were conducted in one hospital.
- Different definitions of bacteriuria were used in the studies.
A Summary of Guidelines for the Prevention of CA-UTI: Meatal Cleansing During Catheterization


Recommendation:

Do not clean the periurethral area with antiseptics to prevent CAUTI while the catheter is in place. Routine hygiene (e.g., cleansing of the meatal surface during daily bathing or showering) is appropriate. (Category IB)

Quality/strength of evidence:

Category IB: A strong recommendation supported by low quality evidence suggesting net clinical benefits or harms or an accepted practice (e.g. aseptic technique) supported by low to very low quality evidence.


Recommendation:

Daily meatal cleansing with povidone-iodine solution, silver sulfadiazine, polyantibiotic ointment or cream, or green soap and water is not recommended for routine use in men or women with indwelling urethral catheters to reduce CA-bacteriuria (A-I). Data are insufficient to make a recommendation as to whether meatal cleansing reduces the risk of CA-UTI.

Quality/strength of evidence:

Category A-I: Good evidence to support a recommendation for or against use. Evidence from >1 properly randomized, controlled trial.


Recommendation:

Basic practices for preventing CAUTI: recommended for all acute care hospitals: Employ routine hygiene; cleaning the meatal area with antiseptic solutions is unnecessary (quality of evidence: III).

Quality/strength of evidence:

III: Low. The true effect may be substantially different from the estimated size and direction of the effort. Evidence is rated as low quality when supporting studies have major flaws, there is important variation between studies, the confidence interval of the summary estimate is very wide, or there are no rigorous studies, only expert consensus.

**Recommendation:**

*Routine daily personal hygiene is all that is needed to maintain meatal hygiene. Class A*

**Quality/Strength of evidence:**

Class A: At least one meta-analysis, systematic review, or randomised controlled trial (RCT) that is rated as 1++, and is directly applicable to the target population, or a systematic review of RCT or a body of evidence that consists principally of studies rated as 1+, is directly applicable to the target population and demonstrates overall consistency of results. Evidence drawn from a NICE technology appraisal (National Institute for Health and Clinical Excellence).


**Recommendation:**

*Routine meatal care is recommended. Evidence is insufficient to support a specific hygiene routine. Antimicrobial agents have not been proven to be effective for urinary tract infection prevention.*


**Recommendation:**

*Topical antiseptics or antibiotics applied to the catheter, urethra or meatus are not recommended (A). Benefits from antiseptic substances have never been established, therefore they are not recommended (A).*

**Quality/Strength of evidence:**

Is based on clinical studies of good quality and consistency addressing the special recommendations and includes at least one randomized trial.