Catheter-associated urinary tract infections are an expected consequence, even in home-based client populations not at risk for nosocomial cross-contamination, during indwelling urinary catheterization. Causative organisms include but are not limited to *E. coli*, *candida*, enterococci, klebsiella, proteus, pseudomonas, enterobacter, and *serratia*. Urinary collection devices are reservoirs for bacterial growth and ascending bacteriuria. A urinary tract infection can negatively impact the recovery equation.

A safe and evidence-based method for clients to cleanse their urinary drainage leg and bed bags between alternating usage was sought. An Internet data search yielded approximately 25 research articles, most of which were written in the 1980s. The most frequent decontaminates used were peroxide (Sweet et al., 1985), chlorhexidine (Noy, Smith, & Watterson, 1982), and diluted 5.25% sodium hypochlorite (Dille, Kirchhoff, Sullivan, & Larson, 1993). In a comparison study using plain tap water, 0.25% acetic acid (vinegar), 3% hydrogen peroxide, glutaraldehyde (sporicide) 1:16 solution, and 0.06% sodium hypochlorite (household bleach), Giroux and Perkash (1985) found that only glutaraldehyde and bleach were bactericidal. Thompson (1984) refuted the efficacy of hydrogen peroxide and Gillespie (1983) disproved chlorhexidine. In the author’s geographic area, hospital-based home health programs currently use acetic acid. Dille and Kirchhoff (1993) conducted the most current pivotal study. This research study was reported in two journals formatted for two different audiences. The physician journal article “Increasing the Wearing Time of Vinyl Urinary Drainage Bags by Decontamination with Bleach” (Dille et al., 1993) included the technical research nuts and bolts of the sampling, methodology, and statistical tools. The nursing journal article “Decontamination of Vinyl Urinary Drainage Bags with Bleach” (Dille & Kirchhoff, 1993) concisely and simply defined the study parameters, statistical significance, and previous research. The body of the nursing version described the procedure piece that lent to practice application; same study, different audience, different foci.

Using evidence-based analysis for experimental study designs by Brown (1999), the study’s credibility, applicability, and potential for translation into clinical practice were evaluated. Method

Dille and Kirchhoff’s (1993) experimental study used a randomized two-group parallel design that compared a new protocol (using the urinary drainage bags for 4 weeks) to the standard (using the drainage bags for 1 week). A standardized procedure for decontaminating all study urine bags was used. The dependant measures were the counts of colony forming bacteria (CFU) in the bladder, bed bags and leg bags, and signs of clinical infection. Admission to the study was strictly controlled by inclusion...
Table 1.
Vinyl Urinary Drainage Bag Decontamination Procedure

1. Wash hands; put on protective rubber, latex, vinyl or nitryl gloves.
2. Disconnect urine drainage bag from your catheter and put your other drainage bag onto your catheter (example: in the morning take off your bed bag and connect your day leg bag, prepare to wash your nighttime bed bag).
3. Empty all urine from the bag into the toilet.
4. Fill the empty urine bag with 200 ml or one pint cold tap water from the top tubing. (If it is a leg bag fill it through its connector and extension tubing; if it is a bed bag fill it through its top tubing.)
5. Vigorously shake the water in the bag for a slow count to 10.
6. Empty the water out through the bag’s drainage spigot into the toilet.
7. Repeat steps 3, 4, and 5. Rinsing must be done twice.
8. Use an irrigating bottle to squirt approximately 30 ml or 1 oz of the premixed bleach solution into the bag.
9. Swish the bleach solution around in the bag while you slowly count to 30 making the bleach touches all of the inner surfaces of the bag.
10. Drain the bleach solution into the toilet.
11. Hang the bag on a bathroom hook and allow to air dry until its next use.

Note: Use liquid bleach: Purex®, Clorox®, or generic nonperfumed bleach containing 5.25% sodium hypochlorite, fill irrigating bottle with 150 ml or 5 oz of cold tap water and add 15 ml or 1/2 oz liquid bleach, invert the bottle to mix well.

Adapted from Dille and Kirchhoff (1993).

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and exclusion criteria. Zero to 100 CFU/ml was defined as the acceptable bag bacteria levels post-decontamination.

One admission criterion was that the patient needed to be willing and able to perform the decontamination process while on leave of absence from the hospital. This is an important consideration in determining the applicability of this protocol to an outpatient population.

Results

Interrater reliability checks at study initiation and at 1 year achieved 100% agreement. Data were encoded and continuously loaded to evaluate quality, reliability, and inordinate risk to participants. ANOVA, ANACOVA, and Fisher’s Exact Test MANCOVA were applied to access differential impact on outcomes, significance of variables, covariate analysis in data composites, and sample size.

No clinical significance was found in the number of CFU/ml (nor increases in the number of urinary tract infections) between the control group that had a new urinary drainage bag weekly and the study group that reused the bags for 4 weeks following the procedure described in Table 1.

Discussion and Conclusion

The purpose of this clinical query sought to determine what cleansing protocol constitutes a best practice that will be effective, inexpensive, and possibly decrease ascending bacterial invasion of the bladder through the lumen of the urinary bag tubing. The parameters included an evidence-based plan that would be easily replicable within the home context by an age 50+ population that had an added value of optimizing health outcomes.

Dille and Kirchhoff (1993) initiated their study as a means to realize cost containment by increasing urinary bag wearing time. Using a dilute solution of standard household bleach (following a simple procedure) kept the CFU/ml counts at 100 CFU/ml or below (10 to the sixth power denotes a positive urine culture). One could logically extrapolate that minimizing CFU counts within the urinary drainage bag would decrease ascending bacteriuria. Clearly, more study needs to be done to definitively qualify this theory.

References


