

Fig. 1. Forest plots of alcohol impregnated caps versus isopropyl alcohol wipes to prevent catheter-associated bloodstream infection (A, fixed effects approach; B, random effects approach). CI, confidence interval; IPA, isopropyl alcohol; M-H, Mantel-Haenszel model.

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Instillation of disinfectant behind a temporary obstruction created by an inflated urinary catheter balloon improves sink drain disinfection



To the Editor:

Sink drainage systems are a potential reservoir for spread of multidrug-resistant gram-negative bacilli.¹ Pouring liquid disinfectants into sink drains has only a transient impact on sink colonization.^{1,2} The efficacy of pouring disinfectants may be suboptimal in part because liquid disinfectants flow rapidly down the drain, providing minimal contact time and poor penetration into areas harboring microorganisms. We previously demonstrated that use of a mechanical stop valve to allow instillation of disinfectant throughout the proximal drainage system for 1 hour reduced proximal sink drain colonization for several days, whereas pouring disinfectants down the drain resulted in only a transient reduction.³ In the current study, we tested whether a more practical approach involving instillation of

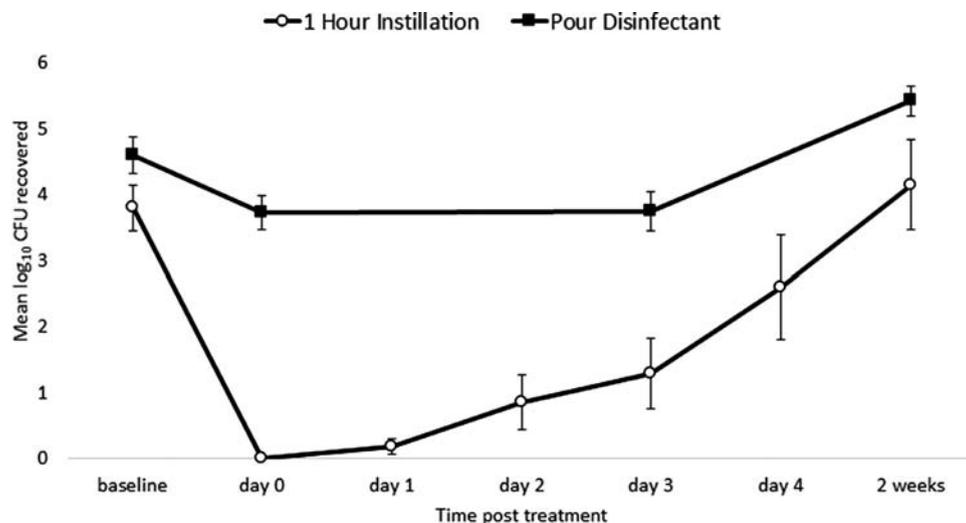


Fig 1. Efficacy of pouring versus instilling 300 mL of OxyCide disinfectant on recovery of gram-negative bacilli from proximal sink drains on medical wards. For instillation, a urinary catheter was inserted through the strainer to a depth of 6 inches, and the balloon was inflated to create a snug seal followed by instillation of disinfectant for 1-hour dwell time. For pour controls, the disinfectant was poured over 1 minute. Quantitative cultures for gram-negative bacilli were collected from the proximal sink drain to a depth of 1 inch below the strainer before treatment and intermittently for 2 weeks posttreatment. $P < .05$. CFU, colony-forming units.

disinfectant behind a temporary obstruction created by an inflated urinary catheter balloon would enhance sink drain disinfection.

We compared the impact of instilling OxyCide disinfectant (EcoLab, Minneapolis, MN) behind inflated urinary catheter balloons versus pouring the same volume down sink drains. In-use sinks on hospital medical wards were used for testing. The urinary catheters used were Bardex Foley Catheters size 12 French with a 30 mL balloon (CR Bard Inc, Covington, GA). The tip of catheter was inserted through the strainer to a depth of 6 inches. The balloon was then inflated to create a snug seal and disinfectant was instilled to fill the sink drainage system from the balloon to just above the strainer (approximately 300 mL). After a 1-hour dwell time, the catheter balloon was deflated and removed, followed by flushing with water for 15 seconds. For control sinks, the same volume of the disinfectant was poured over 1 minute, and after 15 minutes the sink was flushed with water for 15 seconds. Rayon swabs premoistened with Dey-Engley neutralizing medium were used to sample the proximal sink drain to a depth of 1 inch below the strainer before treatment, immediately after treatment, and on days 1, 2, 3, 4, and 14 after treatment; control sinks were not sampled on days 1, 2, and 4 because initial results demonstrated no reduction after treatment. Quantitative cultures for gram-negative bacilli were performed.³ Twelve sinks were included in each intervention group. Analysis of variance for repeated measures was used to compare the treatment groups.

Figure 1 shows the mean concentrations of gram-negative bacilli recovered from 12 pour control and 8 instillation sinks; 4 instillation sinks were excluded as the catheter balloon popped or the disinfectant leaked. Pouring disinfectant down sink drains resulted in a 0.9 log₁₀ colony-forming units reduction in recovery of gram-negative bacilli from the proximal sink drain. Instillation of disinfectant resulted in significantly reduced recovery with undetectable levels after the initial treatment and maintained suppression to ≤ 1.3 log₁₀ colony-forming units on days 1, 2, and 3 posttreatment. In comparison to pour controls, instillation sinks had significantly lower concentrations of gram-negative bacilli than pour controls at baseline, and when measurements were taken on day 0 (posttreatment) and day 4.

Our results are consistent with previous evidence that fitting sinks with mechanical cutoff valves to allow instillation of disinfectant may be more effective than pouring of disinfectants in reducing sink contamination.^{3,4} The use of a balloon to provide a temporary blockage of the drainage system is likely to be much more feasible than

approaches that require modification of drain pipes. Recently, Buchan et al⁵ reported that a hydrogen peroxide-based foam disinfectant was more effective than liquid bleach in decreasing sink drain bacterial counts at 24 hours posttreatment, presumably due to longer persistence of foam within the drain. Further studies are needed to compare foam disinfectants with approaches that allow disinfectant instillation.

Our study has some limitations. The study was a proof-of-concept evaluation that will require validation. Studies are needed with a variety of different sink designs. For example, the sinks included in testing did not have overflow drains in the sink bowl that could potentially contribute to recolonization after disinfection. We did not confirm that the level of suppression of gram-negative bacilli was enough to reduce the risk for dispersal from sink drains. Finally, some of the urinary catheters were ineffective in maintaining obstruction of the drainpipes. Further work is needed to generate a sturdier device that will be effective in maintaining obstruction of the pipes.

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Regarding “Risks and benefits of using chlorhexidine gluconate in handwashing: a systematic literature review”



To the Editor:

We read with interest the systematic review entitled “Risks and benefits of using chlorhexidine gluconate in handwashing: a systematic literature review.”¹ We remind the authors and the readership of the *American Journal of Infection Control* that chlorhexidine gluconate (CHG) is not only a known skin irritant² but also a cause of allergic contact dermatitis,³ which can impair the skin barrier. For this reason, the American Contact Dermatitis Society

recommends testing all patients with chronic dermatitis for CHG contact allergy as a part of its Core patch testing series.⁴ Furthermore, CHG may cause photo allergic contact dermatitis,⁵ urticarial reactions,⁶ fixed drug eruptions,⁷ and even anaphylaxis.⁸ It is important for health care workers to understand these potential adverse events because CHG contact allergy may be misdiagnosed as cellulitis,⁹ leading to unnecessary and expensive treatments. Finally, recognizing these risks is necessary to prevent iatrogenic re-exposures in known CHG-allergic patients, which may cause rebound CHG-specific IgE.¹⁰

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Conflicts of interest: Dathan Hamann is a first degree relative of Curt Hamann, who is the owner of SmartPractice, a company that produces and sells patch test supplies, including an allergy test for chlorhexidine gluconate.

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