



Topic Exploration Report

Topic explorations are designed to provide a high-level briefing on new topics submitted for consideration by Health Technology Wales. The main objectives of this report are to:

1. Determine the quantity and quality of evidence available for a technology of interest.
2. Identify any gaps in the evidence/ongoing evidence collection.
3. Inform decisions on topics that warrant fuller assessment by Health Technology Wales.

Topic:	Chlorhexidine-based meatal cleansing (Hexicath) prior to urinary catheter insertion
Topic exploration report number:	TER219

Introduction and aims

Urinary tract infections are one of the most common healthcare associated infections in the UK in both hospital and community settings. Around half of these infections are associated with urinary catheter usage. Cleansing the area around the urethral meatus before catheter insertion aims to reduce the risk of bacterial contamination. Current UK practice uses 0.9% saline for meatal cleansing.

Hexicath is a 0.1% chlorhexidine sterile wipe for meatal cleansing, designed to ensure consistent delivery of antiseptic at the point of catheter insertion and reduce the incidence of catheter associated asymptomatic bacteriuria (CA-ASB) and CAUTI.

Health Technology Wales researchers searched for evidence on chlorhexidine-based meatal cleansing prior to catheter insertion.

Summary of evidence

Guidelines

Five guidelines were identified that referred to meatal cleaning prior to urinary catheterisation, published between 2004 and 2012. All guidelines recommended cleaning of the urethral meatus before catheterisation; some specified that cleaning should be done with appropriate saline or antiseptic solution. NICE CG139 state that the meatus should be cleaned in accordance with local guidelines or policy (for long term catheterisation).

Systematic reviews

We identified four systematic reviews. The most recent (Fasugba et al., 2017) was a systematic review and meta-analysis of 14 studies (three quasi-experimental studies and 11 randomised controlled trials [RCTs]) investigating the effectiveness of antiseptic cleaning before urinary catheter insertion and during catheter use for prevention of CAUTIs. Authors

reported no significant difference in incidence of CAUTIs between antiseptic cleaning (all types) and non-antiseptic cleaning (pooled odds ratio [OR] 0.90, 95% confidence interval [CI] 0.73 to 1.10; $p = 0.31$). Two of the 14 studies compared chlorhexidine with water; one study used 0.3% chlorhexidine gluconate plus 3% centrimide and the second used 0.1% chlorhexidine gluconate solution. Authors reported no significant difference in the incidence of CAUTIs when comparing chlorhexidine versus water. Authors considered risk of bias was low in five of the studies and high in the remaining nine studies.

A second systematic review and meta-analysis from Cunha (2013) aimed to determine the effectiveness of cleaning the urinary meatus with water or saline comparing to its sterilization through a systematic review and meta-analysis; two of the five included studies evaluated chlorhexidine gluconate (0.05% and 0.1%, respectively). Authors concluded that “the cleaning or disinfection of the urinary canal prior to bladder catheterization is not statistically significant (OR = 1.07, 95% CI 0.68 to 1.68; $p = 0.779$) and that there is some evidence that the use of water/saline reduces rates of UTI”.

The remaining two systematic reviews (Moola 2010, Lockwood 2004) looked at preventing UTIs in short-term indwelling urethral catheters. Both concluded that the use of a surgical sterile catheterisation technique is not required, and that using tap water to clean the meatal area is sufficient.

Primary evidence

One primary study (Fasugba 2019) was identified: a cross-sectional, open-label, stepped-wedged RCT that assessed the efficacy of 0.1% chlorhexidine solution compared with normal saline for meatal cleaning before urinary catheter insertion in reducing the incidence of catheter-associated asymptomatic bacteriuria and UTI ($n = 697$ patients in the control phase, $n = 945$ in the intervention phase). Authors reported that use of chlorhexidine solution for meatal cleaning before catheter insertion resulted in a 74% reduction in the incidence of catheter-associated bacteriuria (incident rate ratio 0.26, 95% CI 0.08 to 0.86; $p = 0.026$) and a 94% reduction in the incidence of CAUTIs (incident rate ratio 0.06, 95% CI 0.01 to 0.32; $p = 0.00080$).

Economic evidence

We identified one study (Brett 2019) that aimed to evaluate the cost-effectiveness of adopting routine use of chlorhexidine for meatal cleaning prior to urinary catheter insertion, based on the results of the stepped-wedge RCT (Fasugba 2019). The authors estimated that switching to 0.1% chlorhexidine would save AUD\$387,909 (£218,268) per 100,000 catheterisations, which they suggest would be cost-saving based on a willingness-to-pay threshold of AUD\$28,000 (£15,755) per 100,000 catheterisations.

Areas of uncertainty

- The systematic review and meta-analysis by Fasugba (2017) included evidence on use of cleaning both prior to and during catheterisation (i.e. as part of regular meatal care). This may impact the applicability of the analysis should the scope of an appraisal focus on the use of meatal cleansing prior to catheterisation only.
- It is unclear whether short-term and long-term catheters would need to be evaluated separately.

- The strength of chlorhexidine solution varied among primary evidence (from 0.05% to 0.3%). It is unclear whether including all solutions is appropriate or whether an appraisal would focus on the 0.1% solution. If this is the case, the evidence base may be limited.
- It is uncertain at this stage whether the approach in the cost-effectiveness analysis is applicable to the Welsh setting (including the derived 'per catheterisation' willingness-to-pay threshold).

Conclusions

We identified some evidence on use of chlorhexidine solution for meatal cleansing prior to catheterisation, including four systematic reviews, one additional RCT and one cost-effectiveness study. However, the systematic review included multiple types of cleansing options; evidence for chlorhexidine (specifically 0.1% chlorhexidine) is more limited.

All identified systematic reviews conclude that there is no difference in incidence of CAUTI between different antiseptic techniques (including chlorhexidine) and water for meatal cleansing. Subgroup analysis for chlorhexidine versus water in Fasugba et al. (2017) also reported no difference between methods on rates of CAUTI. Conversely, the Fasugba (2019) RCT reported reduced incidence of catheter-associated asymptomatic bacteriuria and CAUTI with chlorhexidine.

Brief literature search results

Resource	Results
HTA organisations	
Healthcare Improvement Scotland	Urinary Catheterisation and Catheter Care Best Practice Statement Jun 2004 Section 4: Indwelling Urethral Catheterisation
Health Technology Assessment Group	SECTION 12.1 URINARY CATHETERS https://www.hse.ie/eng/about/who/healthwellbeing/infectcont/sth/gl/ipcc-guidelines-section-12-1.pdf
Health Information and Quality Authority	We did not identify any relevant evidence from this source.
EUnetHTA	We did not identify any relevant evidence from this source.
International HTA Database	We did not identify any relevant evidence from this source.
UK guidelines and guidance	
SIGN	SIGN 88 Management of suspected bacterial urinary tract infection in adults (2012). https://www.sign.ac.uk/our-guidelines/management-of-suspected-bacterial-urinary-tract-infection-in-adults/ No mention of meatal cleansing or process of catheter insertion.
NICE	CG139. Healthcare-associated infections: prevention and control in primary and community care (2012, last updated 2017). https://www.nice.org.uk/guidance/cg139
Secondary literature and economic evaluations	
https://www.epistemonikos.org/en/	<p>Fasugba O, Koerner J, Mitchell BG, et al. (2017). Systematic review and meta-analysis of the effectiveness of antiseptic agents for meatal cleaning in the prevention of catheter-associated urinary tract infections. The Journal of hospital infection. 95(3): 233-42. https://doi.org/10.1016/j.jhin.2016.10.025</p> <p>Cunha M, Santos E, Andrade A, et al. (2013). Effectiveness of cleaning or disinfecting the urinary meatus before urinary catheterization: a systematic review. Revista da Escola de Enfermagem da U S P. 47(6): 1410-6. https://doi.org/10.1590/s0080-62342013000600023</p> <p>Moola S, Konno R. (2010). A systematic review of the management of short-term indwelling urethral catheters to prevent urinary tract infections. JBI Library of Systematic Reviews. 8(17): 695-729. https://doi.org/10.11124/01938924-201008170-00001</p> <p>Lockwood C, Page T, Conroy-Hiller T, et al. (2004). Management of short-term indwelling urethral catheters to prevent urinary tract infections. International Journal of Evidence-Based Healthcare. 2(8): 271-91. https://doi.org/10.1111/j.1365-2788.2004.00014.x</p>
Trip database	No additional secondary evidence was identified from this source.
Cochrane library	No additional secondary evidence was identified from this source.
Primary studies	

https://www.tripdatabase.com/	<p>Brett GM, Oyebola F, Allen CC, et al. (2019). Chlorhexidine versus saline in reducing the risk of catheter associated urinary tract infection: A cost-effectiveness analysis. International journal of nursing studies. 97: 1-6. https://doi.org/10.1016/j.ijnurstu.2019.04.003</p> <p>Fagsuba O, Cheng A, Gregory V, et al. (2019). Chlorhexidine for meatal cleaning in reducing catheter-associated urinary tract infections: a multicentre stepped-wedge randomised controlled trial. Lancet infectious diseases. https://doi.org/10.1016/S1473-3099(18)30736-9</p>
Other	
Google search (for local guidelines)	<p>Loveday et al. (2014). epic3: National Evidence-Based Guidelines for Preventing Healthcare-Associated Infections in NHS Hospitals in England https://phw.nhs.wales/services-and-teams/harp/urinary-tract-infection-uti-resources-and-tools/uti-downloads/national-evidence-based-guidelines-for-preventing-healthcare-associated-infections-in-nhs-hospitals-in-england-epic3/</p> <p>1000 lives +. Reducing Healthcare Associated Infections: appropriate and timely use of invasive devices. http://www.1000livesplus.wales.nhs.uk/sitesplus/documents/1011/How%20to%20%2821%29%20Invasive%20Devices%20%28M arch_12%29%20Web.pdf</p>

Date of search:	September 2020
Concepts used:	Meatal cleansing, meatal cleaning, hexicath urinary catheter/catheterisations, CAUTI