Healthcare-associated infections remain a challenge for patients and healthcare organisations. Point prevalence studies across the world have repeatedly shown that one of the most common healthcare-associated infections is urinary tract infection (UTI). The majority of UTIs that occur in hospitals are associated with indwelling catheter use, so preventing catheter-associated urinary tract infections (CAUTIs) is important. This article summarises recent research showing that using chlorhexidine rather than saline for pre-catheterisation meatal cleansing reduces the incidence of CAUTIs.

Rationale for prevention
Before beginning research or implementing a change in practice, it is worth considering whether the topic of interest is important and the rationale for any change. In regard to CAUTIs, there are four reasons why strategies to prevent them are worthwhile:

- Frequency – they are one of the most common healthcare-associated infections in hospital – approximately 1% of admitted patients acquire a CAUTI (Mitchell et al, 2016). Urinary catheter use is also common in hospitals and a study conducted in the UK estimated that 13% of hospitalised patients receive a urinary catheter (Shackley et al, 2017);
- Impact – CAUTIs are associated with increased length of stay in hospital (Mitchell et al, 2016). In some patients, they may be complicated to treat and lead to bacteraemia;
- Antimicrobial resistance – organisms that commonly cause CAUTIs are becoming more resistant to antibiotics, so treatment is already difficult and will become more difficult in the future (Fasugba et al, 2016; Fasugba et al, 2015);
- Prevention – the incidence of CAUTIs can be reduced (Saint et al, 2016).

Meatal cleaning before catheter insertion is thought to reduce the risk of contamination. In an Australian study, the incidence of infection was greatly reduced when meatal cleaning was done with chlorhexidine instead of saline. The use of chlorhexidine led to a 94% reduction in the incidence of infections compared with saline, and was the more cost-effective option.

Using chlorhexidine for pre-catheterisation meatal cleaning is more effective than saline.
Clinical Practice

Research

- Correct insertion;
- Appropriate maintenance;
- Prompt removal;
- Surveillance.

There are numerous guidelines that provide evidence of best practice around each of these elements.

One element of care is the cleaning of the urethral meatus before catheterisation. Cleaning the meatal area is thought to reduce the risk of bacterial contamination during catheter insertion. However, the evidence regarding the best agent to use is unclear, as demonstrated in Fasugba et al’s (2017) systematic review.

Given this gap in the literature and variation in current practice, we undertook a study to determine whether chlorhexidine for meatal cleaning was superior to saline for reducing infection, and whether it was more cost effective.

Our study

We undertook a stepped-wedge randomised control study in three Australian hospitals to determine the effectiveness and cost-effectiveness of chlorhexidine 0.1% sterile solution compared with normal saline. During the study period, patients who required a urinary catheter had either saline (control group) or chlorhexidine (intervention group) used for meatal cleaning before catheterisation. Participants were excluded if they were under two years old or had a medical reason contra-indicating the use of chlorhexidine.

Participants were followed up for seven days after catheter insertion to determine whether they had developed a CAUTI or catheter-associated asymptomatic bacteriuria (CA-ASB). Our primary outcomes were the incidence of CAUTI and CA-ASB. We have published full details of the study protocol elsewhere (Mitchell et al., 2017).

Results

There were 1,642 participants in our study; 697 (42%) in the control group and 945 (58%) in the intervention group. We found a 94.5% reduction in the incidence of CAUTI and a 72% reduction in the incidence of CA-ASB in the intervention group compared with the control group. Full results are published elsewhere (Fasugba et al., 2019).

In the cost-effectiveness analysis, we sought to determine the change in costs of switching from saline to chlorhexidine. We identified that the use of chlorhexidine would save hospitals AU$88.87 per 100,000 catheterisations and release valuable bed days as a result of the reduction in infection. Full results of the cost-effectiveness analysis have been published elsewhere (Mitchell et al., 2019).

Implications for practice

The implications for practice are significant. We now have good-quality evidence suggesting chlorhexidine is more effective than saline in preventing CAUTIs and CA-ASBs, and that switching from saline to chlorhexidine is cost effective and saves money.

Evidence-based guidelines and recommendations from national bodies internationally have identified a gap in high-quality studies on this topic. Findings from our study—the first sufficiently powered randomised control study exploring the effect of two different approaches to meatal cleaning—appear to address this gap and provide evidence backing the use of chlorhexidine. All three hospitals, which differ in size, funding (public and private), geographical location and governance, saw reductions in both CAUTIs and CA-ASBs with the use of chlorhexidine.