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Management of short-term indwelling urethral catheters to prevent urinary tract infections
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Best Practice
Evidence-based information sheets for health professionals

Management of short-term indwelling urethral catheters to prevent urinary tract infections

Recommendations

- The evidence suggests tap water is sufficient for cleaning genitalia. **(Grade B)**
- Catheter care should consist of good personal hygiene around the meatal area carried out during daily hygiene care. **(Grade B)**
- In terms of catheter composition, catheters that have been impregnated with silver alloy may reduce the incidence of catheter associated bacteriuria; however, there is no clear evidence regarding which patient groups are likely to benefit from this strategy, nor on the cost effectiveness of its implementation. **(Grade B)**
- Sealed (e.g. taped, presealed) drainage systems should not be relied upon as the sole mechanism for prevention of bacteriuria. **(Grade B)**
- Adding antibacterial solutions to drainage bags has no effect in reducing the incidence of catheter-associated infection. **(Grade B)**
- There is no protective effect gained from routine drainage bag changes compared with changing only if clinically required **(Grade B)**
- Early removal of catheter is recommended in the prevention of UTIs and facilitation of early discharge **(Grade B)**
- Use of stop order approach to physicians by nurses can be recommended to reduce prolonged unnecessary catheterization **(Grade B)**
- There is an urgent need for further high quality RCTs **(Grade B)**

Information Source

This Best Practice information sheet has been derived from a systematic review of research [2] (Moola and Konno, 2010) conducted by the Joanna Briggs Institute, Royal Adelaide Hospital, Adelaide Australia.

The systematic review report is available from the Joanna Briggs Institute www.joannabriggs.edu.au

Background

This review is an update of a review published in 2004. [3]

Indwelling urinary catheters are commonly used for bladder drainage during hospital care.

Short-term use of an indwelling urethral catheter is a safe and effective strategy in the maintenance of bladder and renal health and judicious use contributes to improved outcomes. However, insertion of an indwelling urethral catheter is not without the risk of complications. Catheter associated urinary tract infections (CAUTI) are one of the most frequent infections and the daily risk of developing CAUTI is 3%-7% in the acute care setting. [4]

Grades of Recommendation

These Grades of Recommendation have been based on the JBI-developed *2006 Grades of Effectiveness*[1]

Grade A Strong support that merits application
Grade B Moderate support that warrants consideration of application
Grade C Not supported

Definitions

For the purposes of this information sheet the following definition was used: **Short term catheterisation** – between 1 and 14 days of catheterisation.

Objectives

The purpose of this Best Practice Information Sheet is to summarise the best available evidence related to the prevention of short-term indwelling catheter-associated urinary tract infection (UTI).

Quality of the research

The research included single RCT studies, often with limited number of participants. There were four RCT/AC studies [6, 7, 8, 11] one RCT [9] and one quasi RCT. [10] No comparable RCTs were found for this review.

Findings

Catheterisation technique – clean vs sterile

A sterile insertion technique is not warranted given the additional costs. The non-sterile technique, conducted in the operating theatre environment, involved hand washing with soap and water, cleansing the genitalia with tap water as required, non-sterile gloves, lubricant, tap water to inflate the balloon and not using a catheter pack.

Water cleansing

A small study found no significant difference in outcome between cleansing with water or chlorhexidine gluconate.

Meatal Care

Three studies which investigated meatal care found little or no benefit in using anything other than standard personal hygiene and removal of debris in caring for patients who have an indwelling catheter in order to prevent bactereriuria. However, there was some benefit indicated for a small subset of high-risk female patients.

Catheter composition

Six studies focused on catheter composition. There was no significant difference in catheter related infection rates between silicone or latex catheters, however a statistically significant difference was found by day 6 favouring silver catheters as opposed to Teflon-coated latex Foley catheter. A statistically significant result was also found in favour of silver coated catheters as opposed to silicone-coated latex Foley catheters.

The use of 100% silicon catheters compared with hydrogel and silver salts-coated catheters found there was not a statistically significant difference in the outcome.

A randomised double blind controlled trial evaluated the nitrofurazone-impregnated catheter completed to the standard silicon coated catheter in trauma patients and concluded the incidence of CABF was lower in adult trauma patients in the nitrofuzarone group.

A silicon-based, hydrogel-coated, silver-impregnated Foley catheter was compared to a silicon-based, hydrogel-coated catheter with no statistically significant outcomes in UTI rates.

Drainage System Devices

Seven studies focused on drainage system devices. One found no significant difference in the rates or risk of bacteriuria between a two chamber system as compared to a complex closed system although onset was delayed with the use of the two chamber system. Preconnected sealed junctions had favourable results over unconnected catheters and drainage bags. Another study found no difference in the rate of bacteriuria between a preconnected closed drainage system and standard closed drainage system following catheter insertion. There was no clear benefit found between a closed drainage system and a silver releasing device. No overall benefit was found from using a junction seal applied following catheter insertion although there may be some benefit for men.

A small study comparison of a hydrophilic-coated silicone catheter with sealed drainage system with a standard catheter with exchangeable bags found no difference in terms of incontinence, urethral pain, meatal redness or discharge. The impact of a povidone-iodine releasing cartridge on UTI as opposed to a standard closed drainage system favoured treatment.

Drainage System Solutions

No benefit was found from the addition of chlorhexidine to urinary drainage bags. A small study with multiple interventions found that an antimicrobial catheter with adaptor and trichloroisocyanuric acid was effective in reducing the incidence of catheter associated bacteriuria. The use of hydrogen peroxide was found not to make a significant difference in the incidence of catheter-related bacteruuria.

Care Delivery

Frequency of bag change was not found to make a statistically significant difference. The study also suggested not changing drainage bags for patients on short-term catheterisation may be associated with a reduction of costs and better staff time. A study of women undergoing hysterectomy found that immediate removal of catheter after operation is found to be safe and cost effective as it decreases hospital stay. Another study found a statistically significant lower prevalence of UTI in the early catheter removal group. A study of women following vaginal prolapse surgery found that bacterial count increases in patients with late removal of catheter and vaginal pack.

Stop orders for urinary catheters were found to prevent prolonged unnecessary catheterisation.

Systematic Reviews

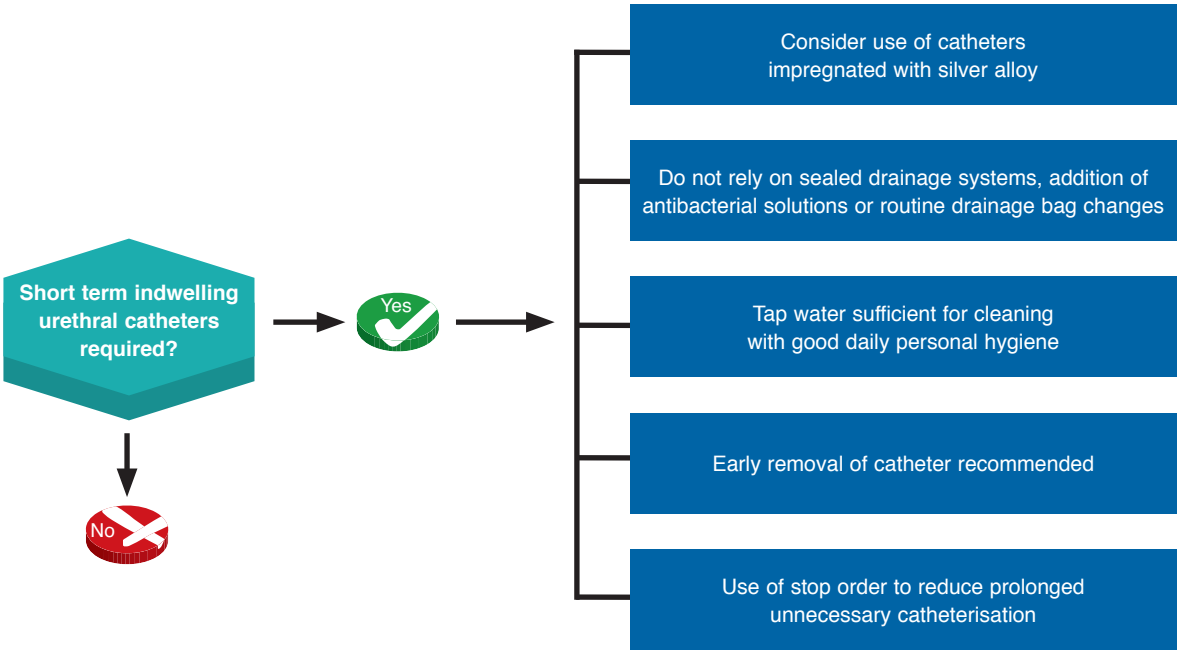
In the previous review published in 2004, some evidence was found that silver impregnated catheter reduced the incidence of CAUTI. The finding from the newly identified cross-over trial support the effectiveness of silver impregnating catheter over the catheter without the silver impregnation.

A systematic review that included 23 randomised and quasi-randomised controlled trials compared types of indwelling catheters on the risk of urinary tract infection in patients with short-term catheterisation in hospitalised patients. The review concluded that no one type of catheter was found to be better than another in terms of reducing the risk of bacteriuria in hospitalised patients.

Implications for practice

- The evidence suggests tap water is sufficient for cleaning genitalia.
- Catheter care should consist of good personal hygiene around the meatal area.
- Catheters that have been impregnated with silver alloy may reduce the incidence of catheter associated bacteriuria.
- Sealed (e.g. taped, presealed) drainage systems should not be relied upon as the sole mechanism for prevention of bacteriuria.
- Adding antibacterial solutions to drainage bags has no effect in reducing the incidence of catheter-associated infection.
- There is no protective effect gained from routine drainage bag changes
- Early removal of catheter is recommended in the prevention of UTIs and facilitation of early discharge.
- Use of stop order approach can be recommended to reduce prolonged unnecessary catheterisations.[1]

Management of short term indwelling urethral catheters



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In addition this Best Practice information sheet has been reviewed by nominees of International Joanna Briggs Collaborating Centres.

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Evidence-based Practice evidence, context, client preference judgement

This *Best Practice* information sheet presents the best available evidence on this topic. Implications for practice are made with an expectation that health professionals will utilise this evidence with consideration of their context, their client's preference and their clinical judgement.[12]

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