A literature search was performed and the identified papers underwent a rapid review. From this review, key points of information for optimal urinary catheter care have been summarised below. A formal scientific critique was not performed on the identified papers and therefore there may be limitations to this process.

Key points from the scientific literature

The risk of infection complication with a urinary catheter is high because:

- The urinary catheter bypasses the body's defence mechanism of micturition - when organisms are naturally flushed from the lower urinary tract.
- The urinary catheter enables micro-organisms to gain direct entry to the bladder along the external catheter surface.
- The urinary catheter drainage system allows micro-organisms to gain entry from any of the connection points if they are disconnected or opened.
- Once organisms have entered the urinary catheter, biofilm forms on the lumen surface and can lead to infection and potentially to complete blockage of the catheter [1-8].

The risk of complications from a urinary catheter increases the longer the urinary catheter remains in situ [1, 4, 6]. Because the risk of infectious complications is so high, indwelling urinary catheters must only be used after considering all the alternatives [1, 4, 6].

Patients requiring urinary catheterisation may have a concurrent UTI - samples should be sent immediately post catheterisation if infection is suspected [9].

The micro-organisms causing CAUTI come from the patient's own flora (endogenous) or via cross-transmission (exogenous). A CAUTI caused by micro-organisms that are not part of the patient's gut flora is suggestive of cross-transmission, i.e. poor infection control procedures. Being in the room with another patient with a urinary catheter has also been identified as a risk factor as has poor hand hygiene and the use of a dirty container to empty the drainage bag [10]. Reminding people to remove catheters significantly reduced duration of catheterisation and reduced CAUTI [11].

Urine is itself an excellent culture media; as a consequence every effort must be made to prevent micro-organisms gaining entry to the catheter drainage system. **It is imperative that all urinary catheter procedures are performed separately.**

Using Continuous Quality Improvement, including feedback of performance, has been shown to improve patient safety by optimising performance and reducing the risk of complications [6, 12-19].

Urinary catheter procedures must only be undertaken by competent healthcare workers (HCWs) [1, 4, 6].
How UCs cause infection

Urinary catheters (UCs) increase the risk of UTI by:
- Enabling organisms to gain entry to the bladder - via external surface or opened connection.
- Reducing the body's defence of flushing out organisms during micturition.
- Facilitating biofilm formation. The organisms causing UTI, can be endogenous - from the patient's own gut flora, or cross-transmitted through poor infection control practices.

Environment

Create a culture where HCWs strive for excellence in performance and patient safety.

Maintain a clean ward, free from clutter. Do not undertake clinical procedures during ward cleaning procedures.

Avoid, as far as possible, caring for a patient with a catheter close to (in the same bay as) other patients with catheters.

Equipment

Store catheters and other sterile single-use items in clean dry areas, away from any splash contamination and following any manufacturer's instruction. Pre-use check the packaging is intact, correctly marked, undamaged and is within expiry date.

Ensure there is a selection of the most appropriate catheters (size and material) on the ward. Consider expert help in assessing ward catheter stocks.

Health Care Workers (HCWs)

There must be sufficient HCWs on the ward to enable clinical procedures to be performed as per the procedure.

HCWs caring for patients with UCs do not wear jewellery. HCWs don PPE, i.e. sterile gloves for insertion; clean gloves for maintenance, apron for all procedures and perform hand hygiene effectively.

Only competent HCWs, or those working under close supervision who are committed to infection control and patient safety, may catheterise patients and undertake catheter care procedures.

Minimising catheter associated urinary tract infections

- Alternatives to indwelling catheterisation have been considered and the need for catheterisation in this patient outweighs possible catheter related complications.
- Explain the reason for a UC to the patient and gain consent.
- Use an insertion checklist to document care/reason for catheterisation.
- The UC material will depend on usage.
- Choose the smallest gauge catheter for effective drainage.
- Use a small sized balloon - 10ml (adult).
- Prior to commencement, reassure the patient and explain the procedure.

Methods - Pre Insertion

- The procedure is performed aseptically using: sterile gloves, apron and creating a sterile field.
- The catheter is lubricated with a sterile gel.
- The urethral meatus is cleaned with sterile saline.
- To ensure the balloon is inflated in the bladder and not urethra, insert the catheter a little further once urine starts to drain before inflating the balloon.
- The catheter is connected to a closed sterile approved drainage bag.
- If a pre-existing UTI is thought possible, a specimen of urine is sent for culture. The UC drainage bag is positioned below the level of the bladder to facilitate drainage.
- Perform a daily review of the need for the UC.
- Hand hygiene is performed, and gloves & apron worn before catheter maintenance procedures; when finished, hand hygiene is repeated after PPE removed.
- Urinary drainage bags are not routinely changed, but are emptied regularly, as separate procedures, each into a clean container (avoiding contact between the container and the tap).
- UCs are continuously connected to the drainage bag.
- Patients are involved in their UC care and educated as to how they can minimise complications.
- Routine daily meatal hygiene is performed.
- HCWs monitor for signs of infection, e.g. fever, pain, cloudy urine. Abnormal findings are reported.
- Samples are taken aseptically from the sample port if infection is suspected.

Methods - Catheterisation

Methods - Maintenance

This fishbone chart is part of the HPS Infection Control Team's infection control quality improvement work to aid in the reduction of healthcare associated infections
Version 4.0 September 2008
References


