

Evidence-based practice in relation to indwelling urinary catheters

Dr Angela Savage provides an extremely practical guide to the prevention of infection via an everyday hospital procedure

Introduction

There is a body of up-to-date research evidence relating to the appropriate management of patients with indwelling urinary catheters (IUC). Healthcare workers are in a position to reduce the morbidity and mortality related to the use of urinary catheters. Rates of IUC insertion in hospitalised patients have been estimated as between 12 and 40% in developed countries.^{1,2} The term 'catheter apathy' has been coined to describe healthcare workers' acceptance of a high rate of urinary catheterisation and the risks that attend it.³ Studies carried out in Africa and around the world suggest that urinary tract infection (UTI) is one of the commonest hospital acquired infections (HAI).⁴⁻⁷ It is estimated that 8.5–10% of all patients with an IUC develop a catheter-associated urinary tract infection (CAUTI) in developed country settings,^{8,9} while as many as 42–50% of patients with an IUC may suffer from UTI in resource-limited settings.^{10,11}

Types of urinary catheterisation

A urinary catheter may be in situ short-term (1–14 days), short- to medium-term (2–6 weeks) or medium- to long-term (6 weeks–3 months). A urinary catheter may be urethral or suprapubic, indwelling or used intermittently. Intermittent self-catheterisation is recommended over long-term catheterisation in some conditions including voiding dysfunction.^{5,12}

Indications for urinary catheterisation

Urinary catheterisation should be avoided whenever possible, in view of the associated risks. Informed consent is a prerequisite. Indications include those in Table 1.^{1,2,5,6,12-16}

Inappropriate use of urinary catheterisation

The following are not appropriate indications for urinary catheter use:

- Incontinence without an appropriate indication.
- Diuresis.
- Frequent measurement of urinary output.
- Nurse's concern for patient comfort.
- Preference of patient.
- A substitute for nursing care.
- Prolonged post-operative care.^{12,14}

- To empty the urinary bladder prior to a specific procedure (e.g. surgery).
- To allow urinary drainage in specific perioperative cases (e.g. urological surgery, need for perioperative monitoring of urine output).
- To relieve urinary retention when medical management has failed and surgery is not suitable or is awaited.
- To measure output accurately in critically ill patients (e.g. in shock) (a urimeter drainage bag should be used in this case).
- To allow healing of perineal or sacral wounds in incontinent patients.
- In cases of deep sedation or paralysis.
- To relieve incontinence when no alternative is possible.

Table 1 Indications for urinary catheterisation

Risk of catheter-associated urinary tract infection

The commonest complication of IUC use is a CAUTI (see Table 2). This infection may be introduced at the time of insertion or travel into the bladder by way of the outside or inside of the catheter tubing.^{3,6,13,17} Morbidity secondary to CAUTI includes patient discomfort, prosthetic joint infection, and the risk of developing a reservoir of multidrug-resistant organisms that are then a hazard for other patients. Having a CAUTI carries a 2–4% risk of developing bacteraemia, which in turn has a mortality rate of up to 30%. Having a CAUTI increases length of hospital stay and thereby increases costs, overcrowding, and workload.^{1,6,13,18-20,22}

IUC use increases the rate of bacteriuria; if this remains asymptomatic it does not normally require treatment, but 20–30% develop a CAUTI, which requires treatment. A CAUTI is diagnosed clinically on the basis of pyrexia, rigors, nausea, vomiting, tachycardia, and loin tenderness without another cause.¹³

Table 3 shows key issues in the prevention of CAUTI.

- Patients with prolonged catheterisation.
- Female patients.
- Patients suffering from other infections.
- Patients suffering from malnutrition, diabetes, or renal failure.
- Elderly patients.
- Patients whose drainage tube is positioned above bladder level.

Table 2 Patients at increased risk of CAUTI¹

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1. Assessing the need for catheterisation.
2. Selection of catheter type and system.
3. Catheter insertion.
4. Catheter maintenance.
5. Education of patients, relatives, and healthcare workers.

Table 3 Key issues in the prevention of CAUTI¹

Risks of IUC other than CAUTI

IUC use has been associated with infections other than CAUTI, trauma, bladder calculi, neoplastic changes, acute confusion, restriction of activity and thereby delayed rehabilitation and discharge from hospital. The presence of an IUC can affect a patient psychologically, and interfere with social, sexual, and work activities; the embarrassment and restriction of activities may interfere with earning capacity and thereby result in economic hardship. Healthcare workers need to be aware of the impact of an IUC on a patient's dignity and lifestyle, as well as environmental risks related to disposal of materials used.^{6,13,18,22-24}

Management of clients with an IUC

Documentation

In an inpatient setting, a standard urinary catheter assessment and monitoring (UCAM) form can be devised (see Table 4).¹⁴ A client who is having an IUC but is not hospitalised should be educated about keeping records in diary form so that catheter and catheter bag changes are carried out at the appropriate time.

Assessing the need for catheterisation

IUC should be a last resort when other methods, such

1. Reason for insertion.
2. Date of insertion.
3. Catheter size.
4. Amount of water inserted into the balloon.
5. Name of the operator undertaking insertion or removal.
6. Care required and provided.
7. Dates and reasons for catheter changes.
8. Dates of changes of drainage bags.
9. Full details of any suspected or actual related complications and their management.
10. Daily reassessment of need to continue with IUC.
11. Date, time and reason for removal.
12. Education/information provided to patient.
13. Discharge planning if being discharged with IUC in situ.

Table 4 Issues to be recorded in relation to IUC use^{3,13,15,17}

as external 'condom' catheters, have been considered. There should be daily review of the continuing need for the catheter, and removal at the earliest time, because the duration of catheterisation is the most important factor in development of CAUTI. It is necessary to clarify who is to make the decision to introduce and to remove the urinary catheter.^{1,2,8,12,13,15,17,24,25}

Selection of catheter type

Where alternatives are available, choice of catheter material should be made on clinical grounds. Latex rubber catheters are cheap and readily available in many African settings but require changing every 7 days, and run the risk of hypersensitivity. Some types of catheters,

1. **Valid indications:** to empty the urinary bladder prior to a specific procedure (e.g. surgery), to relieve urinary retention, to measure output accurately (e.g. in shock), deep sedation or paralysis, to relieve incontinence when no alternative is possible.
2. **Informed consent:** check patient capacity, information about indication, procedure, risks, length of time catheter to remain in situ, lifestyle changes, check patient has understood and whether they agree.
3. **Insertion:** aseptic, gentle; clean meatus with normal saline, use sterile lubricant that is also ideally anaesthetic, after urine starts flowing insert at least another 4 cm before inflating balloon.
4. **Records:** insertion date and operator, review, date for removal, amount of water in balloon, care provided, education given.
5. **Maintenance** of a sterile closed system.
6. **Hand hygiene** and gloving when manipulating catheter.
7. **Position of bag and tubing:** tube attached to leg, no obstruction/kinking, all tubing and bag always below bladder level (or clamped for short time); tubing allows hanging without touching the floor, no pulling on tubing.
8. **Hygiene:** daily with soap and water and after bowel movement.
9. **Bag emptying:** without contamination, clean port with spirit and avoid contamination of port, use of personal protective equipment (PPE), usually 8 hourly and before full.
10. **Changing of catheter and bag:** every 7 days (or per manufacturer's instructions)
11. **Balloon inflated** with 10 mL of sterile water (adult) or 5 mL (child).
12. **Size:** Smallest possible size catheter used, i.e. 12–14 Ch (adult).
13. **Daily review** for signs and symptoms of any complications including fever, swelling, pain, nausea.
14. **Fluids:** intake – adult at least 2L daily – and output all recorded.
15. **Equipment available:** aseptic packs, handwashing equipment, IUC procedure, including single-use lubricant.
16. **Patient and relatives' education** including fluids, hygiene, bag position, lifestyle adaptation.
17. **Aseptic method** of obtaining CSU (catheter specimen of urine).
18. **Remove IUC** as soon as possible.
19. **Education** and supervision of healthcare workers.

Table 5 Key themes in quality care of patients with an IUC^{1,5,6,13,15-17,24-26,29}

including those coated with silicone or hydrogel, can remain in situ for 3 months, but are relatively expensive. For short-term use, there appears to be little difference in CAUTI rates between the different types; if long-term catheterisation is needed, intermittent self-catheterisation has a lower rate of CAUTI than with the use of indwelling catheters. A 12 Charriere (Ch) catheter has a diameter of 4 mm. It is generally appropriate to use catheters with a small diameter, such as 12–14Ch in adults. Some urological conditions such as haematuria may require larger sizes. A size 6–10Ch is used for children.^{1,5,6,15,17,24,26}

Practices to avoid

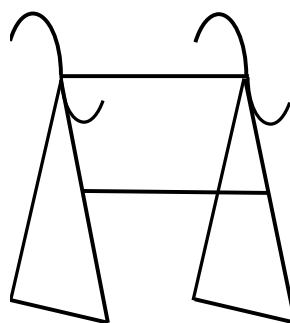
Frequent meatal cleaning and the use of antiseptics for meatal cleaning are no longer recommended. The installation of antimicrobial agents in the drainage bag and bladder irrigation are not justified from research evidence. Frequent IUC changes should be avoided. Antibiotic prophylaxis of CAUTI is generally not recommended; antibiotic management of asymptomatic bacteria related to the use of an IUC is also not supported by current evidence.^{1,13,15–17,20,25,27,28}

Challenges/key clinical practice recommendations in the African setting

- Avoid the use of IUC whenever possible.
- Ensure informed consent is obtained for the use of IUC.
- Maintain a closed system when an IUC is used.
- Review IUC use daily and remove the IUC as early as possible.
- Assess drainage at least three times daily and patient condition at least daily.
- Ensure that guidelines, sterile equipment, and documentation are always available.
- Catheter bag stands and hangers can be made locally at low cost.
- Teach and supervise clients, relatives and healthcare workers about correct IUC management.
- Audit IUC management regularly using selected items in Table 5.

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Urinary catheter stands (illustrated left) can be made locally in the correct width for available drainage bags (example shown right). Care should be taken to ensure that ends are not sharp.



Common urinary catheters (left) and lubricating gel (right)

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