

1. Patient Care Device Management

Introduction

Effective microbial infection management in the hospital environment is important to reduce morbidity and mortality due to infections. Use of patient care devices increases the chances of introducing pathogens to patients. This guideline has been prepared on commonly used devices with the expectation of introducing correct practices in using them which in turn would help to improve the health care delivery system.

Why a Clinical Practice Guideline?

Use of patient care devices such as Hickmann lines, peripherally inserted central cannulae, tracheotomy devices, urinary catheters, drains and other devices are gradually increasing worldwide. These guidelines are expected to help those who use such devices for the better management of them.

For whom is this guideline intended?

This guideline is intended for those who use patient care devices in the management of patients. The devices described in this guideline are used by all disciplines. Therefore it can be used by any specialty including medical officers and the nursing staff.

Objectives

- To provide evidence based recommendations to clinicians in the use of patient care devices.
- To provide recommendations to the administration to help in the improvement of quality of service delivery.

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Patient Care Device Management

Introduction

Use of patient care devices such as Hickmann lines, peripherally inserted central cannulae, tracheotomy devices, urinary catheters, drains and other devices are gradually increasing worldwide. Most of these devices are very expensive but use of them is essential for the management of critically ill patients. At the same time, patient care device related infections are on the increase. Therefore guidelines prepared for the management of these devices would help to improve their management and minimize such infection.

The guideline describes

1. Management of intravascular catheters namely peripheral and central venous catheters
2. Tracheotomy care
3. Care of urinary catheters

1.1 Management of Intravascular Catheters (in adults and children)

Catheter-related bloodstream infections (CRBSI) defined as the presence of bacteraemia originating from an intra-vascular catheter is one of the most important nosocomial infections. They cause a substantial amount of morbidity and are associated with increase in mortality by 12-25%. CRBSI have magnified in recent years by the increasing use of intravascular catheters. CRBSI results in increase in the number of days of

hospital stay and excessive use of antimicrobial agents thereby add significantly to the cost of health care.

Catheter related complications range from local exit site or tunnel infections to frank bacteremia and septicemia. Colonization of the catheter tip may begin by being asymptomatic, but, if the catheter is not withdrawn, may lead to an episode of catheter-related bacteremia and sepsis. The purpose of this guideline is to give recommendations to reduce **Catheter-related bloodstream infections**.

1.1.1 Peripheral Venous Catheters (cannulae)

A. Selection of peripheral-catheter insertion site

- In adults, use an upper site for catheter insertion rather than the lower-extremity. (X)
- If a catheter is inserted at a lower-extremity site change it to an upper-extremity site as soon as possible. (Y)
- In paediatric patients, the hand, the dorsum of the foot, or the scalp can be used as the catheter insertion sites. (Y)

B. Therapy personnel

- Designate trained personnel for the insertion and maintenance of intravascular catheters. (X)

C. Hand hygiene

- Observe proper hand-hygiene procedures either by washing hands with conventional antiseptic-containing soap and water or with waterless alcohol-based gels or foams and wear gloves.
- Observe hand hygiene before and after palpating catheter insertion sites, as well as before and after inserting, replacing, accessing, repairing, or dressing an intravascular catheter.

- Palpation of the insertion site should not be performed after the application of antiseptic, unless aseptic technique is maintained. (X)

- Use of gloves does not substitute for hand hygiene.

D. Aseptic technique during catheter insertion and care

- Maintain aseptic technique for the insertion and care of intravascular catheters. (X)
- Wear sterile gloves when inserting an intravascular catheter. (Y)
- Wear sterile gloves when changing the dressing on intravascular catheters. (Y)

E. Catheter site care

i. Cutaneous antiseptics

- Disinfect clean skin with an appropriate antiseptic before catheter insertion and during dressing changes. A 4 % chlorhexidine-based preparation is preferred. If 4% chlorhexidine is not available use 70% alcohol and 10% povidone iodine. A 4 % chlorhexidine-based preparation should be used if the patient is allergic to iodine. (X)
- Allow the antiseptic to remain on the insertion site and to air dry before inserting the catheter. Allow povidone iodine to remain on the skin for at least 2 minutes, or longer if it is not yet dry before insertion. (X)
- Do not apply organic solvents (e.g., acetone and ether) to the skin before insertion of catheters or during dressing changes.)

ii. Catheter-site dressing regimens

- Use either sterile gauze or sterile, transparent, semi-permeable dressing to cover the catheter site. (X)
- If site is bleeding or oozing, a gauze dressing is preferable to a transparent, semi-permeable dressing.
- Replace catheter-site dressing if the dressing becomes damp, loosened, or visibly soiled. (X)

- Do not use topical antibiotic ointment or creams on insertion sites because of their potential to promote fungal infections and antimicrobial resistance.

- Do not submerge the catheter under water. Showering should be permitted if precautions can be taken to reduce the likelihood of introducing organisms into the catheter (e.g., if the catheter and connecting device are protected with an impermeable cover during the shower).

F. Selection and replacement of intravascular catheters

- Promptly remove any intravascular catheter that is no longer essential. (X)
- When adherence to aseptic technique cannot be ensured (i.e., when catheters are inserted during a medical emergency), replace all catheters as soon as possible. (X)
- Evaluate the catheter insertion site daily, by palpation through the dressing to discern tenderness and by inspection if a transparent dressing is in use. If the patient has local tenderness or other signs of possible catheter related blood stream infection (CRBSI), an opaque dressing should be removed and the site inspected visually. (X)

- In adults, replace short, peripheral venous catheters every 72 hours to reduce the risk of phlebitis. (Y) If sites for venous access are limited and no evidence of phlebitis or infection is present, peripheral venous catheters can be left in place for longer periods, although the patient and the insertion sites should be closely monitored.
- Leave peripheral venous catheters in place in children until IV therapy is completed, unless complications (e.g., phlebitis) occur. (Y)
- Remove peripheral venous catheters if the patient develops signs of phlebitis (e.g., warmth, tenderness, erythema, and palpable venous cord), infection, or a malfunctioning catheter. (X)

G. Replacement of administration sets, needleless systems, and parenteral fluids

i. Administration sets

- Replace administration sets, including secondary sets and add-on devices, no less frequently than at 48-72 hour intervals, unless catheter-related infection is suspected or documented. (Y)
- Replace tubing used to administer blood, blood products, or lipid emulsions within 24 hours of initiating the infusion. (X) If the solution contains only dextrose and amino acids, the administration set does not need to

be replaced more frequently than every 48-72 hours. (Y)

ii. Needleless intravascular devices (e.g. ports, caps)

- Ensure that all components of the system are compatible to minimize leaks and breaks in the system. (Y)
- Minimize contamination risk by wiping the access port with 70% alcohol and accessing the port only with sterile devices. (X)
- Cap all stopcocks when not in use.

iii. Parenteral fluids

- Complete the infusion of lipid-containing solutions within 24 hours of hanging the solution. (X)
- Complete infusions of blood or other blood products within 4 hours of hanging the blood. (Y)
- No recommendation can be made for the hang time of other parenteral fluids.

H. Preparation and quality control of IV solutions

- Do not use any container of parenteral fluid that has visible turbidity, leaks, cracks, or particulate matter or if the manufacturer's expiry date has passed. (X)
- Use single-dose vials for parenteral additives or medications when possible. (Y)

- Do not combine the left over content of single-use vials for later use. (X)
- If multi-dose vials are used
 - a) Refrigerate multi-dose vials after they are opened if recommended by the manufacturer. (X)
 - b) Cleanse the access diaphragm of multi-dose vials with 70% alcohol before inserting a device into the vial. (X)
 - c) Use a sterile device to access a multi-dose vial and avoid touch contamination of the device before penetrating the access diaphragm. (X)
 - d) Discard multi-dose vial if sterility is compromised. (X)
 - e) **Do not leave needles inside multi-dose vials.**
- Collapsible IV infusions are preferable to non-collapsible ones.

I. Prophylactic antimicrobials

- Do not administer prophylactic antimicrobials routinely before insertion or during use of an intravascular catheter to prevent catheter colonization or CRBSI.

1.1.2 Central Venous Catheters (CVC)

CVC include Peripherally Inserted Central venous Catheter (PICC), hemodialysis and pulmonary artery catheters.

A. General principles

- Use a CVC with the minimum number of ports or lumens essential for the management of the patient. (X)
- Use totally implantable access devices for patients who require long-term, intermittent vascular access. For patients requiring frequent or continuous access, a PICC or tunneled CVC is preferable. (X)
- Designate one port exclusively to administer parenteral nutrition. (Y)
- Select the catheter, insertion technique, and insertion site with the lowest risk for complications (infectious and noninfectious) for the anticipated type and duration of IV therapy. (Y)

B. Selection of catheter insertion site

- Weigh the risk and benefits of placing a device at a recommended site to reduce infectious complications against the risk for mechanical complications (e.g., pneumothorax, subclavian artery puncture, subclavian vein laceration, subclavian vein

stenosis, hemothorax, thrombosis, air embolism, and catheter displacement). (X)

- Use a subclavian site (rather than a jugular or a femoral site) in adult patients to minimize infection risk for non-tunneled CVC placement (Y)

C. IV therapy personnel

- Designate **trained** personnel for the insertion and maintenance of intravascular catheters. (X)

D. Hand hygiene

- Observe proper hand-hygiene procedures either by washing hands with conventional antiseptic containing soap and water or with waterless alcohol-based gels or foams. Observe hand hygiene before and after palpating catheter insertion sites, as well as before and after inserting, replacing, accessing, repairing, or dressing an intravascular catheter. **Palpation of the insertion site should not be performed after the application of antiseptic.** unless aseptic technique is maintained. (X)
- Use of sterile gloves does not substitute for hand washing.

E. Aseptic technique during catheter insertion and care

- Maximal sterile barrier precautions during catheter insertion. (X)
- Use aseptic technique including the use of a cap, mask, sterile gown, sterile gloves, and sterile sheets, for the insertion of CVC (including PICC) or guide wire exchange. (X)
- Maintain aseptic technique for care of intravascular catheters. (X)
- Wear sterile gloves when changing the dressing on intravascular catheters. (X)

F. Catheter site care

i. Cutaneous antisepsis

- Disinfect clean skin with an appropriate antiseptic before catheter insertion and during dressing changes. A 4 % chlorhexidine-based preparation is preferred. If 4 % chlorhexidine is not available use 70% alcohol and 10% povidone iodine. A 4% chlorhexidine-based preparation should be used if the patient is allergic to iodine. (X)
- Allow the antiseptic to remain on the insertion site and to air dry before catheter insertion. Allow povidone iodine to remain on the skin for **at least 2 minutes**, or longer if it is not yet dry before insertion. (X)

- Do not apply organic solvents (e.g., acetone and ether) to the skin before insertion of catheters or during dressing changes.

ii. Catheter-site dressing regimens

- Use either **sterile** gauze or **sterile**, transparent, semi-permeable dressing to cover the catheter site. (X)
- Tunneled CVC sites that are well healed might not require dressings. (Z)
- If the site is bleeding or oozing, a gauze dressing is preferable to a transparent, semi-permeable dressing. (X)
- Replace catheter-site dressing if the dressing becomes damp, loosened, or visibly soiled. (X)
- Replace dressings used on short-term CVC sites every 2 days for gauze dressings and at least every 7 days for transparent dressings, except in those paediatric patients in which the risk for displacing the catheter outweighs the benefit of changing the dressing. (Y)
- Replace dressings used on tunneled or implanted CVC sites no more than once per week, until the insertion site has healed. (Y)

- Do not use topical antibiotic ointment or creams on insertion sites because of their potential to promote fungal infections and antimicrobial resistance.

G. Replacement / removal of intravascular catheters

- Promptly remove any intravascular catheter that is no longer essential. (X)
- Do not routinely replace CVC, PICC, hemodialysis catheters, or pulmonary artery catheters to prevent catheter-related infections. (X)
- When adherence to aseptic technique cannot be ensured (i.e., when catheters are inserted during a medical emergency), replace all catheters as soon as possible and after no longer than 48 hours. (X)
- Use clinical judgment to determine when to replace a catheter that could be a source of infection (e.g. do not remove CVC or PICC on the basis of fever alone. Use clinical judgment regarding the appropriateness of removing the catheter if infection is evidenced elsewhere or if a non-infectious cause of fever is suspected). (Y)
- Replace any short-term CVC if pus is observed at the insertion site, which indicates infection. (X)
- Replace all CVC if the patient is hemodynamically unstable and CRBSI is suspected. (Y)
- Do not use guide wire techniques to replace catheters in patients suspected of having catheter-related infection. (X)

Guide wire exchange

- Do not use guide wire exchanges routinely for non-tunneled catheters to prevent infection.
- Use a guide wire exchange to replace a malfunctioning non-tunneled catheter if no evidence of infection is present. (X)
- Use a new set of sterile gloves before handling the new catheter when guide wire exchanges are performed. (X)

H. Replacement of administration sets, needleless systems, and parenteral fluids

i. Administration sets

- Replace administration sets, including secondary sets and add-on devices, at 72-hour intervals, unless catheter-related infection is suspected or documented. (Y)
- Replace tubing used to administer blood, blood products, or lipid emulsions within 24 hours of initiating the infusion. (X) If the solution contains only dextrose and amino acids, the administration set does not need to be replaced every 72 hours. (Y)

ii. Needleless intravascular devices

- Change the needleless components at least as frequently as the administration set. (Y)

- Change caps every 72 hours or according to manufacturer's recommendations. (Z)
- Ensure that all components of the system are compatible to minimize leaks and breaks in the system. (Y)
- Minimize contamination risk by wiping the access port with 70% alcohol and accessing the port only with sterile devices. (X)

iii. Parenteral fluids

- Complete the infusion of lipid-containing solutions within 24 hours of hanging the solution. (Y)
- Complete infusions of blood or other blood products within 4 hours of hanging the blood. (Y)
- No recommendation can be made for the hang time of other parenteral fluids.

I. Injection ports

- Clean injection ports with 70% alcohol or an iodophor before accessing the system.
- Cap all stopcocks when not in use.

J. Preparation and quality control of IV solutions

- Do not use any container of parenteral fluid that has visible turbidity, leaks, cracks, or

particulate matter or if the manufacturer's expiration date has passed. (X)

- Use single-dose vials for parenteral additives or medications when possible.(Y)
- Do not combine the leftover content of single-use vials for later use. (X)
- If multi-dose vials are used
 - a) Refrigerate multi-dose vials after they are opened if recommended by the manufacturer. (X)
 - b) Cleanse the access diaphragm of multi-dose vials with 70% alcohol before inserting a device into the vial. (X)
 - c) Use a sterile device to access a multi-dose vial and avoid touch contamination of the device before penetrating the access diaphragm. (X)
 - d) Discard multi-dose vial if sterility is compromised. (X)
 - e) **Do not leave needles inside multi-dose vials.**
- Collapsible IV infusions are preferable to non collapsible ones.

K. In-line filters

- Do not use filters routinely for infection-control purposes

L. Antibiotic lock solutions

- Do not routinely use antibiotic lock solutions to prevent CRBSI. Use prophylactic antibiotic lock solution only in special circumstances (e.g. in treating a patient with a long-term cuffed or tunneled catheter or port who has a history of multiple CRBSI despite optimal maximal adherence to aseptic technique). This should be done in consultation with the microbiologist.

M. Prophylactic antimicrobials

- Do not administer prophylactic antimicrobials routinely before insertion or during use of an intravascular catheter to prevent catheter colonization or CRBSI.

References

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1.2 Tracheostomy Care

Introduction

Tracheostomy is a frequently performed surgery in Ear Nose & Throat (ENT) wards, emergency departments, Intensive Care Units (ICU) and other wards like oncology and neurology wards. The patients who have undergone tracheostomy surgery can get infectious complications such as infections of the tracheostomy site and respiratory infections such as pneumonia.

In most units where the tracheostomies are performed, there are no guidelines for tracheostomy care. Therefore the aim of this guideline is to provide guidance to staff on infection control aspects of tracheostomy care with a view to reducing the infectious complications associated with tracheostomy.

There is a scarcity of trials and studies on infection control aspect of tracheostomy care in literature. Moreover, there is a wide variation in recommendations provided by different guidelines and a wide variation in the procedures practiced in each unit. However, there should be a protocol or at least an instruction sheet for tracheostomy care in each unit. This guideline could be used to prepare such instruction sheets or protocols for each unit according to the unit policy. This would also be useful for medical officers, nurses and other personnel dealing with patients who have undergone a tracheostomy in a hospital setting.

1.2.1 Infections associated with Tracheostomy

The presence of a tracheostomy can give rise to infections at two sites;

1. Infection of the tracheostomy site.
2. Respiratory infections (nosocomial pneumonia).

Infection control procedures in tracheostomy care will be considered under the following headings.

- A. Care of the Tracheostomy site.
- B. Suction of the Tracheostomy tube.
- C. Humidification of inspired air.
- D. Changing of Tracheostomy tubes.

- Tracheostomy should be performed under sterile conditions using aseptic techniques (X).

A. Care of the Tracheostomy site

Careful attention to post-operative wound care is mandatory. Paragraphs **i-vi** give the procedures to be adopted.

- i. **Inspect the Tracheostomy site and observe for the signs of irritation, inflammation and infection**
 - redness
 - swelling
 - exudates
 - odour

- pain
- Increased body temperature

- These should be observed every 2 hours in the early post-operative period and daily later on. (X)
- Chart the observations. (X)

ii. Dressing

- a. **Keep the site clean and dry by:**(X)
 - Careful attention to replacing soiled dressings.
 - Removing any secretions that collect around or under the T- tube flange.
- b. **The stoma site should be protected using dressings:** (Y)
 - Dressings that trap moisture should be avoided.
 - Gauze swabs should not be used as these trap moisture and loose threads can be inhaled.
 - A slim, absorbent dressing is the most appropriate.
 - Specific tracheostomy dressings will have a keyhole design for easy placement around the tracheostomy tube.
 - Hydrophilic, polyurethane foam dressings (e.g. Lyofoam or Allewyn) are preferable as they are designed to absorb moisture away

from the skin interface, thereby reducing maceration risk.

- If these special dressings are not available, keep the tracheostomy site without any dressing. This is the practice in most units in Sri Lanka.

c. Change the dressings (if used) and the tapes every 24 hours or more frequently if soiled. (X)

d. The skin around the tracheostomy should be cleaned with sterile normal saline. (X)

- 5% povidone iodine could be used if necessary.
- Cleaning should be done every 4 hours in the early post operative period. (X)
- If the skin is excoriated, a skin barrier cream could be used (i.e soft paraffin or cavilon)

B. Suctioning of the Tracheostomy

Suctioning of the Tracheostomy tube is done to remove mucous from the tube and trachea to allow easier breathing and to prevent infections. Chest physiotherapy is also important to remove mucous especially in early post-operative period. Chest physiotherapy should be continued until the patient is able to cough out secretions.

i. Frequency of suctioning

- Suctioning should be done more frequently during the early post-operative period and when there is a respiratory infection.
- It could be done according to a set schedule (e.g. every 2 hours) and as needed.
- The frequency of suctioning will vary on the basis of individual characteristics including age, muscular and neurological status, activity level, ability to generate an effective cough, viscosity and quantity of mucous and maturity of the stoma.

Therefore frequency of suctioning should be decided on clinical assessment.

Suctioning should be done when there is, (X)

- Viscous secretions
- Visible or heard secretions
- Reduced airflow at stoma site during respiration
- Inability to cough up secretions
- Reduced breath sounds
- Restlessness
- Increased use of intercostal muscles
- Sweating
- Increased heart rate and blood pressure
- Reduced saturation levels and dropping in saturation

- If these do not improve with suctioning, the tube may need to be changed.

ii. Suctioning procedure

Assessment of the patient throughout the procedure is essential (X). Assess vital signs and O₂ saturation. Observe the patient closely throughout the procedure for any signs of distress.

1. Wash hands with soap and water.
2. Dry hands using a single use towel.
3. Adjust the suction pressure of the suction machine. It should be set at 80-120 mmHg for adults and between 60-80 mmHg for children.
4. Attach a sterile, disposable suction catheter to the suction tube of the machine. Keep the other end of the suction catheter inside the protective covering until use. This end should not be touched with bare hands.
5. Put on sterile gloves, splash proof surgical mask, a gown and eye protection (goggles or face shield).
6. Pre-oxygenate the patient. If the patient is on ventilator adjust it to 100% O₂ (Oxygen) and depress the mechanical ventilation button 3-4 times. If the patient is on a T-piece, connect the ambu bag to the T-tube and give 3-4 deep breaths.
7. Introduce the suction catheter gently, without suction.

8. Pre-measured technique as described here should be used for routine suctioning. The catheter is inserted to a pre-measured depth, with the most distal side holes of the catheter just exiting the tip of the tracheostomy tube. Exact depth of insertion is critical to avoid epithelial damage or inadequate suctioning. Another tracheostomy tube of the same size may be used to measure the exact depth to which the catheter should be inserted. Pre-marked catheters are also helpful in assuring accurate insertion depths. Deep suctioning should be avoided during routine suctioning as it causes epithelial damage and inflammation.
9. Gently withdraw the catheter by twirling or rotating between fingers while applying suction.

Note - the colour, odour, amount and consistency of the secretions.

10. Avoid suction for more than **10 seconds**. Let the patient rest and breathe for 2-3 minutes and then repeat suction if needed. If the patient is receiving oxygen or ventilatory support, re-apply the O₂ or ventilator for at least 2 minutes before repeating suction. Do not perform suction more than three times in quick succession to avoid trauma and hypoxia.

11. Routine use of normal saline instillation is not recommended. Instead, use adequate humidification and maintain fluid balance to keep the mucous thin.
12. Remove gloves and wash hands thoroughly immediately after suctioning.
13. Discard the catheter, gloves and mask as clinical waste. If normal saline was used to clear the catheter, discard the saline and clean the container.

If the procedure needs to be repeated, new sterile gloves should be worn and a new suction catheter should be used.

C. Humidification

- As the air entering through the T-tube bypasses the moisturizing effect of the upper airway, a suitable method should be used for humidification of the air entering through the tracheostomy eg. use of passive humidifiers such as **Heat Moist Exchangers** (HME).
- The humidification system should be changed regularly, as over time bacteria will accumulate in the circuit.

- ❖ Failure to provide adequate humidity in inspired air may lead to;
 - loss of ciliary action
 - damage to mucous glands
 - thickening of mucous secretions leading to respiratory tract infections and other harmful events.

D. Changing of tracheostomy tubes

i. Frequency of tube changes

- For the tracheostomy tubes inserted surgically, the first tracheostomy tube change should be performed **no earlier than 4-5 days** to allow time for the tract to be formed.
- If the tube was inserted by the per-cutaneous procedure, the tube should only be changed **9-10 days post-operatively**.
- There is no objective data that suggest an ideal frequency for changing T-tubes after fist tube change.

ii. Cleaning of the inner cannula

- Check the inner cannula frequently to ensure patency.
- Change the tube if viscous secretions block the tube.
- Remove inner cannula and clean it using gloves, running tap water and cotton buds or flexible catheter tubing.
- Do not use brushes, as abrasion may lead to bacterial overgrowth.

- Make sure that the inner cannula is dried thoroughly before re-inserting into the outer tube.
- Soaking in sodium bicarbonate for 15 minutes is only required if the cannula is very dirty. Do not leave tubes soaking for longer periods. Dispose the solution immediately. Rinse thoroughly with running water before replacing into patient

• If inner cannula is occluded with secretions and impossible to clean, dispose it. **Do not attempt to clean and reuse.**

- All tubes should be stored in a dry, clean covering. These should be kept by the bedside in a labeled container.

iii. Wound care after de-cannulation

- Once the tracheostomy tube has been removed a dry, airtight dressing should be secured over the stoma.
- The dressing should be changed at least daily and removed once the stoma has healed (**usually 5-7 days**)
- Poor / delayed healing of a tracheostomy stoma will require ongoing wound care and may need further attention from the surgical team.

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1.3 Prevention of urinary catheter- (temporary indwelling) associated urinary tract infections.

Introduction

The urinary tract is the most common site of hospital acquired infections especially in patients with indwelling urethral catheters. Although not all catheter-associated urinary tract infections can be prevented, many of them could be avoided by proper management of the indwelling catheter.

1.3.1 Insertion of urethral catheter

A) Who should do it?

- **Insertion of a urethral catheter** should be done only by a trained health care worker (X)
- Hospital personnel and others who take care of catheters should be given periodic in-service training.

B) Catheter use

- Urinary catheters should be inserted **only when necessary** and should be **removed as early as possible.** (X)

C) Hand-washing (Refer the Hand-washing guideline of the Sri Lanka College of Microbiologists)

- Hand-washing should be done immediately before and after any manipulation of the catheter site or apparatus. (X)

D) Procedure for catheter Insertion

- Catheters should be inserted using aseptic technique and sterile equipment. (X) Catheters are best inserted when bladder is full to get washout effect. (Y)
- Clean the external meatus with 0.02% chlorhexidine aqueous solution.
- Sterile gloves and an apron should be worn.
- Draping should be done around a radius of 45cm before the procedure. (X)
- Insert 5ml of anesthetic gel, preferably a single use lubricant containing lignocaine 2% into the urethra slowly and evenly and wait for 5 minutes. (X)

- ❖ Appropriate gauged catheter consistent with good drainage, should be used to minimize urethral trauma. (X)
- ❖ Indwelling catheters should be properly secured after insertion to prevent movement and urethral traction. (X)

1.3.2 Maintenance and care of urethral catheter

A) Closed sterile drainage system

- A sterile closed drainage system should be maintained.
- The catheter, drainage tube and collection bag should never be left disconnected.
- Irrigation should be avoided unless obstruction is anticipated.
- Closed continuous irrigation may be used to prevent obstruction.

- Continuous irrigation of the bladder with antimicrobials is **not recommended** as it has not proven to be useful.

B) Urinary Flow

- **Unobstructed flow of urine should be maintained.** (X)

To achieve free flow of urine; 

- The catheter and collecting tube should be kept from kinking.
- The collecting bag should be emptied regularly using a separate collecting container for each patient.
- Poorly functioning or obstructed catheters should be irrigated or if necessary replaced.
- Collecting bags should always be kept below the level of the bladder.

- The HCW should wear non-sterile disposable gloves while emptying the collection bag.
- It should be emptied into a clean jar and the outlet of the bag should not touch the container.
- Once emptied ensure the tap is screwed tightly and wipe it dry.
- Do not hold the collection bag upside down.
- The collecting bag should never be allowed to touch the floor.

- If there are any breaks in aseptic technique, disconnection or leakage the collecting system should be replaced aseptically after disinfecting the catheter-tubing junction.

D) Specimen Collection (X)

- When small volumes of fresh urine are needed for urine culture examination, the distal end of the catheter should be clamped.
- Urine should be aspirated using a sterile needle and syringe after cleaning the site with 70% alcohol.
- The site of collection could be either sampling port (if present) or the rubber tubing just above the bifurcation of the tube.
- Larger volumes of urine for special analyses should be obtained aseptically from the drainage bag.

- If faecal contamination occurs the perineum should be cleaned and the catheter and the drainage system changed.
- Daily urethral meatal cleaning with antiseptics is not recommended. However, meatal cleaning with sterile saline may be a reasonable hygienic measure.
- Indwelling catheters should not be changed at frequent intervals.
- Encourage intake of fluids within the limits that the patient can medically tolerate.

- Regular bacteriological monitoring of catheterized patients is not recommended.
- Administration of prophylactic antibiotics is also not recommended as it does not prevent bacteriuria.

References:

1. Guideline for the prevention of catheter associated urinary tract infection in Centres for disease prevention and control last modified in April 2005.
2. Urinary tract infections edited by Brumfitt W, Hamilton-Miller J, Bailey R 1998 Lippincott-Raven Publishers.
3. Infection control manual Ministry of Health, Sri Lanka.