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HOSPITAL INFECTION CONTROL POLICY

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Central Venous Catheter Infection Prevention Policy & Procedures

TITLE	Central Venous Catheter Infection Prevention Policy & Procedures
SUMMARY	<p>This document provides instruction and guidance to hospital personnel on proper procedures for insertion and management of Central Intravenous Catheters (CVC) in order to reduce the incidence of catheter related blood stream infections..</p> <p>All Clinical Directors, Departmental Managers, Heads of Sections and Nursing Officers in charge of wards are required to instigate action to ensure the successful implementation of the policy within their area(s) of control.</p>
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INTRODUCTION

Around 1000 central venous catheters (CVCs) are inserted at Mater Dei Hospital every year. Most are inserted at the intensive care unit and operating theatres. Catheter-related bloodstream infections (CRBSI) increase length of stay, patient mortality and morbidity and hospital costs.

CRBSI are preventable through meticulous attention on strict aseptic technique and skin disinfection during insertion followed by proper maintenance through daily inspection and correct handling. CVCs should be removed as soon as they are no longer needed or when there is suspicion of infection. Programmes have demonstrated good success rates with sustained continued effort and the adoption of a multidisciplinary team approach. One of the most effective interventions has been the adoption of care bundles in which all required procedures for infection prevention are done for every patient every time. It is well recognized that hospitals that have introduced CVC bundles have managed to achieve a significant reduction in CRBSI rates.

EXECUTIVE SUMMARY

Education and Training

1. Heads of departments and nursing officers in charge of wards where central intravascular catheters (CVC) are either inserted and/or maintained have a duty to educate healthcare personnel under their responsibility regarding correct indications for CVCs, proper procedures for the insertion and maintenance as well as appropriate infection control measures to prevent intravascular catheter-related infections [Category IA]
2. Only trained personnel who demonstrate competence should undertake insertion and maintenance of CVC. [Category IA]
3. Training should focus on hospital-specific or collaborative-based performance improvement initiatives in which multifaceted strategies are "bundled" together to improve compliance with evidence-based recommended practices. [Category IB]

Selection of Catheters and Sites

1. Avoid using the femoral vein for central venous access in adult patients. If a femoral site is chosen, document the reason in the patient's notes. [Category IA]
2. For non-tunnelled CVC placement in adult patients, perform a risk assessment to establish if it is indicated to use the subclavian site (which is the site with lowest infection incidence). If the risk assessment suggests otherwise, use a jugular in preference to a femoral site in order to minimize infection risk. [Category IB]
3. Avoid the subclavian site in haemodialysis patients and patients with advanced kidney disease, to avoid subclavian vein stenosis. [Category IA]
4. Use a fistula or graft in patients with chronic renal failure instead of a CVC for permanent access for dialysis. [Category IA]
5. Use ultrasound guidance to place central venous catheters (if this technology is available) to reduce the number of cannulation attempts and mechanical complications. Ultrasound guidance should only be used by those fully trained in its technique. [Category IB]
6. Use a CVC with the minimum number of ports or lumens essential for the management of the patient. [Category IB]
7. Promptly remove any intravascular catheter that is no longer essential. [Category IA]

8. When adherence to aseptic technique cannot be ensured (i.e. catheters inserted during a medical emergency), replace the catheter as soon as possible and no later than 48 hours. [Category IB]

Hand Hygiene and Aseptic Technique

1. Perform hand hygiene procedures, either by washing hands with conventional soap and water or preferably using alcohol-based hand rubs (AHR). [Category IA]
2. Hand hygiene should be performed before and after palpating catheter insertion sites as well as before and after inserting, replacing, accessing, repairing, or dressing an intravascular catheter. [Category IA]
3. Palpation of the insertion site should not be performed after the application of antiseptic, unless aseptic technique is maintained. [Category IB]
4. Maintain aseptic technique for insertion and care of intravascular catheters. [Category IB]
5. Sterile gloves should be worn for the insertion of all central, venous catheters. [Category IA]
6. Use new sterile gloves before handling the new catheter when guide wire exchanges are performed. [Category II]
7. Wear either clean or sterile gloves when changing the dressing on intravascular catheters. [Category IC]

Maximal Sterile Barrier Precautions

1. Use maximal sterile barrier precautions, including the use of a cap, mask, sterile gown, sterile gloves, and a sterile full body drape, for the insertion of CVCs or guide wire exchange. [Category IB]

Skin Preparation

1. Prepare clean skin with a $\geq 0.5\%$ chlorhexidine preparation in 70% alcohol before CVC insertion and during dressing changes. Do not use an aqueous based disinfectant. [Category IA]
2. If there is a contraindication to chlorhexidine, 70% alcohol can be used as an alternative. [Category IA]
3. Antiseptics should be allowed to dry according to the manufacturer's recommendation prior to placing the catheter. [Category IB]

Catheter Securement Devices

1. Sutureless securement devices are preferred since they reduce the risk of infection for intravascular catheters. [Category II]
2. If unavailable, suture the CVC in four sites to ensure correct adherence and prevent pistoning.

MRSA screening

1. If the CVC insertion is planned in advance, perform an MRSA nasal swab and contact Infection Control if it is reported positive.

Systemic Antibiotic Prophylaxis

1. Do not routinely administer systemic antimicrobial prophylaxis before insertion or during use of an intravascular catheter to prevent catheter colonization or CRBSI. [Category IB]
2. In cases of patients known to be MRSA positive, discuss with Infection Control (or microbiologists) if prophylaxis may be indicated and consider inserting an impregnated CVC.

Catheter Site Dressing Regimens

1. Preferably use sterile, transparent, semi permeable dressing to cover the catheter site. [Category IA]
2. If the patient is diaphoretic or if the site is bleeding or oozing, use a sterile gauze dressing until this is resolved and then replace with transparent dressing. [Category II]

Replacement of CVCs on guide wire

1. Avoid using guide wire exchanges for non-tunnelled catheters and do not use guide wire exchanges to replace a non-tunnelled catheter suspected of infection. [Category IB]
2. In the exceptional circumstances where a guide wire exchange is performed follow a full aseptic technique.

Catheter Site Dressing Regimens

1. Preferably use sterile, transparent, semi permeable dressing to cover the catheter site. [Category IA]
2. If the patient is diaphoretic and sweating profusely due to shock or else if the site is bleeding or oozing, use a sterile gauze dressing until this is resolved and then replace with transparent dressing. [Category II]
3. Replace catheter site dressing if the dressing becomes damp, loosened, or visibly soiled. [Category IB]
4. Do not use topical antibiotic ointment or creams on insertion sites, except for dialysis catheters, because of their potential to promote fungal infections and antimicrobial resistance. [Category IB]
5. Do not submerge the catheter or catheter site in 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). [Category IB]
6. Replace dressings used on short-term CVC sites every 2 days for gauze dressings. [Category II]
7. Replace dressings used on short-term CVC sites at least every 7 days for transparent dressings, except in those paediatric patients in which the risk for dislodging the catheter may outweigh the benefit of changing the dressing. [Category IB]
8. Replace transparent dressings used on long term tunnelled or implanted CVC sites no more than once per week (unless the dressing is soiled or loose), until the insertion site has healed. [Category II]
9. Monitor the catheter sites visually when changing the dressing. If patients have tenderness at the insertion site, fever without obvious source, or other manifestations suggesting local or bloodstream infection, the dressing should be removed to allow thorough examination of the site. [Category IB]
10. Encourage patients to report any changes in their catheter site or any new discomfort. [Category II]

Patient Cleansing

1. Use a chlorhexidine or triclosan wash for daily skin cleansing to reduce CRBSI. [Category II]

Antibiotic/Antiseptic Ointments

1. Use povidone iodine antiseptic ointment, silver sulphadiazine or bacitracin/gramicidin/polymyxin B ointment at the haemodialysis catheter exit site after catheter insertion and at

the end of each dialysis session as long as this ointment does not interact with the material of the haemodialysis catheter per manufacturer's recommendation. [Category IB]

Catheter Lock Prophylaxis

1. Use prophylactic antimicrobial lock solution in patients with long term catheters, especially with a history of multiple infections despite adherence to aseptic technique [Category II]

Anticoagulants

1. Do not routinely use anticoagulant therapy to reduce the risk of catheter-related infection in general patient populations. [Category II]

Replacement of Administration Sets

1. In patients not receiving blood, blood products or fat emulsions, replace administration sets that are continuously used, including secondary sets and add-on devices, no more frequently than at 96-hour intervals, but at least every 7 days. [Category IA]
2. Replace tubing used to administer blood, blood products, or fat emulsions (both those combined with amino acids and glucose in a 3-in-1 admixture or infused separately) within 24 hours of initiating the infusion. [Category IB]
3. Replace tubing used to administer propofol infusions every 6 or 12 hours. [Category IA]

Needleless Intravascular Catheter Systems

1. When needleless systems are used, a split septum valve may be preferred over some mechanical valves due to increased risk of infection. [Category II]
2. Change the needleless components at least as frequently as the administration set. There is no benefit to changing these more frequently than every 72 hours. [Category II]
3. Change needleless connectors no more frequently than every 72 hours or according to manufacturers' recommendations. [Category II]
4. Minimize contamination risk by scrubbing the access port with an appropriate 2% chlorhexidine in 70% alcohol and accessing the port only with sterile devices. [Category IA]

Accessing IV tubing

1. Ensure that all components of the system are compatible to minimize leaks and breaks in the system. [Category II]
2. Minimize contamination risk by scrubbing the access port with an appropriate antiseptic (2% chlorhexidine in 70% alcohol) and accessing the port only with sterile devices. [Category IA]
3. Use a needleless system where possible to access IV tubing. [Category IC]

CVC INSERTION

Choice of catheter

After considering the reason for CVC insertion, the catheter with the least number of lumens needed should be inserted. CVCs inserted only for Total Parenteral Nutrition (TPN) should always be single lumen, and preferably tunneled. Lessening the number of lumens reduces the risk of infection. However inserting a CVC with fewer lumens than required and using three-way taps to attach multiple infusions to the same line is also an infection risk besides causing other hazards. Therefore, a 4- or 5-lumen catheter may be justified, and indeed recommended, in the acute management of a critically ill patient requiring administration of multiple concurrent infusions and drugs via the central route.

The length of the catheter should be appropriately chosen so that most or all the line is inserted inside the patient. This avoids dangling of catheters which in turn increases risk of dislodgement and also allows proper fixation of the line to the patient.

There is insufficient evidence that impregnated catheters decrease infection rates in the short term i.e. less than 6 days. Given that they are more expensive, they should only be considered if it is planned that a line will last more than 7 days. Other possible indications for impregnated catheters include:

- a. situations when the line is being changed due to suspected CVC infection;
- b. patients who are already suffering from systemic infections;
- c. in known MRSA carriers.

Choice of insertion site

A sterile insertion technique must be followed in order to reduce the risk of colonization and infection of the line. Prior to insertion, one should consider if the patient actually needs the line. If there is no alternative, a risk based assessment of the most appropriate insertion site should follow. Ideally a subclavian central venous catheter should be inserted as it has the lowest rate of infection. However if the risks outweigh the benefits, an internal jugular central venous catheter should be inserted. Risks of subclavian lines insertion include the increase risk of pneumothorax especially if the patient is mechanically ventilated, subclavian artery puncture, subclavian vein laceration, haemothorax, thrombosis, air embolism and catheter misplacement. The benefits of a subclavian vein insertion are the decrease risk of infection due to less contamination by oral secretions and better fixation to the skin hence avoiding pistoning and flopping around of the line. In patients suffering from advanced kidney disease or are haemodialysis dependent the internal jugular vein is the vein of choice. Subclavian vein thrombosis and/or stenosis is common in this subgroup and it might compromise future fashioning of arterio-venous fistulas.

A femoral vein catheter should be avoided at all costs as the risk of infection is highest. If the clinical situation warrants the use of a femoral vein catheter, as may be the case in severe coagulopathy or neck and chest wall burns, the catheter should be replaced to another site as soon as it is feasible. Choice of a femoral site simply based on personal preference or competence, without clear risk benefit to the patient, is not acceptable. Ultrasound guidance should be used to place central venous catheters as this reduces the number of cannulation attempts and mechanical complications. Doctors should be trained in the use of ultrasound.

Strict aseptic technique should be adhered to at all times during insertion. In a medical or surgical emergency where a CVC needs to be inserted rapidly, and without the use of strict asepsis, the catheter should be replaced as soon as possible and preferably within 24 hours.

Preparation of the area

Once the site is chosen the area needs to be prepared adequately to minimize the risk of contaminating the catheter or insertion pack contents during insertion. Excessive hair should be removed using a hair clipper. The site should NOT be shaved as shaving creates microtrauma at the insertion site that can lead to infections.

Gowning

A sterile gown and sterile gloves must be worn. It is also highly recommended to wear a theatre cap and mask. A visor is advisable since this is an invasive procedure that can result in body fluid splashing on mucosa and therefore requires full protection of the personnel. Hand hygiene should be performed using alcohol hand rub and hands allowed to dry prior to donning sterile gloves. If hands are soiled they should be washed with plain soap and water.

Skin preparation

The patient's skin should be cleansed using a 2% chlorhexidine in 70% alcohol solution. If there is any contraindication to chlorhexidine, 70% alcohol can be used instead. Chlorhexidine should be applied using zigzag movements with firm pressure on skin for at least 30 seconds. It needs to be allowed to dry for another 30seconds - DO NOT WIPE IT OFF as this will reduce the efficacy of the skin disinfectant.

Applying Local Anaesthetic

In the awake patient when it is necessary to anaesthetize the area with lignocaine 1% or 2% this should be done aseptically after skin preparations and not prior to scrubbing.

Draping

The patient should be covered with a full-length sterile drape making sure to cover any cables and tubes and drip stands to avoid contamination of the sterile field during insertion. Sterility needs to be maintained throughout the procedure by avoiding contact of any sterile items with non sterile surroundings.

Use of Ultrasound guidance

Ultrasound guidance is recommended as it decreases the complication rate and the amount of number of attempts in localizing the vein. If ultrasound guidance is being used, the probe should be covered with a sterile sheath and sterile contact gel used.

Second Operator

It is imperative that - if a second operator assists in CVC insertion or with the use of the US probe - s/he follows the same sterile technique including wearing of appropriate attire (mask, hat, gown, gloves) and perform hand hygiene in order to avoid line contamination.

Multiple punctures

If during insertion multiple unsuccessful attempts and punctures are made, the operator should consider asking for assistance or changing strategy as multiple trauma at the site of insertion can increase risk of subsequent infection of the line.

Change of insertion site

If after an unsuccessful insertion attempt the operator decides to change the insertion site (e.g. from subclavian to internal jugular or from right to left side) the same sterile procedure protocol must be repeated from the start including skin preparation, draping etc. This may require using a second set of items and re-gowning and gloving.

Fixation

The line needs to be firmly secured using the skin suture provided and on no account should it be left dangling. Suture-less securing devices are preferred; if unavailable, all anchor points should be sutured. If the correct length of catheter is chosen, only a small part of the line should remain outside the patient. Improper line suturing leads to pistoning of the line in and out of patient thereby increasing risk for infection. Also when the line is not sutured from all points there is greater risk of accidental dislodgement.

Dressing

The line should be covered with a sterile, transparent semi permeable dressing as this allows visualization of the exit site for possible signs of infection. If there is oozing or bleeding the area should be covered with a gauze dressing until the oozing ceases; it should then be changed to a transparent dressing.

Documentation

Every CVC insertion must be documented using the official CVC insertion form (Appendix 1). This will facilitate record keeping of the insertion event. It should be done as soon as the procedure is completed, signed off by both the doctor/s inserting the CVC as well as the assisting nurse. The completed form should be kept with the patient and filed in the patient's records when the line has been removed.

Lines inserted in an emergency

In situations where a line is inserted in an emergency and the full aseptic technique was not followed than one should as soon as possible (preferably within 24-48 hours or as soon as clinically feasible) change the line to one that is inserted aseptically.

Change of lines over guide wire

Change of lines over guide wires should be avoided whenever possible and NEVER undertaken if there is any suspicion of infection or inflammation at the insertion site. In such a case, a new site should be chosen. A guide wire exchange should only be considered in a patient with no alternative venous access options and no evidence of infection at the insertion site. In such exceptional events, a full aseptic procedure should be followed including cleaning of the skin with 2% chlorhexidine in 70% alcohol as well as full gowning and draping.

MRSA screening and MRSA positive patients

If the CVC insertion is planned several days in advance, an MRSA nasal swab should be taken as soon as the decision to insert the line is made. In the event that it is reported positive, Infection Control should be contacted to discuss decolonization and related management.

If the patient is known to be MRSA positive at the time of time of CVC insertion one, infection control (or a microbiologist) should be contacted to discuss the whether to cover the insertion with a single dose of glycopeptide (teicoplanin 400mg iv one hour before procedure).

CVC MAINTENANCE

Daily review of central line necessity with prompt removal of unnecessary lines

Daily review of central line necessity will prevent unnecessary delays in removing lines that are no longer clearly needed for the care of the patient. There are times when central lines may remain in place simply because they provide reliable access or because personnel have not considered removing them. However, it is clear that the risk of infection increases over time as the line remains in place and that the risk of infection decreases if the line is removed. Daily review of line necessity should be done during the daily ward round and documented in the 'Daily CVC review form' (Appendix).

General Principles for Catheter Management

An aseptic technique must be used whenever the catheter is manipulated or catheter dressing is changed.

Before any manipulation with the central venous catheter, hands must be decontaminated using an alcohol handrub. Hands that are visibly soiled or contaminated must be washed with soap and water.

Each injection port or catheter hub should be decontaminated using 2% chlorhexidine gluconate in 70% alcohol before it is removed to access the system. A 15 second hub scrub should be performed.

Line manipulation should be kept to a minimum. More handling results in greater risk of catheter related infections.

Lumina not in use should be flushed daily with sterile 0.9 % sodium chloride injection and kept covered with a hub.

Systemic antimicrobial prophylaxis and/or antibiotic lock solutions should not be used routinely to prevent catheter colonisation or catheter related blood stream infections either before insertion or during the use of a central venous catheter. It is not recommended to apply topical antibiotic ointment or creams on CVC insertion sites because of their potential to promote fungal infections and antimicrobial resistance.

If needleless devices are used, the risk of contamination should be minimised by decontaminating the access port with either alcohol or 2% chlorhexidine gluconate in alcohol before and after using it to access the system. The manufacturer's recommendations for changing the needleless components should be followed.

Care of the Catheter Insertion site

The CVC insertion site must be assessed daily by the nurses and medical staff informed of any inflammation or signs of infection such as redness, warmth, pus or oedema. This must be recorded in the 'Daily CVC Review' form (Appendix 1).

A sterile, semi-permeable transparent dressing should be used to cover insertion site so as to allow regular inspection of insertion site without need to remove the dressing. Transparent dressings can be changed after 7 days unless damp, loose or soiled. Dressing must be labelled with date when changed.

A sterile gauze dressing may be used if there is bleeding from insertion site or profuse perspiration. This must be changed after 2 days or before if damp, loose or soiled. The gauze dressing should be replaced by a transparent dressing as soon as possible. The use of a transparent dressing on top of a sterile gauze dressing is not recommended.

A 2% chlorhexidine in 70% alcohol solution should be used to clean the catheter site during dressing changes, and allowed to air dry. Any dry blood around insertion site must be removed as this acts as a focus for infection.

Hand hygiene must always be performed before changing the insertion site dressing. If a non-touch technique is used clean non-sterile gloves are sufficient; if not sterile gloves should be worn.

Changing a CVC Dressing

Equipment:

- Sterile dressing pack
- 2% Chlorhexidine in 70% alcohol solution
- Non sterile gloves
- Sterile transparent dressing
- Alcohol hand rub

Procedure

1. Perform hand hygiene.
2. Remove dressing and discard. (Wear non-sterile gloves if dressing is visibly soiled.)
3. Perform hand hygiene again. Open sterile dressing pack on a clean surface.
4. Using an aseptic technique clean skin around CVC entry point with gauze swab soaked in 2% chlorhexidine in 70% alcohol. Remove any dry blood debris.
5. Using a new gauze swab soaked in 2% chlorhexidine in 70% alcohol wipe clean the CVC away from the entry point along one of the lumens. Cleanse each lumen using a separate wipe for each until you reach end of the lumen. If a 3-way tap is attached cleanse it as well with the 2% chlorhexidine in 70% alcohol solution.
6. Apply sterile dressing. Label dressing with date when changed and initials.
7. Perform hand hygiene.
8. Document change of dressing in the 'Daily CVC review form' (Appendix 1).

Administering medication and/or starting IV infusion via a CVC

1. Perform hand hygiene. An aseptic non-touch technique should be followed throughout.
2. Put on non-sterile gloves.
3. Clean the injection hub (from the outside) thoroughly for 15 seconds with 2% chlorhexidine in 70% alcohol wipe.

4. Remove hub. If the hub is directly connected to the lumen tip, clamp lumen prior to disconnecting hub so as to reduce risk of air embolism. (If CVC lumen is closed with a needle-less hub this step can be skipped).
5. If administering through an unused lumen, aspirate with a 5 ml syringe until 2-3 ml blood withdrawn. Throw away this syringe.
6. Administer the medication or commence the infusion as prescribed.
7. Flush and lock the line gently using 5 ml of 0.9% Saline (if lumen not in use).
8. Close lumen with a new hub (If CVC lumen is closed with a needle-less hub this step can be skipped).

Administration Sets

Administration sets used for delivering intravenous fluids and medications need not be replaced more frequently than 96 hour intervals unless they become disconnected. Patients with CVC should be wearing an IV gowns so as to avoid disconnecting lines when disowning the patient.

Burettes used intermittently to administer medications must be changed every 24 hours.

Administration sets used for total parenteral nutrition infusions should be changed every 24 hours.

Intravenous tubing used to administer Propofol infusions need to be changed every 6-12hrs due to the high lipid content of the drug.

All IV infusion sets and lines must be labelled with date when changed.

Central Venous Monitoring - Transducers

It is recommended to replace disposable pressure transducers at 96-hour intervals.

Other components of the system, including the tubing, should be replaced at the time the transducer is replaced.

Blood sampling and administration through CVC

CVCs should not routinely be used to take blood samples as frequent catheter manipulation increases risk of infection. However they may be used – but only by trained and competent staff - in the absence of an arterial line in patients where phlebotomy is particularly difficult.

Blood administration through a central venous catheter should be avoided.

MRSA screening

All patients with a CVC should be screened for MRSA by means of a nasal swab on a once weekly frequency until the catheter is removed. In the event that it is reported positive, Infection Control should be contacted to discuss decolonization and related management.

Documentation

Documentation of actions taken for maintenance of CVC line is essential as this ensures continuity of care. The 'Daily CVC Review Form' acts as a check list for compliance with evidence based practice. The form is to be filled in daily .

Replacing and Removing Central Venous Catheters

The need for CVC line should be reviewed daily and recorded in the 'Daily CVC Review' form (Appendix 1).

CVC should be removed as soon as possible so as to reduce the risk for infection.

The date of removal, reason and name of person who removed the line should be documented in the patient's notes

If a line infection is suspected blood cultures should be drawn from both the line and peripherally at the same time as outlined in the MDH 'Blood Culture Policy'.

If exit site is suspicious of infection (redness, leakage, inflammation) swab the exit site and send to laboratory for C&S.

If a CVC is removed because of suspected infection, the tip of the line should be cut off using a clear pair of scissors previously wiped with 70% alcohol. It should be placed in a clean universal container and sent *immediately* to the laboratory

Total Parenteral Nutrition

A single lumen *tunnelled* catheter should be used to administer parenteral nutrition. Tunnelled lines help increase the longevity of the line and reduce risk of infection.

Patients scheduled for TPN line insertion should have an MRSA nasal swab taken once the decision is taken for line to be inserted so as to allow for decolonisation treatment to be started prior to insertion.

Patients with TPN line are to be screened for MRSA on a weekly basis until the line is removed.

If a multilumen catheter is being used, one port must be exclusively dedicated for total parenteral nutrition, and all lumens must be handled with the same meticulous attention to aseptic technique.

TPN lines should be removed as soon as the decision to stop parenteral feeding is made.

Insertion and maintenance of IV cannulae requires joint involvement of both medical and nursing staff.

RESPONSIBILITIES

It is the responsibility of the:

- *anaesthetist* who inserts the CVC to follow the protocols set in this policy and to complete the CVC insertion form which should be counter-signed by the assisting nurse.
- *nursing officer* of the ward to implement systems to ensure that:
 - all the relevant procedures set in this policy are fully complied for every patient.
 - the CVC maintenance form is documented on a daily basis.
 - a doctor is informed of every case where abnormal findings are noted
- *clinical firm* caring for the patient to:
 - review, on a daily basis, the need for the CVC and remove it as soon as it is no longer needed or can be substituted by a peripheral cannula or alternative access.

AUDITING POLICY IMPLEMENTATION

Implementation of the policy will be undertaken on a periodic basis by the Infection Control Unit through assessment of documentation as well as witness audits of procedures. Reports will be fed back to the clinical and nursing stakeholders, including clinical chairs and departmental nurse managers.

EVIDENCE CATEGORIES

Category IA	A strong recommendation supported by high to moderate quality evidence suggesting net clinical benefits or harms.
Category IB	A strong recommendation supported by low quality evidence suggesting net clinical benefits or harms, or an accepted practice (e.g., aseptic technique) supported by low to very low quality evidence.
Category IC	A strong recommendation required by state or federal regulation.
Category II	A weak recommendation supported by any quality evidence suggesting a trade off between clinical benefits and harms.
No Recommendation	An unresolved issue for which there is low to very low quality evidence with uncertain trade offs between benefits and harms.

BIBLIOGRAPHY

5 Million Lives Campaign. *Getting Started Kit: Prevent Central Line Infections How-to Guide*. Cambridge, MA: Institute for Healthcare Improvement; 2008. (Available at www.ihl.org)
CDC (2011) Guidelines for the prevention of intravascular catheter-related infections

REFERENCES

- Blot SI, Depuydt P, Annemans L, et al. Clinical and economic outcomes in critically ill patients with nosocomial catheter-related bloodstream infections. *Clin Infect Dis* 2005; 41:1591–8.
- Dimick JB, Pelz RK, Consunji R, Swoboda SM, Hendrix CW, Lipsett PA. Increased resource use associated with catheter-related bloodstream infection in the surgical intensive care unit. *Arch Surg* 2001; 136:229–34.
- Warren DK, Quadir WW, Hollenbeak CS, Elward AM, Cox MJ, Fraser VJ. Attributable cost of catheter-associated bloodstream infections among intensive care patients in a nonteaching hospital. *Crit Care Med* 2006; 34:2084–9.
- Sindhaghatta K, Venkatram, Horiaana Grosu et al. Reducing central line related bloodstream infection in a university affiliated inner city medical intensive care unit *Chest* 2007; 132 Suppliment
- Mermel LA, McCormick RD, Springman SR, Maki DG. The pathogenesis and epidemiology of catheter-related infection with pulmonary artery Swan-Ganz catheters: a prospective study utilizing molecular subtyping. *Am J Med* 1991; 91:197S–205.
- Parienti JJ, Thirion M, Megarbane B, et al. Femoral vs jugular venous catheterization and risk of nosocomial events in adults requiring acute renal replacement therapy: a randomized controlled trial. *JAMA* 2008; 299:2413–22.
- Moretti EW, Ofstead CL, Kristy RM, Wetzler HP. Impact of central venous catheter type and methods on catheter-related colonization and bacteraemia. *J Hosp Infect* 2005; 61:139–45.

Nagashima G, Kikuchi T, Tsuyuzaki H, et al. To reduce catheter-related bloodstream infections: is the subclavian route better than the jugular route for central venous catheterization? *J Infect Chemother* 2006; 12:363–5.

Ruesch S, Walder B, Tramer MR. Complications of central venous catheters: internal jugular versus subclavian access—a systematic review. *Crit Care Med* 2002; 30:454–60.

Sadoyama G, Gontijo Filho PP. Comparison between the jugular and subclavian vein as insertion site for central venous catheters: microbiological aspects and risk factors for colonization and infection. *Braz J Infect Dis* 2003; 7:142–8.

Heard SO, Wagle M, Vijayakumar E, et al. Influence of triple-lumen central venous catheters coated with chlorhexidine and silver sulfadiazine on the incidence of catheter-related bacteremia. *Arch Intern Med* 1998; 158:81–7.

Richet H, Hubert B, Nitemberg G, et al. Prospective multicenter study of vascular-catheter-related complications and risk factors for positive central-catheter cultures in intensive care unit patients. *J Clin Microbiol* 1990; 28:2520–5.

Schillinger F, Schillinger D, Montagnac R, Milcent T. Post catheterisation vein stenosis in haemodialysis: comparative angiographic study of 50 subclavian and 50 internal jugular accesses. *Nephrol Dial Transplant* 1991; 6:722–4.

Cimochowski GE, Worley E, Rutherford WE, Sartain J, Blondin J, Harter H. Superiority of the internal jugular over the subclavian access for temporary dialysis. *Nephron* 1990; 54:154–61.

Barrett N, Spencer S, McIvor J, Brown EA. Subclavian stenosis: a major complication of subclavian dialysis catheters. *Nephrol Dial Transplant* 1988; 3:423–5.

Trerotola SO, Kuhn-Fulton J, Johnson MS, Shah H, Ambrosius WT, Kneebone PH. Tunnelled infusion catheters: increased incidence of symptomatic venous thrombosis after subclavian versus internal jugular venous access. *Radiology* 2000; 217:89–93.

Merrer J, De Jonghe B, Golliot F, et al. Complications of femoral and subclavian venous catheterization in critically ill patients: a randomized controlled trial. *JAMA* 2001; 286:700–7.

Goetz AM, Wagener MM, Miller JM, Muder RR. Risk of infection due to central venous catheters: effect of site of placement and catheter type. *Infect Control Hosp Epidemiol* 1998; 19:842–5.

Hind D, Calvert N, McWilliams R, et al. Ultrasonic locating devices for central venous cannulation: metaanalysis. *BMJ* 2003; 327:361.

Raad II, Hohn DC, Gilbreath BJ, et al. Prevention of central venous catheter-related infections by using maximal sterile barrier precautions during insertion. *Infect Control Hosp Epidemiol* 1994; 15:231–8.

Clark-Christoff N, Watters VA, Sparks W, Snyder P, Grant JP. Use of triple-lumen subclavian catheters for administration of total parenteral nutrition. *JPEN J Parenter Enteral Nutr* 1992; 16:403–7.

Darouiche RO, Raad II, Heard SO, et al. A comparison of two antimicrobial-impregnated central venous catheters. Catheter Study Group. *N Engl J Med* 1999; 340:1–8.

Maki DG, Ringer M, Alvarado CJ. Prospective randomised trial of povidone-iodine, alcohol, and chlorhexidine for prevention of infection associated with central venous and arterial catheters. *Lancet* 1991; 338:339–43.

Maki DG, Stolz SS, Wheeler S, Mermel LA. A prospective, randomized trial of gauze and two polyurethane dressings for site care of pulmonary artery catheters: implications for catheter management. *Crit Care Med* 1994; 22:1729–37.

Cook D, Randolph A, Kernerman P, et al. Central venous catheter replacement strategies: a systematic review of the literature. *Crit Care Med* 1997; 25:1417–24.

KEMAR WATER DE		NURSING REPORT				Ward:		Bed:		DATE: / /			
Person's Name:				ID No:				Consultant:					
Diagnosis:				ALLERGIES: N <input type="checkbox"/> Y <input type="checkbox"/>				DOA: / /					
COGNITIVE COMMUNICATION	Oriented <input type="checkbox"/> Anxious <input type="checkbox"/> Disoriented <input type="checkbox"/> Unresponsive <input type="checkbox"/>						ELABORATE ON COGNITIVE STATUS IF NEEDED						
BREATHING	Self-vent <input type="checkbox"/> Assisted <input type="checkbox"/> O ₂ rate & mask type:						ELABORATE ON BREATHING IF NEEDED						
HYGIENE	Self-caring <input type="checkbox"/> Assisted <input type="checkbox"/> Dependent <input type="checkbox"/>						ELABORATE ON HYGIENE IF NEEDED						
MOBILITY	Mobile <input type="checkbox"/> Armchair <input type="checkbox"/> Assisted <input type="checkbox"/> Bed bound <input type="checkbox"/> Assistive aids:						ELABORATE ON MOBILITY IF NEEDED						
SKIN preventive measures	Intact skin <input type="checkbox"/> Surg. Incision <input type="checkbox"/> Ulcer <input type="checkbox"/>						ELABORATE ON SKIN IF NEEDED						
	COD done today <input type="checkbox"/> Drains:												
	Wound site												
	Dressing Used												
Progress/ Due													
PVC Y <input type="checkbox"/> N <input type="checkbox"/>	PVC No:	ARM		PVC Colour	VIP score (0-5)		PVC removed		Name of MO informed		Rx started	VIP 0: No action required; VIP 1: Observe every 6 - 8 hrs; VIP ≥2: Remove cannula and inform MO to refer to algorithm	
		L	R	G	P	B		Y	N		Y		N
		L	R	G	P	B		Y	N		Y		N
IVI REGIME	Y <input type="checkbox"/> N <input type="checkbox"/> IV REGIMEN IN THIS SPACE						I/O charted <input type="checkbox"/>						
NUTRITION	Independent <input type="checkbox"/> Assisted <input type="checkbox"/> NBM <input type="checkbox"/> Dysphagia <input type="checkbox"/> NG Tube <input type="checkbox"/> Diabetes <input type="checkbox"/>						ELABORATE ON NUTRITION IF NEEDED						
ELIMINATION	Independent <input type="checkbox"/> Urine bottle <input type="checkbox"/> Commode <input type="checkbox"/> Urine Urinary Catheter <input type="checkbox"/> Bedpan <input type="checkbox"/> Diaper <input type="checkbox"/>						ELABORATE ON ELIMINATION IF NEEDED						
	Bowels Bowels opened Y <input type="checkbox"/> N <input type="checkbox"/> Stoma <input type="checkbox"/> NG Drain <input type="checkbox"/>												
SLEEP/REST	Slept well <input type="checkbox"/> with difficulty <input type="checkbox"/>						ELABORATE ON SLEEP IF NEEDED						
REFERRALS	To do:			To send:			DISCHARGE PLAN						
	Sent:			To be S/B:									
SAMPLES	Wound swab <input type="checkbox"/> MRSA <input type="checkbox"/> Sputum <input type="checkbox"/> Stools <input type="checkbox"/> Urine <input type="checkbox"/>						To be taken <input type="checkbox"/> Sent <input type="checkbox"/>						
Observations	EWS		BP	T	P	R	BGM	Wt					
	Date of Op	ROS due		Urinary Cath:			MDRO Y <input type="checkbox"/> N <input type="checkbox"/>		REMINDEERS				
					Due Date:					Size:			

PRINT THIS SIDE

HOSPITAL INFECTION CONTROL POLICY

Policy no: ICU_05Pol2011v01.0

Bare Below the Elbows Policy

TITLE	Bare Below the Elbows Policy
SUMMARY	<p>This document provides instruction and guidance to hospital personnel on correct practices related to attire when visiting or working in clinical areas.</p> <p>All Clinical Directors, Departmental Managers, Heads of Sections and Nursing Officers in charge of wards are required to instigate action to ensure the successful implementation of the policy within their area(s) of control.</p>
DATE OF REVIEW	December 2014
APPROVED VIA	Infection Control Committee
DISTRIBUTION	For distribution to all wards and sections
RELATED DOCUMENTS	Hand Hygiene Policy
AUTHOR(S) / FURTHER INFORMATION	Infection Control Team Ext: 4540
THIS DOCUMENT REPLACES	None
ISSUED BY:	CEO, Mater Dei Hospital
ISSUE DATE:	November 2011

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Audience

This policy is for the attention of all staff working in or having occasion to visit clinical areas. It refers not only to the clinical professions, but applies additionally to **all** staff including managers, social care staff, pharmacy and support staff visiting clinical areas. Managers on walk-a-rounds must also lead by example and adhere to these requirements.

Background

This policy position has been adopted in line with the hospital's campaigns to reduce health care associated infections particularly focusing on hand hygiene. Bare Below The Elbow is necessary to facilitate effective hand hygiene practice and therefore help to reduce spread of infection in the hospital.

Definition of clinical area

The MDH dress code policy does not define clinical area. Bare below the elbow in "clinical areas" means the area from the door providing direct access to a ward or department where patients are seen or treated, or in any facility where personal care is being provided.

Policy requirements

All staff within clinical areas should comply with the following:

- **Nails should be short and clean – no gel nails, nail polish or extensions.**
Why: long nails harbour bacteria, especially if they contain artificial materials
- **Wrist watches, bracelets or other jewellery should not be worn around the wrist.**
Why: watches and jewellery increase bacterial contamination of the wrist which can be transferred to hands when the watch is manipulated
- **No rings with stones should be worn – one plain band (e.g. wedding ring) is permitted.**
Why: jewelled rings contain openings where dirt and bacteria can accumulate
- **Sleeves must be short or else rolled securely up to the elbow.**
Why: It is impossible to wash hands or perform alcohol rub effectively with long sleeves
- **Ties are preferably not used; if worn, they should be tucked in.**
Why: Since ties are difficult to wash, they can pick up bacteria over time and transfer these to patients on contact
- **Long hair should be tied back**
Why: Hair contains a heavy bacterial load, including Staphylococcus aureus, and any contact with patients must be avoided at all costs.

Jackets should be left outside the 'clinical area'; if this is not possible, they should be removed and secured immediately on entering the patient room.

Responsibility

Responsibility is delegated to individual line managers who have the responsibility to ensure that this policy and associated procedures are implemented within their area of responsibility. In the case of nurses, this involves the nursing officer in charge of the ward and then the Departmental Nursing manager and Director of Nursing. For the medical profession the responsibility relates to the consultant in charge of the firm followed by the Chair and Medical Administrator.

Monitoring and Adherence

All line managers who observe breaches of Bare Below the Elbow and/or Hand Hygiene Policies are expected to address this with the individual concerned.

Hand hygiene and ward audits will now include an observation of compliance with Bare Below the Elbow. In the event of non-compliance, Infection Control personnel have been instructed to send a report (attached) to the line manager responsible who will be expected to take the necessary actions to ensure the individual concerned is aware of the policy and the need for its compliance.

Appendix 1

To: Nursing Officer / Consultant i/c of firm

Re: Adherence to 'Bare below the elbow' and Hand Hygiene Policy

During a ward audit:

on _____ (date)

in _____ (clinical area)

undertaken by _____ (name)

the following member of staff _____(name) falling under your responsibility was identified not to be adhering to the MDH Bare Below the Elbow & Hand Hygiene Policy as follows:

- Nails should be short and clean – no nail polish or extensions.
- Wrist watches must not be worn in clinical areas.
- No other jewellery should be worn around the wrist.
- No rings with stones should be worn – one plain band is permitted.
- Sleeves must be short or rolled securely up to the elbow.
- Ties, if worn, should be tucked in.
- Long hair should be tied back

Compliance with this policy is an important patient safety matter and I trust that you will communicate with the individual in question so to ensure that s/he will comply with the requirements of the policy in the future.

Signed

cc Departmental Nurse Manager / Chair

Director of Nursing / Medical Administrator

CENTRAL VENOUS CATHETER INSERTION & REMOVAL FORM



Tick all that apply. This form should be kept with the patient and filed in the patient's records when the line has been removed

Patient ID _____ Patient name: _____ <i>or affix addressograph</i>	Date: / / / / / Time: :
Location: ITU <input type="checkbox"/> Operating theatre <input type="checkbox"/> A&E <input type="checkbox"/> Radiology <input type="checkbox"/>	MRSA status: Neg <input type="checkbox"/> Pos* <input type="checkbox"/> Not available <input type="checkbox"/> *If MRSA positive, was Infection Control contacted beforehand? Yes <input type="checkbox"/> No <input type="checkbox"/>
Reason: Inotropes <input type="checkbox"/> Multi-use <input type="checkbox"/> TPN <input type="checkbox"/> Dialysis <input type="checkbox"/> Other <input type="checkbox"/>	
Insertion: Elective <input type="checkbox"/> Emergency <input type="checkbox"/> U/S guidance: Yes <input type="checkbox"/> No <input type="checkbox"/>	
No of lumens: _____ <i>(insert number)</i> Impregnated: Yes <input type="checkbox"/> No <input type="checkbox"/>	
Tunnelled? : Yes <input type="checkbox"/> No <input type="checkbox"/>	Comments:
Site of insertion evaluated before procedure with preference to subclavian	
Site: Subclavian <input type="checkbox"/> Jugular <input type="checkbox"/> Femoral* <input type="checkbox"/> Side: R <input type="checkbox"/> L <input type="checkbox"/> *If femoral: state why jugular or subclavian could not be used: _____ <i>Femoral lines should be avoided as much as possible and inserted only if no other option</i>	
Hand hygiene performed for the necessary duration	
Method: Alcohol rub x 30 secs <input type="checkbox"/> Washing (soap) x 1 min <input type="checkbox"/>	
Skin at insertion site scrubbed vigorously with disinfectant for 30 seconds	
Disinfectant: 2% chlorhexidine in 70% alcohol <input type="checkbox"/> 0.5% chlorhexidine in 70% alcohol <input type="checkbox"/>	Inserted by: Name _____ Signature _____
Maximal barrier applied for both patient and operator/s	
Operator/s: Sterile gloves <input type="checkbox"/> Gown <input type="checkbox"/> Mask <input type="checkbox"/> Cap <input type="checkbox"/> All <input type="checkbox"/>	
Patient: Sterile drape (Large) <input type="checkbox"/>	
CXR done: Yes <input type="checkbox"/> No <input type="checkbox"/> Correct position confirmed by doctor: Yes <input type="checkbox"/> No <input type="checkbox"/>	Assisting nurse: Name _____ Signature _____ <i>Both doctor and nurse to sign form</i>
Ease of insertion: Easy <input type="checkbox"/> Moderate <input type="checkbox"/> Difficult <input type="checkbox"/>	
Problems / Complications: 	

REMOVAL	No of CVC days _____
Removed on ___ / ___ / ___ by _____	
Reason for removal: <input type="checkbox"/> No longer required <input type="checkbox"/> Infection <input type="checkbox"/> Other	

Notes:

CENTRAL VENOUS CATHETER MAINTANANCE FORM



DATE		1		2		3		4		5		6		7	
		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Daily assessment	Catheter site inspected														
	Redness, pus, oedema present?														
	Daily review of CVC necessity performed with consultant														
	Weekly MRSA nasal screen done														
CVC Access	Hub scrub with 2% alcoholic chlorhexidine x 15 secs														
	Administration sets/tubings replaced (every 96 hrs) *														
	All lines are labelled with date														
	All unused lumens flushed with 0.9% saline														
Dressing	Dressing type (T: transparent A: Absorbent)														
	Dressing intact, dry & clean														
	Catheter site cleaned with 2% chlorhexidine in 70% alcohol														
	Date marked on dressing														
Nurse initials															
DATE		8		9		10		11		12		13		14	
		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Daily assessment	Catheter site inspected														
	Redness, pus, oedema present?														
	Daily review of CVC necessity performed with consultant														
	Weekly MRSA nasal screen done														
CVC Access	Hub scrub with 2% alcoholic chlorhexidine x 15 secs														
	Administration sets/tubings replaced (every 96 hrs) *														
	All lines are labelled with date														
	All unused lumens flushed with 0.9% saline														
Dressing	Dressing type (T: transparent A: Absorbent)														
	Dressing intact, dry & clean														
	Catheter site cleaned with 2% chlorhexidine in 70% alcohol														
	Date marked on dressing														
Nurse initials															

Any line in situ for more than 14 days is at increased risk of infection - discuss with consultant

* Change TPN and intermittently used lines every 24 hours.