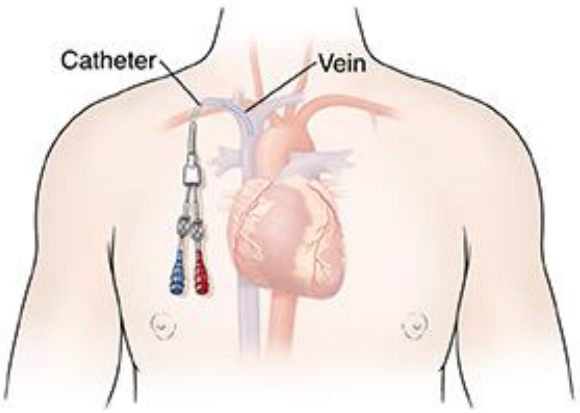
SOP for the Maintenance of Central Venous Catheters



Ministry of Health and Wellness
MAURITIUS

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Approval Form

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STANDARD OPERATING PROCEDURE FOR THE MAINTENANCE OF CENTRAL VENOUS CATHETERS			
	NAME	**SIGNATURE**	**DATE**
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Dr. D. Nuckchady. This document was vetted by the IPC Writing Committee.

PEER REVIEW

Dr. K. Azmutally (IPC Doctor).

Date of next review: December 2025

Updates

June 2023

- It is highlighted that this document does not discuss the insertion and removal of central lines in any level of details.
- A table on which attire to wear when manipulating central lines has been appended to the document.
- Sterile gloves should be used to accessed central lines.

Version history

Version	Date
Version 1.0: Created	27 February 2022
Version 1.0: Approved	15 March 2022
Version 2.0: Revised	21 June 2023
Version 2.0: Approved	21 July 2023

Standard Operating Procedure for the Maintenance of Central Venous Catheters

Progress made since the last version

A survey carried out in 2022 revealed that the rate of central line associated bloodstream infections remains quite high in the country while an assessment at the end of 2022 demonstrated improved knowledge on the topic despite persistent poor practices.

Disinfection of the hub prior to access appears to be rarely done.

Purpose

This document explains the steps that should be taken for the daily maintenance of CVC in public healthcare facilities. This document does not cover the steps for insertion or removal of central lines.

Key points

1. CVCs are accessed many times while in place, to deliver fluids and medications and to collect blood specimens. Because each entry into access points in the delivery system is an opportunity to introduce microorganisms, the post–CVC insertion period presents multiple opportunities for risk of infection.[2]
2. Internationally, the most common lapses are related to keeping caps and site dressings in place.[3] However, in Mauritius, frequent failures include not performing hand hygiene and using the same gloves across multiple patients.
3. CVCs should be reviewed daily by the nursing officer. Inform the treating doctor if an infection is suspected. Ask the treating doctor whether the line can be removed if it is no longer needed.
    a. Always prefer to use peripheral IV lines whenever possible.
    b. Documentation by the practitioner that the line has been reviewed and continues to be needed is essential.
    c. Use clear dressings to cover the site of insertion in order to facilitate the assessment. Gauze dressings may still be used if blood is oozing.
4. The date of insertion of the line should be clearly recorded. This will help the doctor to decide when to remove or change the CVC.
5. Catheter injection ports:
    a. Open lumens (such as catheter hubs or stopcocks) are covered by injection ports, sterile endcaps or needleless connectors.
    b. Access ports are sanitized with alcohol, chlorhexidine/alcohol, povidone-iodine, and iodophors before and after each use, a method known as the “Scrub the Hub” protocol. The protocol is described in the steps in the next section.[4]
    c. Injection ports should be covered by caps or valved connectors.
6. Proper procedures for catheter site dressing monitoring / changes:
    a. Change gauze dressings every 2 days and clear dressings every 7 days (and more frequently if soiled, damp, or loose).
    b. Catheter site care is performed with chlorhexidine at dressing changes. Use a chlorhexidine gluconate scrub at a concentration of 2-4% chlorhexidine with 70%

isopropyl alcohol and apply it to sites for dressing changes (30-second scrub, 30-second air-dry).

c. In the absence of chlorhexidine, use 10% povidone iodine.

7. Catheter hub, cap, and tubing care:

    a. Replace administration sets, including add-on devices, no more frequently than every 72 hours unless they are soiled or suspected to be infected.

    b. Replace tubing that is used to administer blood, blood products, or lipids within 24 hours of initiating infusion.

    c. Caps do not need to be soaked for disinfection.

    d. Caps are changed no more often than 72 hours (or according to the manufacturer's recommendations and whenever the administration set is changed).

8. Scheduled replacements of CVC are not necessary (when all precautions listed in this document are taken) unless the line was inserted during an emergency which increases the likelihood that the CVC bundle was not properly followed.[5,6]

9. The CVC must be removed if there is the slightest chance of it being infected and if needed, another line may be reinserted once the patient is confirmed not to be bacteremic.

    a. If it is too difficult to insert another CVC due to poor venous access and a CVC continues to be necessary despite it being infected, then treating the infected line without its removal may be considered in selected scenarios.

10. The skin should be disinfected before inserting a central line. The skin should also be cleaned with soap and water as well as disinfected prior to changing a CVC.

Steps to follow during connection[7]

1. Before accessing the CVC, perform hand hygiene.
2. Wear appropriate personal protective equipment (PPE) as per risk assessment.

    a. If splashes are expected e.g., when removing lines, eye protection should be worn.

3. Clamp the catheter.

    a. Always clamp the catheter before removing the cap.

    b. Never leave an uncapped catheter unattended.

4. Disinfect the hub with caps removed using an appropriate antiseptic.

    a. Use a chlorhexidine gluconate scrub for 30 seconds or an alcohol scrub (70% isopropyl alcohol) for 15 seconds before each use.

    b. Prior to cap removal, disinfect the caps and the hub that is visible and discard the antiseptic pad (i.e., use a separate antiseptic pad for the subsequent disinfection of the hub).

    c. Remove the caps and disinfect the hub with a new antiseptic pad for each hub. Clean the sides (threads) and end of the hub thoroughly with friction, making sure to remove any residue (e.g., blood).

d. Using the same antiseptic pad, apply antiseptic with pressure to the catheter, moving from the hub at least several centimeters towards the body. Hold the limb while allowing the antiseptic to dry. Wait for the contact time which is 30-60 seconds.

e. Use a separate antiseptic pad for each hub/catheter limb. Leave hubs "open" (i.e., uncapped and disconnected) for the shortest time possible.

5. Always handle the catheter hubs aseptically. Once disinfected, do not allow the catheter hubs to touch nonsterile surfaces.
6. Attach sterile syringe, unclamp the catheter, withdraw blood, and flush per facility protocol.
7. Repeat for other limbs if necessary (this might occur in parallel).
8. Connect the ends of the blood lines to the catheter aseptically. Disinfecting the ends of the blood lines is not required if the blood lines have been handled aseptically prior to connection and care has been taken to not contaminate the blood lines.
9. Remove gloves and other PPE and perform hand hygiene.

Steps to follow during disconnection[7]

1. Perform hand hygiene and don PPE as needed.
2. Clamp the catheter.
    a. Always clamp the catheter before disconnecting.
    b. Never leave an uncapped catheter unattended.
3. Disinfect the catheter hub before applying the new cap using an appropriate antiseptic
    a. Disinfect the connection prior to disconnection. Use a separate antiseptic swab for the subsequent disinfection of the hub.
    b. Disconnect the blood line from the catheter and disinfect the hub with a new antiseptic pad. Clean the sides (threads) and end of the hub thoroughly with friction, making sure to remove any residue (e.g., blood).
    c. Use a separate antiseptic pad for each hub. Leave hubs "open" (i.e., uncapped and disconnected) for the shortest time possible.
4. Always handle the catheter hubs aseptically. Once disinfected, do not allow the catheter hubs to touch nonsterile surfaces. Hold the catheter until the antiseptic has dried.
5. Attach the new sterile caps to the catheter aseptically. Use caution if tape is used to secure caps to the catheter.
6. Remove gloves (and other PPE if worn) and perform hand hygiene.

PPE

Limited scientific evidence exists to provide guidance regarding which PPE should be worn e.g., some organizations prefer the use of sterile gloves while others find the use of clean gloves to be preferable to connect or disconnect a CVC. Based on local preferences, expert opinions and international protocols, the following attire should be worn in Mauritius:[7-9]

	Insertion of CVC or exchange through a guide wire	Dressing change or access of implanted port	Access of CVC (not implanted port) to give medication or take blood
Sterile gown	Yes	Yes, in NICU or with immunosuppressed patients; otherwise, no	No in general; as per risk assessment for hemodialysis patients
Medical mask	Yes	Yes	No in general; yes for hemodialysis patients
Sterile gloves	Yes	Yes	Yes
Non-sterile gloves	No	No	No
Caps	Yes	Yes, in NICU or with immunosuppressed patients; otherwise, no	No
Face shield / goggles	Yes	Per risk assessment	Per risk assessment
Overshoes	No	No	No

References

1. Nuckchady DC. Infection Prevention and Control: Situational Analysis 2019-2020; Dr. A. G. Jeetoo Hospital. 18 November 2020.
2. The Joint Commission. Preventing Central Line–Associated Bloodstream Infections: Useful Tools, An International Perspective. Nov 20, 2013. Accessed 28 February 2022. http://www.jointcommission.org/CLABSIToolkit
3. Shapey IM, et al. Central venous catheter-related bloodstream infections: Improving postinsertion catheter care. J Hosp Infect. 2009 Feb;71(2):117–122. Epub 2008 Nov 14.
4. The Joint Commission. Preventing Central Line–Associated Bloodstream Infections: Useful Tools, An International Perspective. Nov 20, 2013 – Scrub the Hub! Accessed 28 February 2022 http://www.jointcommission.org/CLABSIToolkit
5. Timsit, J. (2000). Scheduled Replacement of Central Venous Catheters Is Not Necessary. Infection Control & Hospital Epidemiology, 21(6), 371-374. doi:10.1086/501775
6. Frasca, D., Dahyot-Fizelier, C. & Mimoz, O. Prevention of central venous catheter-related infection in the intensive care unit. Crit Care 14, 212 (2010). https://doi.org/10.1186/cc8853
7. US CDC. Central Venous Catheter Hub Cleaning Prior to Accessing. Accessed on 28 February 2022.
8. QI Equip 3.0, Caretrac. Obtaining Blood Specimens from a Central Venous Catheter or PICC. https://qiequip.com/policies/1/MS/Nursing%20Policies%20and%20Procedures/SpecimenCollection/Obtaining%20Blood%20CVC-PICC.pdf
9. Bannatyne, M., Smith, J., Panda, M., Abdel-latif, M., & Chaudhari, T. (2018). Retrospective Cohort Analysis of Central Line Associated Blood Stream Infection following Introduction of a Central Line Bundle in a Neonatal Intensive Care Unit. International Journal of Pediatrics, 2018.