

Guidelines for the care of Tunnelled Central Venous Catheters, PICCs and Implantable Ports in Adults December 2001



Introduction

These guidelines for practice are not intended to replace local policies but rather to provide overarching guidance. They are based on the UCL Hospitals NHS Trust Central Venous Catheter Policy (UCLH, 2000) which covers the care of central venous catheters in detail. Individual Trusts within the North London Cancer Network **may** choose to adopt this policy as a whole or may have their own more detailed guidelines on care of Central Venous Catheters.

It is given that individuals who carry out care and management of central venous catheters have undertaken local training and have been assessed as competent to practice within their area. These guidelines do not negate the need to undertake such training.

These guidelines have been approved by a representative of each Trust in the Network, namely (in alphabetical order)

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Tunnelled Catheters and PICCs

General Principles

- a. An aseptic technique in line with each Trust's Infection Control Policy should be used whenever the line is accessed and during procedures involving exit sites. A strong correlation exists between bacteraemia and the presence of a CVC (Haller L T and Rush K L, 1992).
- b. Interruptions to the closed system should be kept to a minimum. Risk of contamination increases with every interruption to the closed system (Haller L T and Rush K L, 1992).
- c. Sterile alcohol-impregnated swabs or aqueous chlorhexidine gluconate should be used to clean connections and bungs prior to accessing or disconnection.
- d. Signs of systemic or local infection should always be taken seriously and referred to a medical or specialist team.
- e. Patient education should emphasise the importance of recognising and reporting infection. "Infection continues to be one of the most frequent and most serious complications associated with CVC Catheters" (Haller L T and Rush K L, 1992).
- f. Iv antibiotics should not routinely be administered prophylactically prior to line insertion. (Pratt RJ et al 2001)

- g. Nurses caring for patients with tunnelled lines and PICCs should be aware that low-dose maintenance Warfarin may reduce the rate of thrombosis development (Krzywda E, 1999).
- h. The catheter should always be secured firmly to the skin away with tape or with a dedicated device so that any tension pulls on the device or tape rather than on the exit site. This is to increase the patient's comfort, to prevent tension or accidental dislodgement, and to reduce 'to and fro' motion which increases the risk of catheter related sepsis (Haller L T and Rush K L, 1992).
- i. In tunnelled lines sutures used to secure the catheter at the exit site should be removed 21 days post insertion
- j. Should the line fracture or be accidentally cut, it should be clamped without delay proximal to the break. In lines without clamps (or if the break occurs distal to the clamp), the line should be folded back on itself and secured with an elastic band or tape to occlude the line. Medical advice should be sought immediately to consider removal or repair.
- k. Nurses should advise patients with PICCs to apply a warm compress (e.g. hot flannel) to the arm proximal to the insertion site every few hours for the first two days after the PICC is inserted to reduce the risk of mechanical phlebitis.
- l. Patients who are discharged home with a tunnelled line or PICC must be given appropriate education regarding the care and maintenance of their line. They must be made aware of the importance of reporting complications and must be given a contact number for this purpose. Liaison with the Primary Health Care Team is vital.
- m. Before the catheter is used for administering therapeutic drugs or fluids, the patency and correct functioning of the line should be established. Signs of catheter occlusion, whether partial or complete, should be taken seriously. Action should be taken earlier rather than later to restore full patency. Ignoring the early signs may lead to the development of more serious problems which cannot then be easily rectified – eg complete blockage or thrombosis (Hadaway L 1998).
- n. Blocked lines should never be force-flushed, and nor should a syringe smaller than 10ml be used to unblock a tunnelled catheter. The use of Urokinase, though only available on a named patient basis, is an acceptable method of restoring patency in partially blocked lines. The "3-way tap method" may be used to instill Urokinase into a completely blocked line (Krzywda, 1999).

Flushing Unused Lumens

- a. Unless it is to be used again within 8 hours, (in which case use 10mls 0.9% Saline) the catheter should be flushed using 5mls Heparinised Saline¹ 10 iu per ml. (Groshong lines may be flushed instead with 0.9% saline though heparinised saline may be preferred to avoid confusion.) Although the evidence is far from clear, the consensus amongst most writers is that a low concentration of Heparinised Saline is the preferred flush for unused lines, decreasing the risk of intraluminal clots and improving catheter function (Cottee s, 1995; Mayo DJ et al, 1996; Gabriel J, 1996; Hadaway L 1998, Weatherill D 1999).
- b. **Frequency:** any unused lumen should be flushed once a week, even when other lumens are in use. The frequency of flushing may be increased to twice a week if problems arise. Each lumen in the catheter should be flushed separately.
- c. If blood or intravenous drugs are present in the line, the lumen should first be flushed with 10mls 0.9% Saline prior to the final Heparinised saline flush.

¹ Heparinised Saline should be prescribed by a Doctor

- d. Nurses caring for adults with Tunnelled lines may consider adhering to **the practice of withdrawing and discarding 3mls of blood** from each lumen immediately before routine flushing of the line but this is not essential as it is not supported by the literature.
- e. A brisk **'push-pause' flushing technique** should be used routinely - i.e. pause briefly after approximately each ml of fluid. The 'push-pause' technique causes turbulence within the catheter, which helps to flush away any debris and prevent occlusion of the lumen (Todd J, 1998).
- f. If the line possesses a clamp, the line should be clamped while the final 0.5mls of the flush is being injected. **Maintaining positive pressure** helps prevent blood entering the catheter after flushing, which might lead to thrombus formation (Todd J, 1998).

Dressings for Exit Sites

- a. As a general principle, where a dressing is used it should be inspected regularly and renewed immediately should it become soiled, wet or detached (Cornock M, 1996). A moist environment is one in which bacteria readily multiply (Gabriel J, 1996).
- b. If the exit site is reddened, painful, exudating or infected, the entry site should be inspected at least daily.
- c. The recommended dressing **immediately post-insertion** is a gauze dressing covered and sealed with an transparent dressing, (eg opsite) as in most cases this will absorb the slight ooze but not necessitate changing the dressing. This dressing should if possible be left on for 24 – 48 hrs **in PICCs** and **ideally 3 – 4 days in tunnelled lines**. Thereafter one of the following options can be chosen for exit sites which are not clinically infected –
 - **iv-dedicated occlusive transparent dressing**, which allows continuous inspection of the exit site (Cornock M, 1996). This should be changed every 7 days, or when fluid is seen to gather beneath the dressing, or when the dressing ceases to be occlusive, whichever is the sooner
 - **Sterile gauze-type dressing taped in situ**, which should be changed twice weekly (in order that the site may be observed), or whenever the dressing becomes soiled, wet or detached, whichever occurs sooner.
 - **No dressing** (in tunnelled lines only from 21 days post insertion once the tissues have fibrosed around the cuff and in the absence of exudate or signs of infection).
- d. In PICCs, since there are usually no sutures to secure the PICC, great care should be taken at dressing changes to avoid pulling on the line. The dressing should be applied so as to secure the PICC firmly to the skin.

Cleaning of exit sites

- a. Cleaning, when it occurs, should be carried out using sterile gauze **and sterile 0.9% saline or aqueous chlorhexidine gluconate** using an outward "single-swipe" motion to avoid transferring bacteria to the exit site.
- b. The exit site should be allowed to air dry before applying a fresh dressing if used.

Bathing, showering & swimming

- a. **Bathing:** It is recommended that exit sites should be kept out of bathwater even when a transparent dressing is used.
- b. **Showering:**
 - **Iv-dedicated transparent dressing:** patients can shower as long as the dressing remains occlusive.
 - **Dry gauze-type dressing:** patients with PICCs should not let a dry dressing get wet in the shower. Patients with tunnelled lines can shower after 21 days as long as they remove the dressing immediately before or after showering and dry the skin thoroughly afterwards using sterile gauze and a no-touch technique. Cleaning of the exit site in the usual way should follow and a new dressing applied if used.
 - **No dressing (tunnelled lines only):** patients can shower after 21 days as long as they clean the exit site afterwards using sterile gauze and a no-touch technique.
- c. **Swimming:** probably constitutes a considerable risk of infection, therefore if the patient is keen to do so, a way must be found of covering the exit site completely with a waterproof dressing leaving no chance of water coming into contact with the site.

Removal

Nurses should only remove Tunnelled CVCs and PICCs if they have been trained in the procedure and are aware of the potential complications. The removal of the catheter should have been discussed and agreed with the specialist team or medical colleagues.

Implantable Ports

Many aspects of managing implantable ports are the same as for tunnelled lines and PICCs and the guidelines above can be followed where applicable. The following section highlights the care of ports only where it differs from the care of tunnelled lines and PICCs.

General Principles

- a. Needles used to access **ports should always be attached to an extension tubing set with luer lock connections** (Rostad M E, 1989) and an integral clamp / stopcock which should be kept closed unless infusion / injection is in progress (Moore C L, 1986). This is to prevent air embolism and to prevent back flow of blood into catheter which might lead to occlusion.
- b. The port should be always be accessed using a **dedicated non-coring needle** of an appropriate style, guage and length (Rostad M E, 1989). The needle must be primed with 0.9% Saline and attached to a clamped extension set). This preserves the integrity of the septum and prolong the life of the port (Rostad M E, 1989).
- c. Most ports may be accessed up to 1000 to 2000 times as long as a **dedicated non-coring needle** is used. Refer to manufacturer's guidelines (Camp-Sorrell D, 1990).
- d. When patients with implanted ports undergo **MRI scan**, scanning personnel should be made aware of the existence and nature of the port (Camp-Sorrell D, 1990). The presence of a metal port may interfere with MRI scanning, leading to problematic interpretation of the scan. The material from which the port is made will affect its impact on the scanning process (Camp-Sorrell D, 1990).
- e. When ports are used for administration of **blood transfusions**, a pressure pump is recommended (Moore C L et al, 1986). This is because most port catheters are relatively fine bore (0.5 mm - 1 mm) and so gravity infusion of blood may result in clot formation due to sluggish flow. Management of occlusion may be difficult to achieve and this may necessitate removal of the port, causing unnecessary distress to the patient (Moore C L et al, 1986).

- f. Cisplatin reacts with aluminium, therefore if it is to be infused via an implantable port, the nurse should ensure that neither the port nor the access needle is made from aluminium.
- g. Any non-dissoluble **sutures** to the side of the port should be removed after 7-10 days.
- h. If the patient with a port requires **defibrillation** then care should be taken not to place the paddles directly over the port, as this may result in skin burns to the patient.
- i. The **skin over the port should be prepared** using alcoholic chlorhexidine gluconate or isopropyl alcohol wiped in an outward spiralling motion to an area 4 inches diameter. This should be repeated twice more, with the alcohol allowed to dry between swabbings.
- j. Once the nurse is confident of correct needle position, the patency and correct functioning of the catheter should be assessed in a similar manner to any other central venous catheter before infusion of drugs or fluids.

Care of the needle site

- a. Non-accessed ports do not require dressings as skin integrity is intact.
- b. When a port is to be used for the prolonged infusion of fluids or drugs, and once patency and correct needle position are confirmed, 90° needles may be padded with sterile gauze for comfort if necessary and then covered with sterile gauze or a transparent iv dedicated dressing. Tape may be used to secure the edges of the transparent dressing (Rostad M E, 1989). The infusion set should be firmly taped to the skin to prevent pulling on the needle (Rostad M E, 1989).
- c. The **needle entry site** should be inspected at least daily. The patient should be advised to report any discomfort or swelling at the puncture site immediately. In this event the area around the needle should be inspected and, if needle dislodgement is suspected, infusions should be stopped immediately and the needle removed. This will help prevent large extravasations leading to possible necrosis.
- d. While continuous infusion is in progress, **the needle should be changed every 7 days** using a fresh puncture site to prevent ulceration or scarring at puncture sites (Camp Sorrell D, 1992).

Flushing the port when not in use

Non-accessed ports should be flushed regularly when not in use with 5 mls Heparinised saline² **100 U/ml** using a brisk "push-pause" technique following accessing and verification of correct needle position as above (Camp-Sorrell D, 1992).

- intravenous ports - flush at least once every four weeks (Bard Access Systems 1997).
- **intra-arterial ports** - flush at least once a week (Bard Access Systems 1997).

Bathing, Showering and Swimming

- a. Non-accessed ports do not require dressings and present no obstacle to bathing, showering and swimming, since skin integrity is intact.
- b. When a port is accessed with a needle, the patient should only **shower** if the needle site is completely covered with an occlusive dressing, and then should take care to ensure that the needle is not dislodged by vigorous movement. If s/he wishes to have a **bath**, s/he should be advised against

² Heparinised Saline should be prescribed by a Doctor

immersing the needle site in water. **Swimming** is not advisable because of the risk of dislodging the needle, as well as the infection risk.

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