Whittington Health NHS

Non-tunnelled Central Venous Catheter (CVC) – Procedure for Insertion

Subject:	Non-tunnelled Central Venous Catheter (CVC) insertion
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Policy Executive Owner:	Clinical Director Surgery
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Name of Assurance Committee:	Infection Prevention & Control Committee
Date Issued:	November 2014
Review Date:	Three years hence
Target Audience:	All staff involved with the insertion of central venous catheters
Key Words:	Central venous catheters (CVCs), bloodstream infections, pneumothorax

Version Control Sheet

Version	Date	Author	Status	Comment
1.0	July 2010	Dr J A Andrews, Consultant Microbiologist Dr T Blackburn, Consultant Anaesthetist Ann McMulkin,CNS Nutrition Dr A Badacsonyi, Consultant Anaesthetist	Offline	
2.0	October 2014	Dr J A Andrews, Consultant Microbiologist Dr T Blackburn, Consultant Anaesthetist Ann McMulkin,CNS Nutrition Dr A Badacsonyi, Consultant Anaesthetist	Current	Review of document following expiry of 3 year period

➢ Background/Introduction

- Indications for central venous catheters (CVCs) include complex intravenous (IV) fluid and drug regimens, parenteral nutrition (PN) and/or haemodynamic monitoring over periods of days or weeks.

- Bloodstream infection is the most common serious complication associated with the use of CVCs. Blood stream infection is more frequently associated with non-tunnelled CVCs, when insertion is via the femoral route and after multiple failed attempts at cannulation.

- The lowest infection risk is with the subclavian or infraclavicular axillary vein approach. Avoid the femoral route unless there is no alternative or for procedures of short duration (e.g. exchange transfusions)

- The risk of blood stream infection increases with the number of lumens of the CVC. Use double lumen rather than quad lumen CVCs whenever possible. Quintuple lumen CVCs should only be available and used in a Critical Care Unit.

- The use of 2D ultrasound to guide insertion is the optimal technique for internal jugular, axillary or femoral approach.

- Maintaining strict asepsis during CVC insertion is paramount in reducing infection-related complications. (Use maximal sterile barrier precautions for the insertion of CVC).

- A CVC inserted in less than ideal aseptic conditions because of clinical necessity should be replaced for a clean new CVC when circumstances allow.

- If a patient has a CVC in situ with all lumens already in use and PN is required, then a new CVC must be inserted.

- CVCs needing replacement ideally should be with a new CVC at a new site, but may alternatively be ‘railroaded’ over a wire technique if there is no evidence of CVC induced sepsis.

- Where long term IV treatment (especially PN or antibiotics for > 2 weeks) is anticipated, the insertion of a tunnelled CVC or Peripherally Inserted Central Catheter (PICC) should be considered.

- Patients discharged from ITU to a general ward ideally should have the CVC removed. If not possible, consider exchanging for a double lumen CVC.

➢ Inclusion criteria

- The insertion of non-tunnelled CVCs into central veins e.g. subclavian, internal jugular or femoral veins.

- This guideline focuses on the aseptic principles required for optimising safe CVC insertion.

Exclusion criteria

- The insertion of PICC or tunnelled CVCs such as Hickman or Broviac lines is not considered.

Trolley/ Tray Preparation

- Ideally a CVC should be inserted in an operating theatre or Critical Care environment, however in an emergency situation some CVCs may have to be inserted in other clinical areas.

- All equipment must be to be gathered together before the start of the procedure.

- Equipment required for CVC insertion:

  - Trolley or tray that has been cleaned with Actichlor Plus and water or detergent wipes, dried, disinfected with hard surface cleaner (70% alcohol) and allowed to air dry for 30 seconds.

  - Pre-packed CVC insertion tray pack containing large absorbent fenestrated drape, gown, syringe, needle, suture, Bionectors, gauze and sterile towels. These packs are kept in theatres, ICU, Mary Seacole and Victoria wards, ED, Delivery Suite and the central store.

  - These pre-packed trays also contain the recommended skin antiseptic preparation: alcohol 70%, 2% chlorhexidene in a single use applicator, known as **Chloraprep**. If the patient is allergic to chlorhexidene then iodine in the form of Betadine can be used instead.

  - Sterile gloves

  - Lidocaine 1 or 2%

  - 10 ml syringe and 0.9% Sodium Chloride for flush.

  - A double or quad lumen CVC. These are stored in theatres, ICU, Delivery Suite, Mary Seacole and Victoria wards, ED and central stores.

  - Eye protection in the form of goggles is strongly recommended for CVC insertion as there is risk of blood splashes to the eyes.

- Theatre hat/mask/sterile gloves.

➢ Patient Preparation

- Obtain consent from the patient prior to the procedure. If there are concerns about capacity, refer to trust guidance on Appointing an Independent Mental Capacity Adviser (IMCA)

	Please see Whittington Health Guideline: ***'Appointing an Independent Mental Capacity Advisor'*** http://whittnet/document.ashx?id=2499

- Aim to have assistance from a nurse or Operating Department Practioner with previous CVC insertion experience.
- Place patient in an appropriate position.
- Hair at the insertion site should be clipped, not shaved, if necessary.

➢ CVC Insertion

- Wash hands for 2 minutes using chlorhexidene 4% solution (Hibiscrub) and water. This should be a surgical level scrub.
- Apply sterile gown, hat/mask and gloves (long hair should be tied back prior to hat/mask being worn). These are a mandatory part of the aseptic technique required for the insertion of CVCs.
- Assistant opens CVC insertion pack.
- Set up equipment in CVC tray.
- Pinch wings of Chloraprep to release antiseptic onto sponge and clean the skin with a gentle friction scrub using repeated up and down, back and forth strokes at the insertion site, before working out toward the periphery. Allow to air dry for 2 minutes.
- Apply drape ensuring only the insertion site is exposed.
- The sterile field must be maintained throughout the procedure.
- Where two attempts to insert a CVC have been unsuccessful, seek help from a senior medical colleague.

- CVCs must be sutured in place using the wings fixed to the catheter. Additional sutures through the extra 'clip on' wings are optional. Apply a Tegaderm CHG transparent dressing, which is chlorhexidine impregnated. The CVC dressing should be dated. Subsequent dressing changes should be dated with the date of the dressing change

- All lumens should have a needle-free access device, such as a Bionector attached.

- A chest X-ray should be obtained at the earliest opportunity to confirm correct positioning and to exclude a pneumothorax after internal jugular and subclavian CVC insertion. If the CVC was inserted easily under direct ultrasound guidance, on transducing gives an appropriate waveform and on blood gas analysis demonstrates a venous sample, the catheter may be used without an immediate chest X-ray;

- Document in the medical notes the insertion procedure, confirmation of CVC position and that nursing staff may use the CVC. The Patient safety first CVC care bundle stickers should be used to document insertion in ITU.

- Nursing staff should initiate a CVC/PICC Core care plan, CVC/PICC check form and PN Core Care plan as appropriate.

- If PN is required (or likely to be) a dedicated lumen should be reserved for its use.

➢ Training

The safe insertion of non-tunnelled CVCs is a key competency acquired by all anaesthetic and ITU trainees at an early stage in their training, in order to assist with the resuscitation of sick patients. Training is provided by consultants and senior trainees on a one-to-one basis and will be recorded in the trainees logbooks and college e-portfolios.

Doctors from other specialties may also insert CVCs if they have acquired the appropriate competence.

➢ Contacts

During working hours:
Critical Care Outreach Team (bleep 2837)
Infection Prevention & Control Team (bleep 2669)
CNS Nutrition (Bleep 2667/2673 for PN related issues)

Out of hours:
ITU SpR (bleep 2613)
Anaesthetic SpR (bleep 3005)
Microbiology SpR (via aircall)

➢ References (evidence upon which the guideline is based)

1. Pratt RJ et al. EPIC 3 guidelines, national evidence based guidelines for the prevention of Healthcare associated infections in NHS Hospitals in England. *Journal of Hospital Infection 2007* 65S S1-65
2. Saving lives High impact interventions number 1 Department of Health available at www.dh.gov.uk/publicationsandstatistics

To be completed and attached to any procedural document when submitted to the appropriate committee for consideration and approval

		Yes/No	Comments
1.	**Does the procedural document affect one group less or more favourably than another on the basis of:**		
	• Race	No	
	• Ethnic origins (including gypsies and travellers)	No	
	• Nationality	No	
	• Gender	No	
	• Culture	No	
	• Religion or belief	No	
	• Sexual orientation including lesbian, gay and bisexual people	No	
	• Age	No	
	• Disability - learning disabilities, physical disability, sensory impairment and mental health problems	No	
2.	**Is there any evidence that some groups are affected differently?**	No	
3.	**If you have identified potential discrimination, are any exceptions valid, legal and/or justifiable?**	No	
4.	**Is the impact of the procedural document likely to be negative?**	No	
5.	**If so can the impact be avoided?**	N/A	
6.	**What alternatives are there to achieving the procedural document without the impact?**	N/A	
7.	**Can we reduce the impact by taking different action?**	N/A	

If you have identified a potential discriminatory impact of this procedural document, please refer it to the Director of Human Resources, together with any suggestions as to the action required to avoid/reduce this impact.

For advice in respect of answering the above questions, please contact the Director of Human Resources.

Checklist for the Review and Approval of Procedural Document

To be completed and attached to any procedural document when submitted to the relevant committee for consideration and approval.

	Title of document being reviewed:	Yes/No	Comments
1.	**Title**		
	Is the title clear and unambiguous?	Yes	
	Is it clear whether the document is a guideline, policy, protocol or standard?	Yes	
2.	**Rationale**		
	Are reasons for development of the document stated?	Yes	
3.	**Development Process**		
	Is it clear that the relevant people/groups have been involved in the development of the document?	Yes	
	Are people involved in the development?	Yes	
	Is there evidence of consultation with stakeholders and users?	Yes	
4.	**Content**		
	Is the objective of the document clear?	Yes	
	Is the target population clear and unambiguous?	Yes	
	Are the intended outcomes described?	Yes	
5.	**Evidence Base**		
	Are key references cited in full?	N/A	
	Are supporting documents referenced?	N/A	
6.	**Approval**		
	Does the document identify which committee/ group will approve it?	Yes	
7.	**Dissemination and Implementation**		
	Is there an outline/plan to identify how this will be done?	Yes	
8.	**Document Control**		
	Does the document identify where it will be held?	Yes	
9.	**Process to Monitor Compliance and Effectiveness**		
	Are there measurable standards or KPIs to support the monitoring of compliance with and	Yes	

	Title of document being reviewed:	Yes/No	Comments
	effectiveness of the document?		
	Is there a plan to review or audit compliance with the document?	Yes	
10.	**Review Date**		
	Is the review date identified?	Yes	
	Is the frequency of review identified? If so is it acceptable?	Yes	
11.	**Overall Responsibility for the Document**		
	Is it clear who will be responsible for co-ordinating the dissemination, implementation and review of the document?	Yes	

Executive Sponsor Approval			
If you approve the document, please sign and date it and forward to the author. Procedural documents will not be forwarded for ratification without Executive Sponsor Approval			
Name		Date	
Signature			
Relevant Committee Approval			
The Director of Nursing and Patient Experience's signature below confirms that this procedural document was ratified by the appropriate Governance Committee.			
Name		Date	
Signature			
Responsible Committee Approval – only applies to reviewed procedural documents with minor changes			
The Committee Chair's signature below confirms that this procedural document was ratified by the responsible Committee			
Name		Date	
Name of Committee		Name & role of Committee Chair	
Signature			

Tool to Develop Monitoring Arrangements for Policies and guidelines

What key element(s) need(s) monitoring as per local approved policy or guidance?	**Who will lead on this aspect of monitoring?** **Name the lead and what is the role of the multidisciplinary team or others if any.**	**What tool will be used to monitor/check/ observe/Assess/inspect/ authenticate that everything is working according to this key element from the approved policy?**	**How often is the need to monitor each element?** **How often is the need complete a report ?** **How often is the need to share the report?**	**What committee will the completed report go to?**
Element to be monitored	**Lead**	**Tool**	**Frequency**	**Reporting arrangements**
Accurate record keeping of CVC insertion which measures compliance for High Intervention Care Bundle No.2	ITU Consultants	Insertion sticker used in patient notes every time central line inserted.	Yearly	IPCC
Compliance with CVC insertion and maintenance care bundles	ITU Consultants	CVC care bundle audit tool	Yearly	IPCC