Ashford and St. Peter's Hospitals
NHS Foundation Trust

Peripheral Venous Catheter insertion and care (NICU)

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Guideline History		
Date	**Comments**	**Approved By**
2008	Gill Ayton-Smith, Tracy Lawson Adapted from ASPH PVC care for adults	Neonatal clinical management group
2011	Reviewed	
2014	Reviewed	
2019	Reviewed and reformatted as part of infection control bundle	Neonatal Guidelines Group

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Contents

Peripheral Venous Cannulation and Care in Neonatal Patients

A. INTRODUCTION

Peripheral venous catheters (PVC) are devices that are inserted intravenously usually into the veins of the upper or lower limbs or the scalp of babies. They are used to administer intravenous fluids, drugs, PN (parenteral nutrition) or blood products.

This policy outlines measures that shall be implemented to reduce the risk of infectious and non-infectious complications in any neonate with a PVC.

B. BACKGROUND

Intravascular catheter-related infections are systemic infections which have a vascular access device (VAD) catheter as the source. Catheter-related Blood Stream Infections (CRBSIs) account for 10-20% of hospital acquired infection in the UK and are associated with increased ICU stay and mortality (Gahlot *et al*., 2014). CRBSIs are caused by micro-organisms, such as Staphylococcus aureus and Staphylococcus epidermidis. These organisms found on the patient's skin contaminate the catheter during insertion, or migrate along the catheter track. Contaminated fluids and equipment, cross infection and colonised hands are also factors implicated in catheter related infection.

Infection care bundles have been proposed to be an effective way to reduce incidence of CRBSIs (Schmid *et al*., 2018). This includes a range of measures such as good hand hygiene; use of gloves/aprons; limiting access to devices with clustered care; thorough cleaning of access ports with alcohol and high quality training with use of clear guidelines and policies. It is hoped that this policy will be used in conjunction with other relevant policies to standardise infection control practice on NICU and aid training for all staff involved.

C. POLICY

To reduce the incidence of CRBSIs all health care professionals will receive training and comply with the PVC guidelines which are based on best available evidence (Loveday *et al*., 2014, Health Protection Scotland, 2015). The policy is based on the following elements of PVC insertion and management:-

- Insertion and fixing of catheter
- Site assessment
- Accessing and Flushing of lines
- Care of lines
- Administration of fluids
- Documentation
- Training
- Audit

D. INSERTION AND FIXING OF CATHETER/CANNULA

Insertion of catheter/cannula:

- Adhere to the hand washing guidelines and follow aseptic technique throughout the procedure.
- Wipe clean a trolley surface with Clinell detergent wipes.
- Gather required equipment and set up trolley (figure 1.0):
  - Sterile dressing pack - including sterile gloves, apron and gauze
  - Chloraprep Sepp 0.67ml (70% Isopropyl Alcohol & 2% Chlorhexadine)
  - Cannula (Yellow 24G Jelco/Neoflon, White 26G Abbocath)
  - 2ml Syringe
  - 18G Red Blunt Fill Safety Needle
  - 0.9% Normal Saline (10ml)
  - Bionector T-piece
  - Green antibacterial gauze (for all babies on NICU)
  - Steristrips
  - Tegaderm Film
  - Sterile Scissors
  - IV Support Board in appropriate size
  - Blood bottles as required
  - 30 Second Sand Timer
  - Sucrose
  - Extra equipment for Blood Culture if required (See Blood Culture Policy for Neonatal Patients).

- Ensure you have a second person to assist with securing cannula, collecting samples and management of sand timer.
- Using clean gloves position baby and identify vein to be sampled.
- Rewash hands and apply sterile gloves and apron.
- Draw up 0.9% Normal Saline with Red Needle and 2ml syringe, attach to and flush Bionector T-piece.
- Cut steristrips, green antibacterial gauze and sterile gauze with sterile scissors in preparation for fixation (see figure 2.0)
- Second person to administer sucrose as required and hold baby securely.
- Apply ChloraPrep Sepp to skin surface and **leave to dry for 30 seconds** (Sand timer to be started by second person).
- Ensure you have a secure hold, pull skin taut at insertion site and introduce cannula at a shallow angle observing for a flash back.

- When flashback seen advance cannula by approx. 1mm, partially withdraw needle and thread cannula into vein.
- Collect Blood Culture sample and any other bloods required at this point (See Blood Culture Policy for Neonatal Patients and Blood Sampling Guideline).
- Attach Bionector T-piece and gently flush cannula to ensure patency.
- Gently place green antibacterial gauze around insertion site.
- With assistance from second person secure cannula as per figure 3.0 using Steristrips and Tegaderm Film. A small square of gauze should be placed under the cannula hub over the skin as a protective barrier.
- Remove syringe from Bionector T-piece bung
- Apply IV Support Board.
- Complete blue cannulation sticker and place in medical notes for inpatients or on NESS chart for outliers

Figure 1 – Equipment on trolley

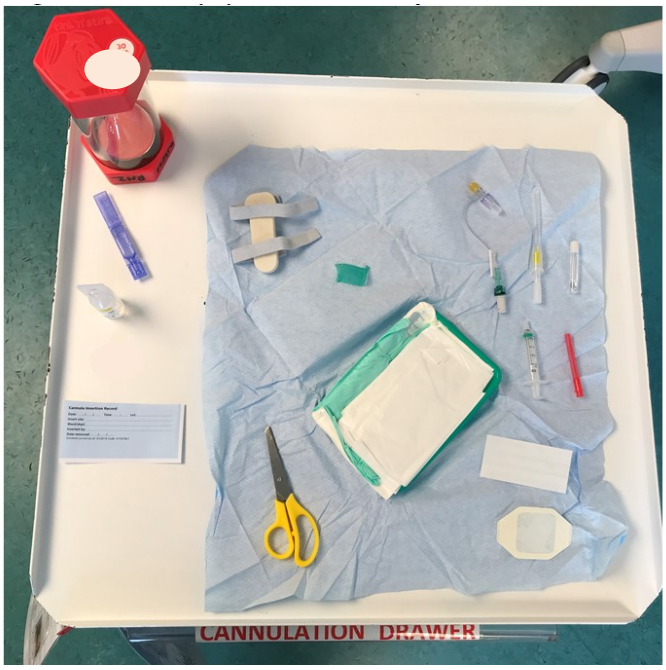


Figure 2 – Steristrips and green gauze

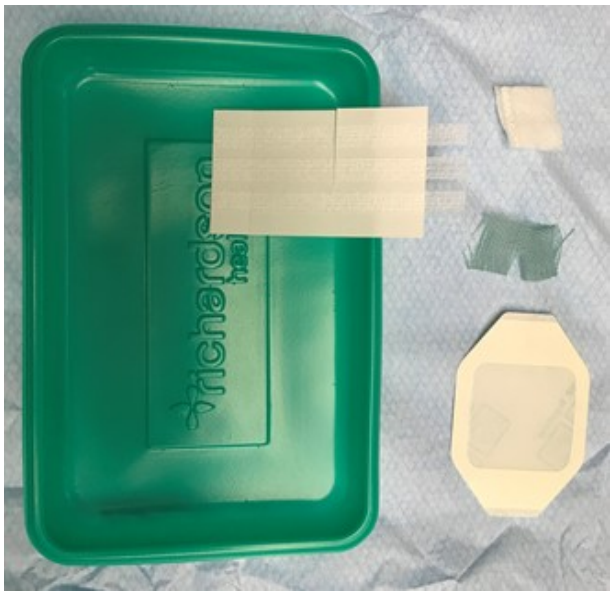
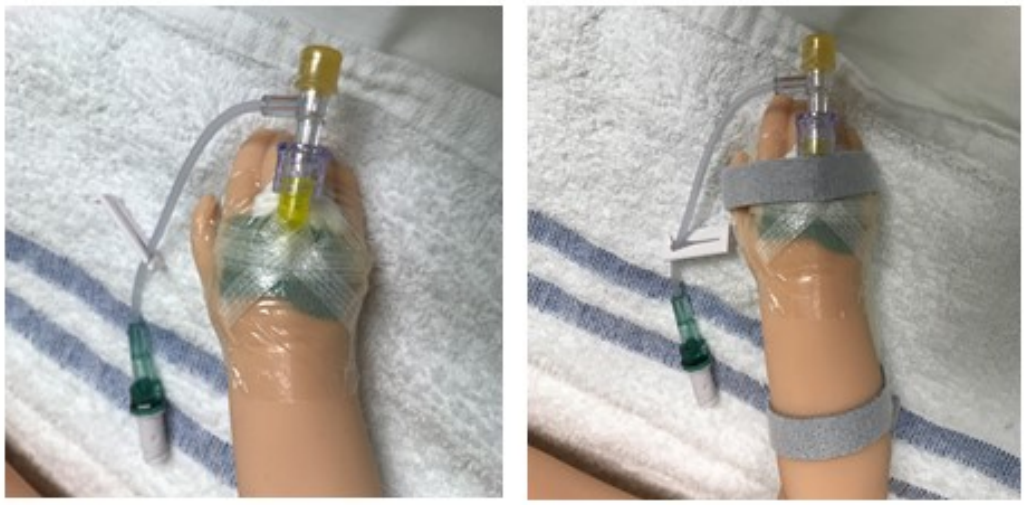


Figure 3.0 – Fixation



Cannula site dressing: The dressing should be changed when it becomes damp, loose, soiled or if the baby develops problems at the site that require further inspection.

Bionector devices: PVC's used for peripheral PN should have a minimum of one hub between infusion line and PVC to minimise the risk of infection. For patients who require intravenous therapy and administration of intermittent intravenous drug administration a double or triple lumen octopus Bionector should be used.

E. SITE ASSESSMENT

The PVC site needs to be assessed for signs of infiltration, phlebitis or infection including pain, redness, swelling, induration, disruption of flow. If the baby is receiving a continuous infusion the site should be assessed hourly. The PVC site should also be assessed prior to and during administration of any boluses. Assessment should identify any signs of infiltration, phlebitis, extravasation or occlusion. Medical staff should be informed of any concerns and appropriate action taken (See Extravasation Policy). It will usually be necessary to remove the affected PVC and insert a new cannula.

F. ACCESSING & FLUSHING LINES

Each time the PVC is accessed, the bung must be thoroughly cleaned with a Green Clinell Swab (2% Chlorhexidine in 70% Alcohol) for 15 seconds and **allowed to dry for 30 seconds** ('Scrub the Hub'). For bolus medications the PVC should be flushed with 0.5 - 1 ml of 0.9% Sodium Chloride via the Bionector T-piece using a 2ml syringe.

A cannula which is not in use for continuous intravenous therapy should be flushed 12 hourly with 0.9% Sodium Chloride (RCH, 2019). In rare situations a baby may require flushes with 0.45% Saline (Consultant led decision).

Effective flushing is achieved with a 'push-pause' technique, (RCN, 2019; Dougherty and Lister, 2015).

All flushes shall be prescribed on the patient's Drug Chart.

G. CARE OF LINES

Administration sets should be changed as follows:

- SMOF line and filter - every 24 hours
- TPN line and filter – every 48 hours
- Clear fluid (10% Dextrose) line and filter – every 72 hours
- Drug Infusions (e.g Morphine, Inotropes, Hepsal) line and filter – every 24 hours

The administration set and filter should be labelled with an expiry date.

Where possible attempt to minimise access of IV ports by clustering fluid changes and medications to reduce risk of infection (RCN, 2016; Health Protection Scotland, 2014).

Following a risk assessment PVCs should be removed if not in use, unless specifically requested by the medical staff.

Priming of set: All PVC administration set tubing shall be primed and inspected for the presence of air and if present eliminated before use.

Intermittent infusion sets: All intermittent infusion sets if disconnected from patient should be discarded and NOT capped for future use.

Disconnection of Bionector port: If port becomes accidentally disconnected, port shall be cleaned thoroughly with a Green Clinell Swab (2% Chlorhexidine in 70% Alcohol) for 15 seconds and **allowed to dry for 30 seconds** ('Scrub the Hub'). New tubing should then be attached.

H. ADMINISTRATION OF FLUIDS

Except in emergency situations, all PVC fluids, where possible, shall be administered via an infusion pump.

Peripheral PN should ideally be administered through designated PVC with no additional fluids via an infusion pump. Any concurrent infusions through the same PVC should be checked with the medical team and/or pharmacist to ascertain compatibility. In this situation, PN is to run through the green octopus port and other medications will run via the orange port.

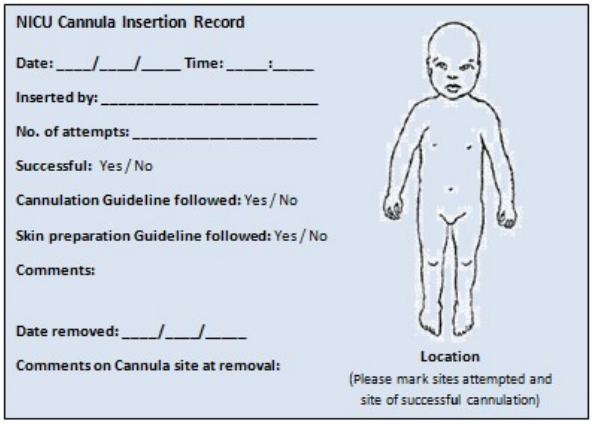
I. DOCUMENTATION

Insertion of PVC must be documented on the blue cannulation stickers and placed in the medical notes or on the separate NESS sheet for outliers on antibiotics.

If a baby is receiving an infusion the nurse should document NESS assessment of the PVC site every hour on the IV therapy fluid sheet. All babies with a cannula who are not on continuous infusions should have a separate NESS chart.

PVC flushes need to be documented in patient's drug chart in the PRN section.

Removal of PVC by nursing staff should be documented on the original blue cannulation sticker.


NICU Cannula Insertion Record

Date: ____/____/____ Time: ____:____

Inserted by: _____

No. of attempts: _____

Successful: Yes / No

Cannulation Guideline followed: Yes / No

Skin preparation Guideline followed: Yes / No

Comments:

Date removed: ____/____/____

Comments on Cannula site at removal:

Location
(Please mark sites attempted and site of successful cannulation)

J. TRAINING

Nursing staff who insert PVCs must have evidence of successful completion of the Neonatal Unit Cannulation course.

Training Needs Analysis

To establish uniform practice, to a standard acceptable to the Trust, appropriate competences have been identified.

In accordance with NICU cannulation training if an infant is identified as being fragile or difficult to cannulate then cannulation should only be attempted by someone senior. E.g. Individuals undergoing cannulation competency should not attempt cannulation on extreme preterm infants.

The knowledgeable practitioner must be able to demonstrate that she or he:

- abides by these and other associated guidelines for practice
- can outline the risks and complications associated with peripheral venous cannulation, their prevention and treatment
- can describe the procedures for reporting errors and adverse incidents
- understands the correct procedures for minimising infection including hand washing, use of gloves, non-touch technique and aseptic technique
- understands the ongoing care required when a peripheral venous cannula is in place
- is able to assess the need for removing or re-siting a peripheral venous cannula and the rationale for this
- records information relating to the peripheral venous cannula in a manner that is clear, concise, timely and accurate

In order to achieve competence, theoretical and practical education and training will be needed. The practitioner, undertaking such education and training, must be directly supervised in all aspects of peripheral intravenous cannulation care until such time as they are able to demonstrate their knowledge and competence.

A list of nurses who are trained in cannulation is available on the T: drive under 'Neonatal Infection Control Group'.

K. AUDIT

Aspects related to insertion of PVCs and associated care will be audited to assess compliance with PVC policy, in accordance with the Department of Health Saving lives/High Impact Intervention.

Monitoring Compliance with these guidelines

The success of the implementation of these guidelines will be measured by clinical audit approximately six months after their introduction and thereafter at 2 yearly intervals to inform the regular review process.

Sample size, audit tool and location and how the audit is conducted will be determined at the time of audit.

2. Supporting References

Dougherty L., Lister S. (2015) The Royal Marsden Hospital Manual of Clinical Nursing Procedures. 9th Ed. Blackwell Sciences Ltd, Oxford.

Gahlot, R., Nigam, C., Kumar, V., Yadav, G., Anupurba, S. (2014) Catherter-related bloodstream infections. Int J Crit Illn Inj Sci, 4(2): 162-167.

Health Protection Scotland (2014) Preventing infections when inserting and maintaining a PVC. Version 2. Accessed 11th September, 2019. Available at: http://www.documents.hps.scot.nhs.uk/hai/infection-control/evidence-for-care-bundles/key-recommendations/pvc-v2.pdf

Loveday, H.P., Wilson, J.A., Pratt, R.J., Golsorkhi, M., Tingle, A., Bak, A., Browne, J., Prieto, J., Wilcox, M. (2013) epic3: National Evidence-based guidelines for preventing healthcare-associated infections in NHS hospitals in England. J Hosp Inf, 8651:S1-S70.

Royal Children's Hospital (2019) Peripheral intravenous (IV) device management. Accessed 11th September, 2019. Available at:

https://www.rch.org.au/rchcpg/hospital_clinical_guideline_index/Peripheral_Intravenous_IV_Device_Management

Royal College of Nursing (2016) Standards for Infusion Therapy. Royal College of Nursing, London

Schmid, S., Geffers, C., Wagenpfeil, G., Simon, A (2018) Preventive bundles to reduce catheter-associated bloodstream infections in neonatal intensive care. GMS Hyg Infect Control, 13:10

3. Supporting relevant trust guidelines

Competency for administration of intravenous drugs

Skin Preparation Guideline for Neonates

Blood Culture Policy for Neonatal Patients

Hand hygiene policy

ANTT policy

4. Guideline Governance

a. Scope

This guideline in relevant to all staff caring for babies across neonatal intensive care, transitional care and maternity.

b. Purpose

i. This guidelines aims to facilitate a common approach to the management of babies admitted under neonatal care. At times deviation from the guideline may be necessary, this should be documented and is the responsibility of the attending consultant.

ii. This guideline is subject to regular review to ensure ongoing evidence based practice.

c. Duties and Responsibilities

See above Training Needs Analysis

d. Approval and Ratification

This guideline will be approved and ratified by the Neonatal Guidelines Group.

e. Dissemination and Implementation

i. This guideline will be uploaded to the trust intranet 'Neonatal Guidelines' page and thus available for common use.
ii. This guideline will be shared as part of ongoing education within the Neonatal Unit for both medical and nursing staff.
iii. All members of staff are invited to attend and give comments on the guideline as part of the ratification process.

f. Review and Revision Arrangements

a. This policy will be reviewed on a 3 yearly basis.
b. If new information comes to light prior to the review date, an earlier review will be prompted.
c. Amendments to the document shall be clearly marked on the document control sheet and the updated version uploaded to the intranet. Minor amendments will be ratified through the Neonatal Guidelines Group. A minor amendment would consist of no major change in process, and includes but is not limited to, amendments to documents within the appendices.

g. Equality Impact Assessment

Background • Who was involved in the Equality Impact Assessment
Methodology • A brief account of how the likely effects of the policy was assessed (to include race and ethnic origin, disability, gender, culture, religion or belief, sexual orientation, age) • The data sources and any other information used • The consultation that was carried out (who, why and how?)
Key Findings • Describe the results of the assessment • Identify if there is adverse or a potentially adverse impacts for any equalities groups
Conclusion • Provide a summary of the overall conclusions
Recommendations • State recommended changes to the proposed policy as a result of the impact assessment • Where it has not been possible to amend the policy, provide the detail of any actions that have been identified • Describe the plans for reviewing the assessment

h. Document Checklist

To be completed (electronically) and attached to any document which guides practice when submitted to the appropriate committee for approval or ratification.

Title of the document:

Policy (document) Author:

Executive Director:

		Yes/No/ Unsure/NA	Comments
1.	**Title**		
	Is the title clear and unambiguous?		
	Is it clear whether the document is a guideline, policy, protocol or standard?		
2.	**Scope/Purpose**		
	Is the target population clear and unambiguous?		
	Is the purpose of the document clear?		
	Are the intended outcomes described?		
	Are the statements clear and unambiguous?		
3.	**Development Process**		
	Is there evidence of engagement with stakeholders and users?		
	Who was engaged in a review of the document (list committees/ individuals)?		
	Has the policy template been followed (i.e. is the format correct)?		
4.	**Evidence Base**		
	Is the type of evidence to support the document identified explicitly?		
	Are local/organisational supporting documents referenced?		
5.	**Approval**		
	Does the document identify which committee/group will approve/ratify it?		
	If appropriate, have the joint human resources/staff side committee (or equivalent) approved the document?		
6.	**Dissemination and Implementation**		
	Is there an outline/plan to identify how this will be done?		
	Does the plan include the necessary training/support to ensure compliance?		

		Yes/No/ Unsure/NA	Comments
7.	**Process for Monitoring Compliance**		
	Are there measurable standards or KPIs to support monitoring compliance of the document?		
8.	**Review Date**		
	Is the review date identified and is this acceptable?		
9.	**Overall Responsibility for the Document**		
	Is it clear who will be responsible for coordinating the dissemination, implementation and review of the documentation?		
10.	**Equality Impact Assessment (EIA)**		
	Has a suitable EIA been completed?		

Committee Approval (Neonatal Guidelines Committee)			
If the committee is happy to approve this document, please complete the section below, date it and return it to the Policy (document) Owner			
Name of Chair		**Date**	
Ratification by Management Executive (if appropriate)			
If the Management Executive is happy to ratify this document, please complete the date of ratification below and advise the Policy (document) Owner			
Date: n/a			