

PAEDIATRIC NURSING PRACTICE MANUAL
SECTION 5

SPECIMEN COLLECTION

5.1 BLOOD

5.1.4B COLLECTION OF BLOOD FROM A PERIPHERAL LINE

Aim

To minimise procedural pain and discomfort for the patient when multiple blood sampling is required for *short-term investigative procedures or emergency management*.^{1,2}

Key points

1. Due to an increased risk of haemolysis leading to inaccurate results:
 - It is recommended that peripheral IV cannula larger in diameter than 22g (ie. 21g, 19g) are routinely used.^{1,3,4}
 - It is recommended that only 5mL syringes or smaller are used.⁵⁻⁷
2. This procedure is performed when a peripheral line is already in situ.
3. This is a clean aseptic procedure.
4. This procedure is performed via a needle free bung⁶ which should be in situ on the add-on device.
5. Blood tubes must be filled in the correct order to avoid contamination from the tubes additives.^{7,8}

Refer to the Pathology Handbook for specific requirements. (Order of Draw, Pathology Manual, General Guidelines Section 2.6 page 12-13)

Relative contraindications

This procedure is not recommended for obtaining coagulation studies,⁶ blood cultures⁸ or potassium.⁹ If these tests are requested advice must be sought from pathology/medical staff.

Equipment

Non sterile gloves

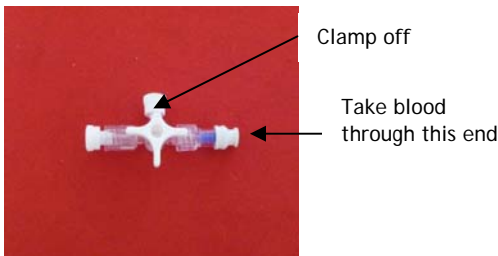
Luer lock syringes x 3

Sterile 0.9% sodium chloride 10mL (for injection)

Isopropyl alcohol 70% swabs x 3

Pathology request form – *to be completed by medical staff*

Relevant blood specimen bottles – *check expiry dates* Check with pathology if unsure of correct bottles, minimum amounts required and/or special requirements.

PROCEDURE	ADDITIONAL INFORMATION
Prepare equipment in a clean tray. Maintaining an aseptic technique, draw up 5mL of sodium chloride into a syringe.	Prevents contamination of the equipment.
Positively identify the patient.	Refer to the Pathology Handbook. (General Guidelines Section 2)
Turn off any infusion/s in progress. If infusion in progress wait for 3 minutes before sampling. ^{1, 10}	See PNPM 2.7 for special requirements for Parenteral Nutrition (PN) solutions.
Hold and encircle the needle free bung with an isopropyl alcohol 70% alcohol swab. ¹¹ Clean the needle free bung using another Isopropyl alcohol 70% swab. ¹¹ Allow to dry.	
Attach the syringe to the needle free bung. Unclamp the add on device. Slowly withdraw 1.5mL of blood. ² Clamp the add on device.	When using a 3 way tap.  <p>Blood must be taken in the manner specified to prevent cell trauma, leading to inaccurate results.</p>
If the cannula will not bleed back try: 1. Flushing the line with 1.5mL of sodium chloride. and/or 2. Applying a tourniquet above the cannula site.	The tourniquet should not remain in situ for more than 1 minute. ⁸
Discard the first sample. ^{1, 5, 6, 9, 10, 12, 13}	The first sample should not be re-infused back to the patient due to the risk of haemolysis and clot formation. In certain age groups ie. neonate's re-infusion may be required to prevent excess fluid loss. Medical direction should be sought and documented in the progress notes.
Subsequent samples. Just prior to drawing the second sample release the tourniquet.	Prevents hemoconcentration. ⁵

PROCEDURE	ADDITIONAL INFORMATION
Using a second syringe, slowly withdraw the amount for the specimens required.	Repeat the steps above.
Using the pulsating push-pause and positive pressure technique, ^{1, 6} flush the line with sodium chloride, as prescribed.	These techniques assist to remove debris in the catheter due to a turbulent effect and prevent reflux of blood into the cannula.
Clean the needle free bung using another isopropyl alcohol 70% swab. ¹⁰	Ensure all blood is removed.
If required recommence the infusion.	
Place blood in the appropriate sample bottles and label correctly. Transport to laboratory in a Biohazard bag.	Refer to Pathology Manual, General Guidelines Section 2.

References:

- Seeman S & Reinhardt A. Blood sample collection from a peripheral catheter system compared with phlebotomy [Level III-2]. *J Intravenous Nursing*.23(5):290-297; 2000.
- Berger-Achituv S, Budde-Schwartzman S, Ellis MShenkman Z & Erez I. Blood sampling through peripheral venous catheters is reliable for selected basic analytes in children. *Pediatrics*.126:179-186; 2010.
- Dugan L, Leech L, Speroni G & Corriher J. Factors affecting hemolysis rates in blood samples drawn from newly placed IV sites in the emergency department [Level III-1]. *J Emerg Nursing*.31(4):338-345; 2005.
- Tripathi S Kaushik V & Singh V. Peripheral IVs: factors affecting complications and patency - a randomized controlled trial [Level II]. *J Infus Nursing*.31(3):182-188; 2008.
- Frey AM. Drawing blood samples from vascular access devices [Expert opinion]. *J Infus Nursing*.26(5):285-293; 2003.
- Royal College of Nursing IV Therapy Forum. Standards for Infusion Therapy [Expert Opinion]. 2003. Available from: http://www.rcn.org.uk/_data/assets/pdf_file/0005/78593/002179.pdf?bcsi_scan_276FAA45874D151E=0&bcsi_scan_filename=002179.pdf. Accessed: 7 December 2008
- Wiechula R & Hodgkinson B. Promoting best practice in the management of peripheral intravascular devices. Adelaide: Joanna Briggs Institute; 2002.
- Becan-McBride K. Laboratory sampling: Does the process affect the outcome? [Expert opinion]. *J Intravenous Nursing*.22(3):137-143; 1999.
- Zlotowski S Kupas D & Wood C. Comparison of laboratory values obtained by means of routine venipuncture versus peripheral intravenous catheter after a normal saline solution bolus [Level III-2]. *Annals of Emergency Medicine*.38(5):497-504; 2001.
- Mohler M Sato Y Bobick K & Wise L. The reliability of blood sampling from peripheral infusion lines [Level III-2]. *J Intravenous Nursing*.21(4):209-214; 1998.
- Joanna Briggs Institute for Evidence Based Nursing. Management of peripheral intravascular devices [Level I]. Best Practice Information Sheet.2(1):1-6; 1998.
- Himberger J & Himberger L. Accuracy of drawing blood through infusing intravenous lines [Level III-2]. *Heart & Lung*.30(1):66-73; 2001.
- Holmes K. Comparison of push-pull versus discard method from central venous catheters for blood testing [Level III-2]. *J Intravenous Nursing*.21(5):282-285; 1998.