



CLINICAL PRACTICE GUIDELINE

Guideline coverage includes NICU KEMH, NICU PMH and NETS WA

Peripheral Arterial Catheter Insertion and Removal

This document should be read in conjunction with the [Disclaimer](#)

Insertion

To gain peripheral arterial access for:

- Blood sampling and isovolaemic exchange transfusion.
- Monitoring of blood gases and invasive blood pressure monitoring.

Key Points

- Only an artery with collateral circulation should be cannulated e.g. Radial artery and posterior tibial artery. Assess collateral circulation using the Allen test - Elevate the arm and simultaneously occlude the radial and ulnar arteries at the wrist, then rub the palm to cause blanching. Release pressure on the ulnar artery. If normal colour returns to the palm in < 10 seconds, adequate ulnar circulation is present. Document Allen test undertaken in progress notes.
- If an artery has recently been used for an arterial line, it is expected that the artery will remain occluded for at least a month. If another arterial line is required, discuss placement with NCCU consultant.
- Only heparinised saline should be infused through a peripheral arterial line. Never use glucose solutions.

Occasionally, an infant's condition may require arterial access via one of the following:

- Dorsalis pedis artery.
- Femoral artery.
- Brachial artery.

It should be noted that complication rates of arterial access in these vessels are greater, specifically peripheral ischaemia and gangrene (10% published rate). The brachial artery, in particular, has very limited collateral circulation.

Cannulation or sampling of these arteries is only to take place after discussion with NICU consultant.

Ulnar artery cannulation is only to be performed by NICU consultants or under their direct supervision.

Cannulation or sampling of axillary or superficial temporal arteries is not to be performed at all.

Equipment

- Dressing pack
- 1% Chlorhexidine and 70% Alcohol swab > 27 weeks gestation or Povidone-iodine 10% solution < 27 weeks gestation
- Normal saline
- Heparin 1000 IU/mL
- 1 mL, 50 mL syringe
- Intravenous cannula
- Luer lock monitoring extension set
- Long extension
- Splint and leukostrips and/or occlusive (Tegaderm) dressing and leucoplast backstrapped)
- Transducer set and cable
- Syringe Pump
- Transilluminator

Procedure (Standard Aseptic Technique)

Refer to [Infection Prevention Control Manual - Aseptic Technique](#).

1. Check correct patient for procedure.
2. Consider giving sucrose.
3. Prime monitoring extension set.
4. Clean skin and allow skin prep to dry before proceeding with the procedure.
 - 1% Chlorhexidine Alcohol 70% Swab - wait 30 seconds.
 - Povidone-iodine 10% Swab - wait 60 seconds.
5. Puncture both the anterior and posterior wall of the artery at a 30-45 degree angle. Remove the stylet. There should be little or no back flow of blood. Pull the cannula back slowly until blood is seen; this signifies that the arterial lumen has been entered. Attach the syringe and flush the cannula, **or**
6. Puncture the anterior wall of the artery until blood return is seen. At this point the cannula should be in the lumen of the artery. Advance the cannula into the artery while simultaneously withdrawing the stylet. The blood should be flowing freely from the cannula if the cannula is properly positioned. Attach the syringe, advance the cannula and then flush the cannula.
7. Secure cannula with leukostrips and/or occlusive dressing and attach primed monitoring extension set.
8. Place armboard in correct position, ensuring the cannula and extension set is well stabilised.
9. Commence infusion and calibrate transducer.
10. Observe for adequate patency of artery, pink, warm, well-perfused digits and/or limbs distal to the cannulation.
11. Document the number of attempts, sites accessed and final placement in progress notes.
12. Document on the observation chart when and where the arterial line was inserted, as well as hourly recordings of the circulation to distal digits and/or limbs.

13. Heparinised saline at a rate of 0.5-1 mL/hr should be used. Care must be taken during sampling and flushing to avoid trauma and spasm. If there is other than transient blanching when the arterial line is flushed, it should be reviewed for removal by medical staff. Over-vigorous flushing of the arterial line has a risk of the dispersal of emboli into the systemic circulation.

Complications of Arterial Lines

- Peripheral ischaemia and gangrene.
- Spasm of the artery may occur PROXIMAL to cannulation site with more extensive gangrene (e.g. whole forearm).
- Ischaemic skin loss.
- Median nerve palsy.
- Carpal tunnel syndrome.
- Tendon damage.

If ischaemia occurs, consideration should be given to use of topical [Glyceryl Trinitrate 0.2%](#) ointment to minimise tissue loss.

Removal of a Peripheral Arterial Catheter

Can be removed by a RN deemed competent in this procedure.

Procedure

1. Cease infusion.
2. Remove all tapes with adhesive remover.
3. Apply pressure over the insertion site with gauze and withdraw catheter whilst maintaining pressure over the insertion site.
4. Continue to apply pressure for a minimum of 5 minutes or until bleeding has ceased.
5. Document removal of catheter on observation chart and progress notes, noting perfusion of peripheries after removal.

References


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2. Chalmers E A. Neonatal thrombosis. *J of Clin Path.* 2000; 53:419-23.
3. Ramasethu J. Complications of vascular catheters in the NICU. *Clin Perinatol.* 2008; 35:199-222.
4. Vasquez P, Burd A, Mehta R, et al. Resolution of peripheral artery catheter induced ischemic injury following prolonged treatment with topical nitroglycerine ointment in a newborn: a case report. *J Perinatol.* 2003; 23(4):348-50.
5. Wong A F, McCulloch L M, Sola A. Treatment of peripheral tissue ischaemia with topical nitroglycerine ointment in neonates. *J Pediatr.* 1992; 121(6):980-3

Related WNHS policies, procedures and guidelines

[Infection Prevention Manual - Aseptic Technique](#)

[Neonatal Medication Protocols - Glyceryl Trinitrate Topical 0.2%](#)

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