



SECTION 5: VENOUS AND ARTERIAL ACCESS AND LINE MANAGEMENT

INSERTION AND REMOVAL OF A PERIPHERAL ARTERIAL CATHETER

INSERTION

To gain peripheral arterial access for:

- Blood sampling and isovolaemic exchange transfusion
- Monitoring of blood gases & 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 secs, 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 NCCU CONSULTANT.

***Ulnar artery cannulation is only to be performed by NCCU 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 1000IU/ml
- 1ml, 50ml syringe
- Intravenous cannula
- Luer lock monitoring extension set
- Long extension
- Splint & leukostrips and/or occlusive (tegaderm) dressing & leucoplast (backstrapped)



- Transducer set and cable.
- Syringe Pump
- Transilluminator

PROCEDURE (STANDARD ASEPTIC TECHNIQUE)

See Infection 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 0.5-1ml/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 (eg. 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

Baserga M C, Puri A, Sola A. The use of topical nitroglycerine ointment to treat peripheral tissue ischemia secondary to arterial line complications in neonates. J Perinatol 2002; 22(5): 416-9.
 Chalmers E A. Neonatal thrombosis. J of Clin Path. 2000;. 53:419-23.
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 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.
 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.

National Standards



Legislation -Nil

Related Policies - Nil

Other related documents – [Aseptic Technique](#)

RESPONSIBILITY

Policy Sponsor	Neonatology Clinical Care Unit – Neonatal Coordinating Group
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