Arterial Line

Statement of Best Practice

All patients with an Arterial Line in situ will have care delivered safely, optimising their comfort and minimising adverse effects.

Introduction:

Complications of Arterial Line cannula can be divided into four main areas:

- Accidental disconnection which can lead to severe haemorrhage and hypovolaemia
- Inadvertent arterial injection of drugs leading to distal ischaemia and necrosis
- Local damage to the artery leading to changes in distal circulation and tissue damage
- Catheter related infection

This guideline is divided into four sections:

- Insertion
- Management (including arterial blood sampling and trouble shooting)
- Removal
- Education and training

Insertion

- Communicate effectively to the patient by giving a full explanation of the procedure and providing reassurance, maintaining privacy and dignity at all times.
- Prepare the equipment needed for the procedure and assist medical staff (E.g. Arterial packs/box/trolley). Ensure infection control standards are adhered to at all times.
- The pressure bag containing prescribed 0.9% Sodium Chloride flush should be inflated to 300mmHg at all times to ensure patency of the cannula. The flush bag should be changed every 72 hours as a minimum. If the flush bag needs to be changed sooner, the arterial monitoring set should be changed at the same time.
- Apply a dedicated sterile, permeable IV cannula dressing and ensure it is attached securely.
- Document insertion, time, date and site of cannula in accordance with local trust documentation.
- All arterial lines must be labelled clearly.

Subcutaneous local anaesthetic (1% lignocaine) should be used for the insertion procedure if the patient is conscious.

Management

- Calibration/re-zeroing should be performed at the start of each shift, a minimum of 8 hourly, or as required (position change) placing the transducer height at mid-axillary point.
- Appropriate alarms limits should be set and clearly audible.
- The Arterial Line trace should be constantly displayed, giving a waveform that represents the patient's blood pressure.
- Vigilant assessment of the Arterial Line site and the extremities should be made for signs and symptoms of local damage to the artery every 8 hours as a minimum standard. All observation/monitoring of the line and site should be documented using the local trust patient documentation.
- Ensure there are clear indications for arterial line sampling. Appropriate infection control standards are adhered to and PPE precautions are taken. Following completion of the procedure a new sterile cap should be placed on the withdrawal port and the contaminated equipment disposed of appropriately. *Arterial Line sampling can only be performed by a registered and competent practitioner.*

- Refer to manufacturer's guidance regarding the initial sample withdrawal measurement and flushing of the port after the sample has been taken.
- **Never administer drugs through an Arterial Line.**

Trouble Shooting & Arterial Line Removal

Troubleshooting of the Arterial Line should involve:

- ensure removal of any air bubbles and clots
- checking the arterial site and tubing for kinks
- rezeroing of the line and checking the line position
- ensure there is 300mmHg of pressure in the bag.

Arterial Line Removal should be considered:

- if evidence of infection is suspected. The cannula tip should be cut with sterile scissors and sent to microbiology for culture.
- if the surrounding skin/tissue is swollen or inflamed, or if there is impaired circulation to the digits distal to the catheter.
- if a sample cannot be withdrawn or the pressure trace is not reading.
- if the line has been in place for 7 days and further arterial access is required.
- arterial lines should be removed when they are no longer required.

The cannula should be removed whilst pressure is applied to the site. Pressure should be maintained at the site for a minimum of 3 minutes or until bleeding has stopped following removal. Ensure appropriate infection control standards are adhered to and PPE precautions are taken.

Document removal, time and date of cannula in accordance with local trust documentation.

Education and Training

- All staff involved with any aspect of the insertion, removal care and management of Arterial Lines must have received the appropriate training and be able to demonstrate competence in accordance with local trust policies.
- National Competency Framework for Adult Critical Care Nurses is available from www.cc3n.org.uk

References

Critical Care National Network Nurse Lead (CC3N)
National Competency Framework for Adult Critical Care Nurses www.cc3n.org.uk

Bersten, A. and Soni, N. Edited by Oh, T. (2003) Intensive Care Manual. 5th Edition Chapter 10 – Haemodynamic Monitoring. London. New York. Butterworth-Heinemann

NPSA (2008) Rapid Response Report NPSA/2008/RRR006 – Problems with Infusions and Sampling from Arterial Lines.

Woodrow, P. (2009) Arterial Catheters: Promoting safe clinical practice, Nursing Standard, 24 (94), p.35

Group Membership

Jo McBride	NoECCN
Julie Platten	NoECCN & Queen Elizabeth Hospital
Lesley Durham	NoECCN
Andrea Burdess	Sunderland Royal Hospital
Barbara Jameson	University Hospital of North Durham

Diane Cruickshank	Darlington Memorial Hospital
Jayne Williamson	North Tyneside General Hospital
Jennifer Graham	Wansbeck General Hospital
Patricia Hogg	University Hospital of North Durham
Annie Crest	James Cook University Hospital
Michelle Hutchinson	Queen Elizabeth Hospital
Tracy Kelly	Queen Elizabeth Hospital
Dawn Cameron	Darlington Memorial Hospital