ARTERIAL LINE INSERTION

PERIPHERAL ARTERIAL LINES

INDICATIONS

• Frequent monitoring of blood gases
• Direct monitoring of arterial blood pressure
• Premature removal (or failure to site) an umbilical artery catheter (UAC)

CONTRAINDICATIONS

• Bleeding disorder
• Inadequate patency of ulnar artery on transillumination (if cannulating radial artery) or vice-versa
• Pre-existing evidence of circulatory insufficiency in limb
• Local skin infection
• Malformation of upper extremity

Possible sites of arterial entry

• Radial (most commonly used): the only procedure discussed in this guideline
• Posterior tibial
• Dorsalis pedis
• Ulnar (usually only if ipsilateral radial artery cannulation has not been attempted)

EQUIPMENT

• Gloves
• Cleaning solution as per unit policy - suggest aqueous chlorhexidine 0.5%/isopropyl alcohol 70% (Hydrex), diluted 50:50 with Normasol for infants <26 weeks’ gestation.
• 24-gauge cannula
• T-connector with Luer lock
• Adhesive tape
• Splint
• Sodium chloride 0.9% flush in 2 mL syringe, primed through T-connector
• Transillumination fibre-optic light source
• Three-way tap

PROCEDURE USING RADIAL ARTERY

Preparation

• Wash hands
• Check patency of ipsilateral ulnar artery and proceed only if patent
• Put on gloves
• Extend baby’s wrist with palm of hand upwards
• Transilluminatate radial artery with fibre-optic light source behind baby’s wrist
  OR palpate pulse
• In preterm infants, holding fibre-optic light source behind baby’s wrist will make artery clearly visible
• Clean skin with antiseptic cleaning solution

Procedure

• Enter artery with 24-gauge cannula just proximal to wrist crease at angle of 25–30°
• Remove stylet from cannula and advance cannula into artery
• Connect cannula to T-connector primed with sodium chloride 0.9%, and flush gently
• Secure cannula with tape, ensuring fingers are visible for frequent inspection, and apply splint
• Connect T-connector to infusion line (sodium chloride 0.9% with heparin 1 unit/mL), with three-way tap in-situ for blood sampling

Documentation
• Document clearly in notes all attempts at cannulation, including those that are unsuccessful

AFTERCARE

Monitor
• Inspect distal digits regularly for circulatory status: if blanching does not recover after 5 min, remove line
• Avoid excessive hyperextension of wrist, as this can result in occlusion of artery
• Ensure a continuous pressure waveform tracing is displayed on monitor screen at all times: if flushing line does not restore lost tracing, change position of limb/dressing

Usage
• Do not administer rapid boluses of fluid as this can lead to retrograde embolisation of clot or air: use minimal volume when flushing after sampling and inject slowly
• Use cannula only for sampling, and infuse only sodium chloride 0.9% with heparin 1 unit/mL. In hypernatraemic babies, sodium chloride 0.45% with heparin 1 unit/mL can be used
• Remove cannula as soon as no longer required

Removal
• Removal of arterial line: aseptic, apply pressure for at least 5 min (longer if coagulopathy/low platelets, until no bleeding or bruising)
• dressings do not prevent bleeding or bruising
• do not send tip for culture routinely

COMPLICATIONS
• Thromboembolism/vasospasm/thrombosis
• Blanching and partial loss of digits (radial artery)
• Necrosis
• Skin ulceration
• Reversible occlusion of artery
• Extravasation of sodium chloride infusate
• Infection (rarely associated with line infection)
• Haematoma
• Haemorrhage
• Air embolism