ARTERIAL LINE INSERTION ● 1/2

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)
- Exchange transfusion (peripheral venous and arterial catheters 'continuous' technique) or partial exchange transfusion

Contraindications

- Bleeding disorder
- Inadequate patency of ulnar artery on transillumination or failed Allen's test (if cannulating radial artery) or vice-versa
- Pre-existing evidence of circulatory insufficiency in limb
- Local skin infection
- Malformation of upper extremity for radial arterial cannulation

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
- 24 G 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
- 3-way tap

PROCEDURE USING RADIAL ARTERY

Preparation

- Wash hands
- Check patency of ipsilateral ulnar artery using Allen's test and proceed only if patent
- Put on gloves
- Extend baby's wrist with palm of hand upwards
- Transilluminate radial artery with fibre-optic light source behind baby's wrist
  OR palpate pulse
- Clean skin with antiseptic cleaning solution

Procedure

- Enter artery with 24 G cannula just proximal to wrist crease at 25–30° angle
- 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 3-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

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- 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 or removal of blood during exchange transfusion, and infuse sodium chloride 0.9% or 0.45% with heparin 1 unit/mL
- Remove cannula as soon as no longer required

Removal

- Aseptic removal of arterial line: 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