

ARTERIAL LINES

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

CONTRAINDICATIONS

- Bleeding disorder
- Inadequate patency of the ulnar artery on transillumination (if cannulating the 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) – only procedure discussed in this guideline
- Posterior tibial
- Dorsalis pedis
- Ulnar (usually only if ipsilateral radial artery cannulation has not been attempted)

EQUIPMENT

- Gloves
- Alcohol-free antiseptic wipes/solution
- 24-gauge cannula
- T-connector with luer lock
- Adhesive tape
- Splint
- Saline flush in 2 mL syringe, primed through T-connector
- Transillumination fibre-optic light source equipment
- 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
- Transilluminate radial artery with fibre-optic light source behind baby's wrist
OR palpate pulse, situated at midpoint of lateral third of wrist
- In preterm infants, holding fibre-optic light source behind the baby's wrist will make artery clearly visible
- Clean skin with antiseptic

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 saline, 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 the 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 embolization 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 u/mL
- Remove cannula as soon as it is no longer required

Removal

- Removal of arterial line: aseptic, apply pressure for at least 5 min (longer until no bleeding or bruising if coagulopathy/low platelets)
- 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