ARTERIAL LINE SAMPLING

INDICATIONS
- Blood gas analysis
- Biochemical and haematological investigations

CONTRAINDICATIONS
- Infusions of glucose solution preclude sampling for blood glucose estimation
- Blood drawn from an arterial line may not be suitable for clotting studies (see Coagulopathy guideline)

COMPLICATIONS

Haemorrhage
- Ensure all connections secure, Luer locks tight and 3-way taps appropriately adjusted

Infection
- Maintain sterile technique during sampling to reduce risk of infection
- Clean hands with alcohol gel and don gloves (clean, not from sealed pack)

Artery spasm
- Limb appears blanched. Stop procedure and allow time for recovery. Warming of opposite limb can elicit reflex vasodilatation

Thromboembolism
- Flush catheter with 0.5 mL sodium chloride 0.9% with each time sample taken. If catheter not sampling, clot formation may be in progress. Request urgent registrar review of arterial line for a prompt decision about removal

Inaccuracy of blood gas results
- Analyse sample immediately. After blood is withdrawn from an artery, it continues to consume oxygen and produce carbon dioxide
- Excess heparin in syringe can result in a falsely low pH and PaCO₂. Remove excess heparin from syringe before obtaining sample
- Do not use if air bubbles in sample: take fresh specimen

EQUIPMENT
- Gloves
- Paper towel
- Alcohol swabs × 2
- Syringes
  - 2 mL syringe (A) for clearing line
  - 2 mL syringe (B) for other blood samples as necessary
  - 1 mL syringe (C) pre-heparinised for blood gas analysis
  - 2 mL syringe (D) containing 0.5-1 mL heparinised sodium chloride 0.9%
- Appropriate blood sample bottles and request forms

PROCEDURE

Preparation
- Record SpO₂ and TcCO₂ at time of taking blood to allow comparison with blood gas
- Wash hands and put on gloves
- Place paper towel beneath 3-way tap collection port (maintain asepsis by non-touch technique rather than sterile gloves and towel)
- Ensure 3-way tap closed to port hole

**Procedure**
- Remove Luer lock cap, clean with alcohol swab and allow to dry, or prepare bioconnector
- Connect 2 mL syringe (A)
- Turn 3-way tap so it is closed to infusion and open to syringe and arterial catheter
- Withdraw 2 mL blood slowly. It must clear the dead space
- **If bioconnector not being used,** turn 3-way tap so it is closed to arterial catheter to prevent blood loss from baby
  - if bioconnector used, do not turn 3-way tap until end of procedure
- Attach appropriate syringe (B/C) needed for required blood sample
- **If bioconnector not being used,** turn 3-way tap to open to syringe and arterial catheter and withdraw required amount of blood for blood samples. Do not withdraw more than required amount
- **If bioconnector not being used,** turn 3-way tap off to arterial catheter in between syringes B and C if both required, after taking required samples with syringes
- Reattach syringe (A)
- Clear the connection of air
- Slowly return to baby any blood in line not required for samples
- **If bioconnector not being used,** turn 3-way tap off to arterial catheter
- Attach syringe (D) of heparinised sodium chloride 0.9%
- **If bioconnector not being used,** turn 3-way tap so it is open to syringe and arterial line, clear line of air and slowly flush line to clear it of blood
- Turn 3-way tap so it is closed to syringe, remove syringe (D), swab port hole with alcohol wipe and cover with Luer lock cap
- Record amount of blood removed and volume of flush on infant’s daily fluid record

**AFTERCARE**
- Ensure all connections tight and 3-way tap turned off to syringe port to prevent haemorrhage
- If sampling from UAC, ensure lower limbs are pink and well perfused on completion of procedure
- If sampling from percutaneous arterial line, check colour and perfusion of line site and limb housing arterial line
- Ensure line patency by recommencing infusion pump
- **Before leaving infant, ensure** arterial wave form present and all alarms set