ARTERIAL LINE SAMPLING

INDICATIONS
- Blood gas analysis
- Biochemical/and haematological investigations

CONTRAINDICATIONS
- Blood drawn from arterial line is not suitable for bloodspot screening
- Blood from arterial line can give inaccurate coagulation studies result if not taken correctly – ensure taken in appropriate way with a minimum 2mL volume of blood withdrawn from the dead space before taking sample

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

Infection
- Maintain sterile technique during sampling to reduce risk of infection

Arterial spasm
- Limb appears blanched. Stop procedure and allow time for recovery. Warming of opposite limb can elicit reflex vasodilatation
- If available, using warmed fluids as flush may minimise artery spasm

Thromboembolism
- Flush catheter with sodium chloride 0.9% 0.5 mL each time sample taken. If catheter not sampling, clot formation may be in progress. Request senior 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 After blood is withdrawn from an artery, it continues to consume oxygen. Ensure all air in syringe expelled immediately to prevent inaccurate oxygen levels
- Excess heparin in syringe can result in a falsely low pH and $PaCO_2$.
- Do not use if air bubbles in sample – take fresh sample

EQUIPMENT
- Gloves
- Paper towel
- Alcohol swabs x 2
- Syringes
  - 2.5 mL syringe for clearing line
  - 1 or 2.5 mL syringe for blood sample. Calculate volume needed before sampling.
  - 2.5 mL syringe containing 0.5–1 mL of sodium chloride 0.9%
- Appropriate blood sample bottles and forms pre-requested on ICE

PREPARATION AND PROCEDURE
Preparation
- Record SpO_2 at time of taking blood to allow comparison with blood gas if performed
- 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 side port

Procedure
- Remove Luer lock cap from 3 way tap side port, clean with alcohol swab and allow to dry

- Connect 2.5 mL syringe to 3 way tap side port
- Turn 3-way tap so it is closed to heparin saline infusion and open to syringe and arterial catheter
- Withdraw 2 mL blood slowly. This should clear all heparin.
- Before disconnecting syringe, turn 3-way tap so it is closed to arterial catheter to prevent blood loss from baby. Keep syringe and sample in clean tray
- Attach appropriate size syringe needed for required blood sample
- Turn 3-way tap to arterial catheter and slowly withdraw required amount of blood for blood samples. Do not withdraw more than required amount.
- Turn 3-way tap off to arterial catheter in between all syringe changes
- Reattach dead space sampling syringe after expelling any air bubbles from sample
- Slowly infuse dead space sample through arterial catheter to baby
- Turn 3-way tap off to arterial catheter in between all syringe changes
- Attach syringe of sodium chloride 0.9%
- Turn 3-way tap so it is open to syringe and arterial line and flush slowly to clear line.
- Turn 3-way tap so it is closed to syringe, remove syringe, swab port with alcohol wipe and cover with Luer lock cap
- If strict fluid balance is required, document blood volume removed and volume of flush on baby's daily fluid chart

AFTERCARE

- Ensure all connections tight and 3-way tap turned off to syringe port to prevent haemorrhage
- If sampling from umbilical arterial catheter, ensure lower limbs are pink and well perfused on completion of procedure
- If sampling from peripheral arterial line, check colour and perfusion of line site and distal limb of arterial line. Blanching or cyanosis appearance requires immediate review
- Ensure line patency by recommencing infusion pump
- Before leaving baby, ensure arterial wave form present and all alarms set appropriately