Arterial Blood Sampling

Educational objectives and program outputs to be satisfied in this session:

**Clinical Competence**

The student will:

- Obtain a sufficient level of medical knowledge to understand the basic facts, concepts and principles essential to competent medical practice.
- Exhibit the highest level of effective and efficient performance in clinical skills data gathering, organization, interpretation and clinical decision-making in the prevention, diagnosis and management of disease.

The student should have mastery of the concepts and skills upon completion of each session.

**Aim:** To teach the students how to safely obtain an arterial blood sample.

**Objectives:**

**SSBAT**

- Understand the indications for blood gas sampling.
- Understand the contra-indications for blood gas sampling.
- Demonstrate knowledge of possible complications of the procedure.
- Correctly obtain an arterial blood sample from a simulation model.

**Methods:** Small group teaching sessions; explanation and demonstration by tutors; practice on a simulation model.
**Equipment:**

- ABG needle sets – bring several
- Alcohol swabs
- Cotton wool
- Tape
- Tray
- Gloves

**Planning:**

- Introduce yourself to the patient and check patient identification.
- Explain to patient what you are about to do and gain consent.
- Prepare equipment and bring to bedside.

**Procedure:**

- Hand hygiene.
- Palpate both radial arteries to check for any differences between the two sides.
- Assess collateral blood flow using the Allen’s test.
  - Have patient make a fist.
  - Use fingers to apply direct pressure to both radial and ulnar arteries.
  - Have patient open and close hand into a tight fist.
  - Release pressure over ulnar artery; observe colour of fingers, thumbs and palm of hand.
  - If no flushing is observed within a maximum of 15 seconds the radial artery should not be punctured and test must be repeated on the other arm (Pullen, 2005).
- Hyperextend the patient’s wrist slightly to stabilise artery (use pillow or rolled up towel for support if necessary).
- Apply gloves.
- Open kit in an aseptic manner and prepare area. Ensure that plunger is running freely and leave a least 0.5ml of air in syringe.
- Tell patient that it may be painful for a short time as needle is inserted.
- Clean area with alcohol swab and allow to dry for 30 seconds.
- Place 2 fingers 3cms apart palpating artery and puncture artery between fingers at an angle of 45 degrees with bevel up and allow syringe to fill with a minimum of 1.5ml of blood. A successful artery puncture is usually indicated by pulsatile, typically bright red, blood flow.
• Withdraw needle and immediately apply pressure to puncture site with gauze or cotton wool ball and maintain this pressure for at least 3-5mins or until the bleeding stop (Approximately 15 minutes if patient is undergoing anticoagulant therapy or has a bleeding disorder- Pagana and Pagana, 2006).

• While maintaining pressure use other hand to expel air from syringe into cotton wool ball or something similar to avoid spilling blood onto exposed surfaces. Failure to expel air from the syringe may result in falsely elevated PaO2 and oxygen saturation (Chernecky and Berger, 2004).

• Make needle safe by using block supplied in kit and dispose of into sharps bin.

• Inspect site for signs of continued bleeding or haematoma formation. Place dressing over site.

• If sample is taken directly to machine for analysis ensure patient identification number is attached.

• If any delay beyond 10 minutes is anticipated place identification label on syringe, place syringe in ice and fill in appropriate laboratory requisition form and send to lab.

• Indicate the % of supplemental oxygen that patient is receiving when documenting of results.

**Learning Point**

• Palpate the pulse bilaterally before attempting an ABG to determine which side is strongest (if any) to maximise the likelihood of a successful puncture.

• Placing the sample on ice prevents oxygen being metabolised by cells in the blood which could lead to a falsely low result. The ice slows this down. (Cox, 2005).

**References**


