Arterial Blood Sampling

Also known as Arterial Blood Gas Sampling. ABG

Indications

To assess.

- Respiratory Status

  Assess oxygenation and ventillation
- Acid Base Balance
- Phlebotomy. Used if venous route is unavailable or inaccessible due to trauma or burns. Usually a femoral puncture, uncommon variation.

Contraindications

- Overlying infection or burn at insertion site.
- Absent collateral circulation.
- Arteriovenous shunt. Often radial or brachial.
- Severe atherosclerosis
- Raynauds disease.
- Coagulopathy.

Sites

- Preferred radial or femoral arteries.
- Less common. Dorsalis pedis and posterior tibial.
- Avoid. Branches without collateral supply. Example is the brachial artery.

Complications

- Bleeding causing hematoma.
- Arterial occlusion causing thrombus or dissection.
- Infection causing arteritis or cellulitis.
- Embolization

- Last 3 uncommon.

Normal Values

- pH, 7.36 to 7.44. For acid base status of blood.
- pCO_2, 38 to 44 mmHg. Reflects ventillation.
- pO_2, 85 to 95 mmHg. Reflects oxygenation.
- HCO_3, 21 to 27 meq per litre. Key blood buffer.
- Base excess, plus or minus 2 meq per litre

- ABG quiz. http://www.vectors.cx/med/apps/abg.cgi

Pathophysiology

- Metabolic alkalosis
- Metabolic acidosis
- Respiratory alkalosis
- Respiratory acidosis

Initial Preparation

- Wash hands
- Gloves
- Protective eye wear
- Iodine swab. **Povidone-iodine, betadine.** Followed by alcohol swab
- Arterial blood gas sampling kit
- 2 x 2 cm gauze
- Bag of ice. To store sample

Allens Test

- Indicates collateral circulation to hand.
- Radial artery on non dominant hand.
- Palpate radial artery.
- Simultaneouslys palpate ulnar artery, or as close to that area as possible.
- Patient makes a fist. Palpate both arteries for10 seconds.
- Release ulnar artery and witness blood flow and pinking of the hand via collateral radial artery
- Radial artery is now a candidate for testing.

Set Up

- Patient seated on stretcher
- Rolled up towel under wrist. That hyperextends wrist, bringing artery closer to surface.
- Clean area in a cicular motion with iodine. Allow to dry.
- Wipe away iodine with alcohol. While drying, open sampling kit.

Sampling Kit

- **3 pieces**

1. Orange air ball or cube. Used to expel excess air from the syringe.
2. Black cap for syringe, used for transport.
3. 3 cc, cubic centimetres heparinised syringe. With needle attached.

Sampling Kit Use

- Pull back slightly on plunger, so once needle is in artery, natural pulsations will fill the syringe.
- Remove clear needle cap. Locate the bevel. Bevel is a slanted opening on one side of the needle tip. We want bevel facing upward, so you can see it.

Syringe Use

- 45 degrees, sharper angle.
- Hold like a dart or pen.
- Feeling pulse under non syringe finger is the only landmark for orientation.
- Before piercing skin, roll finger back slightly from artery, so you dont stab yourself in the finger.
- **Flash of blood** into hub of needle. Artery has been accessed.
- Blood will pulse into syringe. 1.5 to 2.0 cc required.
- Cover needle with gauze. Quickly remove needle.

After Care

- Physician applies pressure to gauze for 5 minutes. 10 minutes if patient is on anticoaggulant therapy.
- Optional to ask patient to do this instead.

Blood Care

- Insert needle into orange air cube or ball. Want bevel covered, dont want needle to go through cube.
- Push down on plunger to expell excess air. So it doesnt affect results. **Key point** because we are measuring air component levels in blood.
- Remove cube and needle as one.
- Attach black cap to syringe.
- Roll test tube between hands, to ensure blood heparinisation.
- Place in iced bag. Send to lab.
- Needle and cube to sharps container.

Video

- http://www.youtube.com/watch?v=stxntv0KkBE