**PCC.PHLEB.HBL.4.0 ARTERIAL BLOOD GAS COLLECTION**

**STATEMENT OF PURPOSE**

To provide a uniform method for determination of pH/blood gas, which is used for diagnosis, treatment, and monitoring of critical care patients.

**SCOPE**

Arterial Blood Gases (ABG) are performed to determine acid/base status or oxygen status of respiratory distress patients. An ABG includes the measurement of pH, pCO2, and pO2 (the partial pressures of oxygen and carbon dioxide).

**ABGs may only be performed by experienced MACL staff who have completed a competency that was overseen by a Medical Technologist. Laboratory associates may perform arterial draws on patients >=18 years of age. Younger patients are to be referred to medical staff or Respiratory department, dependent on hospital policy.**

**DOCUMENT OWNER**

Manager, St. Vincent Jennings Hospital Laboratory

**SPECIMEN**

1. PATIENT PREPARATION
2. No patient preparation needed for trauma/emergent conditions. Proceed to Specimen Collection.
3. Discuss procedure with outpatients and conscious patients. Alleviating the anxiety will enhance cooperation and prevent hyperventilation, which could produce atypical results.
4. Perform Modified Allen test on conscious patients and outpatients, to determine if the wrist has sufficient collateral circulation.
5. Perform Allen’s test as follows:
6. Patient clinches fist for 20 seconds.
7. Hold firm pressure against ulnar and radial arteries.
8. Patient opens fist, and hand should blanch white.
9. Examiner releases ULNAR side only.
10. Hand should blanch pink. (Positive Allen Test) Proceed to ABG collection.
11. If hand does NOT blanch pink, Allen’s test is negative and indicates inadequate collateral circulation. Do not collect ABG from site.
12. No brachial draws are to be performed by laboratory associates at SV Jennings or SV Randolph (Radial Only).
13. If there is no suitable site for collection, then contact the patient’s physician for further instructions.
14. IDENTIFICATION
    1. Identify outpatients per lab protocol. Obtain orders and labels.
    2. Identify inpatients by armband, per protocol. Identify the specimen with labels, date, time and initials.
    3. Identify Code Blue patients and emergency patients by any means available.
15. TYPE

The only specimen type is minimum 125UL (manufacturer of analyzer recommendation) lithium heparin or balanced heparin whole blood, anaerobically contained prior to testing.

* + 1. No clotted samples
    2. No air bubbles in samples

1. HANDLING CONDITIONS
2. Refer to specific Operations manuals for specific instructions on the sample type for each analyzer.
3. Universal precautions must be observed by all testing and attending personnel.

**REAGENTS, SPECIAL SUPPLIES, AND EQUIPMENT**

* 1. Arterial Blood Gas Sampling Kit.
  2. Patient labels and/or other information, such as patient temperature and FIO2
  3. Bandages and/or Coban wrap
  4. Gloves, lab coat, other PPE as directed by hospital infection control protocols, per patient.

**SPECIMEN COLLECTION**

**Radial Artery:**

* + 1. Locate and palpate appropriate site for arterial puncture.
  1. Open ABG Sampling Kit and assemble equipment.
  2. Make sure needle is firmly attached to safety cap
  3. Prevent the plunger from sticking by pulling it halfway out and pushing it all the way back down in one movement, reseating the plunger.
     1. Cleanse chosen site with alcohol pad.
     2. Remove needle cap and with bevel up, enter the artery at approximately a 30-45 degree angle to skin surface.
  4. Enter artery slowly with enough depth to allow syringe to fill, or detect flash-back. Blood may need to be aspirated from patients with weak pulse.
  5. Avoid probing with needle.
     1. Allow syringe barrel to spontaneously fill to approximately 1.5 ml mark.
     2. Apply slight pressure ABOVE the puncture site with sterile gauze pad while simultaneously withdrawing the needle from artery. DO NOT APPLY PRESSURE ON PUNCTURE SITE WITH NEEDLE IN ARTERY.
     3. Using a one-handed technique, engage the safety cap on needle.
     4. Request assistance with holding direct pressure on puncture site, as the tech must be excused to run the ABG in the main lab.
  6. Have assistant hold direct pressure for 5 to 10 minutes or until hemostasis is achieved.
  7. Coban may be wrapped firmly, but not tourniquet-tight in code situations.
  8. Always cover puncture with a bandage or coverlet to prevent infection at the puncture site.
     1. Using universal precautions, remove the safety capped needle from syringe barrel and discard in sharps.
     2. Firmly attach the Filter-Pro device to top of syringe.
  9. Holding syringe upright, tap barrel of syringe against vertical hard surface. This will force air bubbles to top of syringe.
  10. Aim syringe away from face and others, and slowly depress the plunger to force air from barrel through the Filter-Pro device.
  11. When blood saturates the Filter-Pro, the sample is anaerobic and ready for analysis.
      1. Vortex syringe by hand to mix specimen. Inversion will not properly mix a properly anaerobic syringe.
      2. Identify syringe barrel with patient name, medical record number, accession number, initials, date and time, per lab protocol.
      3. Record patient FIO2 or O2 Flow.
      4. Deliver to lab immediately for testing.

**REPORTING RESULTS**

Refer to laboratory policies for reporting in LIS, ranges, critical results, suspect results, and patient identification protocols, as needed. O2 flow and Allen test results should be documented in FIO2 result field. Enter English Text Comments: RADA (Radial artery-Allen’s Test Positive) or TABG (Trauma ABG, No Allen’s Test)

**LIMITATIONS**

Arterial punctures are associated with hematoma, infection, nerve damage and excessive bleeding. All steps should be taken to minimize the risks associated with arterial puncture.

**REFERENCES**

* + 1. Kaplan LA, Pesce AJ. Clinical Chemistry: Theory, Analysis and Correlation, (St. Louis: C.V. Mosy Co. 1984) p 1048-1052.
    2. Osmetech OPTI Critical Care Analyzer with touch Screen Operator’s Manual, Osmetech Inc, Critical Care Division.
    3. i-STAT 1 System Manual, Abbott Laboratories, Rev. Date 02-Sep-08.
    4. Arterial Blood Gas Collection, P&P ABG 001, 11/16/00.
    5. St. Vincent Indianapolis Hospital Policies and Procedures Online, RT 70.003.
    6. http://www.the-abg-site.com
    7. http://www.apiig.net/viewtopic.php Why is Allen test performed?