

Name of Policy: <u>Performing Arterial Punctures for Blood Gas Analysis</u> Policy Number: 3364-136-08-06 Department: Pulmonary Services Approving Officer: Senior Hospital Administrator Responsible Agent: Director, Pulmonary Services Scope: The University of Toledo Medical Center Pulmonary Services Department	 Effective Date: 08/08/2023 Initial Effective Date: 7/01/1979
<input type="checkbox"/> New policy proposal <input checked="" type="checkbox"/> Minor/technical revision of existing policy <input type="checkbox"/> Major revision of existing policy <input type="checkbox"/> Reaffirmation of existing policy	

(A) Policy Statement

Respiratory Care personnel will perform arterial punctures, after competency testing, as prescribed by the ordering physician.

After successful completion of the competency requirements listed under “Procedure”, arterial punctures will be performed by the following Respiratory Care staff members:

- Advanced Respiratory Care Practitioners
- Respiratory Care Practitioners
- Staff Technicians

(B) Purpose of Policy

To promote and ensure optimum safety for the patient during the performance of an arterial puncture and to contribute to the accuracy of arterial blood gas analysis.

(C) Procedure

Competency: To be authorized in the performance of an arterial puncture, both of the following requirements must be fulfilled:

- Successful completion of arterial blood gas competency performance check-off by a qualified Respiratory Care Practitioner (BSRT).
- Successful completion of blood gas laboratory competency performance check-off.

1. Collect the following items for sampling:

- a. Pre-heparinized (lithium) syringe with 23G needle.
- b. 2x2 swab / bandage
- c. alcohol swabs
- d. container of ice (if sample not analyzed within 15 minutes of collection)
- e. patient sticker with appropriate patient information and ventilatory parameters and oxygen setting

2. The radial artery is the preferred site to be used for the puncture. If a palpable pulse is not present or if there is a negative Allen’s test, a brachial puncture can be performed. If a therapist cannot obtain a sample after two attempts, a physician will be notified.

3. Performing the Arterial Puncture:

- a. Verify the order, using two (2) patient identifiers, to assure correct patient for the procedure.
- b. Explain the procedure to the patient.
- c. Perform a modified Allen test to assure collateral circulation.
- d. If negative (the hand does not become flush within 10-15 seconds), check the other arm. If both are negative, a brachial puncture can be performed.
- e. If an auto-filling syringe is used, the plunger must be moved then set at the desired sample volume.
- f. Don gloves, then clean the site of the puncture with the alcohol swab. The wrist is then slightly extended and the radial artery is palpated. Severe extension of the wrist may obliterate the palpable pulse.
- g. Palpate the artery at two points to facilitate proper location of the site of puncture. Insert the needled syringe at an angle of 45 degrees, bevel facing upward, into the artery against the flow of blood. If the brachial site is being punctured, the needle is inserted at a 60-degree angle. Let the pressure of the arterial blood fill the syringe. DO NOT ASPIRATE! If the needle is advanced through the artery, withdraw it slowly until blood begins to flow into the syringe. If blood does not flow into the syringe and re-direction of the needle is necessary, withdraw the needle until the top of the needle bevel is observed and then redirect toward the palpable pulse.
- h. Patients needing repeated arterial blood gases should have the blood taken from alternating radial arteries if possible. When the volume of the sample is adequate for analysis (approximately 0.5ml) withdraw the syringe and immediately compress the site of the puncture with an alcohol swab or 2x2 swab for a period of at least five (5) minutes; ten (10) minutes for a brachial puncture. A pressure bandage may be used once the bleeding is stopped.
- i. In situations where the patient is on anticoagulants or has an elevated PT/PTT or low platelet count, the time should be increased to ten (10) minutes.
- j. Be sure the bleeding has stopped, and no hematoma is developing before releasing the compress. Air bubbles should be immediately expressed from the sample without mixing. Next, remove the needle from the syringe using safe capping technique and dispose of it properly, then replace with cap.
- k. Record all pertinent conditions of the time of puncture that might have a bearing on the results on the label. Examples would be respiratory rate, tidal volume, minute volume, FiO₂, and the site from which the blood was drawn. Document procedure, site, and any complications in the patient's medical record.
- l. Possible complications of arterial punctures:
 - 1) infection
 - 2) hematoma
 - 3) peripheral nerve damage
 - 4) pain
 - 5) ischemia
 - 6) thrombosis formation
 - 7) laceration of the artery

