 <b>Alberta Health Services</b> Chinook Regional Hospital Interim Policy and/or Procedure	Title: <b>Capillary Blood Gas Procurement</b>
	Sponsor: <b>Respiratory Therapy Services</b>
Approved By: <b>Respiratory Administration</b>	
Effective as Of: <b>April 1, 2011.</b>	
Expires on: <b>To be determined</b>	
Scope/Applies To: <b>Registered Respiratory Therapist (RRT) Student Respiratory Therapist (under the direct supervision of a certified RRT)</b>	

**Terminology/Definitions:** N/A

Term	Definition

**Policy:**

1. A physician's order is required for capillary blood gas procurement

**Background Information:**

Properly obtained capillary blood can provide a good estimate of arterial pH and pCO<sub>2</sub> levels.

**INDICATIONS**

- A. When arterial blood gas access is not available.
- B. Patient status change.
- C. Abnormal non-invasive monitoring readings (EtCo<sub>2</sub>, SpO<sub>2</sub>).
- D. Assessment of therapeutic modalities.

**CONTRAINDICATIONS**

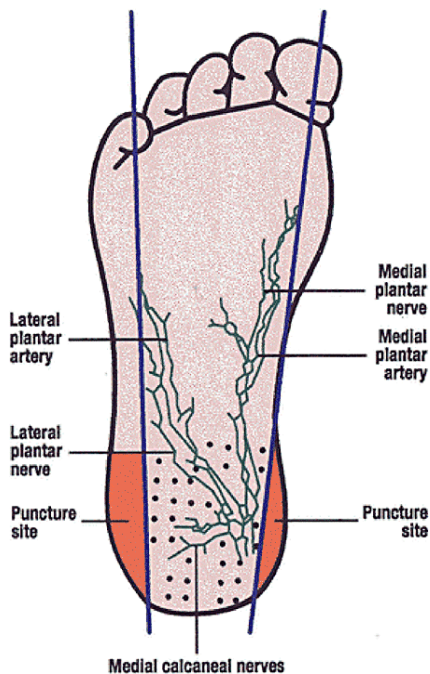
- A. Patients less than 24 hrs old- due to poor peripheral perfusion

- B. Site locations not to be used
- i) Areas of infection
  - ii) Cyanotic or poorly perfused heel
  - iii) Fingers of neonates
  - iv) Inflamed, swollen or edematous tissue
  - v) Previous Puncture sites
- C. When direct analysis of arterial blood is needed (ie. accurate PaO<sub>2</sub>)

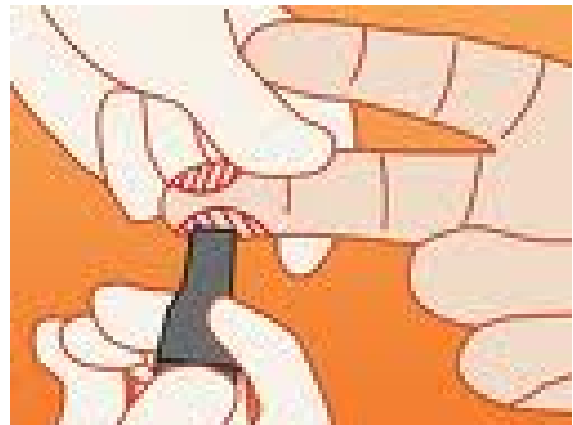
#### ANATOMY

To perform a heel stick, the anatomy of the heel is important to know. The lateral and medial areas of the heel are vascular with relatively few nerve endings. The centre of the heel should be avoided because of the nerve endings and since the distance to the bone is small and scar tissue formation could cause discomfort later. The blood is obtained from the vessels at the dermal subcutaneous junction so the lancet device should not penetrate more than 2 mm into the skin for larger babies and less for very low birth weight infants.

A.



B.



- The side of the finger is generally less sensitive than the tip of the finger.
- Sensitivity may be lost in tips of fingers if used regularly.
- Rotation of sites is advised to avoid painful and hard skin forming.

#### PUNCTURE SITES

- A. Heel (posterior-lateral or medial, see Fig 1) – preferred in preterm and newborn Infants.
- B. Fingers (lateral aspects of distal phalanges) – both in older infants and children

## Equipment and Materials:

1. Incision lancing device with depth of 2 mm or less
2. Alcohol swab
3. Capillary tube with caps
4. Metal rod and magnet
5. Gauze or cotton balls
6. Gloves

## Procedure:

1. Verify order, and verify patient by checking ID bracelet.
2. Explain procedure to child and/ or parents if they are present, bundle infant and provide non-nutritive sucking to decrease pain and physiologic compromise.
3. Warm the skin puncture site with a cloth warmed with tap water. NOTE: Hold cloth on your wrist for 5 sec to determine if correct temperature for infant or child's skin.
4. Wash hands
5. Don gloves
6. Cleanse area with alcohol
7. Puncture skin with an appropriately sized lancet
  - A. Employ a quick perpendicular stab. Avoid previous puncture sites. **Do not** use posterior heel curvature or antero-medial aspect of heel.
8. Discard 1<sup>st</sup> drop of blood (wipe off with gauze)
9. Hold puncture site downward, and apply gentle continuous pressure to the surrounding tissue to improve flow of blood. Strong, repetitive pressure (milking) should be avoided as it may cause hemolysis and increase the amount of tissue fluid in the specimen.
10. Place heparinised capillary tube at downward angle as close to puncture site as possible. Avoid unnecessary exposure to air. Avoid collecting air in tube.
11. Collect 0.085-0.15 mL of blood to fill capillary tube.
12. Apply pressure to puncture site with dry gauze for 5 minutes or until bleeding stops.
13. Place small metal mixing rod into tube and seal ends.
14. Dispose of lancet in sharps container.
15. Mix sample with a magnet and analyze as soon as possible.

## Documentation:

1. Record puncture information (i.e. time, site, FiO<sub>2</sub>, delivery device, ventilation, etc.) in patient's chart.

## Related Documents: N/A

**References:**

1. Adapted from AHS Calgary Respiratory Services Policy and Procedure Manual
2. Malley, WJ. Clinical Blood Gases: Application and Noninvasive Alternatives. WB Saunders Company, 1990, 3-20.
3. Scanlan CL, et al. Egan’s Fundamentals of Respiratory Care. 8th Edition. Mosby, Inc. 2003, 358-362.
4. A.A.R.C. Clinical Practice Guidelines, Arterial Blood Gas Sampling. Respiratory Care August 1992, Vol. 37, 913-917

**Signatures/Approvals:**

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