

Blood Collection for Blood Gas Analysis

Capillary Sampling Procedure

When direct collection of arterial blood is not feasible, an “arterialized” sample collected from a skin puncture is generally suitable for measurements requiring arterial blood.

1. Select the appropriate dry electrolyte-balanced lithium heparin capillary sampling device.
2. Choose the puncture site from one of the following areas:
 - Lateral or medial plantar surface of the heel (especially for infants <1 year of age): Medial to a line drawn posteriorly from the middle of the big toe to the heel, or lateral to a line drawn posteriorly from between the fourth and fifth toes to the heel. NOT on the curvature of the heel (**Figure 1 shaded area**).
 - Plantar surface of the big toe (typically used for children or infants).
 - Palmar surface (not side or tip) of the distal phalanx of thumb or first three fingers (older children and adults).

NOTE: Site should not be swollen (fluid contamination).



Figure 1.

3. Using a warm, moist towel, or other warming device arteriaize the puncture site to a temperature of approximately 42°C for at least three to five minutes.

NOTE: Ensure that the towel and the collection site are not cooled by evaporation.

4. Clean the puncture collection site according to hospital protocol. Do not use a cleaning agent with quaternary ammonium substances such as benzalkonium as it may impact the electrolyte results. Allow the cleaned area to dry.
5. Puncture the skin with a disposable lancet to a depth no greater than 2.0 mm (**Figure 2**).

NOTE: Do not use a surgical blade.



Figure 2.

6. Wipe away the first drop of blood with a clean gauze pad.
7. Allow a large, well-rounded droplet of blood to form without excessive squeezing of the collection site.
8. Place the tip of the capillary sampling device in the center of the blood droplet and allow to fill as rapidly as possible, without air bubbles (**Figure 3**). Avoid “milking” the collection site.



Figure 3.

9. Fill the capillary sampling device completely, immediately seal the tube at both ends with capillary caps, and mix the sample thoroughly to dissolve the heparin and minimize clots from forming in the capillary by rotating your wrist back and forth for a minimum of 20 seconds (approximately 8 to 10 times) (**Figures 4 and 5**). Label the sample.

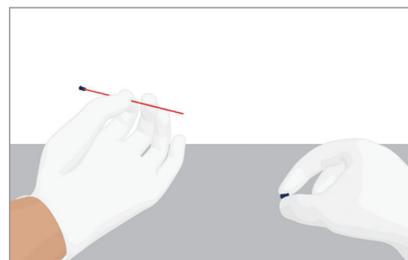


Figure 4.

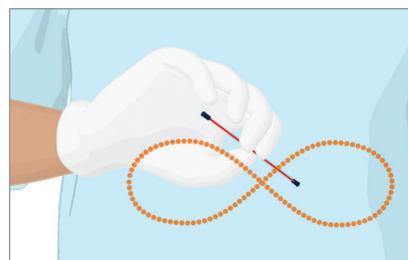


Figure 5.

10. According to the CLSI guidelines,¹ blood gas testing should be completed within 10 minutes and not longer than 30 minutes of drawing the sample. Always remix the sample immediately prior to the analysis by rotating your wrist back and forth and rolling the capillary between your fingers approximately 10 times. Remove the capillary caps prior to sampling.



1. CLSI Guideline references GP42-A6, C46-A2.

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Published by

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