Blood Collection for Blood Gas Analysis

Venous Blood Gas (VBG) Procedure

siemens-healthineers.com/blood-gas-proper-sample-handling

Arterial blood may be difficult to obtain due to a patients diminished pulse rate or low blood pressure, and a venous blood collection represents a viable option as an alternative sample type to arterial blood for blood gas analysis. Venous Blood Gases (VBGs) are commonly performed in the emergency room by venipuncture and in intensive care units from a central venous catheter because the sample is quickly and easily obtained.

Peripheral Blood Gas Sample (venipuncture)

1. The peripheral veins **(Figure 1)**, typically the antecubital veins, are the most common draw site for venipuncture.

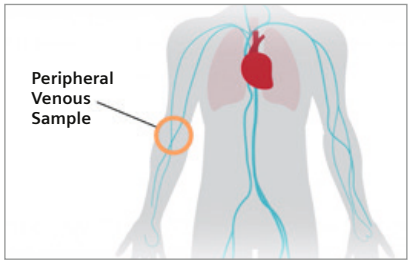

Figure 1.

2. Select the appropriate dry, electrolyte-balanced lithium heparin syringe.

3. Apply a tourniquet for improved access to the antecubital vein.

4. Clean the venous blood puncture site and let it dry. Do not use a cleaning agent with quaternary ammonium substances **(Figure 2)**, such as benzalkonium, as it may negatively impact the electrolytes, particularly sodium.

Figure 2.

5. Adjust the needle position such that the bevel of the needle is facing up. Locate the vein and puncture the skin at a 45° angle **(Figure 3)**.

Figure 3.

6. Pull back on the syringe plunger *slowly* to withdraw the desired amount of blood, preferably within less than 1 minute of applying the tourniquet.

7. After the blood is obtained, place a gauze pad over the puncture site, withdraw the needle, and apply pressure to the draw site.

8. Close the needle protection device **(Figure 4)** and remove and dispose of the needle according to hospital protocol.

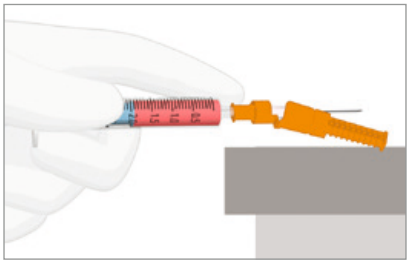

Figure 4.

9. Fit the filter cap to the syringe luer. With the luer end up, gently tap the syringe to dislodge any air bubbles **(Figure 5)** and slowly expel the air bubbles into the filter cap **(Figure 6)**.

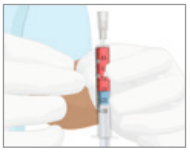

Figure 5.

Figure 6.

10. Mix the sample thoroughly to dissolve the heparin and minimize clots from forming in the syringe by rotating your wrist back and forth for a minimum of 20 seconds or approximately 8 to 10 times **(Figure 7)** and rolling the syringe between your hands **(Figure 8)**. Label the syringe and transport immediately to the blood gas system for analysis.

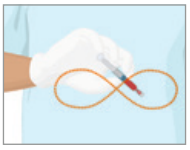

Figure 7.

Figure 8.

11. 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. If testing is delayed longer than 30 minutes, samples should be placed in an ice slurry. Always remix the sample immediately prior to the analysis following a two-step process, first rotating your wrist back and forth and then rolling the sample between your hands approximately 10 times **(Figures 7 and 8)**.

For more information, please visit us at siemens-healthineers.com/blood-gas

1. CLSI Guideline C46-A2.

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Central Venous Blood Gas Sample (central venous catheter)

Attention should be taken and reported as to the site of the catheter placement, whether a jugular, subclavian line, PICC or femoral line **(Figure 1)**, as the oxygen exchange in the various regions of the body can lead to extreme differences of these values.

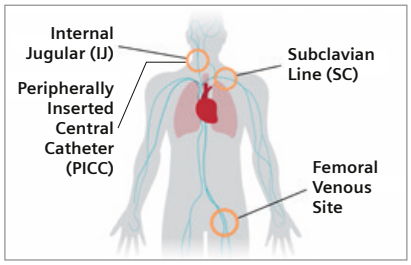


Figure 1.

1. Select the appropriate dry, electrolyte-balanced lithium heparin syringe for the blood collection, plus a saline flush syringe and a waste syringe.
2. Clean the central line cannula port and let it dry. Do not use a cleaning agent with quaternary ammonium substances **(Figure 2)**, such as benzalkonium, as it may negatively impact the electrolytes, particularly sodium.

Figure 2.

3. Perform a saline flush and then attach the waste syringe and remove the initial fluid from the central line catheter **(Figure 3)**. (The amount of fluid that needs to be withdrawn varies with the line system used.) Remove and discard the waste syringe.

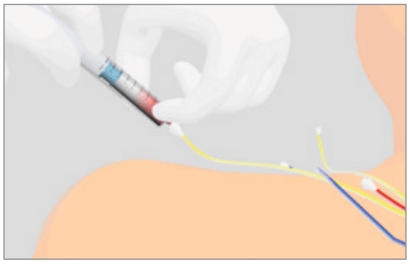


Figure 3.

4. Attach the heparinized syringe to the line cannula port and *slowly* withdraw the desired volume of blood from the patient **(Figure 4)**. Once the desired amount of blood is obtained, without bubbles or frothing, remove the syringe from the line cannula.

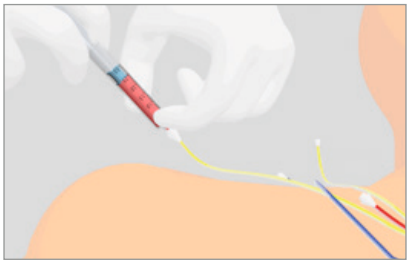


Figure 4.

5. Fit the filter cap to the syringe luer. With the luer end up, gently tap the syringe to dislodge any air bubbles **(Figure 5)** and slowly expel the air bubbles into the filter cap **(Figure 6)**.

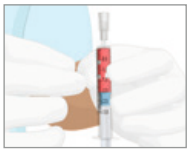
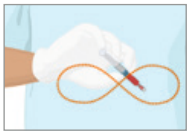


Figure 5.

Figure 6.

6. Mix the sample thoroughly to dissolve the heparin and minimize clots from forming in the syringe by rotating your wrist back and forth for a minimum of 20 seconds or approximately 8 to 10 times **(Figure 7)** and rolling the syringe between your hands **(Figure 8)**. Label the syringe and transport immediately to the blood gas system for analysis.



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NOTE:
Follow your hospital directives for the proper protocol when obtaining a venous blood gas sample by venipuncture or from a central line catheter.

For more information, please visit us at siemens-healthineers.com/blood-gas

1. CLSI Guideline C46-A2.

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