

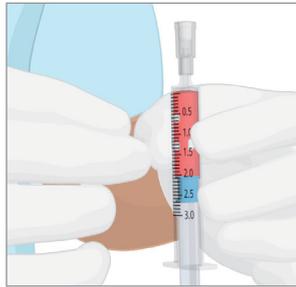
Arterial Blood Analysis

Preamanalytical Concerns

The results obtained from a blood gas analyzer are only as good as the proper collection and handling of the sample. For accurate results, and to avoid clots, collect the sample with a device containing electrolyte-balanced lithium heparin. Expel all air from the syringe, and immediately mix the sample thoroughly after sample draw and again before analysis.

1. Sample Contamination with Room Air

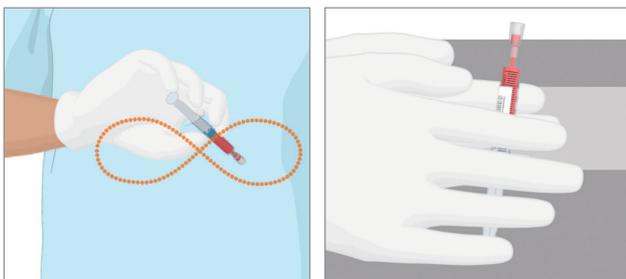
Any air present in the syringe must be expelled immediately after collection. The presence of air will affect the pO_2 , especially when the sample is mixed. Even a few small bubbles left in the sample will significantly distort the pO_2 . Exposure to room air can also affect pH, pCO_2 , and iCa^{++} results.



2. Clotting

Never analyze a sample that contains clots on your blood gas system. The fluidic channels in the blood gas analyzer can be blocked by sample clots. Whole blood must be fully mixed with electrolyte-balanced lithium heparin to minimize the negative effect that clots may have on analyzer performance.

Mix the sample as soon as possible after collection to distribute the heparin throughout the sample. Ensure that you use the correct sampling device, and mix the anticoagulant and blood thoroughly by rotating your wrist back and forth (in a figure-8 motion) for a minimum of 20 seconds or approximately 8 to 10 times and rolling the sample between your hands approximately 10 times.



3. Hemolysis

If blood is collected under force, through a very small needle bore, or is aggressively mixed, the red blood cells may hemolyze (break), releasing their contents.

Note: Small amounts of hemolysis can elevate the potassium level significantly. You cannot visually identify hemolysis in whole blood.

4. Settling of Red Blood Cells

Red blood cells settle very quickly in anticoagulated blood. If settling has occurred, the analyzer will aspirate too many or too few red blood cells, affecting the total hemoglobin result.

If a sample is not analyzed within 30 seconds of mixing, it must be remixed by rotating your wrist back and forth and rolling the sample between your palms approximately 10 times (see the figures in Section 2).

5. Dilutional Errors

If the sample is drawn from an arterial line that has not been fully cleared or from too close to an infusion site, or if liquid heparin is used, the results will reflect the sample contamination from these fluids. All results may be affected, depending on the contaminating fluid.

Note: You cannot see fluid contamination. When mixed in the blood sample, it looks like whole blood.

6. Errors from Delayed Analysis

Cell metabolism continues after the sample is collected. The white blood cells consume O_2 and produce CO_2 , and they also use the glucose in the sample and create lactate as a metabolized byproduct. For the sample to accurately reflect the status of the patient, it should be analyzed immediately; otherwise, the cell metabolism will alter the test results of the sample.

Parameters affected by ongoing cellular metabolism:

pO_2	↓ due to consumption by cells
pCO_2	↑ due to production by cells
pH	↓ due to change in CO_2 and glycolysis
Glucose	↓ due to cellular metabolism
Lactate	↑ due to glycolysis

Blood gas testing should be completed within 10 minutes and no longer than 30 minutes of drawing the sample.

For more information, please visit us at [siemens-healthineers.com/bloodgas](https://www.siemens-healthineers.com/bloodgas).

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