

# Tip of the Month



## The Facts about Climate Change

Regardless of where you stand on today's environmental issues, the effects of "climate change" on phlebotomy procedures are real and measurable. To determine if your collection technique is exerting a warming or cooling effect on the lab results reported from the samples you draw, consider the atmosphere you are subjecting them to.

### The Pre-collection Era

*Global Warming* — When it comes to neonatal capillary collections, do you believe in "global warming"? You should. Make it your policy to consistently prewarm infant heels three to five minutes prior to performing a puncture. Cause & Effects: This short but effective period of warming the skin's surface increases blood flow to the area, thereby speeding collection and improving specimen quality. However, be careful not to overheat the site, as temperatures exceeding 42 degrees Celsius can damage delicate skin.

*Ice Age* — Several compelling theories exist about how to reduce fear and discomfort in needle-phobic patients. One of the most convenient methods is to have the patient lie flat with the knees bent and apply an ice pack to the intended puncture site for 10-15 minutes prior to the draw. Cause & Effects: Employing this strategy numbs the arm and lessens the potential for shock reflex. Taking the time to recognize and reduce a patient's anxiety level before phlebotomy procedures may prevent a "meltdown", allowing for a successful and uneventful collection now and for ages to come.

### The Post-collection Era

*Temperature Fluctuations* — Once blood samples are collected, environmental extremes can wreak havoc on specimen integrity and test results. Unless chilling of the sample is required, tubes should be kept at room temperature during transportation. According to CLSI, temperatures above 22 degrees Celsius may cause some analytes to deteriorate.

*The Big Chill* — Refrigerating blood samples prior to centrifugation can alter analyte concentration, most notably potassium. Cause & Effects: When whole blood samples collected for electrolytes are chilled, potassium rushes out of the red blood cells into the serum/plasma, falsely elevating potassium results. It's an inconvenient truth that even when whole blood samples are held at room temperature, irreversible changes in analyte concentration can occur if more than two hours have passed since collection. When citrate tubes for protimes are chilled before testing, cold activation of Factor VII can lead to inaccurate results.

When chilling of a sample is appropriate (i.e., ammonia, lactic acid, etc.) the tube should be placed in a mixture of ice and water, as opposed to using large cubes of ice that do not allow for uniform cooling. Specimens that are stored frozen should remain frozen until prepared for testing, as freeze-thaw cycles are detrimental to analyte stability.

The tide is rising against a successful draw unless you control the skin's climate on infants and needle-phobic patients. And you are the master of the universe when it comes to protecting samples from the effects of man-made warming or cooling. As a preanalytical environmentalist, you know the effect temperature has on patients and test results, and you use that knowledge to their advantage. Given these facts, your Nobel Prize for phlebotomy can't be far behind.