Potential misreadings by sampling from big blood drops

If generating big blood samples (> 20 µl), please note the increasing risk of misreadings by test strips: Uptaking only a small part (< 1 µl) of the sample, the correlation to the different blood compounds of the whole sample can be reduced significantly:

- the required (prolonged) time for generating big droplets may cause beginning coagulation inside the blood drop, including hemolysis and increasing readings (setting free Hemoglobin with electrochemical influence)
- Sampling repeatedly from big drops (covering a bigger area on the skin), the contamination by continuosly generated sweat is much bigger. Touching the skin with the test strip, the locally measured values will also be increased.
- Wiping away the first drop with a wet tissue, the blood may be diluted
- Contacting a drop with test strips repeatedly, parts of their reagents (enzymes, additives) can contaminate the sample, changing its lactate content locally
- After sampling, the vaporescence of the generated blood drop changes the concentration of its compounds continually, leading to undefined sample characteristics very quickly (> 30 sec) with not reliable measurement results
- All the named effects will be increased if the blood drop is smeared or diverged during the sampling, especially by the additional sweat contamination

Recommendiation for reliable comparison studies with test strip meters:

- After cleaning the sampling area by water or wet tissue, dry it again
- After puncturing, wipe away the first generated blood drop. Press slightly (!) to generate a regular sized sample volume (2 - 5 µl) and uptake it immediately
- For repeated measurements, always wipe away the blood with a dry tissue (sweat will also be removed within) und generate a new small sample. Take care to avoid smearing of the blood drop
- Uptake the sample immediately to reduce potential changes or contamination
- Avoid any direct contact of the test strip with the skin surface

Regarding independent customer reports, there is a high correlation of the Lactate SCOUT pocket device with many lab analyzers (EKF BioSen, Dr. Lange/Diaglobal, Analox, Yellow Springs YSI, ABL Radiometer; with limitations: Eppendorf Ebio, SuperGL, Lactate Pro, AccuSport/AccuTrend). Comparison tables and scientific studies are available on demand.

Between all device types from different manufacturers, differences of readings up to 10% concerning their absolute values of measurements are usual. Such differences are no real malfunctions of any of these devices, but they are caused by different measurement or calibration methods. Even the same device type from the same manufacturer may show similar differences, caused by aging of the device and its fluidic or sensor components.

Regardless it does not exist a real "gold standard" in lactate meters, their usability and reliability can be proofed and demonstrated in a comparison of step test results: All devices must show a similar shape of the lactate curves (may be on different levels), to allow a clear diagnosis of the aerobic threshold as the essential result for sport medical analysis.