

J Sci Med Sport. 2003 Dec;6(4):408-21.

Effect of measuring blood lactate concentrations using different automated lactate analysers on blood lactate transition thresholds.

Buckley JD, Bourdon PC, Woolford SM.

Centre for Research in Education and Sports Science, Division of Health Sciences, University of South Australia, Underdale, South Australia.

This study investigated the effect of using three automated blood lactate analysers (Accusport, Lactate Pro, YSI 1500 Sport) on blood lactate transition thresholds (BLTT). Blood lactate concentrations were measured using the three analysers in rowers ($n = 17$) and kayakers ($n = 6$) during incremental exercise. The BLTT determined were: 1) ADAPT lactate threshold (data point preceding lactate increase of $> \text{ or } = 0.4 \text{ mmol} \times \text{l}^{-1}$), 2) log-log lactate threshold (point of lactate increase when log lactate plotted against log of relevant exercise parameter), 3) DMAX anaerobic threshold, 4) ADAPT anaerobic threshold (modified DMAX method), 5) Onset of blood lactate accumulation (OBLA, fixed blood lactate concentration of $4 \text{ mmol} \times \text{l}^{-1}$). Measurements of blood lactate concentration differed between analysers ($p < 0.0001$), resulting in BLTT differing between analysers when expressed as a blood lactate concentration ($p < 0.0001$), or when the BLTT was defined as a fixed blood lactate concentration (e.g. OBLA) ($p < 0.0001$). When expressed as a power output or heart rate using BLTT based on relative changes in lactate concentration (log-log, ADAPT and DMAX thresholds) the values were similar between analysers ($p > 0.05$), except the Accusport provided higher values for the log-log lactate threshold ($p < 0.0001$). We concluded that, despite providing significantly different lactate concentrations, unless the Accusport was used to determine the log-log lactate threshold, or values were expressed as a blood lactate concentration, the use of different analysers had little effect on the BLTT.