

Caution when using heart rate as a marker of exercise intensity

To the Editor: Heart rate is commonly used during exercise as a marker of exercise intensity. However, responses from two runners participating in an experiment that I have conducted indicate that this relationship may not always be strong. In this experiment, both runners completed two 10 km treadmill time trials, separated by 7 days, under identical controlled laboratory conditions. Runner A's time improved by 2:44 (min:sec) and runner B's time by 2:03 from the first to the second time trial. This represents a performance increase of 6.6% and 5.4% respectively, which are highly significant changes in the context of competitive performance. However, their respective heart rates were identical for both time trials (Figs 1 and 2).

These observations illustrate why the sole use of heart rate could be misleading when prescribing or monitoring exercise intensity. Users of heart rate monitors need to be made aware of the fact that heart rate should be interpreted in conjunction with other indicators of training intensity, such as subjective perception of effort, time and distance feedback.

During maximal exercise effort, as in these 10 km time trials, it may be assumed that the perceived exercise intensity stayed the same. This is a valid assumption as the runners were asked to run as fast as possible in each time trial, and ratings of perceived exertion recorded during all time trials indicate that this was indeed the case.

Therefore, the fact that their heart rates were similar despite a faster running speed suggests that these runners were more 'efficient' during the second run, when they both ran faster. This change in 'efficiency' has the potential to be a sensitive marker of training status provided that all the factors, which can affect heart rate, are adequately controlled.

M Kirkman

*University of Cape Town/Medical Research Council
Research Unit for Exercise Science and Sports Medicine*

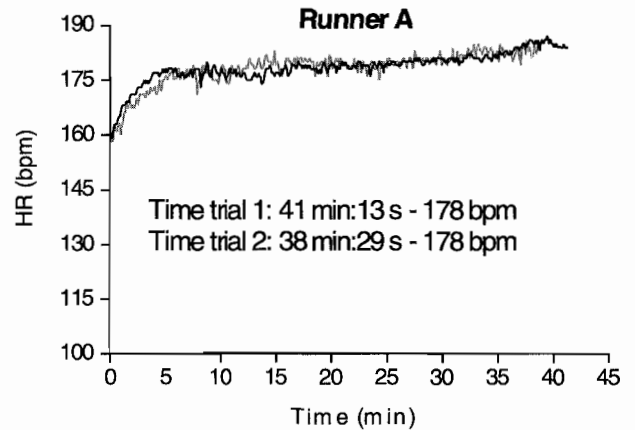


Fig.1. Heart rate data for runner A (26 yrs)

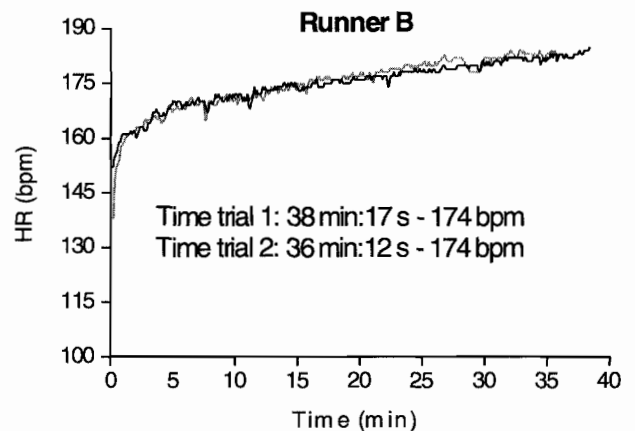


Fig.2. Heart rate data for runner B (24 yrs)