USING CRITICAL VELOCITIES TO SET TRAINING INTENSITIES

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Determining training intensities is a real challenge for a swimming coach because of the few physiological variables measurable on pool-side. The use of blood markers such as lactate can help in the assessment of a swimmer's aerobic endurance through the identification of a lactate threshold although *a*) blood sampling is not necessary an option and *b*) lactate threshold is such a low intensity (maintainable for hours) that it is not necessary very pertinent for setting training intensities. Similarly, performances over long distances (2-km or 3-km time trials) have been suggested to help defining training intensities but have their own limitations (pacing issues; physiological meaning).

This talk will focus on the critical velocity concept, which in swimming research, and since the early nineties, has been suggested to be a valuable tool to assess aerobic endurance. A stop watch is the only equipment required to determine a swimmer's critical velocity. The method relies solely on the measure of two or more performances (from 3 to 15-20 min) from which a distance *vs* time relationship is plotted and modelled using a 2-parameter model (y=ax+b). The slope of this relationship (a) is recognised as critical velocity, an intensity a swimmer would maintain, in theory, indefinitely. In reality, critical velocity can be sustained for around 30 minutes.

This presentation will focus on the latest findings on critical velocity and the reasons why it can be seen as an attractive tool to set training intensities. Critical velocity will be compared with more classical "thresholds" and the findings will lead the audience to consider their own ways of setting their aerobic training zones. Some concepts such as aerobic power and capacity will be challenged in an attempt to gain an appreciation of the physiological mechanisms behind swimming endurance.