BIOMECHANICS FEEDBACK IN SWIMMING

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ABSTRACT

Feedback in swimming may include measures of physiological and technique variables related to performance. Among highly trained swimmers, who are approaching their physiological limits, fine-tuning technique is essential to realising performance potential. Feedback on swimming technique ranges from analysis of performance in races to feedback from in-depth three-dimensional (3D) quantitative analysis of technique. The purpose of this paper is to describe and evaluate examples of feedback provided to swimmers and coaches by analysts of the Centre for Aquatics Research and Education (CARE) of Edinburgh University. These include the following:

1. Immediate replay on poolside of above and below water video recordings of mid-pool swimming, starts, and turns, with spontaneous qualitative analysis and interaction among biomechanists, swimmers, and coaches.
2. Rapid quantitative analysis of gliding ability and spontaneous qualitative assessment of gliding performance in relation to postures.
3. Simple 2D quantitative analysis supplementing qualitative video analysis presented to swimmers, coaches, and support personal such as physiotherapists and strength and conditioning specialists. The analysis includes quantification of stroke length, stroke frequency, swimming speed, mid-pool, start, and turn times, and postural assessment with graphical enhancements. A team approach to developing training and intervention strategies is applied.
4. Quantitative analysis of gliding ability and gliding postures and assessment of accuracy of timing the post-glide actions.
5. 3D analysis of swimming technique and postures to identify technique flaws and asymmetries that may be corrected through training interventions. These data are combined with land-based posture, flexibility, and strength assessments to determine appropriate dry land training and in-water intervention programs.

These will be discussed in the light of emerging technologies and analysis systems that improve the turnaround time for feedback and facilitate more efficient, affordable, ‘swimmer/coach friendly’, and convenient evaluation of swimming technique.