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Better times

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Better Times: Monitoring Performance in Swimming.

The extent to which feedback is valued by swimming coaches is related to how quickly the feedback is available. At the Centre for Aquatics Research and Education (CARE) methods have been developed with the aid of recent technology to return information to swimmers and coaches with quick turnaround times. The purpose of this paper is to describe the methods currently used at CARE to provide information to coaches and swimmers aimed at improving the performance of the swimmer. Methods The following protocols have been developed for providing feedback to swimming coaches and swimmers: 1. Video recording of mid-pool, starts, and turns, using above and below water cameras. The recordings are replayed on a plasma screen on poolside in normal, slow, and stopped motion. Advice of coaches and biomechanists can then be tried immediately by the swimmer and changes observed again in the same session. 2. Simple quantitative analysis is performed using the video data obtained from several camera views. Dartfish software is used to enhance the effectiveness and attractiveness of the reports. In addition to the typical 'race analysis' variables, two-dimensional angles and body positions are quantified enabling assessment of posture and technique. Discussion of the results with coaches, physiotherapists, strength and conditioning specialists, and the CARE biomechanists leads to informed interventions to improve performance. 3. A new method of quantifying glide performance in starts and turns (Naemi, and Sanders, 2008) has been further developed to yield coach friendly software that enables fast feedback (Naemi et al., under review). The efficacy of the system to improve start performance has been established by (Thow et al., under review). 4. Feedback regarding muscle activity could be instructive with respect to teaching a swimmer to relax muscles when they are not required to generate force. However, EMG is rarely used to provide feedback to coaches and swimmers. This is due to the difficulty of collecting EMG from swimmers while swimming. Waterproofing is normally problematic and the time required to prepare the swimmers is excessive. Additionally there is a problem in moving the recording system and the EMG electrode leads with the moving swimmer. However, recent technological advances have enabled the development of a wireless system that is easily waterproofed and quick to set up.

References Thow J, Machtsiras G, Sanders RH. *Journal of Sports Sciences*. Under review. Naemi R, Goodwill S, Aratan S, Haake S, Machtsiras G, Sanders RH. *Sports Technology*. Under review. Naemi R, Sanders R. (2008). *Journal of Biomechanical Engineering*, 130(6), 9-16.