SUCCESSFUL INTERVENTIONS FOLLOWING ANALYSIS

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Of all sports, swimming is probably the most challenging to provide biomechanical analysis that will result in improved performance. The three main reasons for this are: biomechanical equipment will not perform well or possibly even survive for any length of time in an aquatics environment; in free swimming, propulsion occurs as a consequence of the swimmer's body reacting with water, which makes the measurement of force almost impossible; because swimming occurs at the interface between water and air it is difficult to capture data from measuring apparatus and provide immediate feedback to the swimmer. Consequently, much of the technique analysis in the sport generally involves video cameras to obtain footage of the swimmer's performance. As a consequence of such video usage, both biomechanists and coaches often rely upon subjective analysis based on just moving images to provide advice to the swimmer. If it looks good and fits the mould it must be good.

At the Australian Institute of Sport, the Australian government has invested in an aquatics testing, training and research centre. The centre was opened in 2006 at a cost of AUD17million. Purpose built analysis systems have been developed to provide immediate feedback to swimmers and coaches concerning performance. Here the biomechanists operate the analysis systems and the coaches are encouraged to provide the feedback to the swimmers on pool deck. As well as provide a high quality image of the performance, the analysis systems also provide quantitative parameters to objectively assess the performance. Information such as the magnitude and the direction of forces generated by the swimmer, the velocity of the swimmer at various stages of performance, the angles of movement of the swimmer's body and the times taken to reach various points in the activity are provided so that objective assessment may be made to evaluate the performance. Here the coach can objectively identify not only if the performance has improved but also the degree of such improvement. This talk will focus on technique inefficiencies that have been disclosed in Australia's top swimmers and how they were dealt with using the analysis systems available at the institute.