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Predicting outcome in individual and team athletes through technology based bio-psycho-social screening and repeated outcome measures

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Introduction: The ability to predict an athlete's recovery time and recovery rate with a view to return to sport is a common goal for sports-health professionals. At present, predictions are approximated through subjective opinion and guidelines from clinical pathways based on injury mechanism, region, tissue type, severity, pathology and physiology garnered over years of clinical practice and education. However, such opinions vary between professions and practitioners and are not quantifiable. A new approach integrates bio-psycho-social screening and patient-reported outcome measures through a technology based computerized clinical decision support software (DSS) system. This provides a prediction methodology that is both accurate and self-rectifying by means of real-time measures based on the bio-psycho-social risk profile, integrated with outcome status.

Methods: This presentation, through the case examples in both team and individual sports, details and highlights the current level of progress in this technology and its future direction. The individual's profile for the risk of delayed recovery is obtained via a basic demographics questionnaire that details the age, gender, area affected and type of injury. This information is supplemented by physical and psychological risk factors derived from a standardised bio-psycho-social questionnaire. Combining these details through an algorithmic calculation enables the production of a recovery date for status as a percentage of pre-injury status. The status is concurrently determined from separate data on perceived capacity, global status, pain and function. These values are combined through an algorithm to provide global status and recorded visually against time from a cloud based a DSS program.

Results: This process enables real time status presentation, comparison to previous status, and through regression analysis a feed-forward prediction for the rate of change and a forecasted recovery date. This is then concurrently compared to the original prediction date from the screening enabling feedback comparison. The DSS software reflects on statistically analysed test-case data using correlation coefficients, regression analysis, and mathematical modelling. The real-time status assessment ensures both a quantifiable model and motivational tool with direct comparison between current and previous status, subsequent recovery rate and direct prediction of future recovery and return to sport - both training and competition.

Discussion: The use of such DSS software with graphical representation of status and recovery ensures a common language and visual history. This history provides instant communication between all parties-the athlete, medical, coaching, management and sponsorship support.

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Notes:

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