Anne Hecksteden

Institute of Sports and Preventive Medicine, Saarland University, Saarbrücken, Germany

Personalized Sports Medicine - Improving Accuracy and Efficacy from Primary Prevention to Elite Sports

From preventive exercise to elite sports, training programs have to be adapted to the individual in order to ensure efficacy, tolerance and safety. To date, this adaptation is based on subgroup specific guidelines, consideration of factors that reduce exercise tolerance or loading capacity, and relative exercise intensities based on reference values measured in the individual. This approach, which is based on group means and main effects, resembles clinical practice in other fields of medicine and enables standardized interventions with predictable mean effects. However, aiming at optimizing predictive accuracy and training efficacy on the individual level, interindividual differences e.g. in training responsiveness have to be taken into account, as well as interactions between subject characteristics, training modalities and environmental factors. These two features – individualization and the consideration of multiple, eventually interacting determinants - set Personalized Sports Medicine apart from standard care. In statistical terms this translates to the separation of between- and within-subject variability components and identification of major moderators. In this respect, specific methodological and statistical requirements have to be considered which go beyond the paradigmatic randomized controlled design. From the applied perspective, the ways of implementing Personalized Sports Medicine differ considerably depending on the framework conditions in the respective field (e.g. preventive or elite sports). These can range from sports drinks as moderators of training efficacy to individualized regression models of stimuli for adaptation. This talk will present a short methodological outline of Personalized Sports Medicine followed by several exemplary projects.