

ISBS 2015 Hans Gros Emerging Researcher Measuring bilateral asymmetry in a long-term athlete monitoring



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Abstract

The purpose of this lecture is to provide examples of how biomechanical testing methods are used to analyse bilateral asymmetry from a long-term athlete monitoring program. This lecture will specifically include the results of bilateral asymmetry data to examine the physical status of both highly competitive and recreational athletes.

Athlete monitoring is a vital component of achieving a successful athletic career. Knowing the physical status and design the training program leading up to major competitions is necessary for an athlete to perform at his/her best. While physiological and psychological monitoring are also important, biomechanical components such as force/power outputs are easy to understand for practical application from a coaches perspective. At the same time, it is important to understand how the magnitude of bilateral asymmetry is detrimental to the performance. Bridging the gap between science and practice is mentioned in this lecture.

From the monitoring data, bilateral asymmetry data has been analysed to further understand physical demands of competitive athletes in various sports. Different types of jumping, landing, and isometric tests have provided data showing the effectiveness of the tests in displaying the athlete's physical characteristics. A standard battery of tests including weighted and un-weighted static and countermovement jumps, as well as isometric mid-thigh pull have been conducted periodically to track athletes' physical improvement throughout their collegiate and athletic career while examining the asymmetry. Other testing methods such as 505 change of direction and 60-m sprints are done using 3D motion analysis to understand how bilateral asymmetry influence their performance.

Professor Kimitake Sato's bio

Dr. Kimitake (Kimi) Sato, is assistant professor in the Department of Exercise and Sport Science, and adjunct faculty for the Center of Excellence for Sport Science and Coach Education, and sport biomechanist for designated Olympic Training Site at East Tennessee State University (ETSU). He is an undergraduate coordinator and also strength and conditioning staff for ETSU men's and women's golf.

His research interest is to utilize technology for athlete monitoring and biomechanical analysis, and also interested in sports products testing for performance enhancement and injury prevention purposes. During the last four years, he has supervised 4 doctoral and 3 master students' theses mainly investigating the influence of bilateral asymmetry in athletic performance.

Dr. Sato is currently an active member of NSCA, ISBS, and ACSM, and a board member of ISBS (2013-15 term), and has served as a chair of organizing committee for 2014 ISBS conference. Prior to coming to ETSU, Dr. Sato was a biomechanics lecturer for the Kinesiology program at Arizona State University and spent time at US Olympic Training Center in Colorado Springs under Dr. Bill Sands.