



US DEPARTMENT OF DEFENSE

BLAST INJURY RESEARCH PROGRAM COORDINATING OFFICE

Health Outcomes Following Extremity Trauma Comparison of 3-D Gait Analysis Data across Department of Defense (DoD) Sites

Extremity Trauma and Amputation Center of Excellence (EACE) researchers at the Advanced Rehabilitation Centers (Walter Reed National Military Medicine Center (WRNMMC), Center for the Intrepid (CFI), and Naval Medical Center San Diego (NMCSDD)) contributed to a study to evaluate the ability to collect and analyze the repeatability of kinematic and kinetic gait analysis data across the three sites. Data reliability is of utmost importance when attempting to share data across sites to evaluate patient progress or to pool research data for comparative effectiveness studies. Measurement consistency across sites participating in multi-center research studies directly influences required sample size, level of detectable difference, statistical power, and ultimately, the ability to detect real change. The same ten subjects were studied in all three laboratories, and data were collected over multiple trials across multiple sessions. Data were processed in each laboratory and then sent to an unbiased third party and analyzed. Data demonstrate that kinematic differences were less than 5.0 degrees for all joint angle measurements. However kinetic errors differed, but were greatly reduced when the subjects walked at their controlled speed.¹ This study, funded by the Center of Rehabilitation Sciences Research (CRSR), demonstrates that it is possible to obtain high quality, reliable data across multiple gait laboratories particularly when gait speed is standardized across testing sessions. These data open the door for sharing data across the sites for multi-center research studies and for patient care. It is possible to standardize the Defense Centers of Excellence (DCoE) facilities to ensure Service Members receive the same consistent quality of care.

¹ Kaufman, K., Miller, E., Kingsbury, T., Esposito, E. R., Wolf, E., Wilken, J., & Wyatt, M. (2016). Reliability of 3D gait data across multiple laboratories. *Gait & Posture*, 49, 375-381. DOI: 10.1016/j.gaitpost.2016.07.075

