EVALUATION OF BODY COMPOSITION VIA MARKERLESS MOTION CAPTURE SYSTEM

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Understanding and controlling body composition can be an important variable when assessing athletes. Specifically, changes in body composition may be related to an athlete's development over time. Therefore, tracking body composition consistently and validly can be a valuable data point when assessing an athlete's readiness. However, performing a validated body composition test is often time consuming and impractical. When dealing with large numbers of athletes, it becomes unmanageable to perform this evaluation as regularly as needed. **PURPOSE:** To compare a novel body composition assessment technology using a markerless motion capture system (MCS) with a previously validated method of body composition assessment using bioelectrical impedance. **METHODS:** Two-hundred and eighteen subjects were tested using a markerless motion capture system (DARI, Overland Park, KS) and a bioelectrical impedance device (BEI; InBody 770, Cerritos, CA). A previously validated anthropometric method using girth measurements for estimating body composition, was used to calculate body composition from girth measures as determined by the MCS. The results from that formula using MCS-derived girths were compared to in the criterion measure for body composition assessment (BEI). The dependent variables of whole body fat mass (%) and lean mass (%) were statistically compared between the two systems using Bland-Altman analyses. **RESULTS:** The two methods showed no statistically significant differences when calculating whole body fat mass and lean mass percentages. Bland-Altman showed a repeatability range of ± 3.2%. This range is within the currently acceptable range of body composition testing utilized in athletic testing. **DISCUSSION:** This study demonstrates that a markerless MCS can provide a valid way of collecting body composition data on this population of athletes. This novel body composition testing modality would result in a reduction in testing time and more testing opportunities for athletes. Additionally, the ability to more readily gather longitudinal data may provide insightful information to better prepare athletes. Further research is needed on other predictive body composition models using the same technology. **PRACTICAL APPLICATION:** A markerless MCS as used in the present study can help identify whole body fat mass and lean mass percentages. The potential ease of administration may help facilitate this type of testing, and may provide the strength and conditioning professional and sports medicine clinician helpful time sensitive information when monitoring athletes across a season and career. Since a markerless MCS is designed to also assess other performance-related measures, body composition testing may be easily integrated into routine standardized performance testing.