A COMPARISON OF METHODS FOR ASSESSING BODY COMPOSITION IN PROFESSIONAL AUSTRALIAN RULES FOOTBALL PLAYERS

Bilsborough, J.C. 1)2), Greenway, K. 3) Opar, D. 3) Cordy, J.2) & Coutts, A.J. 1)2)

1) Carlton Football Club, Australia
2) University of Technology Sydney (UTS), Australia
3) Royal Melbourne Institute of Technology, Bundoora, Australia

Keywords: anthropometry, reliability, lean mass

Introduction
Objective accurate measurements are required to assess small changes in body composition in footballer players. If precise measures of body composition can be obtained, sports scientists can confidently assess the efficacy of training/nutritional interventions strategies. Moreover, since small changes in a player's body composition (i.e. lean and fat mass) can have important impact, it is important that assessment methods have good measurement precision. Therefore, the aim of the present study was to examine the measurement precision of common methods of body composition with a group of professional Australian Football (AF) players.

Methods
26 professional AF players were each assessed twice for their body composition via a DXA_{pencil} beam (DPX-IQ, Lunar Corp, USA). Another 34 professional players were assessed once via a DXA_{pencil}, DXA_{fan} beam (Prodigy, Lunar Corp, USA), $\Sigma 7$ skinfolds and calibrated bioelectrical impedance scales (BIA: Tanita BF-662W, Tokyo, Japan). Comparison measures of a criterion phantom were taken with both DXA_{pencil} and DXA_{fan}. All tests were completed in a randomized order by trained specialists following standard methods. Food and fluid intake was standardised before testing. One-way ANOVA and paired t-tests were used to detect differences in composition measures (body mass (BM), fat mass (BM), lean mass (LM)) between the various methods. The test-retest reliability was determined using intraclass correlation coefficient (ICC), 95% confidence intervals (CI) and typical error (TE). Significance was set at $p < 0.05$.

Results & Discussion
There were no differences in BM between methods ($P > 0.05$), however, %BF was higher in BIA (10.7±1.9%, CI: 10.0–11.3%), and lower with DXA_{pencil} (7.7±1.7%, CI: 7.2–8.3%) compared to the other methods ($P < 0.05$). The DXA_{pencil} show lower bias compared to the phantom (%TE: DXA_{pencil} 0.8%(0.7-1.0%) and DXA_{fan}, 2.7% (2.3-3.5%), respectively). LM was the most reliable measure with the DXA_{pencil} (%TE: 0.48% (CI: 0.38–0.67%).

Conclusion
DXA_{pencil} provides the lowest but most reliable measures, with excellent reliability for LM. The DXA_{pencil} appears to be a most suitable method for tracking changes in body composition in highly trained AF. BIA is not suitable for assessing body composition changes in professional AF players.