Short term in vivo precision of whole body composition measurements on the Horizon® A densitometer

Michael Nowitz, Paula Monahan

Introduction

The use of dual-energy X-Ray absorptiometry (DXA) has progressively increased in the assessment of irregularities in body composition commonly correlated with disorders such as obesity, sarcopenia, diabetes, anorexia, human immunodeficiency virus, lipodystrophy, malabsorption and neuromuscular disorders. Athletes also use body composition measurements because increases in lean mass lead to increases in strength, power, agility and overall athletic performance. The purpose of this research was to ascertain the short-term in vivo accuracy and least significant change in serial body composition dynamics provided by the Hologic Horizon A densitometer as currently no published, peer-reviewed body composition accuracy data exists on Horizon scanners in medical literature
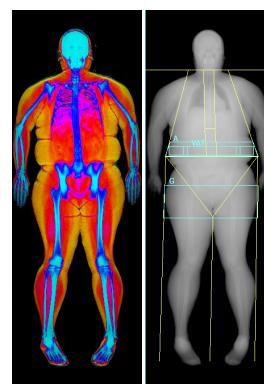
Methods

- Short term precision scanning was performed by scanning 30 volunteers on two Horizon A scanners.
- Subjects underwent duplicate scans on the same day, on the same machine, operated by the same technician in order to measure precision and reduce variables.
- Data from these scans was analyzed using the International Society of Clinical Densitometry's (ISCD) advanced precision tool to calculate the root mean coefficient of variation (CV) and 95% least significant change (LSC) determined for total fat, (nonfat) lean tissue and bone mineral content (BMC) and bone mineral density (BMD).

Results

The coefficients of variation (%CV) and standard deviation of both Horizon scanners showed low precision errors.

	CV%		LSC at 95% Confidence	
	Total Fat	Total Lean	Total Fat	Total Lean
Machine 1	0.78	0.52	2.15	1.45
Machine 2	0.77	0.40	2.15	1.11

Horizon A precision exceeds the minimum acceptable precision value by a factor of four.

Conclusion

Whole body DXA is a fast, non-invasive method to determine measure body composition. This includes percentage of fat, non-fat (lean) tissue as well as bone mineral content. This study showed that the Horizon A scanner is equipped to detect small changes in fat and lean tissue with a high level of precision and accuracy which is highly valuable to performance athletes. The Horizon A scanner exceeds the ISCD minimum acceptable precision values by a factor of four, showing their ability to detect the slightest of differences.