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3-Dimensional Scanning to Determine Body Volume and Composition With and Without a Wetsuit

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ABSTRACT

Wetsuits are designed to improve swimming performance by providing increased buoyant forces, reduced drag forces, and compressive forces on the body. Recently, 3-D scanning technology (2015 Structure Scanner, Occipital) has been used to measure body volume, and may provide an alternative method to obtaining body composition.

Purpose: Therefore, the purpose of this study is to use 3-D scanning to measure and compare body volume with and without a wet suit. Combined with mass, volume from 3-D scanning will provide density calculations for body composition analysis.

A secondary purpose of this study is to measure the difference in body composition with and without a wetsuit. Methods: The Institutional Review Board has recently approved the study and data collection has started; therefore, no data are presented in this abstract. Participants will be 3-D scanned with and without a wetsuit (Company), followed by BodPod (COSMED) measurements with and without the wetsuit. Following measurements, the 3-D scan will be used to calculate volume using MeshLab Software (Company). 2x2 mixed-factor ANOVA will be run to analyze the differences between wetsuit conditions, and between measurement methods (3D Scan vs BodPod).

By comparing measurements of body volume and calculations of body composition with and without a wetsuit, the validity of the 3-D scanning technique will be determined and this might lead to the development of empirically determined wetsuit fit criteria.

Key Words: Buoyant force, Compressive force, 3-D scanning, Body composition

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