# **Golf Injury Prevention: An Orthopedic Approach through Physical Testing, Biomechanics, and Training**

### Introduction

Despite the notion that golf is an injury free activity, participants do sustain musculoskeletal injuries. Currently, there is very little research examining the physical characteristics and swing mechanics that contribute to golf injury. The purpose of our research initiative was to establish the physical and swing biomechanics contributions to orthopaedic injury and develop a golf-specific injury prevention and performance enhancement program.

# Methods

We systematically examined the swing biomechanics (high speed motion analysis) and assessed the balance (force plates), strength (dynamometer), and flexibility (goniometry) of over 400 healthy and injured golfers. Based on our analysis of highly proficient golfers and golfers who have suffered injuries we designed a golf-specific injury prevention and performance enhancement program that was tested during an 8-week clinical trial.

# Results

Skilled golfers demonstrate "ground-up stability" consisting of significantly better balance, core and upper torso strength, and flexibility compared to less proficient golfers and those with hip or low back injury. Injured golfers also demonstrate altered swing mechanics. The clinical trial demonstrated that our training program resulted in significantly better balance, strength, and flexibility, a more efficient swing, and increased driving distance.

# **Discussion and Conclusion**

Our research shows that skilled golfers possess superior balance, strength, and flexibility compared to less proficient golfers and golfers with hip and low back injuries. The altered swing biomechanics demonstrated by injured golfers may be from the physical deficits identified. The clinical trial which improved "ground-up stability", improved performance and may also decrease the likelihood of injury through improved balance, strength, and flexibility.