Nelson Cortes, PhD

Associate Professor, Division of Health and Human Performance
S.M.A.R.T. Lab

Education
PhD, Human Movement Sciences, Old Dominion University

Key Interests

Biomechanics | Lower Extremity | Osteoarthritis | Post-Traumatic Osteoarthritis | Anterior Cruciate Ligament | Falls Risk | Older Adults | Orthopaedics | Bioimaging | Ultrasound

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SELECT PUBLICATIONS

> T. Popovic *et al.*, Implicit video feedback produces positive changes in landing mechanics. *J Exp Orthop* 5(12) (2018).

> N. Cortes, Video analysis verification of head impact events measured by wearable sensors. *Am J Sports Med.* 25(10), 2379-2387 (2017).

> O. Eddo *et al.*, Current evidence of gait modification with real-time biofeedback to alter kinetic, temporospatial, and function-related outcomes: a review. *International Journal of Kinesiology and Sports Science* 5(3), 35-55 (2017).

> S. Sikdar *et al.*, Dynamic ultrasound imaging applications to quantify musculoskeletal function. *Exerc Sport Sci Rev.* 42(3), 126-135 (2014).

Research Focus

The overarching focus of my research is investigating lower extremity biomechanics to develop and optimize injury prevention and gait retraining interventions that can prevent injuries and/or delay the onset and progression of orthopaedic diseases. The interdisciplinary research group develops pre-clinical and clinical research that produces research of consequence. Our state-of-the-art biomechanics laboratory instrumentation (e.g., motion capture, force plates, ultrasound imaging) enables best research practices for basic and translational research. We also conduct community outreach to provide evidence-based interventions to prevent falls in older adults.

Current Projects

- Investigation of injury prevention feedback frequency to decrease anterior cruciate ligament injuries in active individuals: we are using motor learning paradigms of how frequently individuals should receive feedback to optimize learning and acquisition of motor skills.

- Comparison of the effects of gait modification strategies on knee adduction moment in patients with medial knee osteoarthritis: randomized controlled trial: we are implementing an RCT using haptic feedback to assist individuals with knee osteoarthritis by improving gait mechanics and consequently decreasing cartilage degeneration and total knee replacements.

- Evidence-based intervention to decrease falls risk on older adults: for the past 3 years, we have received funding for a community outreach program to deliver evidence-based interventions to community-dwelling older adults. The primary aim is to reduce the risk of falls and number of falls experienced by older adults, and improve quality of life and independent life.

- Investigation of biomechanical patterns in dancers: a comparison study: this unique study uses a multiprong approach to investigate injury risk differences between dancers and non-dancers. Using an experimental approach, as well as a computational modeling approach, we are investigating the distinctive characteristics in dancers that may explain their lower incidence of acute lower extremity injuries.