Exponent®
Engineering & Scientific Consulting

Kevin O'Brien, Ph.D.

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Professional Profile

Dr. O'Brien's areas of expertise include injury biomechanics, human motor control, neurorehabilitation, kinematics and kinetics of human motion, and simulations of musculoskeletal models. His research and testing experience includes cadaveric experimental assessment of lower extremity injury mechanics and collection and analysis of data from anthropomorphic test devices (ATDs) in rollover environments.

Dr. O'Brien's research has focused on assessing rehabilitation of individuals with incomplete spinal cord injury and stroke. Dr. O'Brien has experience using both marker and marker-less motion capture systems, force plates and transducers, and electromyography (EMG) sensors. He also is experienced in using computational models and simulations to measure and assess human motion.

Prior to joining Exponent, Dr. O'Brien was a Graduate Research Assistant in the Locomotion and Biomechanics Laboratory at the University of Notre Dame, where he researched motor control strategies of individuals with incomplete spinal cord injury and balance control for individuals following a stroke. He also worked as an Undergraduate Research Assistant at the University of Virginia Center for Applied Biomechanics where he assisted on rollover crash test experiments and evaluations and testing of ankle injury mechanics.

Academic Credentials & Professional Honors

Ph.D., Bioengineering, University of Notre Dame, 2019

M.S., Bioengineering, University of Notre Dame, 2018

B.S., Mechanical Engineering, University of Virginia, 2014

Pre-Doctoral Fellow in Translational Research, Indiana Clinical and Translational Sciences Institute

Pi Tau Sigma

Licenses and Certifications

Professional Engineer, Michigan, #6201312091

SOLIDWORKS Certificate in Mechanical Design

Certified Forklift Operator (CFO)

Prior Experience

Graduate Research Student, University of Notre Dame, 2014-2019

Undergraduate Research Assistant, University of Virginia, 2013

Manufacturing Intern, St. Jude Medical, 2012

Research Assistant, WLS Surgical Institutes, 2011

Professional Affiliations

American Society of Biomechanics, Student Member, 2015-2019

Publications

O'Brien, Kevin, Charles R Crowell, and James Schmiedeler. Error augmentation feedback for lateral weight shifting. Gait & Posture, 54:178-182, 2017.

Presentations

O'Brien, Kevin, Lise Worthen-Chaudhari, Timothy Faw, Albert Olszewski, Michael McNally, James Schmiedeler, and D. Michele Basso. Characterization of eccentric motor deficiencies in individuals with incomplete spinal cord injury. In American Society of Biomechanics 2018 Conference, Mayo Clinic, Rochester, MN, Aug. 8-11 2018.

O'Brien, Kevin and James Schmiedeler. EMG-driven musculoskeletal simulations using a new threshold optimization technique. In American Society of Biomechanics 2018 Conference, Mayo Clinic, Rochester, MN, Aug. 8-11 2018.

O'Brien, Kevin and James Schmiedeler. Examining the effects of leg stiffness on vertical ground reaction forces using a dual spring loaded inverted pendulum model. In American Society of Biomechanics 2018 Conference, Mayo Clinic, Rochester, MN, Aug. 8-11 2018.

O'Brien, Kevin, D. Michele Basso, and James Schmiedeler. Targeted eccentric motor control to improve locomotion after incomplete spinal cord injury. In Association for Clinical and Translational Science 2018 Conference, Washington, D.C., Apr. 18-21 2018.

David Herlihy, O'Brien, Kevin, and James Schmiedeler. Effects of age, gender, and BMI on maximum knee flexion in single and dual leg bodyweight squats. In American Society of Biomechanics 2017 Conference, Boulder, Colorado, Aug. 8-10 2017.

Jackson Fox, O'Brien, Kevin, and James Schmiedeler. Anticipatory behaviors in lateral weight shifting. In American Society of Biomechanics 2017 Conference, Boulder, Colorado, Aug. 8-10 2017.

Lise Worthen-Chaudhari, O'Brien, Kevin, Albert Olszewski, Timothy Faw, Michael McNally, James Schmiedeler, and D. Michele Basso. Eccentric control deficits in individuals with spinal cord injury. In American Society of Biomechanics 2017 Conference, Boulder, Colorado, Aug. 8-10 2017.

O'Brien, Kevin and James Schmiedeler. Error augmentation feedback for dynamic lateral weight shifting. In American Society of Biomechanics 2016 Conference, Raleigh, North Carolina, Aug. 2-5 2016.

O'Brien, Kevin and James Schmiedeler. Error augmentation feedback for dynamic lateral weight shifting rehabilitation. In American Society of Biomechanics 2015 Conference, Colombus, Ohio, Aug. 5-8 2015.