Canadian Chiropractic Researchers

Profile



James P. Dickey, PhD

Dr. Dickey is an assistant professor at the University of Guelph, in the Department of Human Biology and Nutritional Sciences. Jim did his undergraduate and M.Sc. training in Biomechanics at the University of Waterloo, under the supervision of Dr. David Winter, Department of Kinesiology. Jim worked for three years as a research assistant in orthopaedics at Sunnybrook Health Sciences Centre in Toronto before starting his Doctorate. Jim's doctoral studies were in spinal biomechanics, under the supervision of Dr. Genevieve Dumas, Department of Mechanical Engineering, Queen's University. His doctoral research investigated the anatomy and mechanics of the interspinous ligament. Jim developed novel approaches for in vitro mechanical testing of spinal specimens (published in Journal of Biomechanics), and novel application of quantitative polarized light microscopy for studying collagen fibre orientation in histological ligament sections (published in Journal of Biomechanical Engineering). This research has clarified the mechanics of the interspinous ligament and highlighted the mechanical importance of anatomical interconnections between the interspinous and supraspinous ligament.

Dr. Dickey has studied segmental spinal kinematics in chronic low-back pain patients, in collaborations with Drs. Drew Bednar, Michael Pierrynowski and Victoria Galea (McMaster), and Simon Yang (University of Guelph). This study measured the motion of markers attached to external spinal skeletal fixation screws, and related this motion to reported pain levels. This study has found a clear relationship between segmental spinal motion and lowback pain which highlights the interactions between segmental translations and rotations. Dr. Dickey, together with Dr. Jim Potvin (University of Windsor), has cosupervised a study examining the patterns of muscle recruitment and motion during repeated trunk flexion maneuvers in low-back pain and healthy subjects. Two undergraduate students, Kathy MacDonald and Sara McNorton executed this research. Results from this study were presented at the 2nd Canadian Chiropractic Scientific Symposium.

He is one of the founding members of the Comparative Orthopaedic Research Group at University of Guelph; a multidisciplinary group comprised of professors from the School of Engineering, Human Biology and Nutritional Sciences, and the Ontario Veterinary College. This group has focused on studies of joint injury and healing.

Dr. Dickey's current research continues to investigate the anatomy and mechanics of the lumbar spine. He has merged advanced robotics with in vitro mechanical testing to develop a unique system for applying 6 degree-of-freedom motions to spinal specimens. This system allows mechanical testing under combined loading conditions, similar to in vivo loading. This project is funded by NSERC, and has been advanced by Kevin Gillespie, a M.Sc. student.