

NEWS

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Grants awarded for studies in prevention, treatment and rehabilitation of musculoskeletal injury

ANN ARBOR, Mich., January 29, 2009 — The University of Michigan Bone & Joint Injury Prevention & Rehabilitation Center has awarded grants, totaling \$140,000, to four U-M researchers focused on musculoskeletal health.

Dr. Ron Zernicke, Center director, said, "I am pleased to award these grants to clinician-scientists and researchers focused on unlocking some of the mysteries of musculoskeletal injuries. Research in musculoskeletal health is more important than ever—more than 50 percent of all injuries are to the musculoskeletal system and cost our society more than \$250 million per year."

The 2009 Center grants were awarded to the following researchers:

Peter Erlich, M.D., M.Sc., associate professor and director of Pediatric Trauma, will complete a study of "Measurement of Maximal Hand-Rail and Hand-Rung Coupling Forces in Children: Effects of Age and Gender." Dr. Erlich's research will focus on grip strength as a predictor of breakaway force of a hand from a rail to aid in establishing safer rails and rungs on our nations' playground structures. The study will look at the effect of age, gender, body weight, and hand-hold orientation on the coupling force developed between a hand and a horizontal rung or inclined rail. Erlich said, "Today, there are nationally recognized standards for playgrounds based on grip strength in children, but recent data suggests that grip strength is not a reliable predictor of the breakaway force of a hand from a rail. The ultimate goal of this study is to help prevent unintentional injuries on playgrounds."

Richard Hughes, Ph.D., associate professor of Orthopaedic Surgery and Biomedical Engineering, will lead a study on "Optimizing Shoulder Rehabilitation." The project will develop a mathematical model that can be used to optimally plan physical therapy sessions and determine the best set of exercises for a patient to perform given a specified amount of time available for physical therapy. Hughes said, "Shoulder injuries, particularly rotator cuff disorders, are common occupational and athletic musculoskeletal disorders and physical therapy is an integral part of treating these types of injuries."

Both payers and patients want to use as little time as possible to achieve therapeutic goals. This study will address the needs to enhance the efficient use of a patient's therapy time."

Scott McLean, Ph.D., assistant professor in the School of Kinesiology, will research "Integrated Structural & Mechanical Contributions to ACL Injury Risk." McLean's research will focus on dynamic sports landings by collecting 3D lower extremity structural and biomechanical data to understand the mechanisms of knee anterior cruciate ligament (ACL) injuries. McLean said, "The continued escalation of ACL injury rates, particularly in women, is a major concern. In the coming decades, a large number of young and otherwise healthy women with ACL injury will likely experience severe joint debilitation and reduced quality of life. Identifying and countering the factors of ACL injury is imperative to helping prevent these injuries in the first place."

Jon Sekiya, M.D., associate professor in the Department of Orthopaedic Surgery, will study the "Role of the Acetabulum in Hip Joint Function." The hip joint is one of the most common joints suffering from functionally limiting and debilitating osteoarthritis (OA). Some people with debilitating OA require total joint replacement—a painful surgery with an often painful road to recovery. Sekiya's study will focus on the fundamental biomechanical understanding of the native hip joint, specifically, the role of the acetabular labrum in hip joint function—which still remains unclear. "Understanding the acetabular labrum will not only help guide clinicians to develop new techniques geared toward injury specific deficits, but also help evaluate currently performed surgical interventions to decide which are appropriate from a functional anatomic standpoint or which should be modified."

The 2009 Bone & Joint Center Grants demonstrate the range of strengths at Michigan—Kinesiology, Orthopedics, Biomedical Engineering—all key in the critical research needed to prevent injury. Zernicke added, "It's vitally important that we continue to gain new knowledge in many areas relevant to the prevention, treatment and rehabilitation of musculoskeletal injury and arthritis. The results of these four studies may ultimately enhance the quality of life and functional mobility for many individuals by developing effective prevention, treatment and rehabilitation programs—which are essential to keeping a person healthy or putting a person back on the path to optimal health."

About the Center

The University of Michigan Bone & Joint Injury Prevention & Rehabilitation Center is a collaborative effort between the Medical School, the College of Engineering, the School of Kinesiology and the School of Public Health. The Center's mission is to excel in the creation of new knowledge in all areas relevant to the prevention, treatment, and rehabilitation of musculoskeletal injury and arthritis. The Center is dedicated to conduct mission-driven research, train the next generation of multi-disciplinary researchers, provide leadership for local, national, and international collaborations and partnerships, and promote the effective translation, use, and exchange of knowledge. For more information about the Center, visit www.bjjprc.umich.edu.