

Be kind to your joints...

Understanding the causes of osteoarthritis is the first step towards new treatments

By Case van Wyngaarden

The stats are out; one in every 10 Canadians will develop the painful and weakening joint disease known as osteoarthritis at some point in their lives.

This widespread affliction has prompted NSERC and U of C researchers in several faculties (such as engineering, kinesiology and medicine) to work towards understanding the causes of osteoarthritis in the hopes of providing a future treatment.

“Osteoarthritis is a debilitating disease that often drastically reduces an individual’s mobility, a devastating effect that has led to an expense of \$5 billion annually when you consider health care costs and loss of productivity,” says Steven Boyd.

Boyd, an orthopaedic biomechanist and PhD student in the Department of Mechanical Engineering, is the primary researcher of one U of C osteoarthritis study. His PhD supervisor is Faculty of Kinesiology Dean Ron Zernicke.

Osteoarthritis is characterized by the cartilage of an affected joint becoming worn down until two ends of the bone begin to contact one another during joint movement. This can lead to bone spurs developing around the joint, causing pain and inflammation.

Although there are a number of lifestyle factors and genetic predispositions that can lead to osteoarthritis, Boyd is primarily interested in how traumatic joint injuries, such as ACL (anterior cruciate ligament) pulls, can change the environment of a joint and promote the onset of osteoarthritis 20 to 30 years down the line.

Using high-resolution microcomputer tomography, Boyd hopes to monitor the change in bone structure following a traumatic joint injury. He wants to determine how this change in bone structure creates abnormal joint contact and cartilage erosion, and more importantly, the onset of osteoarthritis.

Researchers like Boyd first need to understand how traumatic injuries change how a joint deals with motor stress. “Only after the first step of understanding can we focus on prevention,” says Boyd.

To carry out his study, Boyd is collaborating with researchers at Harvard University. Harvard is one of a few research institutions that own the expensive microcomputer imaging equipment needed to conduct this research. Boyd was awarded a student travel grant from the International Society of Biomechanics to help pay for his trip to the eastern U.S. school.

Boyd has collected other academic awards as well, including NSERC, AHFMR, Killam and Silver Anniversary scholarships. He has won the best student paper prize at a national biomedical engineering conference for his master’s research, which he completed in the U of C’s mechanical engineering department.

For more details on Boyd’s research, check out his Web site: <http://www.ucalgary.ca/~skboyd>.

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