

Osteoarthritis and back pain

Innovative solutions to disabling conditions

Researchers at Capital Health and Dalhousie University are determined to find ways to better treat and prevent osteoarthritis and recurrent low back pain – the two leading causes of disability in Nova Scotia.

The rising rates of obesity in Nova Scotia are putting a strain on our aging population's knees, ankles and hips, leading to rising rates of osteoarthritis and an ever-increasing demand for joint replacement surgery. That's why Capital Health orthopedic surgeons like Dr. Michael Dunbar have teamed up with physiotherapy professor Dr. Cheryl Kozey and biomedical engineering professor Dr. Janie Astephen Wilson.

“We need to develop ways to manage the progression of osteoarthritis, so we can keep people's joints healthier and delay the need surgery for as long as possible,” says Dr. Dunbar. “The implants used to

replace failing joints only last about 20 years, so we don't want to put them in middle-aged people if we can help it.”

Drs. Kozey and Astephen Wilson are learning how people's unique ways of walking influence their risk of developing lower-limb osteoarthritis. “We've identified gait and leg-muscle activation patterns that are clearly associated with the development and progression of osteoarthritis,” says Dr. Kozey. “Now we're exploring how we can change those walking patterns – through braces, orthotics, gait retraining or muscle training – to slow down the wear and tear on those joints.”

Gait analysis is also helping the researchers determine which kind of joint replacement implant will work best for which patients, to avoid implant failures and costly revision surgeries.

At the same time, Dr. Kozey is studying how the activation of muscles in the abdomen and back affect people's risk and recovery when it comes to low-back injuries. “We've found that certain trunk-muscle activation patterns are associated with a healthy back while others are associated with injury,” she says. “This helps us predict which back-injury patients are more likely to re-injure themselves, and gives us a clear sense of what exercises people need to do to prevent and recover from back injuries.”



Dr. Michael Dunbar, orthopedic surgeon, professor of surgery and biomedical engineering

Physiotherapy professor Dr. Cheryl Kozey uses a variety of sophisticated techniques to analyze gait and muscle-activation patterns in healthy people and in people with hip, knee and back problems. Her data is leading the way to new approaches to muscle training and gait modification that will reduce the human and economic impact of these common, debilitating conditions.

