

Back pain breakthrough

Nearly everyone feels back pain at some point, with many experiencing chronic pain. Krembil Research Institute researchers hope that new tools and tests can alleviate, if not eliminate, the suffering

By Wendy Glauser



ABOUT SIX YEARS AGO, Aki Tanaka felt her first pangs of back pain. It was intermittent at first, with water aerobics, Pilates and visits to physiotherapists helping to keep the pain at bay. Over the next few years, though, things worsened. By 2016, she needed a walker and had to bend forward slightly when she moved. If she stood for too long, she'd feel a stabbing pain in her back and especially down her leg. Tanaka also had to give up her job as an engineer at a non-profit organization and said goodbye to gardening, her passion. She couldn't even help her university-aged sons settle into their new homes. "There was a lot of lying down," she says. "I was in my sixties, but my life was like I was in my eighties. It felt like my life had been stolen from me."

Then, in the fall of 2016, a breakthrough. She was referred to the Inter-professional Spine Assessment and Education Clinic (now called the Rapid Assessment Clinic), which was launched in 2012 by a team at UHN led by Dr. Raja Rampersaud, an orthopedic surgeon and clinician investigator at Krembil, to help pain sufferers get assessed and treated faster. After several tests, she finally received a long-awaited diagnosis: osteoarthritis (OA) and spondylolisthesis in the lower back. One of the vertebrae in Tanaka's spine had slipped over the bone below it, which made her spine unstable and pinched her nerves.

Doctors think age and osteoarthritis caused the muscles supporting the spine to wear down, allowing the disc to slip. In 2017, Dr. Rampersaud surgically stabilized her spine, and Tanaka soon started feeling like her old self again. "By about a year, I thought, 'Wow, this is pretty good,'" she recalls.

Although Tanaka's situation is less common, debilitating back pain unfortunately is not. In any

Aki Tanaka gave up gardening when her back pain became too severe. Now that her pain has improved, she's back to doing what she loves.



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given year, one in three people will experience life-altering back pain. While the problem can disappear with time, exercise and posture improvement, many people can't shake the pain no matter what they do. In a study published in early 2019, Dr. Mayilee Canizares from Dr. Rampersaud's research team looked at data from 13,000 Canadians over a 16-year period and found that almost half of these people reported back pain to a practitioner at least once. Of those, nearly 20 per cent said their back pain continued to persist, while almost a third said their pain, whether occasional or persistent, worsened over time.

While it's clear that back pain is a major issue among Canadians, it's often an invisible struggle. Worse still, back pain, which can be caused by severe forms of arthritis, has received little research attention. A review done by Dr. Anthony Perruccio, a scientist at Krembil, found that at major North American public health and epidemiology conferences, less than one per cent of the

tens of thousands of studies that have been presented focused on musculoskeletal issues, "even though musculoskeletal conditions, like osteoarthritis, are among the most common chronic conditions and the leading cause of disability in the population," he says. With more than 20 per cent of Canadians living with arthritis – a number this is expected to grow – more research is critical, says Dr. Perruccio.

Fortunately, Krembil researchers are facing this growing problem head on. They're trying to find ways of predicting the types of back pain that are likely to be persistent or worsen over time. That way, clinicians can pinpoint who would benefit the most from specialized diagnostic tools and early treatment. Drs. Perruccio and Rampersaud have studied how factors like age, sex, and severity of pain and disability relate to different patterns of back pain – whether it's back-dominant or leg-dominant, intermittent or constant. By identifying differences between subgroups of patients with back

DID YOU KNOW?

People with arthritis are more likely to experience anxiety, mood disorders, poor mental health and difficulty sleeping, compared to those without arthritis.



→ **80%**
 Canadians who experience debilitating back pain at least once in their life
(Bone and Joint Canada)

Dr. Raja Rampersaud says identifying axial spondyloarthritis in patients early can help prevent devastating impacts and side effects.

pain, more targeted interventions are possible. Inflammation can also influence back pain, but its impact isn't uniform. For instance, studies by Dr. Perruccio and colleagues have found that some inflammation-related proteins are associated with pain and multi-joint osteoarthritis in women, but not in men, and vice versa. By narrowing in on the specific contributors to inflammation and pain, researchers might one day develop different anti-inflammatory medications for men and women, says Dr. Perruccio. "The more we can tease apart different groups of back pain and osteoarthritis patients, the faster we can get moving toward personalized treatments," he says. Treating back pain earlier is key for Laura Passalent, a clinician investigator at Krembil and a physiotherapist with advanced training in arthritis, as she's seen the difference the right diagnosis can make. "If we can identify patients with specific types of back pain early in the disease process, they can receive appropriate treatments early, which ultimately improves their overall function



For physiotherapist Laura Passalent, early detection is key.

and quality of life," she explains. Passalent and colleagues found that screening patients for axial spondyloarthritis – a particularly painful type of inflammatory arthritis that affects the back – by physiotherapists with advanced training can speed up the diagnosis by three years. In her research, physiotherapists conducted a comprehensive assessment including a detailed history, a physical exam and appropriate investigations. They would then refer those they suspected of having spondyloarthritis to a rheumatologist who specializes in the disorder. According to Passalent's study, these physiotherapists are comparable to rheumatologists in accurately identifying patients with axial spondyloarthritis. While early and accurate diagnosis is always important, it's especially critical in axial spondyloarthritis, where the immune system attacks the ligaments and tendons around the spine over many years, leading to swelling that can erode the bone and cause it to grow back abnormally. As Dr. Rampersaud puts it, "We want to identify patients earlier so we can actually do something to prevent some of the chronic destructive changes that can happen in the joints and bones." It's also important to treat pain early because it can snowball and affect other areas of health, including sleep and mood. Due to inactivity, patients with arthritic back pain also have a potentially higher likelihood of dying or ending up in a nursing home, says Dr. Rampersaud. It's been two years since Tanaka's surgery, and her pain is no longer dictating her life. She can now laugh and talk with her 99-year-old mother at her nursing home; before her surgery, her visits were limited to giving instructions to the care providers. She's also become a climate change activist, speaking at local libraries and community centres, and she's back to gardening. "I cultivate milkweed, and it's a favourite home for caterpillars that will become beautiful butterflies," she says. It's a fitting metaphor for Tanaka, who is now spreading her wings, after what seemed like an impossibly long wait. ☪

→ **Circle of care**



Dr. Rajiv Gandhi

ALTUM HEALTH IS A NEW KIND OF CLINIC

Nestled inside Toronto Western Hospital sits one of the country's most revolutionary rehab clinics: Altum Health. The clinic, which is headquartered at the hospital but also has satellite clinics across Ontario, is focused on early intervention and an integrated delivery of care. Unlike in the past, when a patient might receive care from a single practitioner, people who come to Altum Health can be seen by a variety of specialists, such as physiotherapists, chiropractors and massage therapists who work together to come up with a highly tailored treatment program for that person. That team approach helps patients receive better, and often more effective, care. "A lot of patients come for back pain assessment and find that a good course of physiotherapy can fix their problem," explains Dr. Rajiv Gandhi, an orthopedic surgeon at Toronto Western Hospital and medical director of Altum Health. When it comes to surgery patients, Altum Health provides "prehab" before an operation and then rehab after it, because "the stronger you are going into surgery, the faster you recover," says Dr. Gandhi. Once it's over, Altum's surgeons and specialists will create a detailed recovery plan. "Patients feel a sense of confidence knowing that all of their health providers are on the same page, and they're talking to each other and learning from each other," he says.