

# THE GLOBE AND MAIL



## Health researchers digging into own pockets to bridge gap in funding

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Later this month, Toronto's University Health Network is planning to enroll a dozen patients with arthritis-wracked knees in a clinical trial of a stem-cell treatment that researchers hope could one day make artificial joint replacements obsolete.

The trial, a Canadian first, won't be cheap, despite the small number of recruits. To cover the estimated \$500,000 cost, the researchers turned to an unconventional source of funding: 10 orthopedic surgeons at UHN's Toronto Western site who donated a total of \$1.25-million of their own money beginning five years ago to kick-start the network's research into a cure for arthritis.

Adrian Wydra, whose startup True Phantom Solutions Inc., creates "phantom" or artificial skulls and brains using synthetic polymers that mimic the real thing. These phantoms can be used for research and for neurosurgeons to practice ultrasound and MRI procedures without risk of harming real people.

The orthopedic surgeons' decision to raid their own bank accounts to help pay for research is a rare – but not unheard-of – move in Canada, one that was driven in part by how much harder it has become to score publicly funded medical research grants in this country.

"We felt very strongly that in order to go to anybody and say, 'Would you please give me support for this idea?' we had to have our own commitment beyond just the time and effort we would all have to put in," said Nizar Mahomed, director of the UHN arthritis program and one of the surgeons who donated \$125,000 over five years. "We needed to make a commitment of actual dollars and put skin in the game."

The doctors' gift prompted a philanthropic avalanche from grateful patients toward a campaign that has now raised \$38-million to combat osteoarthritis, a disease that affects 4.6 million Canadians but does not traditionally have the fundraising pull of cancer or heart disease. The upcoming stem-cell experiment is the first human trial to be funded by the campaign.

In 2011, the neurosurgery team of 14 doctors at UHN, a network of four downtown Toronto hospitals, followed the lead of the orthopedic surgeons and made a collective \$1-million donation to brain research. Last year, a group of eight orthopedic surgeons in Thunder Bay announced a \$2-million personal donation over 10 years to a research project aimed at reducing diabetic limb amputations in



Dr. Nizar N. Mahomed, Head, Division of Orthopaedic Surgery at Toronto Western Hospital, is photographed by the laboratories at the Buchan Arthritis Research Centre in the Krembil Discovery Tower, part of Toronto Western Research Institute, on Jan 8 2015. (Fred Lum/The Globe and Mail)

Ontario's remote northern communities. And it is not uncommon for doctors and other health-care workers to give to the charitable foundations that support their hospitals.

What all these physicians have in common is the challenging research-funding climate in which they are operating.

"I think it's pretty clear that the accessibility to funds has never been more competitive," said Jim Woodgett, director of research at the Lunenfeld-Tanenbaum Research Institute at Toronto's Mount Sinai Hospital.

To give one telling example, the success rate for applications to the Canadian Institutes of Health Research's open operating grant program – the federal agency's largest pot of money, which accounts for a little over half of all the funding it doles out – fell to 18 per cent for 2014-2015, down from 33 per cent less than a decade earlier.

Part of the explanation for the low success rate for the 2014-2015 granting year was an unusual spike in applications as investigators scrambled to submit proposals before an administrative revamp takes full effect at CIHR.

Among other changes, the overhaul is expected to require researchers to more frequently secure partnerships and matching funds through charities and industry to augment CIHR grants.

Canada's pharmaceutical industry, meanwhile, continues to spend less and less on research in this country, despite promising in the 1980s to invest the equivalent of 10 per cent of annual sales in research and development in Canada in exchange for longer patent protection for their products.

In 2013, the ratio of research expenditure to sales was 4.5 per cent, down from 5.3 per cent the previous year, according to the federal Patented Medicine Prices Review

Board. (The association that represents brand-name drug makers disputes those figures, saying the board's definition underestimates the industry's investments.)

Funding the upcoming UHN stem-cell trial through a traditional peer-reviewed grant would have been especially difficult because the project falls squarely in what medical researchers call the "valley of death," the chasm between basic scientific breakthroughs and late-stage clinical trials for which public funding has always been scarce.

"There's a lot of grunt work that has to happen in between, which isn't necessarily very sexy or exciting for grants panels, but it's absolutely essential to get to the clinical trial," said Sowmya Viswanathan, the associate director of the cell therapy program at UHN. "There's really very few mechanisms for this bridge funding."

The trial will involve 12 patients between the ages of 40 and 65 with moderate to severe osteoarthritis in their knees. Bone marrow extracted from the back of their hips will be used as a source of mesenchymal stromal cells, or MSCs, which UHN scientists will grow in an incubator for four to six weeks and inject into the patients' knees.

The hope, Dr. Viswanathan said, is that the MSCs will awaken the body's innate healing ability and spur new cartilage to grow around the damaged joint. But at this point, the main purpose of the trial is to establish that the therapy is safe and to gather the pilot data necessary to ask a public granting agency to fund a larger trial in the future.

"The goal of the model here is not to rely purely on philanthropic funding for the research program, but to get to step one, to get pilot data to then be able to prove to CIHR that what we're proposing is going to be effective," Dr. Ma-

homed said.

The orthopedic surgeons in Thunder Bay who announced their \$2-million donation last year faced a set of challenges different from the doctors at UHN, which is one of Canada's leading research networks.

Along with performing operations at the Thunder Bay Regional Health Sciences Centre, they teach at the newly established orthopedic surgery program at the Northern Ontario School of Medicine.

The surgeons were looking to establish a research pedigree for their fledgling program while also helping to solve a dire problem in Northern Ontario, that of aboriginals losing their limbs to poorly managed diabetes.

"Many of these granting agencies have already established relationships with researchers who are also advertising very good and worthy projects," said David Puskas, the chief of orthopedic surgery at Thunder Bay Regional Health Sciences Centre and a contributor to the collective donation. "Breaking into that as basically an unknown research group is very difficult."

By going public with their gift, the Thunder Bay surgeons hoped they would encourage government funding agencies and private donors to follow suit, something that has not happened as briskly as they first hoped.

Dr. Mahomed of UHN sees the orthopedic surgeons' philanthropic approach as one other physicians could consider if they are frustrated with the slow march of research that could improve their patients' lives. Their gift amounted to \$25,000 a year for five years, or between five and 10 per cent of their salaries.

"I think we're going to have to start to look at these models," Dr. Mahomed said. "Otherwise, we're going to have to be waiting a long, long time."