

# SickKids unveils first-of-its-kind AI initiative

Dr. Anna Goldenberg, hospital's new chair of biomedical informatics, hopes to use data to help predict disease

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Inside the pediatric intensive care unit at Toronto's Hospital for Sick Children, an infant recovering from open-heart surgery is barely visible through the forest of whizzing and beeping machines that monitor his every vital sign.

In the old days, those vital signs — a baby's heart rate, blood pressure, oxygen levels and other signals — would have flashed across a screen and then been lost to posterity.

But in 2013, SickKids began collecting and storing the data that emanate from patients in their 42 intensive-care beds. The unit now has more than two trillion data points in its virtual vault, far more than a mere mortal could make sense of.

That's where artificial intelligence, machine learning and Anna Goldenberg come in.

On Tuesday, SickKids will announce the appointment of Dr. Anna Goldenberg as the hospital's first chair in biomedical informatics and artificial intelligence, a post funded in part by a \$1.75-million donation from Amar Varma, a Toronto engineer and entrepreneur whose newborn son underwent surgery at SickKids six years ago.

The hospital's fundraising foundation will match the Varma family's gift, bringing the total donation to \$3.5-million.

The endowed position, the first of its kind at a Canadian chil-



Dr. Peter Laussen, chief of critical care at SickKids, checks on a newborn patient named Mason who is recovering from open-heart surgery. CHRIS DONOVAN/THE GLOBE AND MAIL

dren's hospital, will help Dr. Goldenberg and her colleagues to expand their AI research with an eye to saving and improving the lives of patients.

"I feel like right now as a computer scientist, as a researcher in machine learning and AI, I can actually make a big difference in health care," Dr. Goldenberg said. "It will take time, but I think we are getting closer and closer to seeing it happen."

Among the projects that Dr. Goldenberg is keen to accelerate is one that would use AI to help predict when and in what part of the body a malignancy will develop in patients with Li-Fraumeni syndrome, a rare hereditary disease that predisposes people to cancer.

Another is based in part on those two trillion data points collected inside the pediatric ICU.

Working with Peter Laussen, the hospital's chief of critical care, Dr. Goldenberg and her team used the beat-to-beat data from past patients to develop a computer model that can predict up to 70 per cent of cardiac arrests five minutes before the heart stops beating.

SickKids is now preparing to test the early-warning system at the bedside, Dr. Laussen said during an interview inside the pediatric ICU, where between 40 and 50 different physiological signals an hour were streaming from an infant boy named Mason. Less than a week earlier, Mason had undergone two open-heart surgeries to

correct a congenital heart defect.

If the model works as planned, doctors would be able to use the five minutes of lead time to change medications or make other interventions to prevent a cardiac arrest. In cases in which prevention is not possible, at least the medical team would have time to prepare.

"Instead of it being a sudden event and we're rushing to the scene, we [will have] people there, ready, organized and responding," Dr. Laussen said. "That response is critical."

For Dr. Goldenberg, the new appointment is a cherry atop an already impressive résumé — one she began building when she arrived in Kentucky in 1995 as a 17-year-old Jewish refugee from the

former Soviet Union.

Despite hailing from a family of successful scientists and engineers, she couldn't avoid the anti-Semitism that was rampant in her hometown of Voronezh in southwestern Russia, near the border with Ukraine.

Each day as Dr. Goldenberg walked to school, "I had to pass by a building that said, 'Jews get out of our city,'" she recalled in an interview Monday. "When I was smaller, [other children] would dump my bag into the toilet just because of my last name."

After completing an undergraduate degree at the University of Louisville, she moved on to Carnegie Mellon University in Pittsburgh, where she completed her master's degree and PhD in data mining and machine learning.

Before her new appointment, Dr. Goldenberg was already a senior scientist in genetics and genome biology at the SickKids Research Institute, an associate professor in the department of computer science at the University of Toronto, and the associate research director for health at the Toronto-based Vector Institute for Artificial Intelligence. She is only 40.

The promise of Dr. Goldenberg's groundbreaking work is part of what inspired the donation from Mr. Varma, a University of Waterloo trained engineer and entrepreneur who co-founded Autonomic, a software platform for connecting self-driving cars to smart infrastructure that was bought out by Ford Motor Co. last year.

"I'm excited for Dr. Goldenberg because this is really her chance to showcase her ability to do a lot of this stuff," Mr. Varma said. "We need people like her that are willing to dedicate their life to this craft."

## Justice, Indigenous Affairs and Veterans all set for new leadership

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With nine months to go before the next federal election, Prime Minister Justin Trudeau shuffled his cabinet in a way that places one of his most trusted ministers in charge of government spending, while shaking up key portfolios at Justice, Indigenous Affairs and Veterans Affairs.

Departing Treasury Board president Scott Brison triggered the shuffle with his announcement late last week that he was stepping down from cabinet after deciding not to run for re-election.

Three current ministers received new assignments Monday, while two Liberal MPs were elevated to cabinet.

Replacing Mr. Brison at Treasury Board is Jane Philpott, who is now in her third cabinet post after moving from Health to Indigenous Services in the summer of 2017.

Mr. Trudeau said moving Ms. Philpott again made sense because she has been the vice-chair of the Treasury Board cabinet committee, which oversees the government's internal spending decisions.

The president of the Treasury Board reviews and approves detailed spending plans submitted by departments. The job comes with a low public profile, but the responsibility involves preventing future political headaches for the government by challenging questionable spending proposals.

Veterans Affairs minister Seamus O'Regan will take over Ms. Philpott's duties at Indigenous Services, while Justice minister Jody Wilson-Raybould moves to Veterans Affairs.

Speaking with reporters from the steps of Rideau Hall on a cold and sunny winter morning in Ottawa, the Prime Minister rejected suggestions that Ms. Wilson-Raybould's move could be viewed as a demotion.

"I would caution anyone who thinks that serving our veterans and making sure they get the care to which they are so justly entitled from any Canadian government is anything other than a deep and awesome responsibility," he said.

"With her experience and tremendous leadership, Jody will ensure our veterans receive the care and support of a grateful nation."

During his year-and-a-half tenure in the Veterans Affairs portfolio, Mr. O'Regan earned the scorn of some veterans' advocates who accused him of being tone-deaf to their issues and in some cases, not fully understanding the policies of his own department.

"I am very happy to see him go," said Mike Blais, the head of Canadian Veterans Advocacy. "He said, 'I am here to listen,' but he clearly wasn't hearing what the veterans were saying."

In August, 2017, Mr. Trudeau announced a decision to split Indigenous Affairs into two separate departments, with Carolyn Bennett continuing in the file as Minister of Crown-Indigenous Relations and Northern Affairs, while Ms. Philpott moved from Health to a new position as Minister of Indigenous Ser-

vices. Mr. O'Regan said his priority in the new position is to listen and work hard. He then outlined his personal connection to Indigenous issues.

"I grew up in Labrador. I left a fairly urbane and cosmopolitan life in St. John's, Newfoundland, and at 13 moved to Goose Bay, Labrador, and that was an isolated community up in the North.

"Suddenly, I was in high school with Métis, with Inuit. It was a very different experience for me. It opened my eyes at a very young age."

In university, Mr. O'Regan added, he took courses in Indigenous studies and Indigenous resource development. Most of his experience, he admitted, is from 20 years ago, and there's catching up to do.

"I walk into this portfolio with all humility, but somebody who — at a very young age — knows what it is to grow up in the North, somebody at a very young age [who] knows the plight ... of our Indigenous peoples."

Perry Bellegarde, the national chief of the Assembly of First Nations, said Monday's changes will cause some concern among Indigenous people. He praised the work of Ms. Wilson-Raybould — a former AFN regional chief — and Ms. Philpott for advancing several files affecting Indigenous people. However, he also said their replacements should be given a chance to prove themselves.

"These issues are too important to drop the ball on," he said. "There's going to be some apprehension, but we've got to make sure that these ministers are doing a very effective job."

Conservative MP Pierre Poilievre said the Prime Minister should have shuffled Mr. O'Regan right out.

"Conservatives cannot understand why he remains in cabinet," he told reporters.

"We're surprised that he is now being inflicted on our First Peoples, who deserve so much better from a minister."

Joining cabinet for the first time is David Lametti, who jumps into the senior position of Minister of Justice and Attorney-General of Canada, while Bernadette Jordan takes over the newly created position of Minister of Rural Economic Development.

Mr. Lametti is a Yale-educated former associate dean at McGill University, where he was a professor of law. Since the Liberals formed government in 2015, he has held two parliamentary secretary positions: first to the International Trade minister, and then more recently as parliamentary secretary to the Innovation Minister.

Ms. Jordan, who represents the Nova Scotia riding of South Shore-St. Margarets, will replace Mr. Brison as the only member of cabinet from Nova Scotia.

She is a former parliamentary secretary to the Minister of Democratic Institutions and was elected by Liberal MPs as the chair of the Liberal caucus.

She will be the first woman in cabinet to represent a Nova Scotia riding.

With files from Gloria Galloway

CAMPBELL  
CLARK

OPINION



OTTAWA

It was nice that when one of Justin Trudeau's friends inexplicably fell upward into a more high-profile cabinet post there were also promotions for some of the Liberals' brighter lights.

Seamus O'Regan's 17 months as Veterans Affairs minister was no tour de force, so you'd expect there would be a question mark on his judgment rather than a gold star. But Mr. Trudeau moved him to Indigenous Services, a bigger hot seat that's likely to be very visible in an election year.

The Prime Minister called his friend a "leader in cabinet," but if so, it was leadership that wasn't obvious to the outside world, with Mr. O'Regan sometimes displaying a loose command of his portfolio and suspect political judgment.

It's a good thing for Mr. Trudeau, then, that he was able to promote Jane Philpott, the cabinet's paragon of quiet competence, from Indigenous Services to a major economic portfolio, Treasury Board. And for good measure, he lifted sharp-minded David Lametti, a former McGill law professor, straight into the Justice portfolio.

Still, Monday's cabinet shuffle stuck out as a peculiar game of political Chutes and Ladders that included some odd choices. There was the sudden demotion of Jody Wilson-Raybould, dropped from Justice to Veterans Affairs, the not-easily explained promotion for Mr. O'Regan and, with that, some strange gaps left in important places.

The immediate reason for the shuffle was the resignation of Treasury Board president Scott Brison, which meant Mr. Trudeau had to put a Nova Scotia MP into cabinet and shift a more experienced minister into the Treasury Board.

The filling of the Nova Scotia slot was the most obvious political move of the day — and not only because the job went to MP Bernadette Jordan, who represents a riding the Liberals rarely win, South Shore-St. Margarets. It's also because she was handed a new portfolio, Rural Economic Development, mandated to deal with issues that matter to small communities, such as internet access — and to score points in a lot of swing ridings, notably in Atlantic Canada.

## Trudeau's shell game produces some surprises, not all good

One big surprise was the precipitous fall of Ms. Wilson-Raybould. The appointment of an Indigenous woman as Justice minister had been seen as a milestone in 2015, but on Monday she dropped several pegs to Veterans Affairs, notable mostly for its pitfalls.

There have been rumours that Ms. Wilson-Raybould was rough on officials and staff and rubbed some of her colleagues the wrong way — MaryAnn Mihychuk was bumped from cabinet for similar reasons in 2017. But Ms. Wilson-Raybould was far from a political liability. She had spent three years in a high-profile portfolio without committing any embarrassing blunders. It seemed odd that Mr. Trudeau suddenly clipped his minister's wings before an election.

That demotion probably made Ms. Philpott's promotion all the more inevitable. Mr. Trudeau needed an experienced hand, but with Ms. Wilson-Raybould going down the ladder — and after the demotion of Mélanie Joly last July to the Tourism portfolio — it was good politics to move a woman into a senior economic portfolio.

But it meant pulling Ms. Philpott from Indigenous Services, where she was winning plaudits for making unexpected progress. She was put into the job because she was a hands-on minister, trusted to make headway on a perennial problem file. Her departure leaves a skills gap, and Mr. O'Regan isn't the most probable minister to fill it.

The job was a new portfolio, created in 2017 when Indian Affairs was split in two, and Ms. Philpott was handed the task of improving services and bleak social outcomes for Indigenous communities — lifting boil-water advisories, reducing the number of children taken into care and so on.

Now it's an election year, when the Liberals' big promise to revamp the way Ottawa deals with Indigenous Canadians will be judged, and Mr. Trudeau has moved his most credible figure on the file to a portfolio that is more concerned with internal government matters.

In the end, of course, a prime minister has to fill the slots. Mr. Brison's departure required an election-year shuffle, and Mr. Trudeau decided to keep it to a few shifts rather than a major renovation of his government. Once you decide to keep most of the big names in place, there aren't as many options for change. But in this peculiar shuffle, Mr. Trudeau filled some holes with square pegs.