The

INSIDE STORY®

OCTOBER 2017

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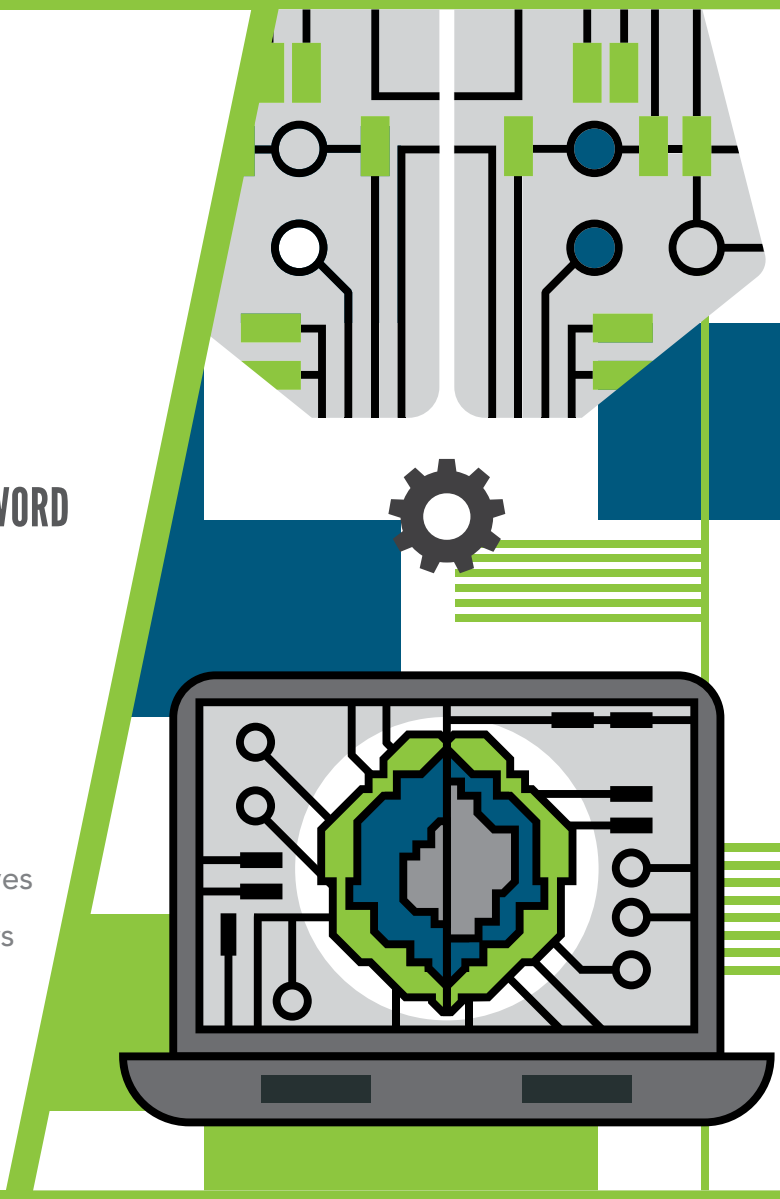

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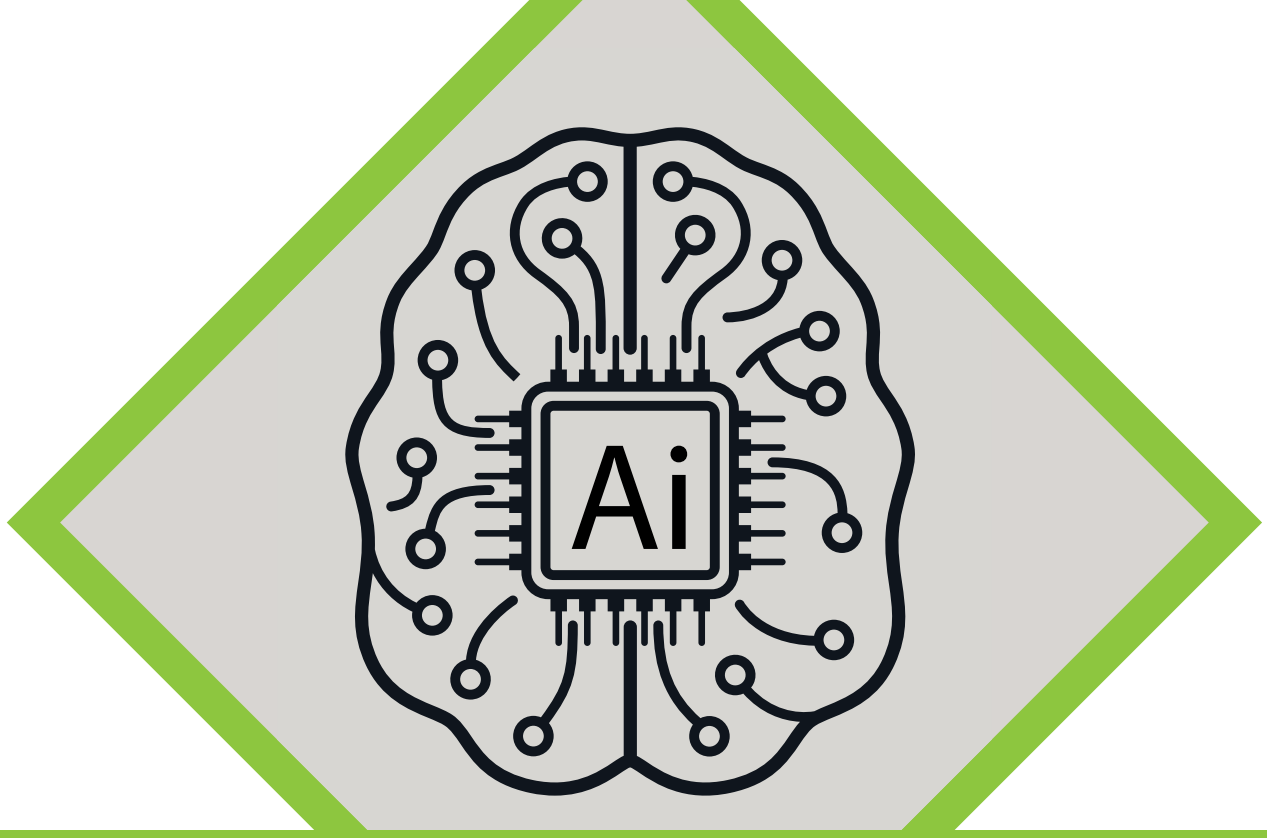

ARTIFICIAL INTELLIGENCE ISN'T JUST A NEW BUZZWORD

...IT'S A GAME CHANGER, ESPECIALLY IN MANAGING CLAIMS

Words like "disruption" and "revolutionize," and expressions like "catching fire," typically conjure up images of hip new IT startups—*not* an insurance company. But that's exactly how the application of artificial intelligence (AI) in the insurance industry is being described. And we're not talking about hype like robots replacing humans, we're talking about the practical application of AI in all kinds of insurance from health and life to property and casualty.

So get ready! AI has the potential to impact the entire insurance industry to the same degree as driverless cars will impact transportation—it's a game changer. Although it won't happen overnight, and it's still early days, leveraging the power of AI is revealing many advantages. But first, what exactly is AI?

AI isn't just one technology

AI is defined in many ways, but the common thread is that AI is not just one specific type of technology, but rather an umbrella term that captures a variety of different technologies. However, all AI technologies have one fascinating thing in common: they aim to imitate or augment human intelligence.

For example, the goal of an AI technology might be to try to mimic a certain human behaviour or human thought process and try to behave intelligently or rationally. AI technologies try to learn, reason, and problem solve—just like humans. Overall, a main benefit of the various AI technologies to all types of insurance is that it has the potential to enable insurers to continually improve the customer experience. And along the entire continuum of the customer experience...

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Risk and pricing: AI technologies can build more accurate predictive risk models to more effectively and efficiently assess risk and in turn, enhance pricing strategies. For example, a property insurer uses AI technologies that combine satellite imaging and machine learning to determine roofing conditions of houses, decreasing the need for human assessment and more accurately pinpointing properties that present higher risk.[1]

Sales and marketing: AI technologies can find and compile such a wide range and large volume of data that they can create a full profile of a potential customer and then match it with suitable products, resulting in a more targeted approach and ideally more receptive sales targets. For example, an auto insurance broker used natural language processing to analyze over 20,000 car insurance chat conversations to build a virtual assistant (VA).[2] The VA acts as a broker by interacting with consumers via Facebook Messenger to assess their policy requirements and cost preferences. Based on these preferences, the VA then reviews each insurer's service and product reviews to make recommendations of potential insurers to the consumer.

Customer service: AI technologies can provide customers with more ways to get help and information beyond meeting with or talking with humans. In fact, there is now even a chatbot that helps people understand and track all of their insurance policies. Based on data from more than 9,000 insurance policies, the chatbot intuitively gauges the intent of the user's questions and answers them super quick.[3] It's even trained to explain complex insurance jargon.

Claims management: AI has the potential to automate a range of administrative processes that traditionally have been done manually. For example, many insurers along all lines are now using AI technologies that pre-populate application forms with customer data.[4]

Fraud prevention and detection: AI technologies are now able to not only find and compile masses of data like never before, but also to find patterns at a level beyond human capabilities. For example, an auto insurer's AI technology may pick up a simple tweet of a photo of a car accident that is then used to verify accident details like the accident location and people involved.[5]

AI TECHNOLOGIES OFTEN MIMIC HUMAN BEHAVIOUR BETTER THAN HUMANS

- **Machine vision** is the science of making computers see. And because technology isn't held back by biology, it can be programmed to see beyond the ability of human eyesight—like seeing through walls. The ability to detect human movement through the wall may assist with health care and childcare, as well as law enforcement and military applications.[6]
- **Robotics** is a branch of engineering that has recently been taking off. Researchers have now developed robotic "muscles" that are 1,000 times stronger than human beings. And in the future there may be robots that can interact authentically in social settings.[7]
- **Natural language processing (NLP)** is programming to automatically understand, write, and speak human languages. Chatbots use NLP to provide information or entertainment whereas a virtual assistant is a chatbot that is focused on helping with specific tasks. NLP continues to get better at languages spoken in every country around the world, and now scientists predict AI will allow us to translate dolphin language by 2021 (yes, the aquatic mammal).[8]

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Next generation of fraud busters... next generation technology

Today, an increasingly more sophisticated approach to fraud prevention and detection is critical because of the way fraud is evolving.

In the past...
Fraud was mainly small scale like individual plan members or health care providers acting alone to commit fraud, not as part of a group.

Now...
Today, it's organized fraud—collusion in all shapes and forms—collusion among plan members, collusion among health care providers, and collusion among health care providers and plan members. This may sound familiar as 2017 seemed to see its share of headlines about collusion-style health benefits fraud.

But...
Just as fraudsters have become more sophisticated, so too has fraud prevention and detection—thanks to AI.

In the past, preventing and detecting fraud involved manual processes. Essentially, the focus was on following a paper trail. Now the ability of certain types of AI to find patterns in data at both the individual and aggregate levels means that amazingly, AI can tease out correlations typically hidden to the human eye. For example, the GSC fraud detection and prevention strategy applies a type of AI called machine learning or ML to do exactly that.

FRAUD BUSTING WITH AI

Benefits fraud refers to any abuse, misuse, or over-use of the plan by plan members and health care providers—whether intentional or not. Accordingly, fraud can include when plan members or health providers submit false claims, alter invoices, bill for ineligible services disguised as eligible services, overcharge/over use, or return an item after reimbursement.

Fortunately, AI technologies can quickly assess all the circumstances surrounding a claim to either confirm or question it. As necessary, the system can then flag that the claim requires further investigation.

An effective way that GSC uses ML technologies to flag potential health provider fraud is through provider analysis. By continuously monitoring health care provider practices and interpreting claims data at a highly sophisticated level, our ML technology is able to identify patterns. These patterns can then be compared to other providers to see if they fall out of any of a number of norms. Ideally, this results in catching potential issues before they escalate.

However, there are some important best practices to consider as Brent Allen, GSC's vice president, Service Operations, explains, "ML technologies definitely have tremendous potential regarding fraud strategies; however, it's essential they are built on a solid foundation. For instance, we were able to establish an effective provider profiling system by building on our national provider registry. This registry ensures that each health provider has appropriate credentials and is uniquely registered on our claims adjudication system before we will pay a claim. This means that all provider profiling activities have a sound basis; it's a classic case of you need quality in, to get quality out."

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Machine learning means look out fraudsters!

Simply put, ML is the computerized detection of data patterns and analytic processes that is essential to cope with the broad range—and massive volume—of new types of data now available (known as "big data"). OK, even the simplest descriptions of ML aren't that simple.

Basically, today's range of data—that comes in a huge volume in all forms and from all directions—is impossible for us mere mortals to compile, let alone make sense of it all. By contrast, ML technologies can not only find and compile all kinds of data—at a tremendous volume—it can also identify patterns at a much more sophisticated level than we can.

Part of this is because as humans, we often unwittingly have biases that skew what we see and in turn, what we find. In addition, humans get tired and have to eat—and although we find it hard to relate to, apparently some actually get bored analyzing data—meanwhile, ML technologies just keep chugging along.

And it just gets better and better—literally with 'self-education'

ML technologies also "self-educate"—another fancy term; it means that ML continuously learns as new data presents itself. As a result, the learning curve for ML technologies is automatic and in real time, much faster and more sophisticated than possible for humans. Without being explicitly programmed like technologies of the past, ML technologies continually reassess prior transactions and revise their analyses as they find new connections—they automatically get smarter and smarter.

For example, GSC's ML technology continually adapts so it gets increasingly better at spotting potentially fraudulent activity. Specifically, because it can amass such a broad range of data, at such high volumes, and perform very sophisticated analysis, it is able to unearth *non-obvious* connections between individuals—whether members or providers.

Sussing out the non-obvious connections is essential because collusion means that the fraud is very organized. The actions by anyone in the group are orchestrated so that everyone in the group responds methodically and identically. As a result, fraud strategies need to catch the colluders off guard by finding non-obvious connections that allow us to surprise them. For example, a non-obvious connection may lead us to contacting someone who isn't even aware that their data is being used fraudulently.

Plus, because big data means fraudsters have to cover their tracks across all this high volume of data, GSC's ML technology will make it increasingly difficult for fraudsters not to slip up. This is especially significant regarding catching collusion because these larger-scale fraudsters cover their tracks over a much larger amount of information.

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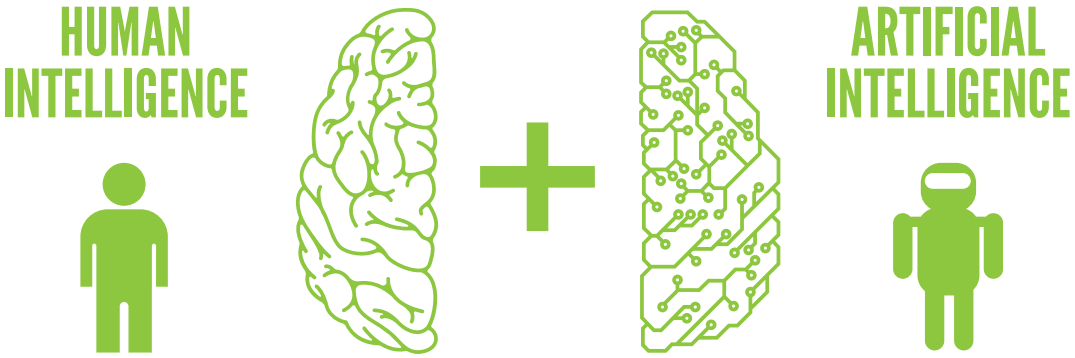
Brent Allen, GSC's vice president, Service Operations sums it up: "Smaller-scale fraud where individual plan members or health care providers act alone or team up to a limited degree continues to represent the highest incidence of fraud. Whereas, the collusion that is now part of the fraud scene is less frequent, but it by far represents the highest dollar amount. Fortunately, by applying ML technologies, we will be able to continually enhance our ability to catch both small-scale fraud and collusion, especially due to ML's self-educating capabilities."

So what about ML actually replacing humans? This is definitely a misconception as actual human brainpower will always be essential for ML technologies to be successful. For example, regarding fraud prevention and detection, humans still need to manage the ML applications and then as ML identifies potentially fraudulent activities, fraud analysts and investigators are essential to follow-up on leads. Accordingly, although ML is taking fraud prevention and detection to a whole new level of sophistication, the ideal is still human intelligence *combined with* artificial intelligence.



Just the beginning...

We're sure to continue to see applications of AI cropping up in increasingly innovative ways. Given that AI aims to mimic human behaviour—and health management is all about human behaviour—it's no wonder developing virtual health assistants is one of the hottest trends in health right now. Since a virtual assistant is essentially a chatbot that can intuitively converse with you to help you accomplish tasks, virtual *health* assistants can help with any number of health-related tasks—like effectively taking your medications or even helping you select the best playlist for your morning run.

It's clear that what we're seeing today in AI is really just scratching the surface of what the future will hold—and what future editions of *The Inside Story* will cover. Definitely more to come!

[1]Artifical Intelligence Impact on Insurance, Max Kraus, The Think Blog, Oct 28, 2016. Retrieved October 2017: http://www.logiq3.com/blog/artificial-intelligence-impact-on-insurance.

[2]"The Impact of Artificial Intelligence on Selling & Distributing Insurance (Part 2)," Max Kraus, The Think Blog, June 13, 2017. Retrieved October 2017: http://www.logiq3.com/blog/artificial-intelligence-impact-selling-distribution.

[3]"IBM helps launch insurance chatbot," Maria Terekhova, Business Insider, June 8, 2017. Retrieved October 2017: http://www.businessinsider.com/ibm-helps-launch-insurance-chatbot-2017-6.

[4]"Insurance sector tunes into artificial intelligence," Oliver Ralph, Financial Times, March 29, 2017. Retrieved October 2017: https://www.ft.com/content/a0d9aa8a-1494-11e7-80f4-13e067d5072c?mhq5j=e5.

[5]"3 Things The Insurance Industry Can Learn from Silicon Valley Insurance Accelerator," Chris Murumets, The Think Blog, Oct 20, 2016. Retrieved October 2017: http://www.logiq3.com/blog/3-things-the-insurance-industry-can-learn-from-svia.

[6]"Seeing through walls," Emily Finn, MIT News, October 18, 2011. Retrieved October 2017: http://news.mit.edu/2011/ll-seeing-through-walls-1018.

[7]"New robotic 'muscle' is a thousand times stronger than a human's and capable of hurling an object 50 times heavier than itself," Daniel Miller, The Daily Mail, December 21, 2013. Retrieved October 2017: http://www.dailymail.co.uk/sciencetech/article-2527612/New-robotic-muscle-thousand-times-stronger-humans.htm.

[8]"Scientists predict AI will allow us to translate dolphin language by 2021," Luke Dormehl, Digital Trends, May 10, 2017. Retrieved October 2017: https://www.digitaltrends.com/cool-tech/dolphins-natural-language-processing/.

What's UP...

GSC SAILS INTO UNCHARTED WATERS… AGAIN

At GSC, we're all about health management and prevention. That was the motivation behind the launch of our Change4Life® health management portal—we want to empower plan members to take control of their health by providing them with tools and resources that are easy to use and access. But, there was one piece of the health picture that remained elusive for us—mental health. This has not been an area in which we, as an industry, have seen much advancement. We talk about it, dig through data, and pay claims, but have seen little done in the realm of mental health prevention and support… until now.

In the coming weeks, GSC will be launching the industry's first preventive, digital mental-health support program. Based on the growing body of evidence demonstrating the real impact preventive strategies can have on mental health, this program is aimed at helping plan members manage their mental wellness as part of their overall health. It will be available to every GSC plan member via the Change4Life health management portal, at no cost.

We can't wait to share more about this exciting program in our next issue of *The Inside Story*. So, stay tuned!

OPIOID CRISIS UPDATE: NEW STATISTICS AND NEW INITIATIVES

Newly released national statistics from the Canadian Institute for Health Information (CIHI) reveal more grim facts regarding the opioid crisis that we reported on in the November 2016 edition of *The Inside Story*. Between April 1, 2016, and March 31, 2017, an average of 16 Canadians were hospitalized every day due to opioid poisoning—a 19% increase from two years ago. And this doesn't include people who went to the emergency department but were not admitted, or who died before arriving at the hospital.

Obviously, the opioid crisis is having a devastating effect on people's lives and, although a dollar figure is not yet available, the impact on the health care system is significant. Not only are more Canadians receiving emergency care for opioid overdoses, but they also spend longer than average in hospital. In addition, there are the follow-up costs associated with continuing treatment for any complications after the emergency room visit.

This hospitalization data adds to the picture presented by the Canada Public Health Agency (CPHA) in June 2017 when they released a national snapshot of opioid-related deaths for 2016. Overall, at least 2,458 Canadians died from opioid use in 2016. The crisis is affecting every region of Canada and both small and large communities. Fortunately, in addition to ongoing discussions about how to handle the opioid crisis, some concepts are moving into action.

For the CIHI statistics, visit https://www.cihi.ca/en/opioids-send-more-canadians-to-hospital-as-crisis-grows, and for the CPHA report, visit https://www.canada.ca/en/health-canada/services/substance-abuse/prescription-drug-abuse/opioids/national-report-apparent-opioid-related-deaths.html.

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Improving physician training related to addictive medications

Two new fellowship training programs at St. Paul's Hospital in Vancouver aim to help remedy what has been identified as a serious issue—the lack of physician training that incorporates evidence-based practices from the field of addiction medicine. Simply put, physicians require more information and background about safe prescribing of addictive substances like opioids.

In addition, a recent study—*Barriers and facilitators to implementing addiction medicine fellowships: a qualitative study with fellows, medical students, residents and preceptors*—set out to determine what helps versus hinders implementing the kinds of fellowships that should result in physicians being better able to prevent opioid addiction. The researchers interviewed trainees and faculty from the St. Paul's Hospital fellowships.

The study concludes that implementation of addiction medicine fellowships appears feasible. Factors that promote implementation include human resources, variety of rotations, peer support, and fostering implementation of addiction training. Barriers include money, time, and space limitations. Moving forward, the researchers feel that research into how to effectively scale-up these kinds of education programs should be a priority.

For more information about the fellowship training programs, visit http://www.providencehealthcare.org/news/20151124/st-paul%E2%80%99s-hospital%E2%80%99s-unique-addiction-fellowship-program, and for the study about barriers and facilitators, visit https://ascpjournal.biomedcentral.com/articles/10.1186/s13722-017-0086-9.

BRINGING DRUG INDUSTRY PAYMENTS OUT OF THE SHADOWS

In the March 2017 edition of *The Inside Story*, we reported on findings from *The Fifth Estate* that concluded more contact with, and information from, drug companies can influence doctors' prescribing practices. Now a new American study—*Industry Payments to Physicians for Opioid Products, 2013 – 2015*—comes at a time when there is growing pressure in Canada for "big pharma" to be more transparent regarding money given to doctors. The study concludes that "approximately one in 12 U.S. physicians received a payment involving an opioid during the 29-month study."

For more information about the study, visit http://ajph.aphapublications.org/doi/10.2105/AJPH.2017.303982.

So what about Canada?

In March 2017 it came to light that one of the 15 doctors involved in developing *The 2017 Canadian Guideline for Opioid Therapy and Chronic Non-Cancer Pain* had been paid to do speaking engagements by at least one pharmaceutical company that manufactures opioid medications. The guideline steering committee had pledged there would be no such conflict of interest. As a result, federal Health Minister Jane Philpott asked CIHI to review how the guidelines were developed to ensure the conflict hadn't affected the results. CIHI concluded in September 2017 that although the conflict of interest violated the rules the committee set for itself, there was no evidence that the conflict affected the actual guidelines; the guidelines are based on sound scientific evidence.

For more information about the CIHI review, visit http://www.cihr-irsc.gc.ca/e/50544.html. More information about the Canadian opioid guidelines can be found at http://nationalpaincentre.mcmaster.ca/guidelines.html.

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Some voluntary action by big pharma

Also in March 2017, due to mounting concerns about transparency, the Canadian branches of 10 drug companies agreed to voluntarily publish payments they made to the health care industry last year. And on June 20, 2017, they did just that—they reported their health care industry payments, which amounted to $48 million in 2016. However, some companies only provided numbers for part of the year, and none indicated how much individual doctors received. Providing just lump sums with no details about how the money was spent—or how much individual doctors received—led to criticism that the voluntary disclosure is just a public relations move.

For more information about the health care payments disclosure, visit https://beta.theglobeandmail.com/news/national/canadian-drug-makers-assailed-for-lack-of-transparency-over-payments/article35392284/?ref=http://www.theglobeandmail.com&.

Doctors push for more transparency

And in June 2017, while the Canadian branches of the 10 drug companies prepared to reveal their payments, a group of prominent Canadian physicians and researchers launched the "Open Pharma" campaign. A main campaign message is that drug companies in Canada should be forced to reveal their payments to *individual* doctors. The ideal would be that patients could check an online database to see whether their doctors have received funding from the drug industry. This is already available in the United States, as well as several European countries.

For more information about Open Pharma, visit http://open-pharma.org/.

...And now hot off the press (internet, actually)

On September 27, 2017, the Ontario government introduced the *Strengthening Quality and Accountability for Patients Act, 2017* that, if passed, would result in a number of changes aimed at enhancing oversight and transparency in health care. Specifically regarding the connection between big pharma and health care, the Act would require manufacturers of brand-name drugs, generic drugs, and medical devices operating in Ontario to publicly report payments made to health care professionals; payments such as meals and hospitality, travel-associated expenses, and financial grants.

The payment information would be posted on a searchable online database broken down by the names of health care professionals who received payments. Required reporting includes not just payments to doctors, but to all 26 regulated health care professions like pharmacists, nurses, and psychologists. Payments would also be posted for hospitals and other health care organizations. The minimum reporting amount is still to be determined.

If passed, Ontario will be the first jurisdiction in Canada to make this type of reporting mandatory. The government anticipates that the reporting will begin in 2019.

For more information about the new legislation, visit https://news.ontario.ca/mohltc/en/2017/09/ontario-improving-transparency-in-health-care.html.

October Haiku

Data holds the keys
To reducing the misuse
And fraud that plagues us

FITBIT WINNER

Congratulations to **S. AKINBILE**, of **WINNIPEG, MB**, the winner of our monthly draw for a Fitbit. Through this contest, one name will be drawn each month from plan members who have registered for Plan Member Online Services for that month.

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