



AI meets the real world

Artificial intelligence in the pharmacy is not the way of the future—it's here now.

Sheshtyn Paola reports

Hearing the term 'artificial intelligence' (or 'AI') may conjure up an array of Hollywood images—Skynet in *The Terminator*, the Replicants in *Blade Runner*, The Architect and The Oracle in *The Matrix* or even Haley Joel Osment playing an android boy who desperately wants to be human.

"Hollywood tells us what AI is going to be," Lee Hickin, national chief technology officer at Microsoft Australia, said at this year's Australian Pharmacy Professional (APP) conference.

"We live in the perpetual fear of what

we call the singularity, this idea that technology and humans will converge to a point where the machines suddenly realise that they're better than us, that they don't need us, and it's better off if we just got out of the way and they got on with the job of whatever they need to do.

"The interesting fact is the many AIs that we've seen through Hollywood's lens are made to look and feel like us. It's almost as if to imply that AI is like another human, it is in fact an artificial version of humanity. This is of course very, very far from the truth."

Hickin pointed out the numerous ways that AI already exists in our day-to-day lives and the reality is simpler and far less menacing than the ideas of sentient beings presented by Hollywood—for example, in the form of Google Maps, AirTasker or even the new Designer versions of PowerPoint.

"Data interpretation, image indexing... these are the kinds of markers when you think about AI," he said. "You take data, for example patient data, and feed it into the model.

"The model is simply a logical process

of machine learning that reads the data and looks for patterns, looks for objects that it can label and tag within that data, but looks for the things that you tell it to look for.

“It’s a system that can optimise processes by finding the most obvious markers for whatever you’re looking for.”

AI in the pharmacy

AI has now reached the pharmacy industry in a very real way to augment the role of the pharmacist. These platforms have been designed with the main goal of reducing the burden of repetitive tasks and administrative duties on pharmacists.

As a recent example, Fred IT Group this year launched a new platform, which is the first use of AI in dispensing software in Australia.

Its new tool, called Fred AID (Artificial Intelligence Directions), uses Big Data and AI to predict the directions that a pharmacist will put on the dispensing label and allow fast entry.

This can be applied in the context of doctor’s directions on eScripts, which would normally require manual re-keying by pharmacists.

“What can you predict that the pharmacists in Australia usually type? With a level of confidence, which is what AI does—it shows you a level of confidence—it will tell you what it suggest what you would normally type,” said pharmacist and CEO of Fred IT Group, Paul Naismith.

“It shows you in the top right-hand box what that direction will be and just with two keystrokes, it’ll copy those directions in. You don’t have to type them, you just have to review them and make sure that you’re happy with those.”

Naismith explains that the model “feeds itself” through machine learning, a common application of AI.

“If you use those directions, we learn that that’s a model that you like. If you don’t use those directions, we also learn that there’s something wrong with that model and we continue to feed more and more data into those models over time.”

The goal is to save pharmacists time

by getting rid of repetitive tasks.

“Obviously it saves time... but at the same time it’s also safer because we know there’s no mis-type in there. As long as you’ve read it correctly, the model will probably get it more likely right than you will be able to in most cases.”

However he stresses that the purpose of the AI isn’t to supplant the pharmacist.

“We’re not saying we’re replacing pharmacists because that clinical decision is not automatic—you need to think about it and you need to make that decision. Artificial intelligence will never replace the pharmacist in making clinical decisions,” Naismith emphasised.

“Where it can help is to increase safety and reduce time spent on standard or repetitive tasks, such as keying in medication directions.

“Anything that reduces re-keying of information or manual tasks means that pharmacists can spend time where they need to—supporting patients with health and clinical advice and taking care of their business.”

Facial recognition in pharmacy

The most common misconception about AI within pharmacy is the fear it will replace jobs or reduce the need for pharmacists, according to Max Mito, co-founder and CEO of medical innovation company, Strong Room.

“I think we are quite far from that reality, and rather than rejecting this technology, the profession should embrace it and observe what new opportunities might arise,” Mito said.

Mito, along with co-founders Chris Durre and Kieran Start, developed software that streamlines many of the processes related to staged supply, opioid replacement therapy (ORT) and the drug register.

Strong Room also provides a facial recognition feature that is automated to make it quicker for pharmacists to identify ORT patients.

Their opt-in AI facial recognition technology is used to streamline pharmacy processes by detecting patient faces, requiring the pharmacist to just quickly confirm identity on the computer.



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The engine is “very fast and very accurate”, explains Durre, Strong Room’s chief information officer, using ongoing machine learning to improve results.

“Every time you come into the facility and you get positively identified, we essentially merge together those results and it improves as time goes on and does learn who you are,” he said.

“Very soon we’ll be rolling out mask recognition as well as part of that facial recognition, and so obviously this is quite pertinent with COVID-19, it’s got a high accuracy with that as well.”

Durre said they see facial recognition as a support tool to assist pharmacists.

“We do still provide all the other information for the patient, like name, date of birth, address to double-confirm those entries,” he said.

“What we actually want to do is maximise that time where the pharmacist is interacting with patients and really doing what they should be doing in the pharmacy, and not having to worry about menial stuff like searching through files and backtracking through documents.

“We see AI in the pharmacy being a support tool, enabling pharmacists to do what they do really well, which is spend time with their patients.”

Mark Feldschuh, former president of PSA Victoria branch and pharmacy owner for many years, came on board as Strong Room’s executive director after realising the software’s potential.

“When I was told they used facial recognition in pharmacy, I immediately thought, ‘this is a solution looking for a problem’. I just couldn’t see the use of it.

“But then I got shown the company and I did a double take. If you see it, you can’t go back to the old system. It’s just impossible,” Feldschuh told the *AJP*.

Strong Room, which now has around 500 community pharmacy clients and predicts reaching about 1000 locations by the end of the year, is eventually hoping to bring in facial recognition of the pharmacist as well. The goal is to provide pharmacists with speed and convenience to be able to authenticate themselves and dispense accordingly.

CALs and chatbots

AI has been introduced into the pharmacy in other ways, much of it sped up by the COVID-19 pandemic.

Paul Naismith shared that Fred IT Group has developed a WhatsApp pharmacy chatbot that uses using AI natural language processing.

“As we know, during COVID-19 people wanted things delivered and the consumer experience got quite difficult. What we did there is start to work on how we can make a better interaction for the customer,” explained Naismith.

“We released the ability to order a script on WhatsApp, and it’s using the MySQL to go and grab people’s prescriptions and let them tell you what they want and have it ready when they turn up or have it delivered.

“In the chatbot, most of it is what you’d expect and pretty simple. People can interact with it and it’s interesting, when we did the research on this, most people were happier to be told what to type—they didn’t like to have free-form because they didn’t know what to type.

“They can type the word ‘Yes’, or the number ‘1’ [to make choices].”

As with the other applications of AI, machine learning is a crucial factor.

“The more data we have, the more insights we can make,” said Naismith.

His company has also harnessed Big Data and AI to allow pharmacists to allow Cautionary Advisory Labels (CALs) to be printed on demand for each medication and patient.

“In [the Fred software], you can see the recommendations from the APF. They come up there and you can click on the ones you want,” he said.

“But over time, as we start to get the feedback of what you’re choosing, we can actually learn the model. The model will teach itself.”

AI drawbacks

As with all things, AI comes with risks.

Healthcare provision and patient data necessitate the highest level of accuracy, reliability, security and privacy, explained health researcher Dr Sobia Hamid, from the Babraham Institute at

the University of Cambridge, UK.¹

Consistent accuracy is important to preserve trust in the technology, and any data collected needs to be safeguarded with the highest security standards.

Risks with the technology include bias in an AI model, data or its deployment; data drift; or malicious code injection, Hicken pointed out.

“All of these problems are human problems, in the way we’re building the AI, the data we give it, and how we inject our humanity into the process of applying it,” he said.

Dr Hamid also warns that artificial intelligence programs may be able to learn and alter their recommendations in ways not intended or foreseen by their creators.

She suggests that policies and standards for data collection and testing of medical AI technologies are required to keep such technologies in check.

Meanwhile, privacy concerns have been cited with regard to facial recognition features.

The Strong Room team does not take privacy lightly. Firstly, consent is very important, with their facial recognition system being opt-in. It has a 94% opt-in rate across pharmacies, with just two out of every 30 patients opting out.

Meanwhile the way their data is stored reduces the risk of a privacy breach, as patient images technically aren’t stored as images.

“It’s like a biometric identifier. So from an engine perspective, it’ll look at Kieran and recognise him as 010010. And then if it looks at Chris it’ll be like 11010,” said Mito.

Durre added: “To make sense of these identifiers, you’ve actually got to be using the facial recognition engine and so it can’t be compromised by just pulling the data. You’ve actually got to be running the software for it to make any sense.”

Mito said within the pharmacy setting itself, “once we can roll out this authentication feature, it should actually make each terminal more secure from a cybersecurity breach”.



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The future for AI in pharmacy

Over the next couple of years, Mito predicts AI is going to play an increasingly larger role as there are larger demands on pharmacists to dispense safely and more efficiently.

“You have two sides where AI will be deployed at a larger scale. First is for compliance and audit purposes, so smarter biometric solutions for patient and pharmacist identification become more seamless,” he said.

“The second side is more around quality of care, with augmented decision support tools such as FRED AI Directions. We [will] see more of these tools introduced over this period of time from various players in the market.”

Searching further into the future, Mito predicts pharmacies will start more regularly deploying AI diagnostic, screening, and monitoring tools with other healthcare providers to get a more holistic view of a patient’s condition.

“This will especially be prevalent for patients with chronic conditions or from individuals who want to live at home longer,” he said.

Feldschuh believes the digitisation of pharmacy is here to stay.

“It’s the not the way of the future, it’s here now. COVID-19 has accelerated everything unfortunately, these trends are already here,” he said.

“It just means it’s got to be going much quicker. Just like with telehealth, it’s so obvious. There’s no going back.”

But Naismith doesn’t believe the Hollywood hype, emphasising that it’s a long way to go before AI could ever replace a pharmacist.

“I see AI not as ‘artificial intelligence’ but as ‘augmented intelligence’: it’s really giving you a helping hand, using technology to make it easier for you to do the repetitive tasks, increasing your safety by using Big Data and bringing it together,” he said.

“If you use that technology and leverage it for your patients, I think the outcome for your patients will be better.” ■

REFERENCE

1. The Opportunities and Risks of Artificial Intelligence in Medicine and Healthcare, Dr Sobia Hamid, The Babraham Institute, University of Cambridge. 2016. https://www.repository.cam.ac.uk/bitstream/handle/1810/278276/Hamid_2016.pdf?sequence=1&isAllowed=y