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PHARMACY INNOVATION

The Evolution of New Trends



EVOLVE

evolve

Embracing Ventures and Orientating Leaders to Value Expanded Scope.

mission

Focusing on pharmacy's expanded scope of practice to promote student collaboration and empower them towards better patient care.

vision

Developing a culture geared towards nurturing future pharmacy professionals in the interest of improving health outcomes and ensuring patient-centered care.

values

Surpass, Cultivate, Optimize, Passion, Empower.

Artificial Intelligence in Pharmacy

Andrew Chen (2T2), Event Coordinator

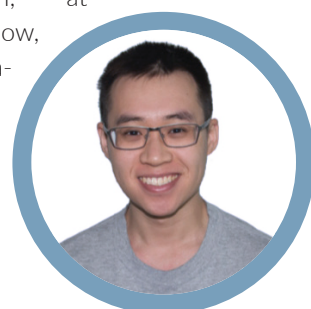
In the short span of a few decades, computers have become ubiquitous. In that time, computing power has increased exponentially. With the advent and widespread adoption of smartphones, practically every pocket is now filled with a device capable of immediately accessing an incredible amount of information. The result: the widespread computerization of practically every field in existence. Pharmacy is no exception.

Artificial intelligence (or AI) is poised to be the next technological revolution. As computers and software continue to advance, AI development has made leaps and bounds. Computers can now generate and analyze data, come to conclusions, and make decisions. As time goes on, their capabilities will only increase.

What does this mean for pharmacy? Will it replace pharmacists? Or will it augment and improve their

role in healthcare? It's hard to tell. It's entirely feasible that within the next couple of decades, computers may become better than humans at many pharmacy-related tasks. Dispensing can already be done with greater accuracy and speed by automated systems than any human – services like PillPack (recently acquired by Amazon) already do this. The natural assumption, then, is that these automated systems will be able to replace more and more of the human pharmacist's job.

However, there is one thing that is likely irreplaceable: human interaction. The value of human interaction, at least for now, is immeasurable. A community pharmacist is





Artificial Intelligence in Pharmacy

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accessible and can offer invaluable information and discussion for a patient. Much like how independent bookstores are surviving and thriving in a world where eBooks and Amazon exist, community pharmacies can carve themselves an important role in our society and provide the human aspect that AI or technology-based pharmacy services cannot offer.

Knowing this, community pharmacies and pharmacists must strive to provide this human connection to their patients – it will not be enough to merely fill and refill prescriptions. The value that pharmacists provide will not be the drugs that they have behind them, rather the information, judgement, counselling, face-to-face discussions, personal knowledge, and other intangibles that they can provide to patients. Perhaps these tasks can also soon be performed by AI – it's not hard to imagine.

For the time being, pharmacists can use these technologies to assist them in fulfilling their goals of patient care and outcomes. Patient health records, drug information, and other data can be streamlined and made more efficient, accessible, and useful. Drug therapy problems can be more quickly identified and solved; further strategies to better improve patient outcomes can be discovered. The pharmacist's focus can shift from the prescription to the patient, allowing pharmacists to deliver the highest quality of care. Ultimately, the development of AI in the field of pharmacy can only be a good thing – it's only a matter of time before we get there.

Opioid Pill Program



Simran Mann (2T1), Event Coordinator

Opioids can be legally prescribed by certain healthcare practitioners for indications including pain associated with surgery, a chronic condition, or cancer therapy. However, opioids can also be illegally shared or sold among individuals without prescriptions. The illicit use or misuse of this class of drugs has contributed to the opioid crisis Canada is currently struggling with.

Drugs on the illegal market often contain fentanyl, which can be fatal even in extremely small doses. Many individuals using illicit drugs have no idea how much fentanyl has been incorporated into what they were sold. Furthermore, fentanyl is hard to trace, see, or smell without the right equipment.

The risks of these drugs are often overlooked as individuals become addicted to the altered state of mind and mood, such as immediate euphoria, that results from its use. More than eight thousand Canadians have already lost their lives due to opioid misuse since 2016 (1).

To help combat this crisis, Vancouver has launched the first ever opioid pill program. The aim of this not-for-profit program is to reduce deaths due to overdose in users by supplying them with pharmaceutical-grade hydromorphone tablets and a safe location to ingest them. The pilot program is able to supply fifty individuals with hydromorphone tablets at a time as the individuals are required to ingest the pills under the supervision of site staff (2).

This program is an expansion of existing programs in Vancouver which combat illicit drug overdoses by supplying patients with injectable opioids. Critics have suggested that individuals may be able to tell the difference between hydromorphone and heroin, and therefore cease to use the program. However, some studies have suggested that users cannot actually distinguish between the two (3).

Hydromorphone tablets are relatively affordable making this program more cost effective than the existing injectable programs. The pilot will be further studied as this is the first program to use pills instead of injectables. The goal of the program is to eventually progress to allow individuals to come into the site to collect the appropriate pills and take them elsewhere to ingest. This will allow more individuals to be treated at once and further minimize costs through a reduction in onsite supervisors.

While Ontario currently does not have any such program, it is still important to review local strategies to combat this crisis, which include the Naloxone program, the needle exchange program, the Fentanyl patch for patch program and appropriate prescribing and monitoring.



Are you ready for the new standards for non-sterile compounding?

Clarence Lam (2T0), President



The Ontario College of Pharmacists Council held a meeting on December 11th, 2017 to discuss changes in pharmacy practice (4). Among the approved changes is the adoption of Model Standards for Pharmacy Compounding of Non-Sterile Preparations, which was developed by the National Association of Pharmacy Regulatory Authorities (NAPRA) (4). The College Council is currently working with pharmacy regulators across Canada to establish an appropriate implementation date (5).

So what are these standards and how will it affect pharmacy practice?

These model standards include a wide variety of requirements for all levels of non-sterile compounding.

For example, all compounding personnel (pharmacy managers, department head, pharmacists, pharmacy technicians) are to be responsible for knowing and performing their roles and responsibilities in accordance with the model standards and requirements for their pharmacy regulatory authority (6). As well, training and skills assessment, policies and procedures, facilities and equipment for non-sterile compounding will need to meet these model standards (6). There are also product and preparation requirements such as beyond-use-dates (BUD), dating methods, master formulation records, compounding ingredients, compounding records, storage, incidents and accidents that will need to be met (6).

Quality assurance programs must also be developed and implemented within each pharmacy.

These standards will apply to any pharmacy that is involved in non-sterile compounding, no matter the frequency or quantity compounded. These model standards will apply to all non-sterile compounding by pharmacy staff, but not every standard will apply depending on the practice setting (7).

How can pharmacies prepare for the upcoming implementation of these model standards?

Pharmacies can prepare themselves for these standards by reviewing and becoming familiar with the model standards and guidance documents that are available on the NAPRA websites (8). Pharmacies can also conduct self-assessments to identify and gaps between their current practice and the new standards. If gaps are identified, the NAPRA guidance documents can provide information on how these standards can be achieved (7). The NAPRA guidance documents also provide details on performing risk assessments to identify requirements needed to minimize contamination of compounded products and to provide protection for compounding personnel (7). With this information, pharmacies can begin to work on addressing these gaps by implementing policies and procedures to improve compounding processes.

The aim of NAPRA's model standards are to help pharmacists and pharmacy technicians achieve high overall quality and safety of non-sterile preparations (7). Once each provincial/territorial pharmacy regulatory authority has adopted these standards, pharmacies will need to work hard to implement these standards to ensure patient safety.

Are Ontarians Using Pharmacy Expanded Scope Services?

Bobby Gill (2T2) Class Representative



Expanded scope services aim to improve healthcare outcomes by strengthening the relationship between pharmacists and patients through improved treatment accessibility and awareness (9). In the past decade, a variety of expanded scope practices have been developed to grant pharmacists a more active role in ensuring the well-being of their patients – but how widespread has the use of these services been in Ontario thus far?

One example of an expanded scope service provided by Ontario pharmacists is the MedsCheck Annual Program. This was initially established in 2007 for Ontario residents taking three or more prescription medications for a chronic condition (10). This is a voluntary program whereby the pharmacist engages in an interview with the patient to review their medications and provide them with an updated medication list (11). One study revealed that participation in the MedsCheck Annual program has increased over a six-year period since its implementation in 2007, with 1 in 9 Ontarians receiving MedsCheck Annual reviews by 2013 (12). It is also projected that MedsCheck reviews will become integrated into other healthcare sectors. For exam-

ple, one study analyzed patient benefits of MedsChecks in an ambulatory care setting (11). The study found that most patients learned something new about their medications during the MedsCheck sessions and gained a better understanding of their medication therapy (11). Additionally, the study demonstrated that the MedsCheck records benefitted ambulatory care physicians by shortening their medication reconciliation sessions by an estimated mean of 7.9 minutes (11).

In September 2011 the Ontario government launched the Pharmacy Smoking Cessation Program, which enables pharmacists to aid patients that wish to quit smoking (13). This program allows pharmacists to provide quit-smoking materials as well as accessible one-on-one support to Ontario Drug Benefit recipients through regular counselling sessions (14). In October 2012, the program was further developed to allow pharmacists to prescribe Ontario-funded smoking cessation medications such as varenicline and bupropion in conjunction with counselling sessions (13). One study analyzed the integration of the Smoking Cessation Program in Ontario two years after its introduction and found that there has been a steady

increase in enrollment since 2011 (13). The study also demonstrated that registration in the smoking cessation program follows a cyclic pattern, with increased enrollment in January (coinciding with New Year’s resolutions) and decreased registration during summer months (13).

As of 2012, pharmacists can also administer vaccinations and injections to individuals aged five or older, with the aim of improving accessibility and increasing vaccination rates (15). Initially, this Bill only allowed pharmacists to administer the influenza vaccine under Ontario’s Universal Influenza Immunization Program (15). Ontario experienced a net increase of 468 666 influenza vaccinations within one year of providing pharmacists the scope to administer influenza vaccines (16).

Overall, expanded scope service uptake in Ontario appears promising. However, it is highly likely that new services will be introduced over time and current services will be amended to increase feasibility and uptake.

Pharmacists are playing an expanding role in the delivery of quality, patient-focused care.

	BC	AB	SK	MB	ON	QC	NB	NS	PEI	NL	NWT	YT	NU
Renew/extend prescriptions	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	✗
Change drug dosage/formulation	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	✗	✗
Make therapeutic substitution	✓	✓	✓	✗	✗	✗	✓	✓	✓	✓	✗	✗	✗
Prescribe for minor ailments/conditions	✗	✓	✓	✓	✗	✓	✓	✓	✓	✓	✗	✗	✗
Initiate drug therapy independently	✗	✓	L	L	✗	✗	L	L	✗	✗	✗	✗	✗
Order and interpret lab tests	✗	✓	P	P	✗	✓	P	✓	P	✗	✗	✗	✗
Administer a drug by injection	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✗	✗	✗
Regulated Pharmacy Technicians	✓	✓	✓	L	✓	✗	✓	✓	✓	✓	✗	✗	✗

Aimovig: A New Biologic for Migraines

Pauline Tram (2T0), Webmaster



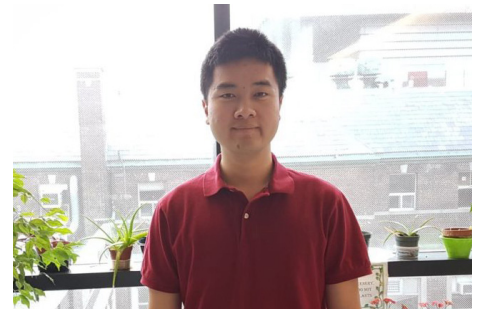
One of the most common, underdiagnosed disorders is migraines (17). Many people suffer from it each day (17). Migraines can disrupt an individual's daily function (17). Two of the most common types of migraines are migraines with aura and without aura (17). Some patients take analgesics, like acetaminophen, frequently which can lead to medication overuse headaches (17). Migraines are considered frequent if they occur in ten or more calendar days per month (17). Fortunately, triptans is another class of drugs that can be used to treat headaches instead of analgesics (17). However, based on anecdotal experience, some patients may not find it effective or have to use it very frequently for efficacy. Other options, such as monoamine oxidase inhibitors (MAOI), are poorly tolerated (17).

Fortunately, this past August Health Canada approved a new class of drugs, calcitonin gene-related peptide (CGRP) receptor blockers, for the treatment of migraines (19). This new monoclonal antibody is produced by Novartis, and people in the States have already been using it (19). It is believed that when CGRP, a protein present in the brain, is released, it can cause inflammation of the meninges (structure that covers the brain) (19). Thus, by blocking the CGRP receptor, it can help prevent a migraine from occurring as inflammation is decreased (19). Aimovig (erenumab) is a self-administered monthly injection (19). As of this past December, Aimovig is now available in Canada (20). There have been clinical trials and cost effectiveness studies done to prove its affordability and efficacy.

One of the clinical trials found that 70mg or 140mg of erenumab significantly decreased the occurrence of migraines and use of acute migraine-specific medication over 6 months compared to placebo (21). The study randomized 955 patients into 3 different groups (21). Erenumab had similar adverse effects to placebo, such as nasopharyngitis (21). More studies need to be done to determine long term side effects of erenumab (20). Another trial called ARISE (phase 3 study), published in SAGE journals, randomized 577 patients to placebo or 70mg of erenumab to treat headaches (22). Overall, it also demonstrated that 70mg of erenumab used monthly significantly decreases the frequency of migraines and use of acute migraine-specific medication (22). Erenumab costs \$6900 each year (23). In the cost-effective analysis, it was found that erenumab may be cost effective for patients who have chronic migraines, but it may not for acute migraines (23). However, productivity costs still need to be looked at. With the launch of this new biologic in Canada, we shall see how popular the drug will be.

HOPE campaign

ANDREW TU, 2T2



What is an expanded scope service you would like to see pharmacists practice in the future?

I would like to see the scope of pharmacists expand to include prescribing authority for medications involved in treating minor ailments like allergies, or cold and flu symptoms. I think this would improve patient accessibility and reduce the wait times experienced at physician offices. After all, pharmacists are medication experts!

SALLY CHEN, 1T9



Where do you want to see pharmacy in Canada go?

I really think all community pharmacies eventually will have a clinic inside that's more focused on non-dispensing service (finance is another aspect). A patient could come in for an appointment and have a whole care plan for them and a pharmacist could follow them continuously. Even if it's a chronic condition like heart disease, diabetes, it's like a continuation of care we're focused on. Many independent pharmacies are offering these services now, which is leading pharmacy in Canada in a direction which is different from other parts of the world.

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