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Group medical visits facilitated by primary care physicians were found to be a cost-effective and equitable way to deliver early intervention services and support patients with mild-to-moderate depression and anxiety. Article begins on page 316.

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ON THE COVER
Self-management training in cognitive-behavioral therapy: A project in Victoria
To help address the lack of access to cognitive-behavioral therapy in Victoria, family physicians were trained by psychiatrists to facilitate CBT-based training to give patients tools to self-manage their condition. Read more about this project, beginning on page 316.

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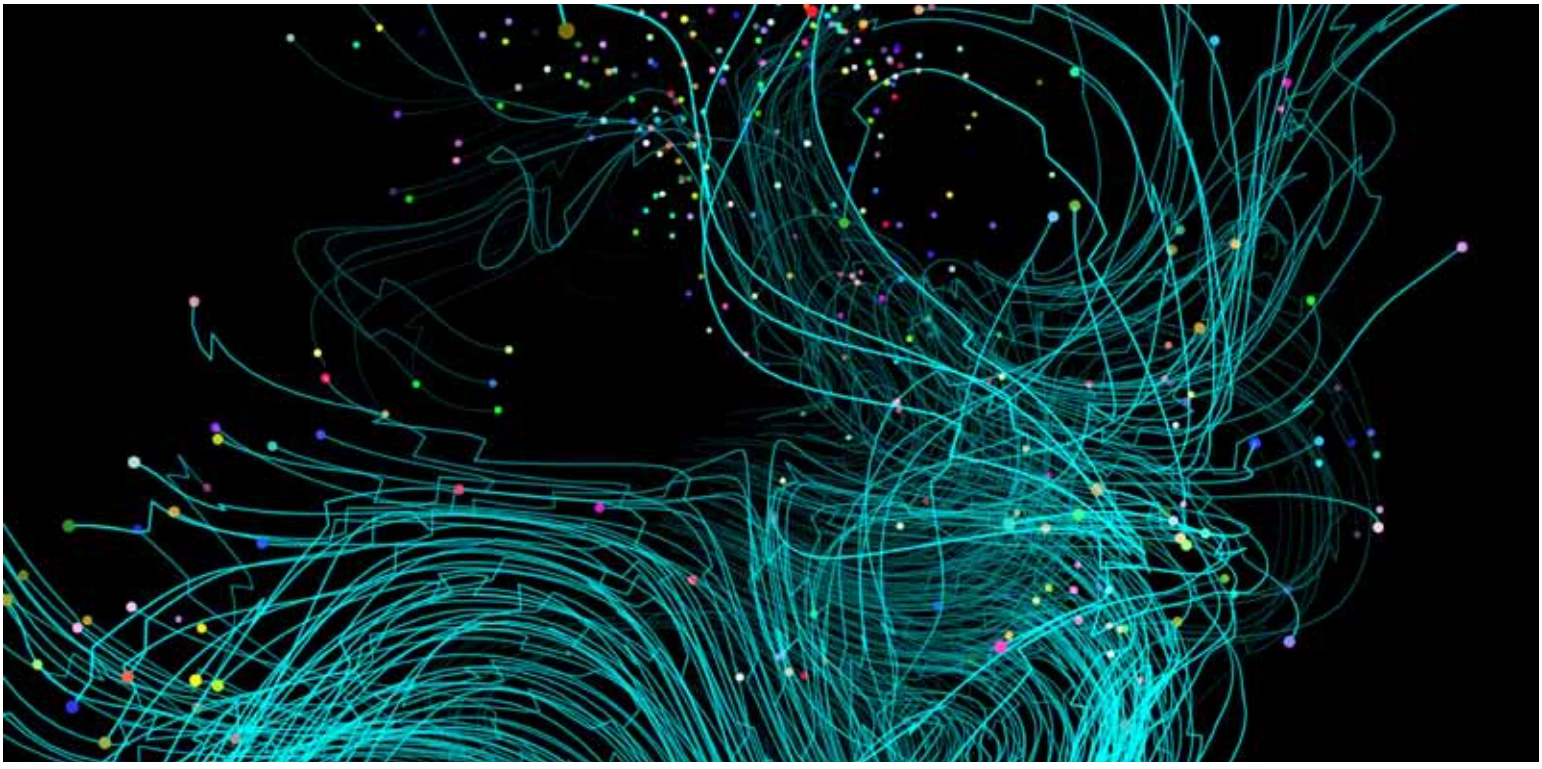

The revolution is here: Artificial intelligence and machine learning are being applied to medicine, though there are considerable challenges ahead. Article begins on page 325.

CLINICAL

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The secret to Icelandic health and happiness

Icelandic police officer: "Would you care to explain why you have three sheep in your car?"

Me: "I rented the economy car so the fourth one wouldn't fit."

I spent 2 weeks in Iceland this summer. Not only was I looking forward to viewing that country's untouched natural beauty (which we drove around and polluted with fossil fuels), but I was very curious to meet these remarkable islanders. Iceland consistently ranks high on worldwide health scales. According to the 2019 Bloomberg Global Health Index, Iceland is the world's third-healthiest country. Canada ranks sixteenth. Iceland also rated fourth in the 2018 World Happiness report.

I began my study of these healthy, happy locals as I emerged jet lagged from Icelandic Air flight one (maybe it was two). My first opportunity for evaluation was the car rental attendant who much to my surprise didn't have blond hair or blue eyes. I gained his trust by smooth small talk.

"How will traffic be?"

"Shouldn't be bad as many people are at the island festival."

"So Icelandic people like festivals?"

"I wouldn't know as I am Polish." (Poles make up 3% of the population.)

Clearly, I would have to dig deeper.

Icelandic people love hotdogs, which don't appear on any top 10 healthy lists.

After finding our bed-and-breakfast, which wasn't easy as it is common to get directions in Iceland such as, "Our road isn't on GPS so find the second gate past the two sheep," I decided to do some research.

Perhaps, I thought, the secret to Icelanders' health and happiness is the health care system. However, similar to our own system, in Iceland health care is a publicly funded and divided into health regions. They also have had problems with retention of physicians and other health professionals due to lower salaries than other Scandinavian countries—so I guess health care isn't the reason for their happiness after all.

I thought, maybe the answer lies in Iceland's natural wonders. Mountains, rivers, and waterfalls (which in Icelandic is a *foss*) are plentiful. I saw Dentalfoss, Permafoss, Candyfoss, Jackfoss, and more. But BC is beautiful as well—it even says so on our licence plates.

How about bad habits? Smoking rates in our two countries are similar, and when it comes to alcohol, Icelandic people are descended from Vikings so horns of ale abound. I decided the answer must lie in the local diet so I scanned in detail the first restaurant menu I was given—mostly lamb, fish, and cheese. Farther down the list I noticed I could order shark, whale, horse, and puffin. Other cultures consume the first three, but cute little puffins? (By the way, it takes a few to make a meal.) Fruit and vegetables are rare, likely due to the fact they are hard to grow on cold volcanic rock. Icelandic people also love hotdogs, which don't appear on any top 10 healthy lists. I had one, which was delicious mostly due to the crumbled Icelandic delicacy lining the bun—I think they are locally know as *Doritos*. So the mystery isn't revealed in the diet.

Perhaps the people are in better physical condition. I did notice a lot of pools and gyms. They also love soccer (football) and 10% of the population accompanied their team to last year's World Cup. I haven't heard of any famous Icelandic cyclists as their 90 km per hour paved roads don't have shoulders, so they are probably all dead. But Canadians are a pretty fit bunch as we all play hockey. (Well, I don't, but the rest of you do.)

So maybe the answer was to be found in a couple of other interesting Icelandic facts. Iceland has the lowest population density of any European country at three people per square kilometre. Also, Icelandic couples often don't get married—they just don't see the need for it.

Perhaps the secret to health lies in the abundance of sheep, I next wondered. You can hike up a remote mountain, and around some corner sitting in a crevasse will be three sheep staring back at you. Apparently the farmers put them out in the late spring and round them up in the fall. They are all tagged to show which farm they are from, so the mischievous part of me wanted to pack a few of them in my car, drive them to the other end of the country, and release them there. The chance of being pulled over by police was slim; I saw only two officers (they don't carry guns) during the whole trip and, you guessed it, it was at a bakery (donut shop). However, Canada also has a lot of sheep and even more cows, so I don't think the answer lies in cloven hoofs.

So after 2 weeks of extensive scientific study I concluded the secret to health and happiness is this: don't get married, don't have neighbors, do eat puffin. Either that or drink like a Viking. ■

—DRR

Transitions

Every year across the country there are millions of photos taken and shared at the beginning of the school year, marking the passage of time in a unique scholastic font. This happens in our household every September, and gradually the number of photo subjects decreases with each matriculation. Our youngest ones are in grade 12, and they went for their actual graduation photos this weekend. That just seems weird and too soon, but it is a fact of life.

We mark births, marriages, graduations, birthdays, anniversaries, and reunions with photos and proud social media posts and emails. They seem like happy things to document and we take photos and send details simply as a matter of course.

But there are other natural milestones that we are less likely to mark and share: an elderly person's last day in their own home, the beginning of the last day in the office, the last surgery performed, the slow or not-so-slow change from brown to grey, the first set of cheaters, the last moments of life. I mean, people do document these things, but sharing them proudly seems a bit more edgy, or taboo, or not fun, or just in bad taste.

I've been thinking that we should honor these transitions too. As humans and biological creatures, we are always transitioning. In life, as we get older, people tend to just become more invisible, especially women. We exist, we keep on going, but for most people, it's as though there is a mute on being interesting enough to warrant updates, or we think that maybe because we aren't as youthful we wouldn't want to appear unattractive, having let ourselves go. We kind of become hangers onto our kids' or associates' transitions and ignore our own. Think about those lists of people we lost that they trot out at the Oscars every year. Most of those people lived for much longer *after* their careers than during them, but we don't think about that part of their life as being newsworthy or important.

I want to start looking at these natural, gentle declining transitions as being just as positive as starting a new job, or getting a promotion, or having a baby.

In a medical career, we go from new recruit to junior staff to senior staff to retired (hopefully) emeritus. The time during which we are working passes by, and except for maybe some posed shots at a retirement party, or lifetime achievement awards, we usually don't mark the declining transitions in work except en passant.

I don't know. I guess as I see myself inching closer to retirement, I want to start looking at these natural, gentle declining transitions as being just as positive as starting a new job, or getting a promotion, or having a baby. Anyone can be young; not everyone gets to be old. I want to have pictures of my wrinkles and grey hair in all their non-glory. I want to know that as I get a thicker middle and become more hobbly-kneed that I'll accept that as a kind of marker of making it to a certain stage and be okay with the consequences and decisions I'll have to make. I want a party when I go into an old age home, when it eventually happens. And I want someone to tell the story of my last days even if that transition is not pretty.

Life is short, shorter for some than others. Careers and families transition naturally, like a bell curve of what we think of notability. Let's not avoid embracing the downhill side of that curve. Sunsets are often longer and more beautiful than sunrises. ■

—CV

Healthy aging

"Aging is an extraordinary process where you become the person you always should have been." —David Bowie

Aging is an inevitable part of life. Each of us deals with the changes brought on by life differently—some embrace them, while others fight them, seeing them as a herald of physical or cognitive limitations and challenges. No matter your view, we can all agree that aging is unavoidable.

The experience of aging is an individual journey. How we achieve healthy aging is of popular interest, particularly as it relates to "aging in place" initiatives across the country aimed at supporting seniors who wish to remain in their homes.

There are definitely a number of factors out of our control that contribute to aging, such as genetics and the presence of multiple medical conditions. However, diet and exercise also play important roles in the experience of aging well, and we do have control over these factors. Maintaining our mental health and limiting our substance use are increasingly being explored as contributors to overall body health and wellness.[1]

The most graciously aging person I know is my dance teacher who at 83 years of age is still dancing the hula on stage with her aging dance group. Her smile is bright and welcoming. Her arthritic hands are gracious and evoke emotion and meaning with each motion. Her knee range isn't the same as it was 8 years ago before she was hit by a car, and her back doesn't move as well as it did before she fell and broke three vertebrae last winter, but there she is on stage, in her flowing dress, smiling and entertaining us all. It would never occur to her to stop dancing; it has been her life. Compare this with a patient of the same age with diabetes, hypertension, chronic renal disease, and arthritis. His idea of exercise is walking from his chair to the fridge and back, his best friends are his TV remote and reclining chair, and he continues to make poor food choices. These individuals have different expectations and attitudes on aging.

So what can we as individual practitioners do to encourage active healthy aging in our patients? I would argue that making time to begin the conversation is a first step. A healthy diet really does make a difference to disease development, but also to weight and muscle mass maintenance. Regular exercise, as little as 4400 steps a day, can help increase life expectancy.[2] Exercise in general improves our mental health and contributes to control of or even elimination of a variety of chronic diseases and improves frailty.[3] If we, as trusted advisors, consistently incorporated diet and exercise questions into each patient encounter, and consistently shared the message that these vitals are as important as heart rate and blood pressure, we could shift patient expectations and motivate even the most at-risk patients to effect meaningful change one step at a time.

We need to shift the dialogue on aging from a vision of fading into the sunset to an active maintenance program akin to properly maintaining a vintage car.

As our population demographic ages we should highlight the benefits of healthy aging. Society is beginning to recognize the limiting effects of agism. We need to shift the dialogue on aging from a vision of fading into the sunset to an active maintenance program akin to properly maintaining a vintage car. It is just too easy to park the body out back, enjoy the easy life, and let the grass grow over the tires. ■

—Kathleen Ross, MD
Doctors of BC President

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Nail-gun eye injuries

Nail-gun eye injuries are a relatively common cause of severe ocular trauma and can take the form of blunt trauma or open-globe injury with penetrating or perforating trauma. These injuries tend to occur in younger individuals with a high risk of subsequent blindness or very poor vision, often accompanied by chronic irritation and pain. Between 2009 and 2018, 198 WorkSafeBC claims were accepted for nail-gun-related injuries. The injured workers were a mean age of 34 years, most were males, and 75% were employed in a construction trade.

Pneumatic nail guns, which are relatively easy to use and can significantly increase productivity, are commonly used in the construction industry. The gun fires a nail, which, at high velocities of up to 160 km per hour, can act as a missile. The nail can injure the eye directly, via ricochet after striking a hard surface or metal, or the gun might backfire or jam. These guns are controlled by a finger trigger and a contact safety tip.

Diagnosis

On presentation, obtain a careful history and assess visual acuity. In a high percentage of cases, the nail may have lodged firmly in the eye. Often, however, the worker removes the nail from the eye at the worksite. Initial slit lamp examination may reveal a sclera or corneal penetration, often including prolapsed uveal tissue; hyphema, iris tears including iridodialysis (the iris is disinserted from its root), or lens trauma. An intraocular foreign body may be detected by CT scanning or, in selected cases, by gentle ultrasonography, taking care not to put pressure on the eye.

This article is the opinion of WorkSafeBC and has not been peer reviewed by the BCMJ *Editorial Board.*

Treatment

Treat the patient with anti-tetanus, if required, and intravenous antibiotics. Arrangements should be made for urgent examination under anesthesia.

If the injured worker has not removed the nail, it should be surgically removed from the eye as gently as possible, followed by primary suturing of sclera or corneal wounds. Prolapsed uveal tissue may need to be reposited or excised. If there is marked lens damage, primary lensectomy may be necessary. Subsequently, the patient will need to be assessed by vitreoretinal services. Common posterior segment complications include hemorrhagic choroidal or retinal detachment. Pars plana vitrectomy, with or without gas or silicone oil, may be required. Retinal tears may need to be surrounded by laser.

The nail can injure the eye directly, via ricochet after striking a hard surface or metal, or the gun might backfire or jam.

Secondary complications may ensue that require further surgery such as penetrating keratoplasty for corneal scars, cataract extraction, and glaucoma valve implant for secondary glaucoma. Scar tissue may form in the vitreous gel or on the retina (proliferative vitreoretinopathy) causing tractional retinal detachment, often requiring multiple surgeries. Visual results may be poor.

Prevention

Nail-gun injuries can be prevented with strict adherence to established safety measures, including proper training and education of nail-gun operators. Some studies have found a high percentage of nail-gun injuries among workers from overseas with poor English-language skills.

Wearing safety glasses and a hard hat are mandatory, and workers must not disable safety features of the gun to increase speed.

The risk of nail-gun injury is doubled when a multiple-shot contact trigger is used rather than a single-shot sequential trigger. The latter forces the worker to push the safety tip against the wood and then pull the trigger to shoot one nail, whereas the former allows the worker to squeeze the trigger before pushing in the safety tip, resulting in "bump" firing.

All nail-gun injuries at work must be reported. Nail guns are useful tools to increase productivity, but they are also potentially lethal weapons that need to be treated with respect to prevent life-changing ocular injury.

For more information or assistance with an injured worker with a nail-gun eye injury, contact a medical advisor in your nearest WorkSafeBC office. ■

—Michael O'Donnell, MD, FRCSC
WorkSafeBC Ophthalmology Specialist Consultant

Additional reading

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Collaboration opens the door to secure texting communication

For most people, texting has become second nature as a fast, easy way to communicate. But the technology hasn't always kept pace with the complexities of health care. Physicians know, for example, that confidential information about patients cannot be transmitted via text messages.

But that's changing. New privacy-compliant texting platforms are making it possible for Canadian doctors to use their smart phones to conveniently and securely exchange information about patient care.

In 2018, physicians working at the University Hospital of Northern BC (UHNBC) in Prince George agreed that texting could be a valuable tool for their day-to-day work. While texting does not replace in-person clinical conversations, it provides many advantages to support communication: it is less intrusive and more responsive than a phone call or voicemail, and it is a simple, quick way to access and share information, especially when a timely response is needed.

With this potential in mind, seven UHNBC physicians representing the medical staff approached Northern Health's information technology (IT) department to see if a means of secure texting could be found. Unknown to them at the time, the IT team had already been looking into technology for secure texting. The timing was good: an opportunity for the two groups to collaborate was available through the Specialist Services Committee Facility Engagement Initiative, a BC-wide program that is increasing physician involvement in health authority decision making. It provides funding for physicians to help identify, plan, and lead improvements in their clinical environment and patient care.

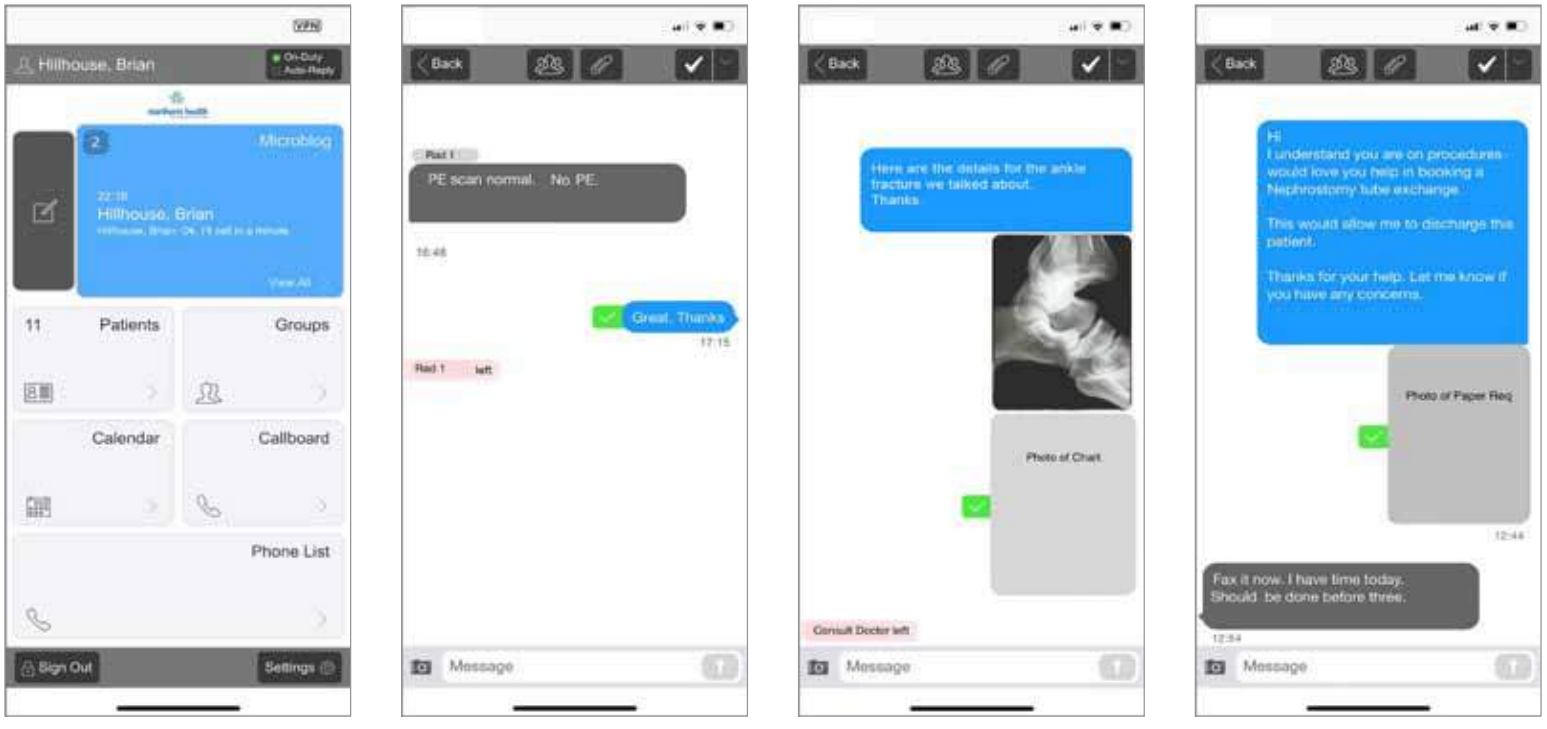
Together with Dr Bill Clifford, Northern Health's chief medical information officer and a former family doctor in town, and Ron Klausing, a project manager for Northern Health IT, the physicians got to work to explore secure texting options. They explained their practical, day-to-day needs that texting could support, and the IT team advised on functionality and appropriate use of the technology. The group settled on an application for purchase by Northern Health that would meet their respective needs as well as BC's privacy requirements.

The benefits

Once in place, the texting application worked better than anyone imagined it would. The app allows physicians to connect to the patient records system, search for a patient's name, and link to their chart. As well, physicians can exchange information and photos securely with each other and other clinical providers for consults and handovers, and communicate with nurses and

This article is the opinion of the Specialist Services Committee and has not been peer reviewed by the BCMJ *Editorial Board.*

The following mocked-up screenshots show various example exchanges using the texting app. These screenshots do not include any patient information. The ankle image is a stock photo.



residents. For example, doctors can alert radiology to prepare for an urgent CT and then receive a text back with the results.

The app's features offer a welcome change for physicians. When using pagers and voicemail, it isn't always clear if a communication has been received, but with texts, doctors get an acknowledgment when a message is read and can move on to focus on other things.

Other features include alerts when a patient is admitted to hospital. Physicians can also access a directory of all Northern Health departments and on-call schedules, and with one click, connect with other doctors across the region. More functionality will be added over time, including notifications for doctors about critical lab results.

Safe and secure

Information sent by text remains secure because it is transmitted through the app but never stored in the app, on the company's software, on the phone itself, or in cloud storage. All information flows through and is stored on Northern Health's servers, with details of conversations retained for legal purposes. Security software is installed on the phone itself and in the app, with a six-digit passcode, facial recognition, and encryption features. Further, Northern Health IT can control the device—including locking or erasing information—if it is lost or stolen.

Collaboration: key to success

Since it was introduced in spring 2019, secure texting has been embraced by more than half the UHNBC physicians and other clinical staff and residents, with further adoption expected over time. While it is not the main or only method of communicating, it is a convenient, secure way of improving the efficiency of physicians' medical practice to support patient care.

Throughout this process, collaboration was key to success. Having physician users work with the IT design team to consider needs from their respective viewpoints ultimately led to higher uptake and satisfaction with this exciting new tool at UHNBC. ■

—Brian Hillhouse, MD
Family Doctor, Emergency Room Physician, University Hospital of Northern BC

News

We welcome news items of less than 300 words; we may edit them for clarity and length. News items should be emailed to journal@doctorsofbc.ca and must include your mailing address, telephone number, and email address. All writers should disclose any competing interests.

Your opinion needed: First Link dementia support services

The Alzheimer Society of BC and the University of British Columbia are working together to evaluate the First Link dementia support services. Physicians working with older adults are invited to participate in a 15-minute survey developed by Dr Julie Robillard and her research team at UBC. The goal of the study is to better understand the strengths and areas of improvement of the First Link dementia support services. You can complete the survey even if you have never heard of or used First Link. If you are interested in sharing your perspectives on First Link or the improvement of dementia support services, please access the survey at http://bit.ly/firstlinkeval. For more information, contact Ms Mallorie Tam, research assistant, Division of Neurology, UBC, at mallorie.tam@ubc.ca. Recruitment ends December 2019.

Do discharge incentives in emergency departments lead to higher readmission rates?

In an effort to address emergency department overcrowding, pay-for-performance incentive programs have been implemented in various regions around the world, including hospitals in Metro Vancouver. But a new study from the UBC Sauder School of Business shows that while such programs can reduce barriers to access for admitted patients, they can also lead to patient discharges associated with return visits and readmissions.

The study looked at over 800 000 patient visits to the four major emergency departments in Metro Vancouver over a 3-year period from 1 April 2013 to 31 March 2016. The study focused on patients with higher acuity levels (triage level 1, 2, or 3). During the first year of the study period, two pay-for-performance incentive programs were in effect, funded by the BC provincial government: emergency departments received a $100 compensation for each discharged patient with a length of stay of less than 4 hours. Emergency departments also received a $600 compensation for admitted patients who spent less than 10 hours in the emergency department.

The government terminated both pay-for-performance programs on 31 March 2014; however, the regional health authority governing all four emergency departments studied decided to internally fund the exact same $600 admission incentive scheme, which continued without interruption. Only the $100 discharge incentive completely disappeared after the government pay-for-performance program was terminated.

"In the past, the extent to which these types of programs affected the length of stay of individual patients was not well understood because previous studies have only examined aggregate performance metrics as they relate to length of stay," says Yichuan (Daniel) Ding, study co-author and assistant professor in the Operations and Logistics Division at the UBC Sauder School of Business. "Our study took a much more granular approach, where we focused specifically on patient discharges that took place within 20 minutes of the deadline for the incentive, because we wanted to know if these patients were discharged to catch the deadline."

The study found that for those patients who were discharged home, there was a significant discontinuity around the 4-hour mark, meaning that there was a significant number of patients who were discharged right before the 4-hour mark. But after the 4-hour mark, there was a decreasing likelihood that a patient would be discharged. This phenomenon was observed in only two of the four emergency departments; the other two did not exhibit this same discontinuity.

"Our study confirmed that this type of financial incentive altered system performance. And in the positive sense, that means that the program is effective because it impacts length of stay for both discharged and admitted patients," says Eric Park, study co-author and assistant professor in the Faculty of Business and Economics, University of Hong Kong. "But when we looked more granularly at the patients who were discharged within 20 minutes before the deadline, we found that one of the four emergency departments had a greater revisit and readmission rate within 7 days—meaning that within 7 days, those patients are more likely to come back and be admitted to hospital. It is possible that this is a signal of premature discharge."

"However, we cannot assert that discharge is premature using this metric alone, especially given that it was only observed in one of the four emergency departments, but it is a potentially worrisome finding," adds Yuren Wang, study co-author with the National University of Defense Technology in Changsha, China.

The study also found that for the case of admitted patients at the 10-hour mark, the discontinuity was even more significant, and it applied to all four emergency departments, not just the two.

"Our recommendations based on this research are that setting an incentive for admitted patients improves length of stay, but the 4-hour benchmark for discharged patients should be implemented with care," says Dr Garth Hunte, study co-author and emergency physician at St. Paul's Hospital in Vancouver. "There is no sense for an incentive to discharge patients that may require admission to hospital." This is consistent with what the hospitals are actually now doing, due to the regional health authorities' ongoing funding of the admission incentive.

The article "Do Financial Incentives Change Length-of-stay Performance in Emergency Departments? A Retrospective Study of the Pay-for-performance Program in Metro Vancouver" is available in the journal *Academic Emergency Medicine*.

Commonly used antibiotics may lead to heart problems

Scientists have shown for the first time a link between two types of heart problems and one of the most commonly prescribed classes of antibiotics.

In a study published in the *Journal of the American College of Cardiology*, researchers at the University of British Columbia, in partnership with the Provincial Health Services Authority's Therapeutic Evaluation Unit, found that current users of fluoroquinolone antibiotics, such as Ciprofloxacin or Cipro, face a 2.4 times greater risk of developing aortic and mitral regurgitation, where the blood backflows into the heart, compared with patients who take amoxicillin, a different type of antibiotic. The greatest risk is within 30 days of use.

Recent studies have also linked the same class of antibiotics to other heart problems.

Some physicians favor fluoroquinolones over other antibiotics for their broad spectrum of antibacterial activity and high oral absorption, which is as effective as intravenous treatment.

"You can send patients home with a once-a-day pill," said Mahyar Etminan, lead author and associate professor of ophthalmology and visual sciences in the Faculty of Medicine at UBC. "This class of antibiotics is very convenient, but for the majority of cases, especially community-related infections, they're not really needed. The inappropriate prescribing may cause both antibiotic resistance as well as serious heart problems."

The researchers hope their study helps inform the public and physicians that if patients present with cardiac issues, where no other cause has been discovered, fluoroquinolone antibiotics could potentially be a cause.

"One of the key objectives of the Therapeutic Evaluation Unit is to evaluate different drugs and health technologies to determine whether they enhance the quality of care delivered by our programs or improve patient outcomes," said Dr Bruce Carleton, director of the unit and research investigator at BC Children's Hospital. "This study highlights the need to be thoughtful when prescribing antibiotics, which can sometimes cause harm. As a result of this work, we will continue working with the BC Antimicrobial Stewardship Committee to ensure the appropriate prescribing of this class of antibiotics to patients across British Columbia, and reduce inappropriate prescribing."

For the study, scientists analyzed data from the US Food and Drug Administration's adverse reporting system. They also analyzed a massive private insurance health claims database in the US that captures demographics, drug identification, dose prescribed, and treatment duration. Researchers identified 12 505 cases of valvular regurgitation with 125 020 case-control subjects in a random sample of more than 9 million patients. They defined current fluoroquinolone exposure as an active prescription or 30 days prior to the adverse event, recent exposure as within 31 to 60 days, and past exposure as within 61 to 365 days prior to an incident. Scientists compared fluoroquinolone use with amoxicillin and azithromycin.

The results showed that the risk of aortic and mitral regurgitation, blood backflow into the heart, is highest with current use, followed by recent use. They saw no increased risk aortic and mitral regurgitation with past use.

Etminan hopes that if other studies confirm these findings, regulatory agencies would add the risk of aortic and mitral regurgitation to their alerts as potential side effects and that the results would prompt physicians to use other classes of antibiotics as the first line of defence for uncomplicated infections.

This study was funded and conducted by the Department of Ophthalmology and the Therapeutic Evaluation Unit at the Provincial Health Services Authority.

Lack of racial diversity in cancer drug trials

New research published in *JAMA Oncology* has found a lack of racial and ethnic diversity in clinical trials for cancer drugs.

The study—conducted by researchers from UBC, the University of Texas MD Anderson Cancer Center, the Fred Hutchinson Cancer Center in Seattle, and Baylor University in Texas—raises concerns about the effectiveness of cancer drugs in some patients, especially since genetic differences may affect how well a patient responds to a drug.

The researchers found that fewer than 8% of cancer drug trials reported participation from the four major races in the United States—white, Asian, black, and Hispanic—between 2008 and 2018. Black and Hispanic patients were particularly underrepresented at 22% and 44%, respectively, considering their populations' incidence of cancer. The findings show that the science might not be applicable to the population that's going to receive the medications. The researchers found that both reporting about race in trials and enrolment rates had changed minimally over the decade.

For this study, Dr Jonathan Loree (assistant professor, UBC Department of Medicine, Division of Medical Oncology) and colleagues reviewed all reported trials supporting US Food and Drug Administration oncology drug approvals granted between July 2008 and June 2018. They scrutinized 230 trials with a total of 112 293 participants. They calculated the US population-based cancer estimates by race using National Cancer Institute and US census data.

Although the researchers used US data, Dr Loree says the findings are relevant in Canada, as well. Pharmaceutical companies typically apply for drug approvals through the FDA first, because it serves the largest market, and then submit to the European Medicines Agency and Health Canada. The trials considered in the approvals are usually the same.

Dr Loree also notes that they weren't able to analyze the participation of Indigenous people in trials because there were only 13 patients reported out of a total of 112 000 participants.

The researchers are now looking at whether clinical trials represent the same gender ratio as the general population to ensure the drugs are effective in all people.

Author correction: Ultrasound and hernias

Dr David Konkin, author of the letter "Avoid the routine use of ultrasound in evaluating clinically apparent inguinal and umbilical hernias" (*BCMJ* 2019;7:276) has identified an error. The second paragraph should begin, "It is best to examine the patient standing and then lying supine" (rather than prone).

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Self-management training in cognitive-behavioral therapy skills: A project to address unmet mental health needs in Victoria, BC

Group medical visits facilitated by primary care physicians were found to be a cost-effective and equitable way to deliver early intervention services and support patients with mild-to-moderate depression and anxiety.

ABSTRACT

Background: The total cost of mental health disorders to Canada's economy is estimated to be more than $50 billion annually. Although evidence supports the use of cognitive-behavioral therapy for depression and anxiety disorders, access to therapy is limited. This is especially the case in the Vancouver Island community of Victoria, where depression and anxiety are prevalent but treatment is difficult to obtain. In 2015 the Cognitive Behavioural Therapy (CBT) Skills Group program was initiated to provide early, destigmatizing, equitable, and timely intervention on a large scale and to enhance collaborative care between psychiatrists and family physicians. Funding was provided by the Shared Care Committee with contributions from the Victoria Division of Family Practice and Island Health. Family physicians were trained by psychiatrists to facilitate the CBT-based training to be delivered in 90-minute group medical visits over 8 consecutive weeks. A referral centre was established and participants were asked to sign up online to join a skills group of 15 members.

Methods: Four psychometric scales were used to measure participant depression symptoms, anxiety symptoms, and functional disability: the Patient Health Questionnaire-8 (PHQ-8), the Generalized Anxiety Disorder-7 (GAD-7) scale, the Work and Social Adjustment Scale (WSAS), and the Sheehan Disability Scale (SDS). Participants used these scales to provide preintervention and postintervention self-reports. As well, participants rated the impact of the program and provided qualitative feedback. All participant responses were converted into non-nominal data and analyzed by an external agency (Reichert and

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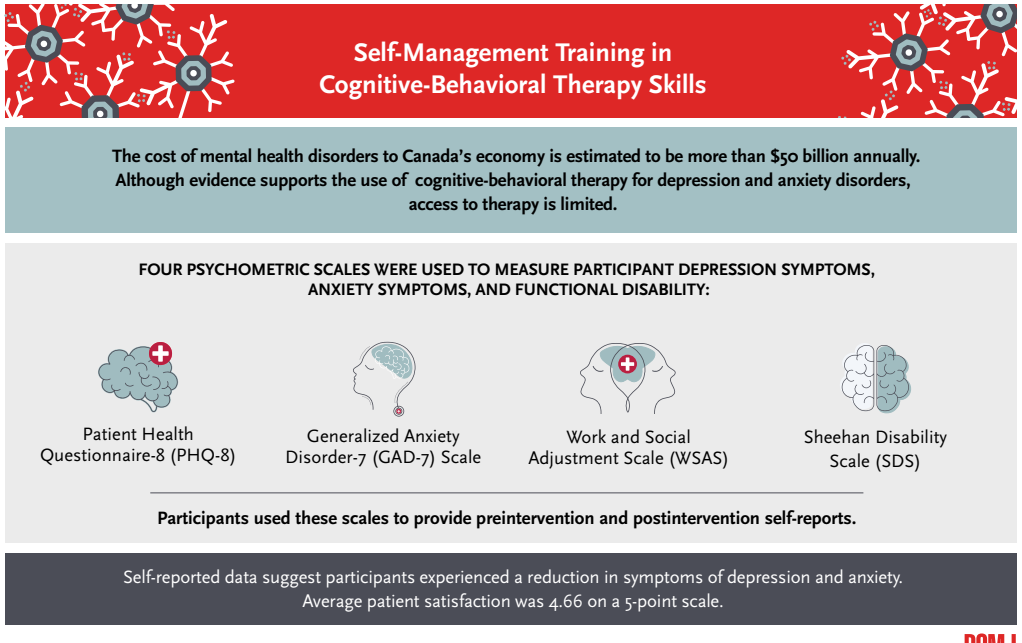
This article has been peer reviewed.



Associates). A wait-time analysis was also conducted partway through the project period.

Results: From September 2015 to April 2018, a total of 2352 participants registered in 149 CBT skills groups. The majority of participants were female (1820) and their average age was 46 years. More than half of participants attended most sessions. Self-reports were collected from 874 of 1403 participants attending six or more of the eight sessions for a response rate of 62%. Mean symptom scores on psychometric scales for anxiety, depression, and functional disability indicated improvement, with many participants demonstrating a shift from moderate to mild levels of symptom severity (n = 802). The average participant satisfaction rating for the program on a 5-point Likert scale was 4.66. The wait-time analysis showed that approximately three-quarters of participants referred had entered a group within 3 months of referral (628 of 832), and approximately one-quarter entered a group within 1 month of referral (204 of 832).

Conclusions: The self-report data analyzed during the project suggest participants in the CBT Skills Group program experienced a reduction in symptoms of depression and anxiety. However, these results must be interpreted cautiously because data were not collected for research purposes but for program quality improvement. A particular challenge encountered during the project was the lack of resources to individually screen and prepare each patient. Consequently, patients who were not a good fit for group CBT delivery (e.g., patients with personality disorder or active trauma symptoms) were occasionally referred. While it may seem costly to use family physicians to facilitate CBT skills groups, the cost of usual care wherein family physicians provide four 20-minute individual appointments ($209.80) was comparable to the per-person cost of the intervention ($197.52), where patients receive 12 hours of physician-led group time, making the skills groups a cost-effective and equitable way to deliver early intervention services. Current limitations in mental health care also make physicians the only viable service providers. Furthermore, having family physicians deliver mental health services may reduce stigma by showing that mental health affects general health and is valued as a vital part of primary care.

Background

Mental health conditions are the leading cause of chronic illness in Canada. In 2016 one in five people were affected by a mental illness, nearly twice the number affected by heart disease and type 2 diabetes.[1] The costs of untreated mental health disorders are immense: individuals suffer poor quality of life, disability, lost productivity,[1] physical health problems, increased mortality,[2] impaired social functioning, and negative impacts on the development and mental health of offspring.[3] The total economic burden of mental health problems in Canada is estimated to be over $50 billion annually.[1]

Mental health services have not kept up with the demand, and access to treatment is a major obstacle to managing this crisis.

Surveys report a high rate of mental health conditions on Vancouver Island.[4] Equally alarming is the steady rise in depression and anxiety each year in this region, as seen by comparing the 2013 prevalence rate of 24.3% with the considerably lower 1992 rate of 3.7%.[4] A recent Canadian study showed that the rise in mental health conditions is growing most rapidly in children and youth, suggesting this trend will continue.[2] Unfortunately, mental health services have not kept up with the demand, and access to treatment is a major obstacle to managing this crisis.

Treatment

A biopsychosocial model is used most commonly to treat depression and anxiety, with treatment guidelines addressing both the biological component (e.g., antidepressant therapy) and psychosocial component (e.g., psychotherapy and self-management skills such as cognitive-behavioral therapy (CBT), mindfulness-based interventions, and interpersonal interventions).[3]

Meta-analyses show that CBT is equivalent to antidepressants in treating depression[5] and most anxiety disorders.[6] Consequently, psychosocial treatments are often recommended as monotherapy for mild-to-moderate anxiety and depression, or in combination with medication for more severe symptoms.[3,7] However, access to psychosocial treatments is extremely limited in the Vancouver Island community of Victoria. While psychiatrists and public mental health teams provide publicly funded psychosocial treatments, the criteria for entry is a very high level of symptom severity, meaning those with mild-to-moderate symptoms are frequently deemed "not sick enough." Treatment from a nonphysician mental health professional such as a clinical counselor or psychologist typically falls under the private system for people with mild-to-moderate symptoms, making cost a major barrier to treatment. This is especially the case for those most in need, as mental health conditions are associated with lower earning potential and socioeconomic status, both as risk factors and as a consequence of such illnesses.[8]

With 1.6 million Canadians reporting unmet mental health care needs each year, a recent Canadian Mental Health Association survey reported that 85% of Canadians felt that mental health services are among the most underfunded services in the health care system.[9]

Since treatment by a physician is covered by the BC Medical Services Plan (MSP), family physicians remain the only viable service providers for many of those with mild-to-moderate anxiety and depression. Indeed, up to 80% of Canadians rely on the primary care system for mental health care.[9] However, family physicians experience many limitations in providing adequate psychosocial treatments for their patients. First, the major family physician shortage in most of BC, including Vancouver Island,[10] leaves family physicians with limited time and resources to adequately address mental health needs. Second, family physicians are restricted to eight 20-minute individual counseling sessions and one mental health planning session per patient (equivalent to 3.2 hours total), as outlined in the General Practice section of the Medical Services Commission payment schedule.[11] Finally, many family physicians have too little experience to provide evidence-based

psychosocial care to their patients, as these skills are not consistently included in family practice training.

Further complicating service delivery is the added burden of stigma concerning mental health conditions. Many people with mental health conditions describe this stigma as more debilitating than the illnesses themselves.[12] Stigma leads to discrimination and disempowerment and can ultimately prevent those who most need services from seeking them.[13] Mental health interventions need to address stigma both when promoting an intervention to patients and physicians and as a treatment target.

While accessing evidence-based treatment is difficult for people struggling with mild-to-moderate depression and anxiety, the Mental Health Commission of Canada has stated that "Investments in evidence-based programs that focus on early and timely intervention can go a long way to prevent or mitigate the impact of illnesses over the life course."[1] The challenge is translating knowledge about treating depression and anxiety into action—specifically, delivering early interventions for mild-to-moderate depression and anxiety conditions.[1,14] Based on suggestions from the Organisation for Economic Co-operation and Development, the World Bank, and the World Health Organization, the Mental Health Strategy for Canada states we must focus on delivering "upstream efforts, timely intervention, improved access to evidence-based treatment, and addressing inequities and the social determinants in transforming mental health care."[1]

CBT Skills Group program

The Cognitive Behavioural Therapy (CBT) Skills Group program was developed to deliver evidence-based primary care treatments for mild-to-moderate depression and anxiety. Our primary aim was to implement a cost-effective and highly accessible service able to provide early, destigmatizing, equitable, and timely intervention on a large scale. Our secondary aims were to enhance collaboration and mentorship between psychiatrists and family physicians, and to expand family physicians' knowledge and confidence in promoting the use of evidence-based psychosocial skills.

Our primary aim was to implement a cost-effective and highly accessible service able to provide early, destigmatizing, equitable, and timely intervention on a large scale.

A team of family physicians and psychiatrists secured funding from the Shared Cared Committee and the Victoria Division of Family Practice to develop curriculum and assist with start-up costs for the program. The team developed 90-minute sessions to be delivered through group medical visits over 8 consecutive weeks:

- Session 1. Introduction to CBT; distress tolerance skills (dialectical behavioral therapy—DBT).
- Session 2. Introduction to mindfulness (mindfulness-based cognitive therapy—MBCT; mindful self-compassion—MSC).
- Session 3. Mindfulness approach to difficult thoughts (MBCT).
- Session 4. Cognitive therapy (CBT).
- Session 5. Introduction to emotions and opposite action (DBT/CBT).
- Session 6. Troubleshooting and motivation enhancement (CBT/motivational interviewing).
- Session 7. Exploring values and value-based specific, measurable, achievable, relevant, time-based (SMART) goals (acceptance and commitment therapy—ACT).
- Session 8. Relapse prevention and moving forward.

The integration of skills seen in the program mirrors recent protocols designed by leaders in CBT approaches such as Barlow and colleagues,[15] and emphasizes psychoeducation and skills acquisition for a primary care population.

A collaborative process was used to train four family physicians to facilitate CBT skills groups. A family physician first observed a psychiatrist facilitating a full set of eight sessions, then took on a minor co-facilitator role for another set of sessions, and finally acted as a major co-facilitator for a third set of sessions. After the training period, family physicians facilitated groups on their own, with ongoing consultation with psychiatrists as needed. Physician facilitators were compensated through MSP with a GMV (group medical visit) code fee. Sessional support was available to the family physician and the mentoring psychiatrist for 30 to 60 minutes of debriefing time per session during the training.

A centralized referral centre was established, embedded within the Victoria Division of Family Practice, and a medical office assistant was hired to manage referrals, communicate with referring physicians, book rooms for groups, and schedule groups and facilitators.

Methods

Prospective participants were screened by referring family physicians, who received information about the CBT Skills Group program through a launch event and written media (e-newsletter, website, brochure).

Exclusion criteria for participants included severe depression, active risk of harm to self or others, cognitive impairment, significant level of substance use, personality disorder that may interfere with group process, and active psychosis, mania, or trauma/dissociative symptoms.

Psychometric scales

Group facilitators provided participants with self-report measures to complete before and after treatment: the Patient Health Questionnaire-8 (PHQ-8), the Generalized Anxiety Disorder-7 (GAD-7) scale, and the Work and Social Adjustment Scale (WSAS).

The PHQ-8 and PHQ-9 are self-report symptom checklists that score each DSM depression criterion from 0 to 3, with the PHQ-8 omitting the final question in the PHQ-9 about suicidal ideation.[16] The original validation studies for the PHQ consisted of 6000 patients and showed identical thresholds for the scoring of depression severity in both the PHQ-8 and PHQ-9.[16]

The GAD-7 is a self-report symptom checklist that scores seven generalized anxiety symptoms from 0 to 3, and has been found to have high internal reliability and validity.[17]

The WSAS is a self-report scale measuring

perceived functional disability on a scale from 0 to 8 (i.e., impairment regarding certain tasks related to work, home, leisure, and social relationships). The WSAS has high internal reliability and sensitivity. It is comparable to the PHQ and GAD-7 in measuring treatment effects, and also measures a distinct functioning factor not captured in the PHQ and GAD-7.[18]

Midway through the evaluation process, feedback led to a change in the measure of functional status from the WSAS to the Sheehan Disability Scale (SDS), as this scale is more commonly used in clinical practice in primary care. The SDS is a three-item self-report. It is a discretized analog measure of functional disability in work, social, and family life that has high internal reliability and construct validity in primary care[19] and is sensitive to treatment effects.[20]

Participants were also asked to rate their experience in the program and the impact of the program on them by responding to statements such as "I felt welcome in the group" and "I am more confident managing emotions." They were asked to do this using a Likert scale ranging from 1 for strongly disagree to 5 for strongly agree. All program completers were also invited to submit written qualitative feedback, and volunteers were interviewed in focus groups by independent evaluators. Demographic and wait-time data were collected. Ethics approval was not sought because the project was conducted for quality improvement purposes under the auspices of the Shared Care Committee and the Victoria Division of Family Practice, not under the auspices of an academic institution.

Data analysis

All participant responses were converted into non-nominal data and analyzed by an external agency (Reichert and Associates). Results from the four psychometric scales (PHQ-8, GAD-7, WSAS, and later SDS) completed by participants before and after the program were compared. Symptom response rates were also obtained, with "full response" defined as a 50% or greater reduction in symptoms, and "partial response" defined as a 25% to 49% reduction in symptoms. The PHQ-8 scores were further analyzed to determine rates of remission from depression before and after intervention.

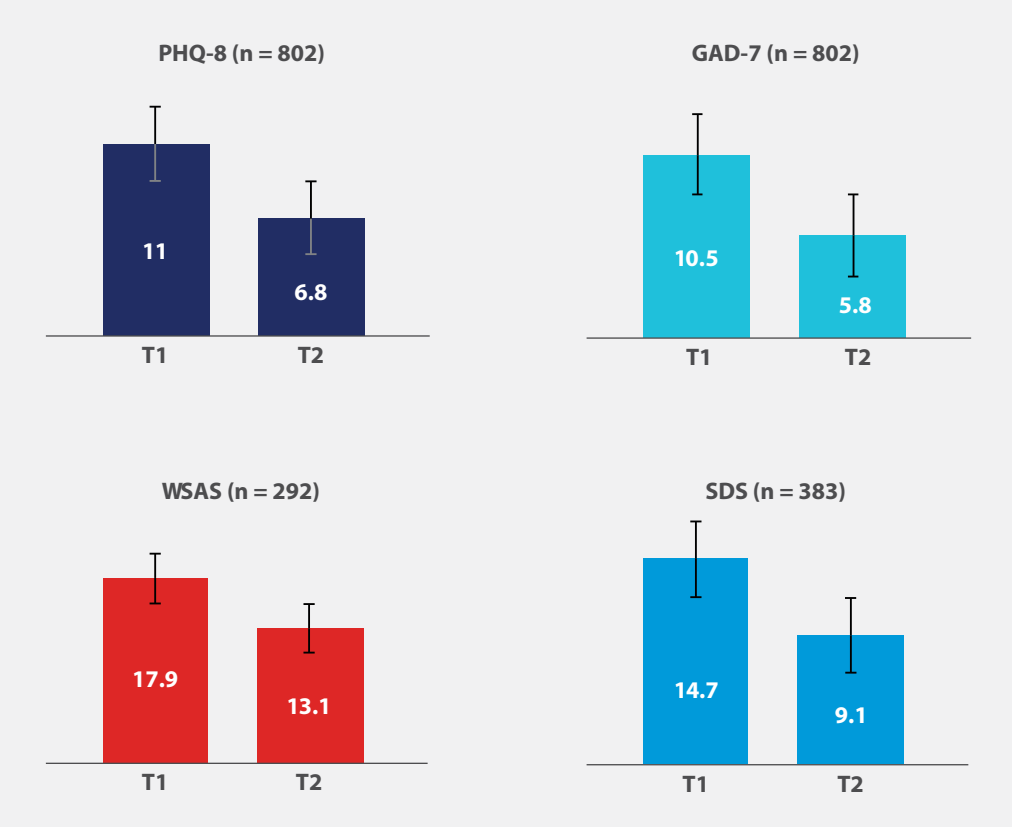


FIGURE 1. Changes in symptoms measured by four psychometric scales* used by participants before (T1) and after (T2) the 8-week CBT training program.

*PHQ-8—Patient Health Questionnaire; GAD-7—Generalized Anxiety Disorder; WSAS—Work and Social Adjustment Scale; SDS—Sheehan Disability Scale

A wait-time analysis was conducted partway through the project to determine how many days participants waited for treatment. Referrals from September 2016 to July 2017 were considered.

Results

The program received 4150 referrals from 376 referring physicians between September 2015 and April 2018. Of those patients referred, 2352 registered themselves in 149 groups. The majority of participants (77%) were female (n = 1820). The average age of participants was 46 years (range 17 to 89 years).

Sixty percent of participants attended six to eight sessions (n =1403), while 29% attended one to five sessions (n = 687), and 8% did not attend any sessions (n =193).

Self-reports were collected from 874 of the 1403 program completers (those who attended six or more of the eight sessions) for a response rate of 62%. The remaining 38% did not complete self-reports because they did not attend the last session or left without responding. No attempts were made to follow up with non-responders due to a lack of additional resources for this.

Results from *t* test analyses **[Figure 1]** indicate improvements in mean symptom scores of program completers for depression (PHQ-8: -4.2, $P < .0001$, Cohen's *d* effect size = 0.86, n = 802), anxiety (GAD-7: -4.6, $P < .0001$, Cohen's *d* effect size = 0.99, n = 802), and work and social function (SDS pre-post: -5.3, Cohen's *d* effect size = 0.77, n = 383; WSAS: -4.8, Cohen's *d* effect size = 0.62, n = 292). A small minority of participants with a change in work status during the course of the program (N = 13) did not fill out the work score of the SDS at T1 or T2, and were thus removed from analysis as their scores were artificially low because they did not complete a third of the questionnaire.

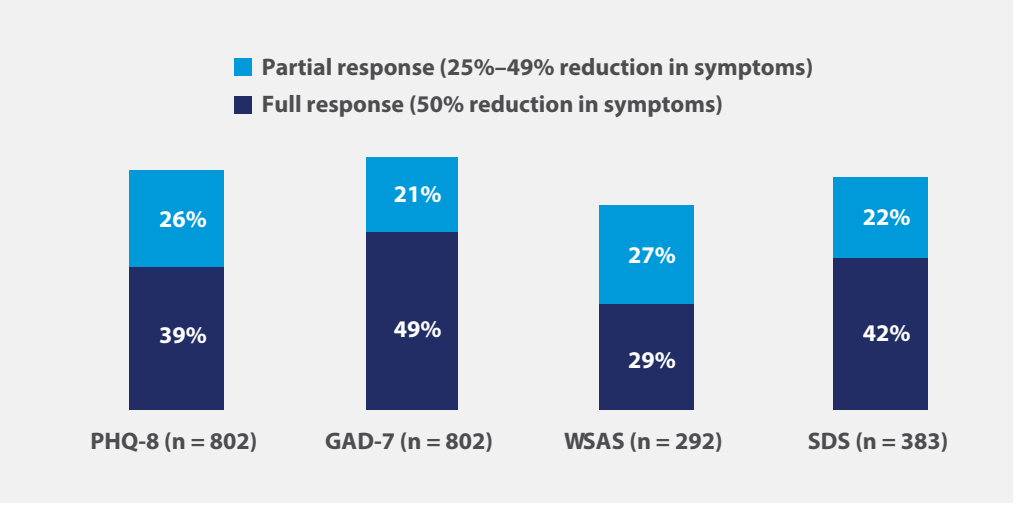


FIGURE 2. Symptom response rates measured by four psychometric scales* used by participants after the 8-week CBT skills training program.

*PHQ-8—Patient Health Questionnaire; GAD-7—Generalized Anxiety Disorder; WSAS—Work and Social Adjustment Scale; SDS—Sheehan Disability Scale

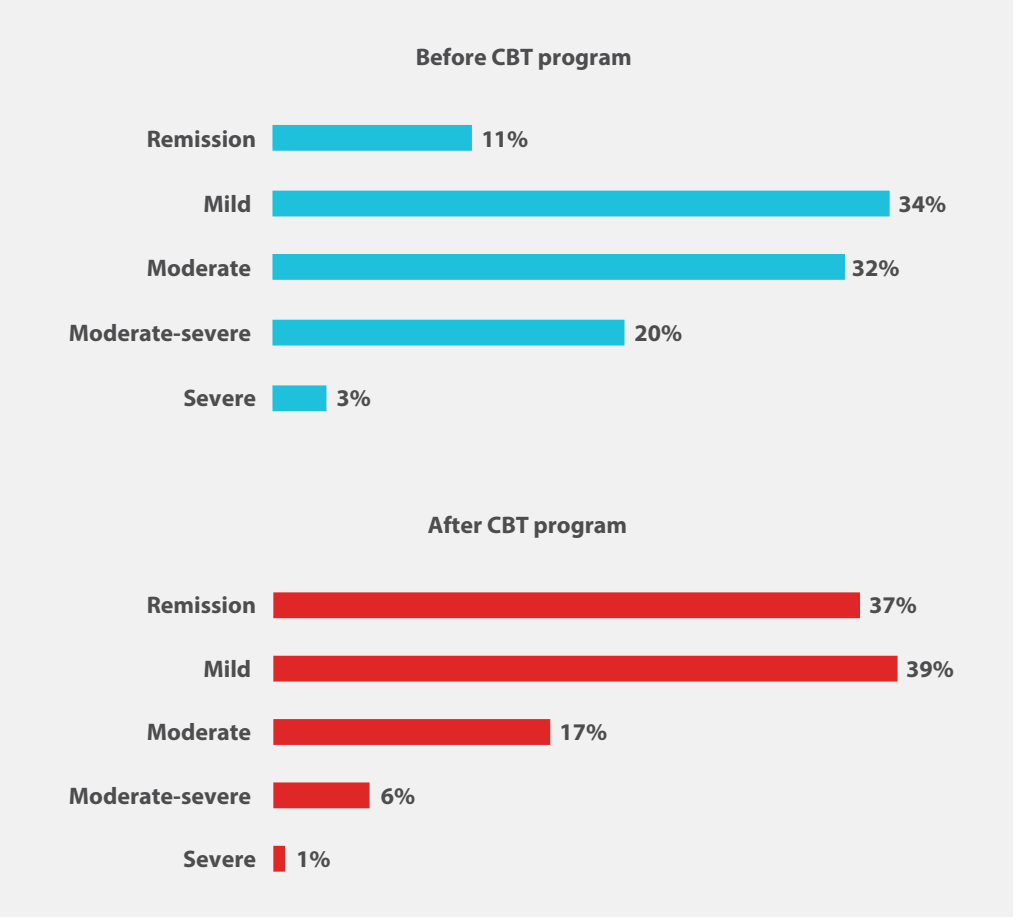


FIGURE 3. Depression severity measured by PHQ-8* scores of participants before and after the 8-week CBT skills training program.

*Patient Health Questionnaire ratings:
Remission = 0–4; Mild = 5–9; Moderate = 10–14; Moderate-severe = 15–19; Severe = 20–24

Improvements in symptoms can also be seen in the remission and response rates for all four psychometric scales **[Figure 2]** and the reductions in depression severity measured by the PHQ-8 **[Figure 3]**.

Analyses of the findings revealed that all improvements were statistically significant, and clinical significance was demonstrated by mean score changes that represented a shift from moderate to mild symptomatology.

Participant responses to questions about their experience indicate that most would recommend the program to friends and family **[Figure 4]**. Participant responses to questions about program outcomes indicate most felt more able to manage their mental health symptoms **[Figure 5]**. The average participant satisfaction rating was 4.66 out of 5.00.

Qualitative feedback suggests that participants valued learning new skills to manage mental health problems, receiving support and a sense of normalization in the group setting, and learning they were not alone in their suffering. Many participants recommended offering longer or more sessions.

A wait-time analysis on referrals from September 2016 to July 2017 showed that three-quarters of participants (628 of 832) entered a group within 3 months of referral, with one-quarter (204 of 832) beginning within 1 month of referral **[Figure 6]**.

Conclusions

Project findings suggest the Cognitive Behavioural Therapy (CBT) Skills Group program provides accessible and timely intervention for those with mild-to-moderate anxiety and depression.

Self-reports completed before and after participants took part in a skills group showed symptom improvements comparable to those found in the literature for both group and individual CBT.[21,22] However, outcome measures reported here must be interpreted cautiously, as the purpose of data collection was quality improvement, not research. There was no randomization, and there were no control groups. As well, final surveys were collected only from participants who attended the last skills group session.

Reviews of the effectiveness of CBT for anxiety show that both group and individual delivery are effective and comparable.[7] In studies comparing group and individual CBT for depression, only small differences were found favoring individual CBT delivery, especially in terms of dropout rates, but it is questionable whether the differences were clinically significant.[23,24] The Canadian Network for Mood and Anxiety Treatments (CANMAT) guidelines for depression recognize the slight superiority of individual CBT, but also support group interventions when considering cost, accessibility, and patient preference.[3]

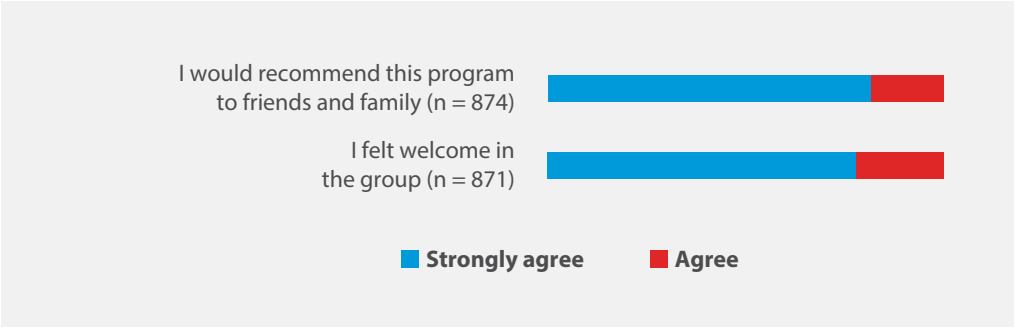


FIGURE 4. Participant experience rating.

Challenges

Dropout rates for the program, which included failure to register for a group after referral, nonattendance after registering, and partial attendance, were a significant obstacle since funding was dependent on MSP billings (and thus attendance at group sessions). A large meta-analysis of 115 studies (N = 20 995) examining dropout rates found group CBT to have higher pretreatment dropout rates of 14.5% compared with 9.7% for individual CBT, and a dropout rate of 24.6% during group CBT that was comparable to the rate for individual CBT.[25] High dropout rates occur in both individual and group interventions for depression and anxiety because of the symptoms of the conditions themselves (i.e., those with anxiety disorders often practise avoidance and those with depression often suffer from poor motivation and fatigue). The group setting can be especially anxiety-provoking for individuals with mental health symptoms. As well, group interventions are less flexible than individual interventions and require a more structured protocol to serve all participants. Consequently, the group format may not meet the specific needs of each participant. While the CBT Skills Group program emphasizes self-management rather than psychotherapy proper, the outcomes found are reflective of those reported for group CBT.

A particular challenge encountered in this project was the lack of resources to individually screen and prepare each patient. The program relied on referring physicians to screen and orient prospective participants. Consequently, patients who were not a good fit for a group

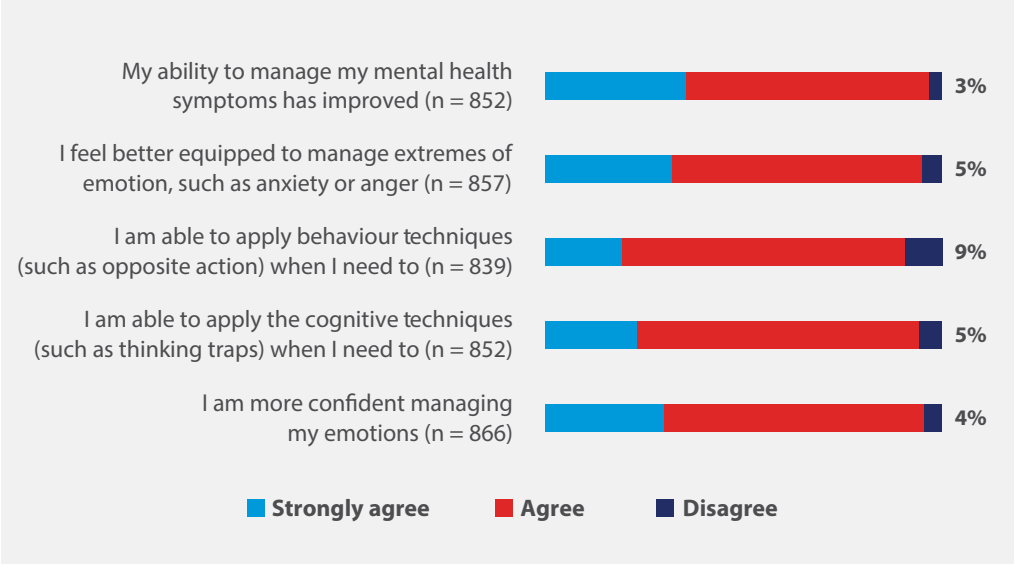


FIGURE 5. Participant outcomes rating.

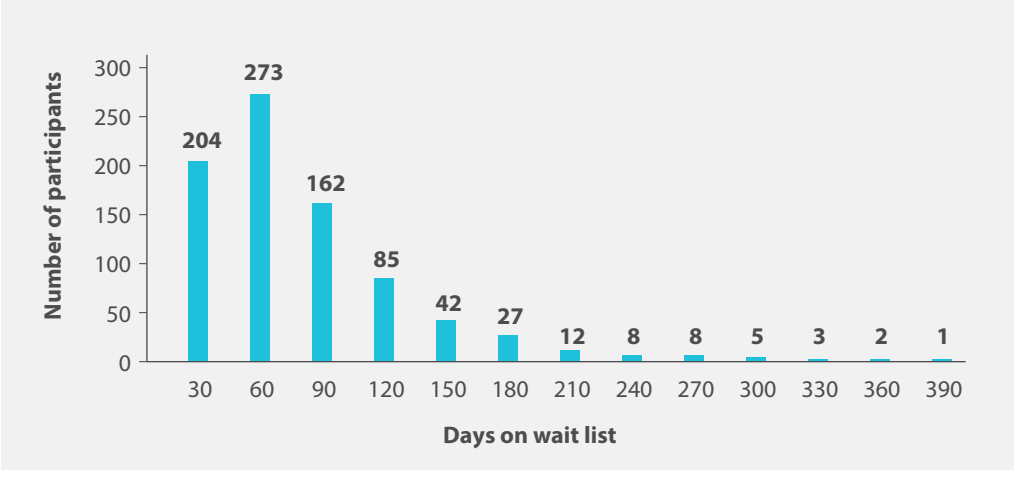


FIGURE 6. Wait times for 832 patients referred to the CBT Skills Group program, September 2016 to July 2017.

setting (e.g., patients with personality disorder symptoms, active trauma symptoms, or poor motivation) were occasionally referred and their participation adversely affected the group. To address this, quality improvement efforts targeted referring physician selection skills via presentations at grand rounds, dine-and-learns, and annual general meetings. As well, direct feedback was provided by the group facilitator to the referrer on each patient's appropriateness for the group setting, and inclusion and exclusion criteria were featured repeatedly in the Victoria Division of Family Practice e-newsletter. A patient no-show fee is currently being trialed to address patient nonattendance and dropouts.

Having family physicians and psychiatrists work together expands family physicians' knowledge and confidence regarding psychosocial skills in primary care, opens pathways for communication, and enables family physicians to coach patients with mental health conditions in their individual practices.

Benefits

As observed in the qualitative feedback, group CBT skills delivery may offer benefits over individual delivery, especially for reducing stigma. Contact with group members reminds participants they are not alone and provides opportunities to build social support, which is known to improve outcomes in mental health.[26] Participants in the project commonly exchanged contact information when the group sessions ended, and several groups continued to meet as peers.

The skills groups proved to be a cost-effective and equitable way to deliver early intervention services with service providers who already provide care for patients with mild-to-moderate mental health concerns. Traditionally, family physicians provide mental health care to their patients through individual visits instead of groups. Based on the payment schedule that was current when the project began, the cost to the health care system for a patient to receive 12 hours of group time led by a family physician was $197.52 (based on 15 patients per session). This cost was comparable to the cost of four 20-minute individual appointments ($209.80) with a family physician.[27] Currently, if a family physician were to use all MSP and General Practice Services Committee incentive fee codes for in-person care per patient per year, the cost would be twice as much to see a patient individually compared to a patient attending a group medical visit. The group visits would also provide 3.75 times more in-person interaction.[11] Furthermore, having family physicians deliver mental health services can reduce stigma by showing that mental health affects general health and is valued as a vital part of primary care.

The use of family physicians as group facilitators also enhances collaboration and mentorship between psychiatrists and family physicians. Having family physicians and psychiatrists work together expands family physicians' knowledge and confidence regarding psychosocial skills in primary care, opens pathways for communication, and enables family physicians to coach patients with mental health conditions in their individual practices.

Further quality improvements

In response to feedback from participants, more advanced program offerings (e.g., booster groups, mindfulness-based cognitive therapy, CBT for insomnia) are now available for those who have completed six or more sessions of the original program. Participants are also invited to register in a CBT skills group as many times as they desire. Other quality improvements being tested are group sessions of 2 hours in length and skills programs with more than eight sessions.

While this quality improvement project suggests CBT skills groups are a cost-effective and accessible intervention for patients in primary care, more research is needed. This might include formal, randomized, controlled trials with an intention-to-treat analysis and longitudinal follow-up to more robustly assess the potential benefits of this short-term intervention.

Summary

The CBT Skills Group program was implemented to provide early, destigmatizing, equitable, and timely mental health intervention on a large scale and to enhance collaboration between psychiatrists and physicians. The self-report data collected from September 2015 to April 2018 suggest participants experienced a reduction in symptoms of depression and anxiety. However, these results must be interpreted cautiously because data were not collected for research purposes but for program quality improvement. Average participant satisfaction rated on a 5-point Likert scale was 4.66, and a wait-time analysis showed that the majority of participants entered a group within 3 months of referral. The cost of physician-led group time compared favorably to the cost of individual family physician appointments, making the skills groups a cost-effective way to deliver early intervention services. ■

Competing interests

None declared.

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Recreational trampoline parks in BC: Safety and upcoming regulation

Trampoline parks, which are recreational facilities not affiliated with formal gymnastics training programs, have increased in popularity dramatically in recent years. When the first park opened in Canada in 2011, it was one of 40 worldwide; in 2017, there were over 1000 parks worldwide and 50 million users in North America.[1]

The growing popularity of these parks has been matched by growing concern about their safety, spurred by high-profile, serious injuries that have occurred. In 2017, for example, an Edmonton teenager became paralyzed following a neck injury in a trampoline park, and in 2018, a 46-year-old man died after being injured while using a park in Richmond, BC. Seven months later, at the same Richmond park, a toddler fell through a trampoline and onto a concrete surface underneath.[2]

While there is anecdotal evidence of an increase in visits to BC emergency rooms involving injuries sustained at trampoline parks, there are no BC-specific surveillance data of the topic. National surveillance databases of hospital-treated injuries, however, show that trampoline park injuries have increased significantly since 2012.[3] These included fractures, dislocations, traumatic brain injuries, and rare spinal injuries. Lower extremity injuries, more stunt-based injuries, and sprains were also more likely compared to injuries sustained on backyard trampolines.

This article is the opinion of the Emergency and Public Safety Committee, a subcommittee of Doctors of BC's Council on Health Promotion, and is not necessarily the opinion of Doctors of BC. This article has not been peer reviewed by the BCMJ *Editorial Board.*

These injuries have focused attention on the fact that trampoline parks are unregulated in BC and all other Canadian provinces. While operators may voluntarily join the International Association of Trampoline Parks, which requires members to pledge to meet the organization's safety standards, as of August 2019, only four BC operators are listed as members.[4] In response to this lack of oversight, regional health authorities have been advocating for Technical Safety BC, the independent provincial body that oversees the safety of rollercoasters, zip-lines, waterslides, and other amusement devices, to be empowered to also regulate trampoline parks under the Safety Standards Act. Led by the municipality of Richmond, the Union of British Columbia Municipalities passed a resolution expressing a similar position in the fall of 2018.

Trampolines put children at risk of injury, and children and their parents should be counseled about this risk and advised not to use [them].

These efforts have had an impact. Technical Safety BC has, over the past months, undertaken a review of the risk of injury at trampoline parks and options for their regulation. During the public engagement phase of this review, they heard strong and consistent feedback from the public that regulation was desired,[5] and they have recently recommended to the provincial government that the relevant regulations be amended to require oversight of trampoline parks.

The BC government has signalled general support for this recommendation.[6] However, it is unclear when or how vigorously the needed amendments will be pursued, and there are significant details that remain to be resolved before regulation could begin. Following their consultation, for example, Technical Safety BC highlighted topics such as the safety of flips, the safety of foam pits, and the degree of training required for staff that generated very different responses among operators.[5] In particular, the consultation identified differences between trampoline facilities associated with formal training programs and strictly recreational facilities. The former are regulated by Gymnastics BC, which imposes restrictions based on coaching, supervision, first-aid training, and other safety considerations. How to differentiate these types of trampoline facilities has not yet been addressed by Technical Safety BC.

For the time being, physicians should be aware of the risks of trampoline parks as well as guidance from the Canadian Paediatrics Association, which states that trampolines put children at risk of injury, and children and their parents should be counseled about this risk and advised not to use trampolines. This guidance was formally updated in 2013 and relates primarily to home trampoline use, but the association's current position is that trampoline parks should not be considered to be safer than home trampolines.[7]

Doctors of BC will continue to monitor injury prevention guidance on this topic as well as changes in trampoline park regulation and will update members as needed. ■

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Preparing for the future of medicine: Considering the need for data-literate physicians

The revolution is here: Artificial intelligence and machine learning are being applied to medicine, though there are considerable challenges ahead.

Azzra Mangalji, BSc, Vishwathsen Karthikeyan, BHSc

ABSTRACT: Artificial intelligence will undoubtedly change the landscape of medical practice and give rise to new possibilities for patient care. Today's physicians are in a unique position to lead this era of technological integration and innovation. Large amounts of patient data currently being collected will be leveraged to provide clinical insight into personalized health care on a global scale. However, there remain many barriers to wide-scale implementation of artificial intelligence tools, including our historic practices of collecting and documenting patient data, as well as the organization of our health care system. Furthermore, a lack of training has physicians underprepared to reap the full potential of these tools and safeguard against adverse consequences for patient care. Given the exciting opportunities for the use of artificial intelligence in medicine, ways to overcome associated challenges must be found.

In 2014 the BC Ministry of Health's report, "Setting Priorities for the BC Health System," outlined information management and technology as one of seven strategies to enable efforts toward creating health system change. One subcomponent of this strategy is to build BC's "informatics capacity to use data to enhance decision making and improve outcomes at all levels of the system."[1,2] Thus far, the medical community has started to adopt digitization of health information in practice to better collect, communicate, and store medical data.[3] In 2016, the Canadian Medical Association (CMA) reported that 75% of general practitioners use electronic medical records (EMRs) to enter or retrieve patient notes, an increase from 26% in 2007.[4] More recently, the role of artificial intelligence (AI) in medicine has surfaced.[5] AI is a field that involves computers using data to simulate human cognition, including our ability to reason, discover meaning, generalize, and learn from experiences in order to make informed decisions.[3] As we move into the intelligence age of medicine, physicians will have to adapt in order to harness the true potential and benefits of AI for patients.

Ms Mangalji is a third-year UBC medical student who enjoys exploring how the current practice of medicine could be enhanced, specifically the technologies entering medical practice in rural and remote areas to allow for improved access to quality health care. She hopes this article will spark discussion about how a practitioner's scope could include data-literacy. Mr Karthikeyan is a third-year UBC medical student interested in the intersection of technology and medicine. During the foundational years of his medical studies, he sought out opportunities to engage in machine learning research. He is excited about the prospective roles that machine learning and artificial intelligence could play in augmenting physicians' practices. He hopes to contribute to efforts to foster a community of data-literate physicians equipped to leverage technology to improve patient outcomes and care.

This article has been peer reviewed.

Benefits of AI integration in medicine

Machine learning (ML), a subfield of AI, has recently received attention for its potential impact on medical practice. ML employs algorithms that can learn patterns from large data sets without being explicitly programmed, and can be equipped with self-correcting tools to improve accuracy with exposure to new data.[6] For example, ML is widely used by online retailers to identify additional products a shopper may be interested in based on their previous purchases.[6] In medicine, ML maps structured data, in the form of patient input variables (e.g., imaging, genetic markers, laboratory results, a patient's age, gender, symptoms, or medications) to an output (outcome of interest), providing a pattern that can be used to make predictions in future cases. To understand how this is playing out in practice to enhance personalized medicine,[7] we look at a few applications of AI in relation to breast cancer.

Genetics

In 2007, the FDA approved MammaPrint, which uses the weighted average of 70 measured genes in patients with early-stage breast cancer to predict 10-year recurrence risk. It is being used clinically by oncologists to select patients for adjuvant chemotherapy treatment.[8]

Imaging

In 2018, the FDA approved Transpara, which identifies soft tissue and calcification lesions on mammograms to generate a cancer suspiciousness score. It is being used clinically to improve the decision-making accuracy of radiologists while reading scans.[9]

Clinical

IBM's Watson for Oncology accesses over 300 medical journals and textbooks to "read" updated literature, guidelines, over 550 breast cancer cases, as well as patient characteristics, medical history, imaging, and laboratory findings to develop patient-specific breast cancer treatment recommendations. It suggests multiple options for each patient.[10]

ML has the potential to significantly assist physicians in proactive decision making. While AI is predicted to first be incorporated into fields that favor structured data such as radiology, dermatology, and pathology, it is relevant to numerous clinical specialties.[11] Not only can it augment clinical decision making, it can also help with logistic operations, clinic performance analysis, continuing education, professional development, and population health.[4] Furthermore, the use of natural language processing is another subcomponent of AI that deals with transforming unstructured data in the form of clinical notes, patient interviews, or medical journals into structured data that can be analyzed by ML, heightening the utility in qualitative aspects of medicine.[12] In order to harness the utility of AI in physicians' day-to-day practices, barriers to integration must first be addressed, and physicians must be taught how to evaluate and use such tools.

Machine learning employs algorithms that can learn patterns from large data sets without being explicitly programmed, and can be equipped with self-correcting tools to improve accuracy with exposure to new data.

Challenges of AI integration in medicine

Data availability

The successful integration of AI into medicine will depend largely on the quantity and quality of accessible electronic data. The data are required to train and test ML models, whether diagnostic, treatment, or administrative. The current structure of the health care system makes obtaining this data challenging. The required data are currently stored in isolated data silos used by pharmacies, laboratories, hospitals, clinics, administrative systems, and others. The data need to be collated before they can be used for ML purposes.[13] Furthermore, while the use of EMRs may be widespread among primary care physicians, the use of electronic health records (EHRs) in hospitals remains limited, although it is underway. Barriers to data access are compounded by privacy and security issues related to patient data sharing between health authorities.[13] In 2016, the CMA reported that due to the structure of the system, harnessing the utility of big data analytic opportunities may be restricted to primary care for now.[4] The exchange of data between computer systems and health records is vastly complex, and there is currently no simple, economical way to achieve it.[14] Despite these challenges, there are multiple interoperability plans in the works in BC and nationally, offering an optimistic future.[15,16]

Data quality

When training ML algorithms, patient variables (e.g., age, sex, vitals, and lab results) must be available and represented in a standardized format to allow for aggregation of data sets. Furthermore, these predictor variables should be low cost and commonly collected by physicians.[6] However, the variability in recording and formatting data poses a challenge to its use in ML. Patient data are often reported using common clinical terms rather than standardized vocabulary. The nature of medical notes adds another complication as many components lack mathematical characterization.[13] Without a foundation of vast amounts of high-quality data, ML models can perform poorly.

There are also important considerations regarding ethical challenges, such as the mirroring of human biases in decision making. The application of ML algorithms outside the health care setting has highlighted some of these concerns, including a propensity for racial discrimination. Similar biases may also enter medicine. For instance, if algorithms are trained only on data from certain populations, they may be prone to conclude false generalizations to other groups.[6,17,18] Poor representation of populations has been a long-standing issue in the academic community. For example, the Framingham Heart Study poorly predicts the risk of cardiovascular events in non-white populations due to sampling bias.[19] Thus, it is paramount to establish measures to minimize these biases from affecting ML models through early critical evaluation of methodological practices, preventing exacerbation of the disparities that currently plague the medical community. Physicians must advocate for their patients by being at the forefront to ensure that core ethical principles are preserved in the development of ML tools.

To augment this process, one suggestion is that data warehouses be built before the data are used. This way, the data can be reused by multiple researchers or developers for a variety of purposes and the collecting and cleaning process does not need to be repeated.[13] In addition, having physicians equipped with skills to critically evaluate, develop, and deploy such models will help inform appropriate use.

The future physician's role

As the role of ML in medicine expands, physicians practising clinical medicine will need to evolve.[17] With the help of ML, physicians will be able to leverage greater amounts of information from the biological, psychological, and social aspects of patients' lives to further augment personalized patient care. To make this possible, continuous, detailed, and affordable monitoring of patients will contribute to big data sets.[3] However, it is of the utmost importance that physicians have a baseline understanding of the tools they are using. They will have to become

familiar with the legal implications of these new tools, as they protect the privacy and security of their patients.

Many argue that medical education must begin to incorporate some of these topics. Despite medical curriculums being time-constrained, it may be necessary to alter teaching strategies and incorporate concepts that are going to revolutionize the field. It may be unrealistic for medical students to become developers or data scientists, but we can begin to train future physicians to become data literate. Students should understand the concepts within ML and AI to critically appraise how data were aggregated and analyzed, and ensure they are appropriately applied.[3] Students should also be competent in navigating the terminology.[6] Furthermore, they should understand what it means to practise in a data-rich environment. One study suggests having a foundation of the four Vs of big data: volume of data being collected, variety of data being collected from different sources, velocity of data generation, and veracity of data (i.e., its quality).[3] In addition, understanding the output of ML algorithms and being able to interpret the prediction will help guide clinical decision making. Lastly, medical students will need to learn how to communicate the information to patients and their families.[20]

While curriculums begin to transform, alternate options such as accredited CME courses can be provided to begin educating current medical professionals.

The need for this shift in thinking is being recognized. For example, Boston University School of Medicine has an introductory ML course,[21] and Stanford University has an AI-assisted health care course available to their medical students.[22] While curriculums begin to transform, alternate options such as accredited CME courses can be provided to begin educating current medical professionals.

Conclusion

As we experience the transformation of the medical landscape through the integration of AI, many new possibilities arise. Physicians will play an important role in ensuring these new tools will maximize benefits to all health care stakeholders. However, we anticipate challenges that require system-level preparation. Data literacy will enable physicians to evaluate the role of these tools, optimize their use in patient care, and help to mitigate any pitfalls that may arise. This can potentially open the way for active participation in the research and development of AI-centred medical tools. This is an exciting revolution: we will be able to draw from the insight gathered from the culmination of billions of patients and their outcomes to inform the care of future patients. ■

Competing interests
None declared.

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Syphilis outbreak in BC: Changes to syphilis screening in pregnancy

In the first half of 2019, there were two cases of congenital syphilis diagnosed in British Columbia; the first cases since 2013. In the context of 919 cases of infectious syphilis reported in BC in 2018—representing the highest number of cases in 30 years—and other concerning epidemiologic trends (for example, increased cases in females of childbearing age), BC's provincial health officer declared a syphilis outbreak in July 2019. Following consultation between members of the BCCDC, Perinatal Services BC, and reproductive and pediatric infectious diseases experts from BC Women's Hospital and Health Centre, the decision was made to institute interim provincial guidelines for enhanced syphilis screening in pregnancy. These took effect in September 2019.

Testing [should] be done in the first trimester or at the first prenatal visit; additional screening done only in cases where there is clinical suspicion for ongoing risk during pregnancy.

The existing standard recommendations for syphilis screening in pregnancy remain the same: for testing to be done in the first trimester or at the first prenatal visit; additional screening done only in cases where there is clinical suspicion for ongoing risk during pregnancy. Additionally, a pregnancy test is recommended for any individual diagnosed with syphilis who is able to become pregnant. The revised guidelines recommend the addition of a syphilis screening test at delivery (or any time after week 35 for those planning home births). The overarching goal of these interim guidelines is to maximize detection and prevention of maternal and congenital syphilis while maintaining a responsible approach to screening. More specifically, the objectives of the guidelines are the following:

1. To determine the epidemiology of maternal and congenital syphilis in BC. Ultimately, the goal is to determine how many cases of maternal and/or congenital syphilis are being missed with BC's current screening approach. Given the high rates of syphilis-associated spontaneous abortion,[1] the elevated transplacental transmission rate, particularly in early syphilis,[2,3] and the long window period,[4] it is plausible that cases are, in fact, being missed in BC. The addition of screening at delivery over a time-limited period will provide valuable information and ensure a comprehensive picture of syphilis epidemiology in BC is obtained.

2. To ensure timely identification and treatment of maternal and congenital syphilis. Syphilis in pregnancy is associated with adverse health outcomes that can significantly impact the health of both mother and fetus.[5] As a majority of infants born with congenital syphilis are asymptomatic at birth,[4] most of those untreated will develop symptoms within months.[6] In the vast majority of cases, maternal treatment is curative for fetal infection, and early treatment of the newborn will prevent most symptoms,[7,8] making early detection a priority.

Implementing these revised, interim syphilis screening guidelines in pregnancy are one part of a larger effort led by the BCCDC and its partners in addressing the syphilis outbreak. Near-future efforts will focus on revising BCCDC's Syphilis Action Plan,[9] and emphasis will be placed on addressing the outbreak in gay, bisexual, and other men who have sex with men, who remain the population most impacted by syphilis. ■

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CME calendar

Rates: $75 for up to 1000 characters (maximum), plus GST per month; there is no partial rate. If the course or event is over before an issue of the *BCMJ* comes out, there is no discount. **Deadlines:** ONLINE: Every Thursday (listings are posted every Friday). PRINT: The first of the month 1 month prior to the issue in which you want your notice to appear, e.g., 1 February for the March issue. The *BCMJ* is distributed by second-class mail in the second week of each month except January and August. **Planning your CME listing:** Advertising your CME event several months in advance can help improve attendance; we suggest that your ad be posted 2 to 4 months prior to the event. **Ordering:** Place your ad at www.bcmj.org/cme-advertising. You will be invoiced upon publication. Payment is accepted by Visa or MasterCard on our secure online payment site.

CLINICS BC CONFERENCE

Vancouver, 17–18 Oct (Thu–Fri)

Join us at the Pinnacle Hotel Harbourfront, 1133 W. Hastings St., on Thursday, 17 Oct for the pre-conference Demo Day, and on Friday, 18 Oct for our 4th annual Clinics BC Conference, the premier networking and educational conference for physicians, clinic managers, and companies offering services to clinics. Enjoy a day of keynote addresses, interactive panel discussions, and hands-on exhibit time. Pre-conference workshops: Thu, 17 Oct—Vendor in-depth demonstrations (no-cost with ticket purchase but pre-registration is required). Target audience: Family physicians, clinic owners, clinic managers. Keynotes: State of primary care; Healthcare in BC; Clinic overhead and profitability. Conference details and registration: https://clinicsbc.org. Accommodation: https://book.passkey.com/event/49968716/owner/2075/home.

CME ON THE RUN

VGH and various videoconference locations, 4 Oct–5 Jun (Fri)

CME on the Run sessions are held at the Paetzold Lecture Theatre, Vancouver General Hospital and there are opportunities to participate via videoconference from various hospital sites. Each program runs on Friday afternoons from 1–5 p.m. and includes great speakers and learning materials. Dates and topics: 22 Nov (dermatology and allergy). Topics include: Hair loss and thinning in middle age; Chronic leg ulcers: The best office approach; Psoriasis: Multimodal treatment—topical and beyond; "Is this lesion cancer?": What's new, what not to miss; Rosacea: What's old, what's new, and what's best?; Acne: A stepwise approach for office practice; Early allergen exposure: Can we reduce incidence of food and environmental allergies?; Do they really have a penicillin allergy? The office challenge. The next sessions are: 31 Jan (psychiatry); 3 Apr (infectious disease and travel); 1 May (prenatal, pediatric, and adolescents); 5 Jun (internal medicine). To register and for more information visit ubccpd.ca, call 604 675-3777; or email cpd.info@ubc.ca.

IAPSP CONFERENCE

Vancouver, 17–20 Oct

The 42nd annual International Association for Psychoanalytic Self Psychology International Conference, Engaging Difference and Sameness: Pathways to Empathic Dialogue, will be held at the JW Marriott Parq. This CME will encourage physicians to expand their exploratory lens to include patients' contexts of politics, culture, race, gender, class, and sexual orientation as vital influences on emotional/somatic suffering. Special guests: Philip Cushman, keynote speaker, has written extensively on the place of the political within psychological theory and practice; Sunil Bhatia, international scholar in understanding the development of self and identity in the context of racism, migration, globalization, and formation of transnational diasporas; Simone Drichel, scholar in psychoanalysis, postcolonial theory, and continental philosophy. There will be a special plenary on Government Sponsored Indian Residential Schools. For further information and registration visit: https://iapsp.org/conference.

BC ENDOCRINE DAY

Vancouver, 1 Nov (Fri)

The Endocrine Research Society is pleased to present Office Endocrinology, an interactive, case-based review of common endocrine problems. Join us at the 19th annual BC Endocrine Day at the Robert H. Lee Alumni Centre, 6163 University Blvd., for a full-day update for the primary care physician on selected endocrine topics. Presented by local physicians, this course will review endocrine health issues pertaining to the thyroid, pituitary, and adrenal, hormone replacement therapy, diabetes, research/laboratory work, and practical mini-case studies. Register now as space is limited. Online registration at: www.endocrineresearchsociety.com/events/19th-annual-bc-endocrine-day. Further information and registration: Eric Chow, Endocrine Research Society. Email endocrine.research.society@gmail.com. Tel 604 689-1055.

Technologies in Emergency Care 2019

Vancouver, 2 Nov (Sat)

The Technologies in Emergency Care—TEC Vancouver Conference 2019 will bring together clinicians, health professionals, health policy makers and administrators, and industry leaders to explore clinical gaps and how technologies can be used to solve real-life challenges in primary and emergency health services in BC and beyond. This conference will share knowledge about existing and emerging innovative health care technologies to improve patient care and identify and address real-life clinical problems and challenges. When: Saturday, 2 November from 8:30 a.m. to 4:30 p.m. Where: Paetzold Auditorium, Vancouver General Hospital. Target audience: Clinicians, nurses, medical support staff, medical residents, and students. Showcase speakers: Dr Shez Partovi, Worldwide Lead, Healthcare, Life Sciences, Genomics, Amazon Web Services; Dr Teresa Chan, Emergency Physician, Hamilton Health

Sciences, FOAM expert; Dr Douglas Kingsford, Chief Medical Information Officer, Digital Health Initiative, BC Ministry of Health; Tolga Tarhan, Chief Technology Officer, Onica—and many more. Learn more and register today at https://digem.med.ubc.ca/2019/04/01/tec-vancouver-conference-2019.

LIVE WELL WITH DIABETES
Richmond, 8–10 Nov (Fri–Sun)

Join us at the Radisson Hotel Vancouver Airport for another successful, comprehensive update in diabetes care! The 2019 agenda features evidence- and research-based presentations designed for family physicians, allied health, diabetes educators, podiatrists, and other health care professionals who have an interest in diabetes care. Topics include working within the health care system to treat diabetes, controversies and updates in diabetes, lifestyle management, and case discussions. Featured talks: Get it covered: Tips and tricks to help patients pay for prescriptions; We're testing too much! A streamlined approach to laboratory monitoring in diabetes; Diabetes care in First Nations patients; The current Diabetes Canada Guidelines: What's included?; Under pressure: Top 3 things for managing hypertension in diabetes; Helping patients who slip through the cracks. Program details: https://ubccpd.ca/course/lwd2019. Registration https://events.eply.com/lwd2019. Tel 604 675-3777; fax: 604 675-3778; email cpd.info@ubc.ca.

GP IN ONCOLOGY CASE STUDY DAY & FAMILY PRACTICE ONCOLOGY CME DAY
Vancouver, 22–23 Nov (Fri–Sat)

BC Cancer's Family Practice Oncology Network is presenting two practice-ready CME events for family physicians at BC Cancer's Annual Summit, 22–23 November, at the Sheraton Vancouver Wall Centre. November 22: GPO (General Practitioner in Oncology) Case Study Day, and November 23: Family Practice Oncology CME Day. GPO Case Study Day (up to 5.5 Mainpro+ credits) provides in-depth exploration of prevalent and emerging challenges in cancer care through case-based discussion, while Family Practice Oncology CME Day (up to 5.75 Mainpro+ credits) provides insight into new developments and practice changing guidelines in cancer care. Both offer opportunity to build helpful cancer care connections. Full details at fpon.ca or via dilraj.mahil@bccancer.bc.ca.

MINDFULNESS IN MEDICINE WORKSHOPS AND RETREATS
Various locations, 29 Nov–24 May 2020

Join Dr Mark Sherman and your community of colleagues for a transformative workshop or retreat! Foundations of Theory and Practice Workshop for Health Professionals, 29 Nov–1 Dec, Kingfisher Resort, Royston, and A Physician Meditation Retreat, 24–29 May, Hollyhock, Cortes Island. Physician Heal Thyself workshops focus on the theory and practice of mindfulness and meditation—reviewing definitions, clinical evidence, and neuroscience, and introducing key practices of self-compassion, breath work, and sitting meditation to nurture resilience and healing. This annual meditation retreat is an opportunity to delve deeply into meditation practice in order to recharge, heal, and build a practice for life. Each workshop is accredited for 16 Mainpro+ group learning credits and has a 30 person limit, so please register today! Contact us at hello@livingthismoment.ca, or check out www.livingthismoment.ca/event for more information.

NUTRITIONAL AND ENVIRONMENTAL INFLUENCES ON NEURODEVELOPMENT
Vancouver, 7 Dec (Sat)

This program examines the current evidence for nutritional support of healthy neurodevelopment in children with a focus on environmental toxicants, alterations in the development of the microbiome, immune dysregulation, and oxidative stress. There is an ever-increasing volume of nutritional research literature that identifies plausible interventions and disease prevention strategies. Various levels of evidence will be presented for evaluation and discussion, in order to facilitate improved communication with patients about health promotion, disease prevention, and preferences for treatment. This 1 credit per hour Group Learning program has been certified by the College of Family Physicians of Canada for up to 6.25 Mainpro+ credits. Additional information and online registration: https://isom.ca/event/neuro-2019.

GP IN ONCOLOGY TRAINING
Vancouver, 3–14 Feb 2020 (Mon–Fri)

The BC Cancer's Family Practice Oncology Network offers an 8-week General Practitioner in Oncology training program beginning with a 2-week introductory session every spring and fall at the Vancouver Centre. This program provides an opportunity for rural family physicians, with the support of their community, to strengthen their oncology skills so that they may provide enhanced care for local cancer patients and their families. Following the introductory session, participants complete a further 30 days of customized clinic experience at the cancer center where their patients are referred. These can be scheduled flexibly over 6 months. Participants who complete the program are eligible for credits from the College of Family Physicians of Canada. Those who are REAP-eligible receive a stipend and expense coverage through UBC's Enhanced Skills Program. For more information or to apply, visit www.fpon.ca, or contact Jennifer Wolfe at 604 219-9579.

Classifieds

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VICTORIA—PRACTICE AVAILABLE

Well-established solo family practice available May 2020 at no cost for patient list. Patient demographics across all ages with an emphasis on seniors care. No obstetrics or hospital work; however, residential care work available. Collegial call group of 20. Office space includes three exam rooms and one reserved parking stall in downtown area. Further details at 250 388-7123 or paulndeb@shaw.ca.

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NANAIMO—GP

General practitioner required for locum or permanent positions. The Caledonian Clinic is located in Nanaimo on beautiful Vancouver Island. Well-established, very busy clinic with 26 general practitioners and two specialists. Two locations in Nanaimo; after-hours walk-in clinic in the evening and on weekends. Computerized medical records, lab, and pharmacy on site. Contact Lisa Wall at 250 390-5228 or email lisa.wall@caledonianclinic.ca. Visit our website at www.caledonianclinic.ca.

NEW WEST—ROYAL CITY MEDICAL RECRUITING FT FAMILY PRACTITIONER

Royal City Medical Clinic, a 2200 sq. ft., established, busy family practice and walk-in clinic located in the heart of New West is currently recruiting a general practitioner to join its family physician team of three (75/25 overhead). The office is well run by a team of senior staff as well as a medical director. Please contact Richard at rw@bcdrug.com for more information.

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POWELL RIVER—LOCUM

The Medical Clinic Associates is looking for short- and long-term locums. The medical community offers excellent specialist backup and has a well-equipped 33-bed hospital. This beautiful community offers outstanding outdoor recreation. For more information contact Laurie Fuller: 604 485-3927, email: clinic@tmca-pr.ca, website: powellrivermedicalclinic.ca.

SOUTH SURREY/WHITE ROCK—FP

Busy family/walk-in practice in South Surrey requires GP to build family practice. The community is growing rapidly

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Considering a change of practice style or location? Or selling your practice? Group of seven locations has opportunities for family, walk-in, or specialists. Full-time, part-time, or locum doctors guaranteed to be busy. We provide administrative support. Paul Foster, 604 572-4558 or pfoster@denninghealth.ca.

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VICTORIA—GP/WALK-IN
Shifts available at three beautiful, busy clinics: Burnside (www.burnsideclinic.ca), Tillicum (www.tillicummedicalclinic.ca), and Uptown (www.uptownmedicalclinic.ca). Regular and occasional walk-in shifts available. FT/PT GP post also available. Contact drianbridger@gmail.com.

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Lansdowne Medical Clinic is located by 5611 Cooney Rd. in Richmond. It is a newly renovated 10-office multidisciplinary clinic. Currently there are two vacancies for specialists and family physicians. Join Dr Jeff Wang, the clinic's medical director, with a team of trained MOAs in the heart of Richmond. For more info contact Richard at rw@bcdrug.com.

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Continued from page 324

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Letters to the editor, articles, and scientific papers must be reviewed and accepted by the *BCMJ*'s eight-member Editorial Board prior to publication. The Board normally meets the last Friday of every month, at which time submissions are distributed for review the following month. We do not acknowledge receipt of submissions; the editor will contact authors of articles by email once the submission has been reviewed by the Board (usually within 8 to 10 weeks of submission). The general criteria for acceptance include accuracy, relevance to practising BC physicians, validity, originality, and clarity. The editor contacts authors to inform them whether the paper has been rejected, conditionally accepted (that is, accepted with revisions), or accepted as submitted. Authors of letters are contacted only if the letter is accepted and editorial staff need further information. Scientific papers and other articles typically take 5 to 10 months from the date of receipt to publication, depending on how quickly authors provide revisions and on the backlog of papers scheduled for publication. Manuscripts are returned only on request. The *BCMJ* is posted for free access on our website.

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1. Gilsanz V, Gibbons DT, Roe TF, et al. Vertebral bone density in children: Effect of puberty. Radiology 2007;166:847-850.

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2. Mollison PL. Blood Transfusion in Clinical Medicine. Oxford, UK: Blackwell Scientific Publications; 2004. p. 78-80.
3. O'Reilly RA. Vitamin K antagonists. In: Colman RW, Hirsh J, Marder VJ, et al. (eds). Hemostasis and Thrombosis. Philadelphia, PA: JB Lippincott Co; 2005. p. 1367-1372.
4. Health Canada. Canadian STD Guidelines, 2007. Accessed 15 July 2008. www.hc-sc.gc.ca/hpb/lcdc/publicat/std98/index.html.

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1. Maurice WL, Sheps SB, Schechter MT. Sexual activity with patients: A survey of BC physicians. Presented at the 52nd Annual Meeting of the Canadian Psychiatric Association, Winnipeg, MB, 5 October 2008.
2. Kim-Sing C, Kutynec C, Harris S, et al. Breast cancer and risk reduction: Diet, physical activity, and chemoprevention. CMAJ. In press.

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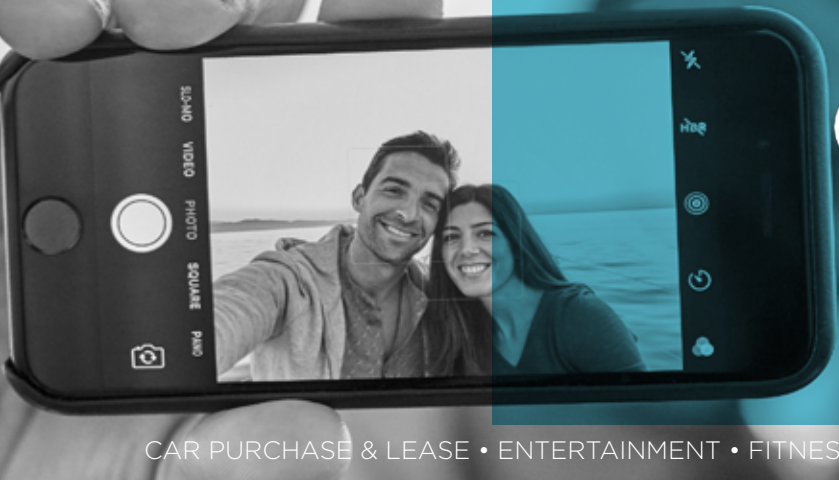

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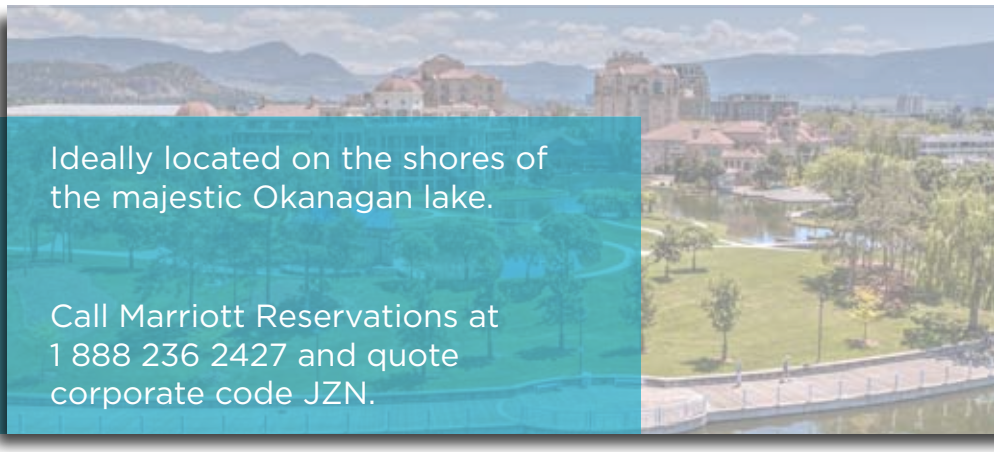

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