

The effects of cannabis on female and male reproduction



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BCM J

BC Medical Journal

September 2019
Volume 61 | No. 7
Pages 269–304



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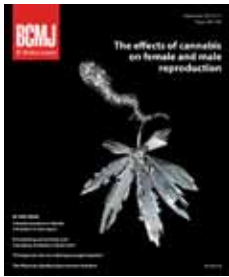
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ON THE COVER

The effects of cannabis on female and male reproduction

Though cannabis is now legal, more high-quality evidence is needed before we can be sure it's not negatively affecting fertility.

The *BCMJ* is published by Doctors of BC. The journal provides peer-reviewed clinical and review articles written primarily by BC physicians, for BC physicians, along with debate on medicine and medical politics in editorials, letters, and essays; BC medical news; career and CME listings; physician profiles; and regular columns.

Print: The *BCMJ* is distributed monthly, other than in January and August.

Web: Each issue is available at bcmj.org.

Subscribe to print: Email journal@doctorsofbc.ca.
Single issue: \$8.00
Canada per year: \$60.00
Foreign (surface mail): \$75.00

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ISSN: 0007-0556
Established 1959



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MAID

Doc, we've been through thick and thin together, and I need you to come through this one last time.”

In 2016 when Bill C-14 was enacted, allowing medical assistance in dying (MAID) for eligible adult Canadians whose death is reasonably foreseeable, I remember having mixed feelings. I was conflicted by an understanding for those suffering with a terminal illness who wanted this choice versus the thought that I didn't really want to be a part of the process. I don't think I was alone in feeling this way; no other recent medical issue has been so polarizing. Those for and against MAID have eloquently and at times passionately expressed their views about this issue in the pages of our journal.

Each year since MAID became law an increasing number of Canadians have decided to end their lives with the assistance of a health professional. The most up-to-date statistics I was able to find ending 31 October 2018 suggest that almost 7000 individuals have used MAID. British Columbia has been a bit of a MAID leader—only Ontario has a higher total number of recorded deaths, but a lower percentage if you consider population differences. Certain health regions in BC have well-organized MAID programs, which are reflected in their

high number of assisted deaths. In contrast my health region has struggled to find physician volunteers to meet the needs of individuals requesting MAID.

I can understand the reasoning of a patient with ALS or terminal cancer not wanting to prolong suffering, I just haven't wanted to be the individual on the other end of the syringe. I feel physicians have a duty to ease pain and suffering, but I entered this profession to save lives, not end them. I'm not sure how a patient taking their last breath due to my deliberate action would affect me. The emotional fallout experienced by physicians involved in MAID doesn't really get addressed, but I know that it weighs heavily on some.

As a result of the shortage of physicians for this program in the health region in which I practise, two of my close work colleagues became involved in MAID following earnest requests from patients with a terminal illness. Leading up to the procedure I could tell that both of them were under significant mental duress. They experienced a range of emotions and were sleeping poorly. Their stress was palpable

as they tried to focus on running their practices under the heavy weight of what was to come. I believe they were both thankful for being able to ease the patients' suffering, and one of them has continued to be involved in other assisted deaths. This physician's initial distress has evolved to a sense of compassion and feeling

honored to be involved in caring for these patients at this most vulnerable time in their lives. The gratitude expressed by patients and their families has had a profound positive impact on this individual.

I doubt I will be able to say “no” if a longtime patient asks me to do this one last thing for them. I have taken care of some families in my practice for

close to 30 years and think of many of them as friends. How can I turn my back when they need me the most? However, I also feel the anxiety developing in my chest when I think about performing MAID and can't help but wonder how my involvement will affect me. ■

—DRR

I can understand the reasoning of a patient with ALS or terminal cancer not wanting to prolong suffering, I just haven't wanted to be the individual on the other end of the syringe.



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Too close to home

It's interesting to me to think about the patients who have left an imprint on my life. What did they have in common that causes me to remember them? What part of our relationship is so memorable for me, and why?

During the early stages of medical school, I volunteered as an ambulance attendant in my home town. It was exhilarating work that brought me into contact with many memorable people who were far removed from my way of life—alcoholics, gangsters, and victims of violence were our usual clients. A memorable event was the night I was called on to deliver my first baby on the floor of a shack by kerosene lamp—before I had done my obstetrics rotation in medical school. The homes in the area had no address numbers, so when we got close to where we were meant to be, the neighbors responded to our flashing lights and blaring sirens

by coming out to direct us to the right shack. In my capacity as an ambulance attendant, I was only permitted to clamp the umbilical cord with a piece of string. The placenta was placed in a plastic bag and remained attached to the newborn until we reached the hospital.

Another call that I remember well involved us transporting a deceased man from his residence to the city morgue. He had been discharged from hospital after a myocardial infarction. Two aspects of that call make it memorable for me. The first was the sound he made when we moved him from his bed onto our stretcher. It was the first time that I had dealt with a lifeless body. I had never even been that close to someone who had died. He was heavier than we expected, so his landing on the stretcher was less than graceful, which is when air was expelled from his lungs through

his partially closed vocal cords. He made a loud groaning sound that scared the heck out of me. The second, and more memorable, was how old the man was: he was close in both age and appearance to my father, who was in his early 50s at the time.


After delivering the body to the city morgue, my partner and I stood outside and smoked a cigarette. I wasn't a smoker and didn't inhale, but I felt quite shaken up and it seemed like the right thing to do at the time. I recall arriving home after my shift as my parents were waking up and feeling very relieved that they were alive and well. At the time, that experience felt too close to home, although thankfully my father lived for another 30 years. It was his birthday in August.

There are patients from throughout my medical career who remain embedded in my memory for various reasons. Their impact on me usually stems from the good relationship that we shared, and the fact that they passed away too early in their lives. One man in particular stands out. We were close in age and life stage (he was slightly younger). He developed an aggressive cancer in his late 30s. He was a kind and generous man with a beautiful family. He had a mischievous sense of humor. He loved his wife and daughters, and they loved him. The anniversary of his untimely passing was also in August.

His journey, in some respects, is too close to home for me as well. Perhaps his illness and untimely passing brings up my existential angst. Why am I here? What is my purpose? What is the point? What is the meaning of life? Although I don't have all the answers, I continue on my life journey with faith and optimism. His words of optimism and hope are a comfort to me. ■

—DBC

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“Without enough sleep we all become tall two-year-olds”

—JoJo Jensen, *Dirt Farmer Wisdom*, 2002

Many physicians are required to do overnight or multiple days of call to ensure patients have access to care when needed. I am midway through another 48-hour call shift for our obstetrical clinic as I write this Comment. For all of us who do multiday overnight call, we understand the importance of sleep to our personalities and our performance. However, we also understand that there are different types of sleep for physicians on call.

Yesterday I was fortunate as there were only a few deliveries and assessments that took me back and forth to the hospital. I had breakfast and lunch at the normal hours, and while dinner was a bit off schedule, I did have time to eat. At 9:00 p.m. I was called back to assess an abnormal fetal heart tracing. Although the situation improved in the 10 minutes it took me to arrive, leaving the hospital was not an option. After watching the tracing for another hour, I decided to try to grab a few minutes of sleep in our breakroom.

Our breakroom is only 6 years old. A luxury. Before we built this room, I slept in my car or in a chair in the operating room doctors' lounge. The room is partially lit from the hallway, and the continuous high-pitch hum of the fan makes the room too cold to immediately drift off. Plus, I can hear the nursing staff grabbing supplies from the storage closet next door. Still, it's better than my car. I am slightly on edge because I am concerned about the patient; however, I also recognize that my body and mind need sleep for me to function at my best. This is the shallow sleep—drifting in and out, answering numerous phone calls from the ward and case room about other patients, and waiting for my patient's situation to progress or to declare an emergency. Several other patients

come in and out of the hospital for assessment and pain management in their labor processes. This sleep feels like body rest, but the mind is not really recharging as I subconsciously process all the possible scenarios ahead.

Things progressed well and the mom-to-be began pushing, but 3 hours later, despite her best effort, we had to proceed to a cesarean section birth. Once the baby was successfully delivered and the mother safely out of her first hour postpartum, I could put my head back down. I call this resolution sleep—sleep that is slightly deeper and more restful that comes at the resolution of prolonged or complicated cases.

When my phone rings again, I feel like I was completely out. According to my Fitbit, I had 3 hours and 11 minutes of sleep overnight; however, the sleep-wake division looks suspiciously like a seismograph.

I am hoping to get a few more hours this afternoon before the nighttime rush starts again, which is sleep that I call pre-sleep. It is different from the first two types of sleep as there is nothing really worrying on my mind, yet it is still difficult to get into a truly deep sleep phase.

The final type of sleep I call blanketed sleep—sleep that feels like you are under a down comforter in front of a cozy fire in the middle of a snowstorm. I will get this type of sleep the evening after I am off call, after I have gotten through the 4 to 5 hours of patients booked in my office and caught up on the many non-clinical tasks required to keep my family practice office running. I will have handed over all my clinical duties and could safely turn off my phone, although many of us never do. The percentage of my REM sleep during this time is certainly higher during those hours than on the nights preceding, and I know I will wake up

refreshed and ready to start the process again.

I do not believe there has ever been a truly comprehensive study of the cumulative impact of sleep disruption that on-call physicians experience over the course of a lifetime. I am not even certain there would be a way to accurately study this topic. What I do know is that this chronic sleep disruption is just one of the many sacrifices physicians make every day to keep our health care system viable and sustainable. Thank you all, and sweet dreams. ■

—Kathleen Ross, MD
Doctors of BC President

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Avoid the routine use of ultrasound in evaluating clinically apparent inguinal and umbilical hernias

Inguinal and umbilical hernias are two of the most common reasons a primary care patient may need referral to a general surgeon. History and physical examination are usually sufficient to make the diagnosis. Patient symptoms include pain, burning, heaviness, or aching in the groin or umbilical region. It may be worse at the end of the day or after prolonged activity. The patient may also report a bulge that often disappears in the prone position.

It is best to examine the patient standing and then lying prone. Usually, with the patient standing, a visible asymmetry is seen. This can disappear when the patient is lying flat. Physicians can also feel the bulge or impulse when the patient coughs or strains.

The surgeon's diagnosis and subsequent treatment decisions are reliably made by the patient history and physical examination alone. The routine use of imaging, including ultrasound, in the setting of a clinically palpable inguinal or umbilical hernia is not required. This only adds unnecessary costs and treatment delay with no useful contribution to management decisions.

Choosing Wisely is a global movement for reducing unnecessary tests and treatments in health care. It tries to inspire and engage health care professionals to take the lead in reducing unnecessary tests, treatments, and procedures, and enables them with simple tools and resources that make it easier to choose wisely.

Recommendation

The Fraser Health Authority Division of General Surgeons, with the support of the Section of

General Surgeons of BC, recommends avoiding the routine use of ultrasound in the evaluation of clinically apparent inguinal and umbilical hernias. We are happy to accept elective referrals without an ultrasound. If the referring physician is not confident in the diagnosis, it is okay to order an ultrasound. Also, if the physician feels an ultrasound is necessary, it can be ordered at the time of initial consultation.

—David E. Konkin, MD, FRCSC, FACS
Regional Division Head, General Surgery, FHA
Department of Surgery Head (Local), Eagle Ridge Hospital
Division Head, General Surgery, Royal Columbian Hospital & Eagle Ridge Hospital
Clinical Associate Professor, UBC

Suggested reading

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Physicians have no right to complain

Physicians, as a rule, don't bother to vote in elections for organizations that deal with the practice of medicine, so we shouldn't complain about the results of those elections.

Organizations suffer two common diseases: regulatory capture and mission creep. In the former, the organization that is supposed to look out for all looks out for only a few. In the latter, the organization takes on more and more

work outside its original mandate, which costs more and more. The institutions concerned with the practice of medicine (the College, CMPA, Doctors of BC, etc.) are no different.

One assumes there is rule of the majority in these institutions, but this is a fallacy.¹ Consider any Western liberal democracy. In these countries about half the population is under the voting age, bringing the number of eligible voters who decide the winners down to 50%. Usually about 50% of eligible voters bother to vote, meaning that 25% of the population does the deciding. Then, if you consider that two parties usually split the vote (say 51% to 49%), you realize that 12.5% of the population decides who rules 100% of the population.

For medicine-related organizations, voter turnout is even more pathetic, rarely topping 10%, and leading to an even more obvious example of minority rule.

The regulation of medicine is not a prescriptive thing. It is very much a give-and-take thing. In other words, there are rules, but these rules require interpretation. That is why unintended (unfair) consequences are unavoidable.

So if you don't vote, then don't criticize.

—Mark Elliott, MD
Vancouver

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Success in personal and professional realms

It was with some weariness that I read the article by Gordon J.D. Cochrane, "Physicians and their primary relationships: How to be successful in both personal and professional realms" [*BCMj* 2019;61:208-211]. I understood the author's concern that physicians may drag their doctor-patient communication methods home, causing stress and conflict and thus interfering with the intimate level of communication needed in primary relationships. My first problem with the article was the implication that the physician should be living in two spheres: be the best when at work as a doctor and be the best when in his (or presumably in her) primary relationship. Easier said than done, and besides, perhaps the partner enjoys

being a doctor's husband or a doctor's wife, with all the imperfections. Reading on, my second problem was that the article was based on the results of a study of long-term relationships of only 57 supposedly happy nonphysician couples. In that study the factors cited to achieve success at home included commitment, love and trust, good communication, effective problem solving, similar views and values, enthusiasm for life with a sense of humor, and sexual intimacy. All I could say was, amen. Actually, I rather liked the helpful suggestions relating to the last item, but think of the performance anxiety trying to excel in all the recommended factors. My third problem with the article was more personal: I am not a fan of generalized behavioral advice. This article had all the good intentions of providing specific assistance in the home relationships of busy doctors, but I couldn't help but imagine Clark Kent changing out of his Superman costume (or Superwoman changing out of her costume) when arriving home after a day's work.

—George Szasz, CM, MD
Vancouver

Author replies

Thank you for this opportunity to respond to Dr Szasz's letter. He is simply offering an opinion about my article and I have no problem with

his comments. In many ways he is right. Maintaining a demanding profession and a fulfilling relationship can be challenging for anyone and his Superman/Superwoman metaphor is often fitting. This is why I wrote the article.

—Gordon J.D. Cochrane, Ed. D., R. Psych.

Vancouver

Reducing disability paperwork and family practice visits

I am inundated with requests from my patients to refill medications and assess conditions outside my scope. Many of them have disabilities and are unable to wait for hours at a walk-in clinic. There is a lack of resources to treat poverty, mental health, and addictions. The money should go there.

The paperwork and number of patient visits related to an injury is overwhelming. The bulk of these patients have soft-tissue injuries that are not quantifiable. A huge number of unnecessary imaging and consults are ordered to prove the diagnosis. I am an experienced physiatrist who teaches and lectures at home and abroad, but have absolutely no idea how to answer the generic questions found on those forms. Most doctors fill out what the patient tells them or face conflict, strains to the treating relationship, and letters of complaint. When I do a legal review it is alarming to see the

number of times some patients see their family physician—three to four times per month, then twice per month, then monthly for years, with essentially no change. Serial visits to family doctors do not improve outcomes in litigation or open claims.¹ Visits should be every 2 to 3 months for a chronic condition.² “My lawyer/insurer says I must,” is not a medical necessity.

We need strict limits on visits for injury. After the initial assessments, insurers should be responsible. Even for significant pathology, there is no need to be assessed at frequent intervals. ICBC, WorkSafeBC, and insurers should stop feeding off the public trough and treat their own patients. We should just write that “The patient has limitations with their right arm. Please modify their job to accommodate or find them another position; if not, get a vocational and functional assessment and follow that plan.”

—Paul Winston, MD, FRCPC
Medical Director Rehabilitation and Transitions, Island Health
President, Canadian Association of Physical Medicine and Rehabilitation

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Plastic-bag concerns

Numerous readers have written to the *BCMJ* recently expressing concerns about the plastic bags that print issues of the journal are occasionally wrapped in. We wholeheartedly agree with readers' concerns about plastics, which is why we don't use them. The bags we use are plant-based and compostable. Furthermore, we rarely use these compostable bags. We discourage advertisers from this type of enclosure and try to steer them to print inside the journal. Over time, we've successfully moved away from this type of advertising. However, we are also not in a position to refuse revenue from this source as we are a membership-funded publication and all advertising helps us defray publishing costs.

The *BCMJ* seeks to minimize its negative impact on the environment by:

- Supporting members who wish to read online with an e-subscription to www.bcmj.org.

- Avoiding bag use, and using certified-compostable plant-based bags when needed.
- Working with Mitchell Press, ranked third in North America for sustainability by canopy.org.
- Printing with vegetable-based inks.
- Using FSC-certified paper.
- Printing locally in British Columbia.

What else we're doing, thanks to your feedback:

- We're looking into printing “compostable” on the bags we use.
- We have added a note to our masthead page about the bags, and about our other environmental practices.

Thank you to everyone who took the time to write to us. It's a good reminder that we need to be more explicit about our environmentally aware practices—and that we should always strive to do more.

—Ed

Meeting movement guidelines in meetings

The Canadian Academy of Sport and Exercise Medicine (CASEM) recently published a position statement reminding medical professionals that our own physical activity habits influence our physical activity counseling practices, and recommending that “clinicians lead by example and integrate physical activity into their own lives, for their own health and well-being, and to provide further credibility and empathy for the challenges patients face.”¹⁻² Ergo, it is in the best interests of physicians and patients to apply this recommendation to the new Canadian 24-Hour Movement Guidelines, which, by 2020, will replace the Canadian Physical Activity Guidelines.

Movement is a deliberate term that reflects an important paradigm shift in the field. Public health professionals are learning that placing explicit limits on sedentary behavior may be just as important as promoting physical activity. In other words, we should be sitting less and moving more. Research has demonstrated that uninterrupted sitting time increases the risks of premature death, cardiovascular disease, obesity, metabolic disease, inflammatory disease, musculoskeletal disorders, cancer, and mental illness, often in settings where recommended physical activity levels have been met.³⁻⁶ In light of this, how can we lead by example? How can we

integrate more movement into our own lives? How can we sit less and move more? Of the many and varied solutions, a relatively simple one is to introduce active workplace meetings.

Active workplace meetings, walking meetings in particular, have been popularized in recent years, largely by professionals and publications in the business, technology, art, and design sectors. While the health benefits are occasionally acknowledged, it is the purported improvements in creativity, learning, engagement, and productivity that garner most attention in these spheres. Popular media tends to spotlight anecdotal evidence on this matter, and meander into (albeit fascinating) philosophical theory.⁷ That being said, we can acknowledge with scientific confidence that health and productivity are not mutually exclusive endeavors, and propose a few recommendations.⁸

Our own physical activity habits influence our physical activity counseling practices.

General recommendations

- Provide notice of the activity to ensure colleagues are prepared (e.g., have appropriate dress/footwear).
- Be considerate of physical limitations or disabilities.
- Acknowledge that activity may not be appropriate for all types of meetings.

Walking meetings

- Limit them to a maximum of two or three colleagues.
- Limit them to meetings that require minimal (if any) reference materials.
- Conduct them in a comfortable outdoor/indoor environment.
- Be cognizant of patient confidentiality in public spaces.

In-room meetings

- Incorporate standing/stretching breaks.
- Offer a variety of sit-stand stations and allow colleagues, perhaps at scheduled intervals, to move between stations.

As research evolves so too will our understanding of how physical activity, sedentary behavior, and sitting time relate to health outcomes, cognitive performance, and work productivity. At the very least, I hope you'll consider CASEM's call to lead by example and table a motion for motion at your next clinic meeting.

—Heather Wray, MD, CCFP(SEM)

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This article is the opinion of the Athletics and Recreation 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.

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.

Editorial Board changes

Dr Amanda Ribeiro has decided to leave the *BCMJ* Editorial Board to allow more time to focus on her OB/GYN residency. We wish her all the best in her residency and look forward to a possible return to our hallowed halls once she is done.



Dr Caitlin Dunne

We are very pleased to welcome Dr Caitlin Dunne as our newest Editorial Board member. Dr Dunne practises in Vancouver as a subspecialist in infertility, egg freezing, and women's reproductive health, nicely rounding out the Board's expertise in that area. She is also co-director at the Pacific Centre for Reproductive Medicine and a clinical assistant professor at the University of British Columbia.

—Ed.

Scholarship winner correction

Doctors of BC awarded a scholarship of \$1000 to Ms Katherine Ryeburn of Prince Rupert. Ms Ryeburn's city of residence was incorrectly listed as Nanaimo in the July/August issue of the journal.

Lifestyle offerings from Club MD

What do you do with your downtime? Doctors of BC knows you work hard. Your downtime is important and we want to help you make the most of it to do the things you love.

Want to enjoy a round of golf in the majestic hills of Whistler? How about attending some live theatre? Feel like joining a gym and living

a more active lifestyle? Club MD gives you access to discounted rates for a curated collection of offerings you'll enjoy.

Relaunched in November 2018, Club MD now focuses on lifestyle offerings—from travel to sports, theatre, amusement parks, dining, car purchases, and more. The team is continually sourcing new, high-value offers exclusive to physicians.

Club MD was relaunched in response to member feedback indicating a wish for new discounts that are more meaningful to physicians. New offers were added and the program continues to grow. We continue to look for even more ways to provide members with discounts that are health-conscious, environmentally friendly, and available anywhere across the province, in some cases, even internationally.

Continued on page 280

Webinar series: Learn more about billing GPSC fees

Family doctors are invited to join a four-part webinar series about billing GPSC fees to:

- Increase confidence when billing GPSC incentives.
- Better support appropriate billing.
- Improve understanding about fee rules.
- Not miss billing for additional services.

Based on physician feedback, the GPSC and SGP are expanding their series from new-to-practice to all family doctors and their MOAs. The webinars were first presented to new-to-practice GPs in winter 2018 and spring 2019.

Led by physician educators, each 90-minute webinar will be cumulative and content-specific. Space is limited. To register, visit www.gpsc.bc.ca. Here are the details about each webinar:

Introduction to MSP Billing for Family Practice: 17 September at 6 p.m.

- Basic visit (00100 series)
- Complete physical (00101)
- Counseling (00120)
- House calls
- WorkSafe BC and ICBC visits

GPSC Billing Part 1: 1 October at 6 p.m.

- GPSC Portal (G14070, G14071)
- Mental Health Planning and Management (14043-14048)
- Palliative Care planning (G14063)
- Prevention (G14066)

GPSC Billing Part 2: 24 October at 6 p.m.

- GPSC Portal Recap
- Complex Care Planning (14033, 14075)
- CDM (14050-14053, 14029)

GPSC Billing Part 3: 20 November at 6 p.m.

- Communicating with patients (G14076, G14078, 14023)
- Conferencing about patients (G14077, 13005, G14018)
- Providing advice to another provider about a patient (13005, G14019, 14021, 14022)

For more information, contact gpsc.billing@doctorsofbc.ca.

Neurosurgical supports, from BC to West Africa

A British Columbian neuroscience charity is delivering neurosurgical support in the most ill-equipped corners of West Africa. Korle-Bu Neuroscience Foundation (KBNF) was founded in 2002 by Vancouver General Hospital neuroscience nurse Marj Ratel. The organization has since developed an extensive international network of neurosurgical supports that recently saved the life of an 8-year-old Liberian patient named Samuel, who was born with nasal encephalocele.

Samuel was born with multiple skull and facial defects, which pushed his brain down inside his face and nasal area. Last fall, the large cyst-like facial defect protruded from his nasion and extended past the nostrils. The life-threatening deformity was so severe it obstructed Samuel's vision and prompted him to quit school in order to avoid being bullied. KBNF members in Liberia connected the patient to neurosurgeon Dr Dan Miulli who, wearing a headlamp as a precaution against failing electricity in Liberia, led a team of experts through 9 hours of surgery.

The procedure was made possible by a Zeiss double-headed neurosurgical microscope, which had been donated by Victoria General Hospital and shipped from BC to Liberia via ship, crane, plane, jet, and truck. A shunt was placed in Samuel's temporal arachnoid cyst to relieve pressure on the brain and allow the reintroduction of viable brain in the intracranial cavity. Nearly 1 year later, Samuel is planning to return to school with ambitions to become a doctor.

Liberia has just a single neurosurgeon serving approximately 5 million people. Over the past 17 years, KBNF has transported more than an estimated \$17 million retail value of medical supplies overseas, and has supported and trained 10 neurosurgeons in West Africa. Visit www.kbnf.org to learn more about the foundation's work, get involved, or donate.

—Jeremy Hunka

Korle-Bu Neuroscience Foundation



Samuel, prior to the surgery.



Samuel and Dr Alvin Nah Doe, a KBNF member and Liberia's sole neurosurgeon, who participated in Samuel's surgery and treatment.

Visit us online today at www.doctorsofbc.ca/clubmd and take advantage of this program. Call the team at 1 800 665-2262 (x7921) or email clubmd@doctorsofbc.ca if you have any questions. We're available and happy to help in any way we can.

—T.J. Alabazo

Club MD Coordinator, Doctors of BC

Study: High insulin production may contribute to pancreatic cancer

UBC scientists have demonstrated a causal link between high insulin levels and pancreatic cancer. In a study published in *Cell Metabolism* ("Endogenous Hyperinsulinemia Contributes to Pancreatic Cancer Development"), researchers lowered insulin levels in mice predisposed to developing pancreatic cancer and found that the lower levels protected the mice against developing the disease. The findings hold promise for early detection and prevention of pancreatic cancer in humans.



BC Medical Journal

@BCMedicalJrnl

Dr Kathleen Ross: A history of stepping up. @DrKathleenRoss1, a family physician with a passion for surgery, is the new president of @DoctorsOfBC.

Read the article: bcmj.org/special-feature/dr-kathleen-ross-history-stepping



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For the study, lead author and PhD student Anni Zhang crossed a strain of mice that is genetically incapable of developing a rise in insulin with a strain of mice predisposed to developing pancreatic cancer. These and the control mice were fed a diet for a year that was known to increase insulin levels and promote pancreatic cancer. At the end of the yearlong study, the mice with slightly reduced insulin levels were shown to be protected from the start of pancreatic cancer.

Study: Pregnant women with lupus discontinuing medication

A study by Arthritis Research Canada has found that almost 30% of pregnant women with systemic lupus erythematosus discontinue their antimalarials (especially in the first trimester) despite these medications being safe and recommended during pregnancy.

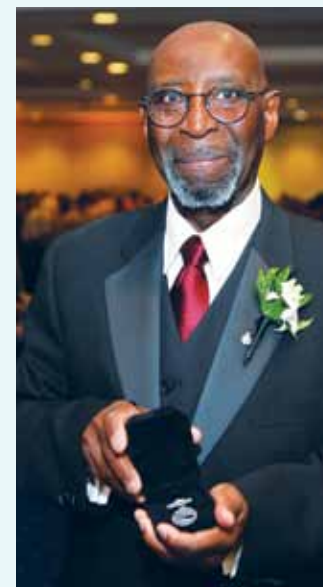
Women with lupus have a higher risk of experiencing pregnancy-related complications like miscarriage, stillbirth, preeclampsia, eclampsia, preterm labor, and fetal growth restriction. The findings of this research point to the importance

Correction: Award winner caption

Dr Kwadwo Asante was pictured in the July/August issue of the journal, being presented with a Doctors of BC Silver Medal of Service. The photo caption incorrectly identified him as Dr Jean Hlady, who was also presented with a Doctors of BC Silver Medal of Service but was not pictured.



Jean Hlady, MD



Kwadwo Asante, MD

of educating women with lupus who are pregnant, or planning to become pregnant, about the benefits and risks of medications during pregnancy.

Few prior studies have examined medication use in pregnant women with lupus and showed

varying frequencies of use prior to conception, during pregnancy, and postpartum.

To obtain a copy of the paper, contact lead researcher on the study, Mary De Vera, MSc, PhD, Research Scientist of Pharmacoepidemiology, at mdevera@arthritisresearch.ca.

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EvidenceAlerts helps identify newsworthy clinical articles

With so many clinical articles published every week, it can be challenging to narrow them down to those that provide new and relevant information for clinical practice.

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—Niki Baumann
Librarian

Caitlin Dunne, MD, FRCSC

The effects of cannabis on female and male reproduction

More high-quality evidence is needed before physicians can reassure patients that marijuana use will not affect their fertility or their offspring.

ABSTRACT: Products of the *Cannabis sativa* plant, including marijuana and hashish, are the most popular recreational drugs in North America. In October 2018, smoking recreational cannabis became legal in Canada. At that time British Columbia had the second-highest per capita cannabis consumption level in the country. With legalization, consumption levels in Canada and BC are expected to rise. This is concerning because both female and male reproductive function may be affected by the ability of cannabis to interfere with the body's natural endocannabinoid system. Cannabinoid receptors have been isolated in the hypothalamus, pituitary, ovary, endometrium, testes, and spermatozoa. Research to date suggests marijuana affects some of the central processes of reproduction, including the release of follicle-stimulating hormone and luteinizing hormone, ovulation, sperm motility, fertilization, and placentation. Although large-scale population surveys have yet to demonstrate a delayed time to pregnancy or a consistent increase in perinatal complications, it seems reasonable to avoid cannabis when attempting to conceive. The Society of Obstetricians and Gynaecologists of Canada believes there is sufficient evidence of harm to advise women to avoid cannabis when preg-

nant or breastfeeding. Until we have high-quality evidence that cannabis is safe, physicians cannot reassure users that consumption will not affect their fertility or their offspring. With the legalization of cannabis, patients may be more forthcoming about their consumption and researchers may be able to generate more accurate data on reproductive outcomes.

On 17 October 2018, it became legal in Canada for adults age 19 and older to smoke products of the *Cannabis sativa* plant for recreational purposes.¹ Before legalization, according to Statistics Canada, 27% of people age 15 to 24 and 13% of people 25 and older were using cannabis.² This amounted to 4.6 million Canadians who reported consuming products of the cannabis plant, which include marijuana and hashish.² In 2017 British Columbia had the second-highest per capita cannabis consumption level in Canada at 24.6 grams per person per year.³

In the United States marijuana is the most popular recreational drug (excluding alcohol and tobacco) and the drug rising fastest in popularity.⁴ As of November 2018, 33 states permitted the use of marijuana for medical purposes and 10 of these had also decriminalized recreational use.⁵ Between 2001 and 2013, marijuana use among US adults more than doubled. This jump was attributed to legalization of the drug in many states and the increasingly permissive attitudes that followed.⁶ The National Survey on Drug Use and Health found a 62% increase in marijuana use by pregnant women between 2002 and 2014, with the prevalence

of past-month marijuana use highest in those age 18 to 25.⁶

Canada can learn some important lessons from the United States. First, cannabis products will continue to rise in popularity with legalization. Second, the fertility of men and women in their reproductive prime may be affected by marijuana use. As physicians it is imperative that we understand the research, or lack thereof, regarding cannabis and reproduction to guide our patients in this new era.

Consumption and effects

Over 500 different compounds are found in *C. sativa*, and at least 100 of these are cannabinoids.⁵ Tetrahydrocannabinol (THC) is the high-inducing component of marijuana.

Cannabis is consumed as raw plant materials and extracts that are smoked or converted into edibles for ingestion.⁵ Smoking is currently the most popular form of consumption but ingestion may eventually surpass smoking in popularity. According to *Current Opinion in Food Science*, ingestion of cannabis creates a slower, longer-lasting experience than smoking because a more psychoactive form of THC (11-hydroxy- Δ^9 -tetrahydrocannabinol) is created in the liver by cytochrome P-450.^{5,7}

Beyond the detrimental respiratory effects of inhaling burning plant material, excess consumption of cannabis products can lead to nausea, vomiting, and disorientation.^{5,8} Contaminants such as pesticides, metals, and microbial toxins are also potential sources of harm.⁵

Dr Dunne is co-director of the Pacific Centre for Reproductive Medicine and a clinical assistant professor in the Department of Obstetrics and Gynaecology at the University of British Columbia.

This article has been peer reviewed.

The endocannabinoid system

The endocannabinoid system is composed of endogenous cannabinoids found throughout the human body. These naturally occurring neurotransmitters bind to cannabinoid receptors. The two most commonly studied molecules are N-arachidonylethanolamine (AEA) and 2-arachidonoylglycerol (2-AG), which target two main cannabinoid receptors: CB1 (found largely in the central nervous system) and CB2 (found largely in the immune system).⁹ These receptors have also been found in reproductive organs such as the endometrium (CB1 only) and the ovaries and testes (both CB1 and CB2).^{9,10}

THC acts as an exogenous ligand of the cannabinoid receptors. Compared with endogenous cannabinoids, however, THC has a much more pronounced effect that some experts have described as “clinically concerning.”⁹

Cannabis and female fertility

The first requirement for normal female reproduction is a functioning hypothalamic-pituitary-ovarian (HPO) axis. Pulses of gonadotropin-releasing hormone (GnRH) from the hypothalamus stimulate the pituitary to release follicle-stimulating hormone (FSH), predominantly in the follicular phase, and luteinizing hormone (LH), predominantly in the luteal phase. Sex steroids are subsequently produced at the level of the ovary. FSH stimulation makes estrogens, and LH stimulation makes androgens and progesterone. It is only when these three structures are operating in a normal, cyclic pattern that an ovarian follicle can be induced to mature and ovulate. After ovulation, the newly formed corpus luteum needs LH stimulation to produce the progesterone that supports the endometrium for embryo implantation.

Exogenous cannabinoids can interfere with the intricate balance of HPO signaling at every level. For example, high levels of endocannabinoids and exogenous cannabinoids have been shown to suppress the release of GnRH, FSH, and LH.⁹ Studies in rats have found that large quantities of THC inhibit ovulation.^{9,11} Studies in humans have been largely observational, but moderate/heavy users of marijuana seem more likely to present with infertility related to ovulatory disorders.^{9,12-14} Disturbances to the

endocannabinoid system may also contribute to polycystic ovary syndrome through dysregulation of appetite and glucose metabolism.^{9,15}

Despite evidence that marijuana can disrupt ovulation, large-scale cohort studies have failed to demonstrate a prolonged time to pregnancy in women who use the drug. The Pregnancy Study Online followed 1125 couples prospectively from 2013 to 2017, tracking their fertility rates and self-reported marijuana use.¹⁶ The study authors concluded that there was little association between female or male marijuana use and fecundability.¹⁶ Another large observational study, the American National Survey for Family Growth, reported that 16.5% of men and 11.5% of women used marijuana while trying to conceive.⁴

Of the 758 male and 1076 female respondents, the time ratio to pregnancy for never users versus daily users was 1.08 in men (95% CI, 0.79-1.47) and 0.92 in women (95% CI, 0.43-1.95).⁴ The authors concluded that marijuana use in any frequency does not prolong the time to pregnancy.

Cannabis and pregnancy

After the legalization of cannabis, the Society of Obstetricians and Gynaecologists of Canada launched a campaign urging pregnant and breastfeeding women to avoid using the drug.¹⁷ No clinical practice guideline has been developed yet, but the *Journal of Obstetrics and Gynaecology Canada* recently published a review article on the subject.¹⁸ In it, the authors highlight the potential for cannabis to cause harm. However, they also state that the effects of cannabis use in pregnancy remain “largely unknown.”¹⁸ Those who research marijuana’s effects face the formidable challenge of controlling for confounding factors such as concomitant use of other drugs and socioeconomic influences.¹⁸

THC and its metabolites can cross the placenta.¹⁹ THC has been isolated in cord blood

samples and maternal blood samples taken simultaneously, with the cord blood containing levels three to six times lower than the maternal blood.^{19,20} Cannabis products can also be found in breast milk during lactation and are metabolized by the infant.²¹

There is evidence that prenatal exposure to cannabis may stunt fetal growth and lead to enduring neurobehavioral effects.^{18,22} A review from the Canadian Centre on Substance Use and Addiction states that prenatal exposure to cannabis can “alter neurodevelopment, leading to adverse effects on cognition and academic achievement.”²¹ Hyperactivity, impulsivity, attention deficits, and increased likelihood of substance abuse are listed as risks.²¹

CB1 receptors are also believed to play a significant role in regulating mitochondria and cellular adenylyl cyclase.⁹ THC has the potential to induce mitochondrial dysfunction, leading to oxidative stress and vascular dysregulation in the placenta.⁹

A recent study of British Columbia’s Perinatal Data Registry reviewed records for 243 140 women to measure drug consumption as documented on antenatal history forms completed from 2008 to 2016.²³ Over the 8-year study period, the proportion of pregnant women who used cannabis rose from 2.2% to 3.3%. Cannabis use during pregnancy was associated with an increased risk of poor perinatal outcomes, including small for gestational age (adjusted OR 1.47; 95% CI, 1.33-1.61), preterm birth (adjusted OR 1.27; 95% CI, 1.14-1.42), and intrapartum stillbirth (adjusted HR 2.84; 95% CI, 1.18-6.82). Women were also more likely to have used other illicit substances during pregnancy and to have a history of mental illness.²³ Like many studies on this subject, the authors relied on self-reported data, which means that actual cannabis use may have been underestimated.

A systematic review of 31 studies published by the American College of Obstetricians and Gynecologists included 7851 patients who used

The use of cannabis products will almost certainly increase in British Columbia. Furthermore, population studies have consistently shown that men and women of reproductive age are the highest users of marijuana.

marijuana during pregnancy and 124 867 who did not.²⁴ The initial, unadjusted analysis of the two groups showed an increased risk for low birth weight (15.4% vs 10.4%; RR 1.43, 95% CI, 1.27-1.62) and preterm delivery (15.3% vs 9.6%; RR 1.32, 95% CI, 1.14-1.54). However, when the authors controlled for confounding factors, primarily tobacco use, these risks were no longer statistically significant. They concluded that “the association between maternal marijuana use and adverse outcomes appears attributable to concomitant tobacco use and other confounding factors.”²⁴

Some women use marijuana in pregnancy because they believe it is safe. A qualitative study of pregnant women found that while they reported trying to reduce marijuana consumption because of potential risks, women believed it was “more natural and safer than other substances, including prescribed medicines.”²⁵ Women frequently justified their marijuana use because it treated pregnancy-related nausea and allowed them to provide nourishment to the fetus by eating. Many women in the study expressed concern that smoking marijuana might affect their babies; the list of perceived harms included asthma, memory function, and eczema. Interestingly, the authors note, “the one perceived risk of prenatal marijuana use about which there was universal agreement was the risk of being reported to child protective services if found using marijuana at the time of delivery. . . . They perceived this involvement as negative, as it was felt to be stigmatizing.”²⁵

A randomized controlled trial of marijuana use in pregnancy is obviously not feasible. However, the medical community recognizes the urgent need for better research in this area and studies that look at the implications of cannabis consumption for pregnancy and prenatal development are reportedly being prioritized by the Canadian Institutes of Health Research.¹⁸

Women frequently justified their marijuana use because it treated pregnancy-related nausea and allowed them to provide nourishment to the fetus by eating.

Cannabis and sperm function

Not surprisingly, more studies have considered the effects of cannabis on male reproduction than on female reproduction and offspring, probably in part because sperm is more accessible than oocytes and embryos.

Several aspects of the endocannabinoid system have been shown to play a role in male reproductive function. Like females, males also need a functional HPO axis to produce spermatozoa and sex steroids. Hypothalamic GnRH leads to FSH and LH production in the testes. This maintains spermatogenesis in the Sertoli cells and testosterone production in the Leydig cells. CB1 receptors are present in the anterior pituitary, Sertoli cells, and Leydig cells, while CB2 receptors are present in Sertoli cells.²⁶ Several studies have shown that disruption of the endocannabinoid system alters secretion of anterior pituitary hormones and decreases testosterone production.²⁶⁻²⁹

Spermatozoa contain both CB1 and CB2 receptors and are exposed to endocannabinoids in the epididymis.^{26,30} Alteration in the delicate balance of endocannabinoids within the seminal plasma has the potential to lower sperm count and motility.³¹

Sperm also appears to be susceptible to damage from THC exposure.^{32,33} In one study, sperm samples from 78 men were exposed in vitro to concentrations of THC equivalent to a therapeutic-use plasma level (0.032 μM) and recreational-use plasma levels (0.32 μM and 4.8 μM).³² In the sperm initially classified as the highest quality, motility was decreased dose-dependently by 2% to 21% ($P < .05$, $P < .001$). In the sperm initially classified as poorer quality, the motility decrease was even more dramatic. Motility was 28% lower in the 0.32 μM recreational-use plasma level ($P = .004$) and 56% lower in the 4.8 μM recreational-use plasma level ($P = .01$).³² Spontaneous acrosome reactions (changes to the spermatozoon as it approaches and prepares to bind to and

penetrate an oocyte) were also reduced in all sperm samples. There was a 35% decrease in both the high and poorer quality samples at the highest dose exposure.³²

Other evidence suggests that marijuana does not harm men’s reproductive health. For instance, one older study (1974) measured plasma testosterone in 27 men before and after a 21-day period of marijuana use.³⁴ The 12 “casual users” smoked an average of 54 marijuana cigarettes in that time, while the “heavy users” smoked an average of 119. No statistically significant changes in testosterone levels were observed.³⁴

Another study (2019) made headlines when researchers reported on their analysis of 1143 semen samples along with 317 blood samples from men attending a fertility clinic.³⁵ The study authors state, “Men who had ever smoked marijuana (N = 365) had significantly higher sperm concentrations. . . than men who had never smoked marijuana (N = 297).” It is important to note that the sperm concentrations of *both* the “ever” and “never” marijuana users were within the normal reference range (> 15 million/mL).³⁶ There were also no significant differences in sperm concentration between current and past marijuana smokers. Additionally, marijuana smoking was not associated with alterations in sperm DNA integrity.³⁵

As mentioned above, the cross-sectional survey data from the American National Survey for Family Growth included 758 male respondents. No difference was found when the time ratio to pregnancy was compared for men who were never users and men who were daily marijuana users (1.08, 95% CI, 0.79-1.47).⁴

Overall, the research on marijuana use and male reproduction has produced mixed results. High-quality data from in vitro and animal studies suggest that HPO function, sperm motility, and sperm fertilization are impaired by THC. However, cohort studies have not consistently found that marijuana harms male fertility, although these findings may be due to confounders and the self-reported nature of the studies.

Looking ahead

The use of cannabis products will almost certainly increase in British Columbia.

Furthermore, population studies have consistently shown that men and women of reproductive age are the highest users of marijuana. There is an urgent need for more data so that physicians can counsel their patients using solid evidence. Without this, women may continue to think that smoking marijuana is safe because it is “natural.”

The Society of Obstetricians and Gynaecologists of Canada believes there is sufficient evidence of harm to advise women to avoid cannabis when pregnant or breastfeeding. Advising men is more challenging. Men's testosterone production, sperm motility, and fertility potential has been unaffected by marijuana in some clinical studies, but we cannot ignore the benchtop research that has demonstrated harm. As we wait for unambiguous evidence, it seems reasonable to recommend patients avoid cannabis when trying to conceive.

Until high-quality evidence shows that cannabis is safe, physicians cannot reassure users that consuming the drug will not affect their fertility or their offspring. Hopefully the legalization of cannabis will make patients more forthcoming about their use of the drug, and this in turn will allow researchers to generate more accurate data on reproductive outcomes. ■

Competing interests

Dr Dunne is now a member of the *BCMJ* Editorial Board, but was not when this article was accepted.

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Emma McCutcheon, MD, Lauren Kitney, MD, Jeff Bishop, MD, Marie-Noelle Trottier-Boucher, MD

Infantile botulism in British Columbia: A case report

The clinical progress of two infants admitted to Victoria General Hospital in 2017 and 2018 illustrates the typical presentation of *Clostridium botulinum* infection and the approach to managing this infection.

ABSTRACT: Infantile botulism is a rare condition in children under 1 year of age caused by ingestion of *Clostridium botulinum* spores. The growing organism colonizes the intestinal tract and releases toxins that cause an acute flaccid paralysis. Many of the complications that occur in infantile botulism are respiratory in nature and include aspiration, acute respiratory distress syndrome, recurrent atelectasis, and pneumothorax. Gastrointestinal complications such as *Clostridium difficile* colitis can also occur. Two infants admitted to our pediatric centre approximately 2 months apart in 2017 and 2018 were both eventually diagnosed with infantile botulism. These cases illustrate the presentation, clinical course, and management approach typically seen in infantile botulism. Each patient presented with constipation and poor oral intake followed by diminishing strength and flaccid paralysis with respiratory compromise. In both cases the patients were treated with botulism immune globulin in the

form of a product called BabyBIG that had to be ordered from the supplier in California. Diagnosis of infantile botulism is challenging because of the low prevalence of the disease in Canada and the large number of possible conditions that must be considered when generating a differential diagnosis for a hypotonic infant. A high index of suspicion is required to detect infantile botulism and treat affected patients early in the clinical course of the infection. The cost of BabyBIG and the need to order the antitoxin product from an out-of-country supplier must be taken into account when treating infantile botulism.

Infantile botulism is a rare condition in children under 1 year of age that begins with ingestion of *Clostridium botulinum* spores.¹ The growing organism colonizes the intestinal tract and then releases toxins that bind to acetylcholine receptors, causing muscle weakness and leading to flaccid paralysis.² In contrast, foodborne botulism and wound botulism are caused by isolated toxin exposure, not colonization of the gut.²

C. botulinum infection is one of several conditions to include in the differential diagnosis when infants present with acute hypotonia. The cases of two infants admitted to Victoria General Hospital in 2017 and 2018 illustrate the typical presentation of infant botulism and the clinical course and approach to managing the infection.

Case 1 data

A previously healthy 2-month-old female presented to a smaller hospital in our region with a 4-day history of constipation and 1 day of decreased oral intake, lethargy, and a hoarse cry. Her father had a mild upper respiratory tract infection, but no other infectious contacts were identified. The patient was breastfed and formula fed and had no exposure to honey or solid foods. The week before presentation she had been switched to a new formula.

On examination the patient had no fever or symptoms of focal infection but did require treatment for dehydration. Her infectious disease workup included a nasopharyngeal swab and urine, blood, and cerebrospinal fluid cultures. The nasopharyngeal specimen was found positive for human metapneumovirus and a chest X-ray indicated pneumonia. The patient was started on ampicillin, cefotaxime, and oseltamivir. On day 1 she was placed on high-flow nasal cannula oxygen to treat apnea and bradycardias. On day 2 she was transferred from the smaller hospital to the pediatric intensive care unit at our centre because of her decreased respiratory effort and progressively worsening hypotonia. Shortly after arrival, the patient was intubated for respiratory failure with hypoxia and hypercapnia. She was profoundly hypotonic with shallow breathing, areflexia, no motor response to stimulation, minimal eye opening, and no cough or suck reflex. Results from an EEG and head imaging (ultrasound and CT scan) were normal. With flaccid paralysis making infantile botulism a possibility, a stool sample was

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This article has been peer reviewed.

collected and sent for botulinum toxin testing.

On day 6 of hospitalization the patient was transferred to the provincial pediatric centre for neurological assessment and further workup. MRI results showed no lesions or other cause for hypotonia. The patient remained intubated and ventilated and exhibited little change in neurological status. With the clinical picture still suspicious for infantile botulism, botulism immune globulin (BIG) was ordered from the supplier in California. The antitoxin product BabyBIG arrived and was administered on day 8. Stool culture results confirmed the presence of botulinum toxin A on day 12.

Once the patient received BabyBIG her neurological function improved. However, due to ventilator-associated pneumonia she had a prolonged recovery and required extensive rehabilitation. After 40 days of hospitalization the patient was discharged with mildly decreased muscle tone, neurological function close to baseline, normal respiratory function, and full oral feeding.

No source of botulism in the patient's home was ever identified. The family used a formula-making machine and followed proper sterilization techniques. Public health was involved in testing the formula, the formula-making machine, and other possible sources of exposure.

Case 2 data

A previously healthy 3-month-old female presented to our centre after 4 days of constipation, 2 days of decreased oral intake and low energy, and 1 day of increased fussiness, poor head control, lethargy, and weak cry. She had no fever and no symptoms of focal infection. Both parents had upper respiratory tract infections. A few days earlier the patient had been seen by a family physician who recommended applesauce for her constipation. Other than the applesauce, the patient had no solid food or honey exposures and was breastfed and formula fed. In the month leading up to admission she had tried multiple premade and powdered formulas.

An examination of the patient revealed non-vigorous spontaneous movement in all four limbs, weak cry, no head movement, moderate peripheral and central hypotonia, and intact reflexes. The symptoms were considered suspicious for infectious causes. Nasopharyngeal

swabs were taken along with urine and blood samples for culture. A metabolic workup, chest X-ray, and head ultrasound were all completed. The nasopharyngeal specimen was found positive for human metapneumovirus. Broad spectrum antibiotics were initiated at first presentation.

On day 1 the patient developed bilateral ptosis and a stool sample was sent for botulinum toxin testing. On day 2 she developed desaturation and increased secretions requiring high-flow oxygen and transfer to the pediatric intensive care unit.

On day 3 the patient was transferred to the provincial pediatric centre for neurological assessment and further workup. On arrival her paralysis was seen to be progressing in a descending fashion. Given the possibility of *C. botulinum* infection, antibiotics were discontinued on day 4 to prevent the exacerbation of toxin release and BabyBIG was ordered. On day 5 the antitoxin product arrived and was administered. The patient was intubated for an MRI and was unable to be extubated after the procedure because of hypoventilation. Her MRI results were normal and no EMG or nerve conduction study was done. On day 7 her stool sample was found positive for botulinum toxin A.

The patient's hypotonia improved slowly after she received BabyBIG. She was extubated on day 10 and continued to recover with the help of extensive physical therapy. The patient was discharged after 22 days of hospitalization. She was back to her baseline for strength and muscle tone at follow-up shortly after discharge. She had mild weakness, but no respiratory distress.

No source of botulism exposure was found, even after public health tested the patient's formula and applesauce. There was also no *C. botulinum* source found that connected Case 2 with Case 1.

Discussion

Diagnosing and managing an acutely hypotonic infant requires investigating many possible

causes. The differential diagnosis for acute hypotonia differs from the differential diagnosis for chronic hypotonia.

Primary neurological causes of acute hypotonia are rare but important to consider and include Guillain-Barré syndrome, myasthenia gravis, encephalitis, and spinal muscular atrophy type 1.³ Infectious conditions other than

infantile botulism that can cause acute hypotonia include poliomyelitis, acute flaccid myelitis, sepsis, and meningitis.⁴ Metabolic disorders can cause hypotonia as well and should be considered along with toxic ingestions and nonaccidental injuries.⁴ Disorders such

as hypothyroidism and electrolyte disturbances can cause milder hypotonia and present in a way similar to the early stages of infantile botulism.⁴

Diagnosis

Hypotonia investigations should include a full neurological examination and detailed history of symptom progression to narrow down the number of possible causes for the differential diagnosis.⁵ There should be careful documentation of muscle tone, strength, head lag, ptosis, hand grip, spontaneous and resisted limb movement, cry, reflexes, gag, suck, ocular movements, pupillary response to light, resting posture and leg positioning, and Babinski reflex.^{3,5} An infectious disease workup and metabolic workup should be completed as well.⁵ The infectious disease workup in hypotonic infants usually includes lumbar punctures.⁵ Other investigations to consider include head imaging, chest X-rays if respiratory symptoms are involved, EEG, and stool testing for botulinum toxins.⁶ Nerve conduction studies and EMGs can be useful when trying to rule out a primary neurological cause such as Guillain-Barré or myasthenia gravis.

As the cases described above illustrate, seemingly benign and mild symptoms are often seen early in infantile botulism.⁷ Constipation, poor feeding, and hoarse cry commonly precede manifestation of muscle weakness, including ptosis, hypotonia, cranial nerve palsies, drooling, and respiratory distress.⁷ The bulbar

***C. botulinum* infection is one of several conditions to include in the differential diagnosis when infants present with acute hypotonia.**

functions are often impaired first, causing the initial weak cry, poor feeding, poor gag reflex, and poor head control seen early on in these cases.⁷ The somatic musculature weakness and respiratory distress usually develop later on.⁷ Eventually deep tendon reflexes are lost as well.⁷ Neither of our patients displayed urinary retention, although this should be monitored since retention occurs in some cases.⁸ Sensation remains intact in affected patients, since the botulinum toxin cannot cross the blood-brain barrier.⁷ In terms of age,

our patients were the age of peak incidence (2 to 3 months), but it is important to remember infantile botulism can occur in any child under 1 year.¹ The relative gut immaturity of infants is thought to allow for colonization with *C. botulinum*, and gut maturation with age precludes older children and adults from developing botulism in the infantile form.² Although both of our patients were female, the incidence of botulism is the same in males and females.²

Often no source of infection is identified, as was the case for both our patients.² *C. botulinum* is known to be present in soil, fruit, vegetables, and honey.¹ The incubation period is between 3 and 30 days, making it difficult to isolate a source of exposure.² A lack of possible sources should not be seen as reassuring. If infantile botulism is suspected, stool samples should be sent immediately for culture and toxin detection.² This is far more challenging than it sounds because an almost universal early symptom of infantile botulism is constipation.⁷ A formal bowel irrigation protocol should be used when collecting stool to ensure the laboratory can process the sample.⁹

Management

Since infantile botulism causes gut colonization with *C. botulinum*, the patient can excrete toxin in the stool for weeks to months after the infection.⁸ This means that caregivers must dispose of stools appropriately and avoid exposing other infants to the infected child's stool for many months.⁸ Anyone with open lacerations

should also wear gloves while handling stool to prevent development of wound botulism.⁸

The natural course of the disease involves the progression of weakness over 1 to 2 weeks until the patient reaches a nadir.⁸ The infant then remains in this weakened state for 2 to 3 weeks before symptoms improve.⁸ If the infant is supported through this nadir of respiratory failure and flaccid paralysis, the symptoms can resolve even without administration of BabyBIG.⁸

Although infantile botulism should resolve with proper supportive care, complications can increase morbidity and mortality. As the ventilator-associated pneumonia developed by our Case 1 patient illustrates, many of the complications that occur in infantile botulism are respiratory in nature. These complications include aspiration, acute respiratory distress syndrome, recurrent atelectasis, pneumothorax, tracheal granuloma, tracheal stenosis, tracheitis, tracheomalacia, and respiratory arrest.⁸ Gastrointestinal complications such as *Clostridium difficile* colitis are also possible.⁶ Other complications are those seen in many critically ill children, including but not limited to anemia, inappropriate antidiuretic hormone secretion, urinary tract infection, and secondary bacterial infections.⁸

BabyBIG contains antibodies for both botulinum toxin A and toxin B.⁶ The antitoxin works by binding to the toxin and thus neutralizing it, and acts only on the toxin, not the organism itself.⁶ The use of BabyBIG reduces the recovery time to 2 or 3 weeks of symptoms in total.⁸ Although BabyBIG is an effective treatment, the cost is high—US\$45 000 per dose at the time our patients were treated and US\$57 000 per dose as of January 2019. The medication is also produced and stored exclusively in California and is not available immediately. Delivery takes 1 to 2 days after an order is submitted.¹⁰ As we learned in our cases, deciding when to order and administer BabyBIG is one of the hardest parts of treating infantile botulism. We had to consider not only the cost and lack of immediate access,

but the need to order the product before we had results from the stool tests. Rather than waiting the 1 week that stool test results typically take, we needed to administer BabyBIG once infantile botulism was suspected to stop the progression of the disease.¹¹

Both of our patients left hospital with normal respiratory function and oral intake but decreased strength. In cases like ours, discharge home can occur before full recovery of strength as long as feeding and respiratory status are good. This is because there is no relapsing or recurring pattern with infantile botulism. Symptoms are unlikely to return after resolution and a full recovery to developmentally normal muscle tone and strength can be anticipated.⁸

After discharge, infantile botulism patients require multiple community supports and long-term follow-up. Many patients have residual weakness at the time of discharge and require physiotherapy or occupational therapy until they return to baseline. Although infantile botulism does not have any direct developmental effects, the critically ill period does create a pause in the affected infant's development.⁸ Assessment and support from an infant development program will be needed. The vaccination schedule of these patients may also need to be adjusted.⁸ Because BabyBIG is made from human plasma,⁶ infants treated with the product cannot receive live vaccines within 6 months of antitoxin administration due to the impaired immune response the antibodies may cause.⁸ Rotavirus vaccine should be deferred until gut function returns to normal.⁸

Infantile botulism in Canada

Infantile botulism is a rare but reportable disease in Canada and engagement with public health is required in all suspected cases.¹⁰ Between 2011 and 2016 only 11 cases were reported in Canada.¹² The source of botulism is often unknown, but the disease tends to cluster in certain regions, with California having the greatest number of cases in North America.¹

The low incidence of infantile botulism in Canada means that access to BabyBIG is limited. The product must be shipped from California and takes 1 or 2 days to arrive. BabyBIG should be ordered as soon as infantile botulism is suspected, even if stool test results are not

Since infantile botulism causes gut colonization with *C. botulinum*, the patient can excrete toxin in the stool for weeks to months after the infection.

yet available. Giving the product early in the disease course is important.¹¹

Although BabyBIG was used in our cases, another antitoxin is available in Canada: botulism antitoxin heptavalent (BAT) for botulinum toxins A to G, available within 24 hours of ordering.¹⁰ However, efficacy of BAT in infants has not been proven and studies have reported complications of anaphylaxis and serum sickness in some adults.¹⁰ BabyBIG is the recommended treatment for infantile botulism in UK and US guidelines.² In our cases BabyBIG was also the choice of the infectious disease team at the provincial pediatric centre.

The diagnosis and management of infantile botulism is challenging because of the low prevalence of the disease in Canada and the large number of possible conditions that must be considered when an infant has acute hypotonia.

to the provincial pediatric centre. Because infantile botulism was the likely diagnosis based on the workups completed at our centre and the provincial centre, the antitoxin product BabyBIG was administered to both patients before stool test results confirmed the presence of botulinum toxin. The diagnosis and management of infantile botulism is challenging because of the low prevalence of the disease in Canada and the large number of possible conditions that must be considered when an infant has acute hypotonia. Management is also challenging because of the high cost of BabyBIG and the need to order the product from an out-of-country supplier. ■

Summary

Our cases show the importance of a high index of suspicion for infantile botulism when patients under 1 year of age present with mild symptoms such as constipation, head lag, and poor feeding. The two females treated at our centre within 2 months of each other in 2017 and 2018 received support for hypotonia and respiratory complications. As well, they underwent infectious disease, neurological, and metabolic investigations. Eventually both patients were transferred

Competing interests

None declared.

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Recognizing, preventing, and managing workplace impairment

Canada's legalization of recreational cannabis in October 2018 reignited the issue of workplace impairment for many employers and workers in BC. Impairment at work, which is not a new health and safety concern, can create significant risk of injury and death not only to the impaired worker, but also to co-workers and members of the public.

Employers and workers share responsibility for managing impairment in the workplace. All employers are encouraged to develop and clearly communicate to their employees the policies and procedures that address impairment at work. Written procedures should indicate roles and responsibilities and include information such as how workers can inform their employer if their ability to safely perform assigned work is compromised due to impairment, or how supervisors can assess for impairment using functional fitness-to-work testing. Workers must tell their supervisor or employer if their ability to safely perform assigned work is impaired for any reason.

While impairment can have many causes, the most common substance-related ones are over-the-counter medications; prescription drugs, including medically prescribed cannabis; alcohol; recreational cannabis; and illegal drugs.

Impairment from substance use can cause physical and behavioral changes that affect people's ability to work safely, putting them or their co-workers at risk of injury. The effects of impairment at work can include decreased motor coordination and reaction time, impaired judgment and decision making, and psychological or stress-related effects such as mood swings or personality changes.

BC has one of the most robust regulatory

frameworks for workplace impairment in Canada. Section 116 (2)(d) of the Workers Compensation Act requires that workers "ensure that the worker's ability to work without risk to his or her health or safety, or to the health or safety of any other person, is not impaired by alcohol, drugs, or other causes."

The Occupational Health and Safety Regulation details the regulatory framework for addressing workplace impairment under Section 4.19: Physical or mental impairment and Section 4.20: Impairment by alcohol, drug or other substance. The latter section states:

1. A person must not enter or remain at any workplace while the person's ability to work is affected by alcohol, a drug or other substance so as to endanger the person or anyone else.
2. The employer must not knowingly permit a person to remain at any workplace while the person's ability to work is affected by alcohol, a drug or other substance so as to endanger the person or anyone else.

3. A person must not remain at a workplace if the person's behaviour is affected by alcohol, a drug or other substance so as to create an undue risk to workers, except where such a workplace has as one of its purposes the treatment or confinement of such persons.

Employers must not assign impaired workers to activities where impairment may create an undue risk and must not permit workers to remain at any workplace while their ability to work safely is affected by alcohol, a drug, or another substance or condition. Employers should also consider how all workplace parties will be notified of and trained in the impairment policy and how supervisors will be trained to identify signs of impairment.

For more information, visit www.worksafebc.com and search "managing impairment in the workplace." ■

—Tom Brocklehurst
WorkSafeBC Director of Prevention Practices and Quality

Physicians who employ staff in a clinic are employers with responsibility for managing impairment in their workplace. All physicians have the additional responsibility to advise patients who work in safety-sensitive positions and may be impaired by illness, medication, and/or recreational substance use that they must inform their employer, request reassignment to non-safety-sensitive work, or take a medical leave as appropriate. Physicians must consider tasks and activities that their patient performs in the workplace, and then consider whether that individual poses a risk of significant harm to self, co-workers, or the public.¹ Physicians in BC are also required to report a patient who, in the physician's opinion, has a medical condition that makes driving dangerous but continues to drive after being warned of the danger by the physician.²

—Olivia Sampson, MD, CCFP, MPH, FRCPC, ABPM
WorkSafeBC Manager of Clinical Services

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

The Physician Quality Improvement initiative: Improving BC's health care system one project at a time

Clinicians often spot opportunities for improvement in their day-to-day practice. They usually become apparent after concerns are shared with colleagues in a hallway or cafeteria, or due to a clinician's own drive to experience job satisfaction. But how does one turn an idea into action in our exceedingly complex health care system?

In partnership with six health authorities, the BC Ministry of Health, and Doctors of BC, the Physician Quality Improvement (PQI) initiative funds training for physicians to develop the skills to bring their quality improvement ideas to life. In addition, participating physicians receive funding and support to design, plan, and implement their projects, usually with involvement from multidisciplinary teams. The training is provided by quality improvement experts over a 10-month period (on average), mostly in a group setting. The size of each project's team varies depending on the scope of the project.

A joint steering committee composed of senior health authority administrators, Specialist Services Committee representatives, patient representatives, and clinically active physicians leads the overall direction of the initiative. Dedicated PQI staff provide support to participating physicians in each health authority.

The PQI initiative began in 2015 and has trained and supported over 500 physicians per year. Program graduates report enhanced understanding of quality improvement and

improved skill development, enabling them to effect change in their workplace. PQI's renewed annual budget based on the 2019 Physician Master Agreement is \$10.5 million.

Examples of past PQI projects include reducing patient wait times to receive radiation therapy, improving sepsis care for inpatients in the acute medical wards, and decreasing unnecessary urine cultures in the emergency department.

Participating physicians receive funding and support to design, plan, and implement their projects, usually with involvement from multidisciplinary teams.

Last year, a PQI Summit brought over 400 health care attendees from across the province to celebrate the work of the initiative, encourage connections, and spark action—with inspiration from keynote speaker, Dr Don Berwick, president emeritus of the Institute of Health Care Improvement.

How to get involved

Throughout the year, PQI teams in each health authority hold 1- to 2-day information and introductory learning sessions. Attending one of these sessions is not a requirement in every health authority, but attending physicians find the sessions useful to learn quality improvement methodology and have their questions answered.

At the beginning of each year there is an intake process in each health authority where physicians submit their proposals to the steering committee and participate in a round of interviews. The steering committee then selects which projects to fund based on a diverse set of criteria. The criteria differ in each health authority, but some noteworthy factors for consideration are:

- Desire to bring improvement, big or small, to the health care system.
- Desire to learn quality improvement concepts.
- The project's strategic alignment with health authority priorities.

The selected physicians are notified that their project has been accepted in early fall.

PQI is one of nine initiatives supported by the Specialist Services Committee. If you have questions, contact sscbc@doctorsofbc.ca. To learn more about the Specialist Services Committee's work, go to www.sscbc.ca. ■

—Gordon Hoag, MD

Provincial PQI Physician Lead



BC Medical Journal
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In December 2015 Dr Gary Andolfatto had a biking accident, broke his femur, and dragged himself for almost 4 hours until he found a park ranger who called an ambulance. Read the article: bcmj.org/news/ketamine-alleviates-acute-pain-during-ambulance-rides

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TB diagnosis: Are we culturing enough biopsies?

Tuberculosis (TB) is caused by *Mycobacterium tuberculosis*, and there are between 200 and 250 new cases diagnosed in BC yearly. Approximately 21% of TB cases in BC are extrapulmonary, with lymphadenitis being a common extrapulmonary site. TB can be suspected based on clinical, microbiological, and histopathological findings. Risk factors include prior TB infection, TB exposure, or residence in or travel to a TB-endemic area.¹ Microbiological confirmation of TB can be by culture of *M. tuberculosis* or molecular detection of *M. tuberculosis* DNA in patient samples.¹ Histopathological findings associated with TB are necrotizing granulomata and positive AFB stain, although non-necrotizing granulomata can also be found.²

Every year there are multiple requests at the Mycobacteriology Laboratory of the BC Centre for Disease Control Public Health Laboratory (BCCDC PHL) to attempt molecular-based diagnosis of TB on formalin-fixed paraffin-embedded (FFPE) tissue samples that were sent for histopathological examination without concurrent tissue culture, and were later suspected of TB based on histopathology. However, this diagnostic route compromises patient care since molecular testing is less sensitive than culture for *M. tuberculosis*, does not confirm organism viability, and limits options for drug susceptibility testing.¹ To estimate how frequently TB diagnosis may be missed, we reviewed lung and

thoracic lymph node biopsy handling practices (635 patients) and associated laboratory and clinical findings and engagement in TB care of those suspected or diagnosed with TB based on biopsy findings (23 patients) in two BC hospitals for 2018. The same review was conducted on all patients whose FFPE samples were sent to the Mycobacteriology Laboratory at the BCCDC PHL for TB molecular testing (48 patients) in 2018.

Physicians ordering biopsies should consider TB in the differential and evaluate each patient for TB risk factors prebiopsy.

We found that 4% to 14% of lung and thoracic lymph node biopsies were sent for mycobacterial culture, in addition to histopathological evaluation. Patients with tissue culture and histopathology were significantly more likely than those with histopathology only to be diagnosed with TB and undergo assessment and treatment by provincial TB services, based on biopsy results. High clinical suspicion for TB prior to biopsy in patients whose biopsies were sent for mycobacterial culture likely drove these differences. Less than 1% of lung biopsy patients were referred to TB services for assessment based on histopathological findings only (presence of granulomata in tissue), resulting in diagnosis and treatment of three additional patients. Out of 48 patients tested by molecular testing for TB at BCCDC PHL in 2018, 44 patients were assessed by the TB services, six were diagnosed with TB based on molecular testing of FFPE samples, with three of those being on peripheral lymph node biopsies. An additional five patients were treated for TB in the absence of microbiological diagnosis, based on clinical and histopathological suspicion alone.

Our review demonstrates that a small portion of TB patients in BC received a sub-optimal diagnostic workup due to lack of tissue culture. To further reduce this number,

physicians ordering biopsies should consider TB in the differential and evaluate each patient for TB risk factors prebiopsy (especially in cases of peripheral lymphadenitis), and ensure cultures are performed for biopsies of patients with clinical suspicion of TB. ■

—Siu-Kae Yeong, MD

UBC Public Health Resident Physician

—Shazia Masud, MD, FRCPC

Clinical Assistant Professor, Department of Pathology and Laboratory Medicine, University of British Columbia, Surrey Memorial Hospital

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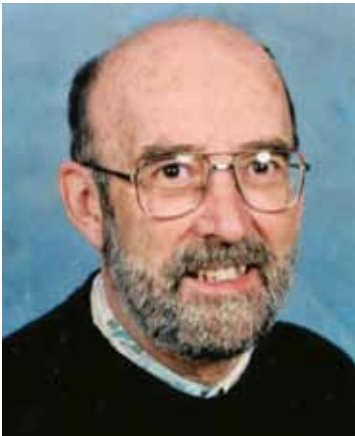
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This article is the opinion of the BC Centre for Disease Control and has not been peer reviewed by the BCMJ Editorial Board.

Obituaries

We welcome original tributes of less than 300 words; we may edit them for clarity and length. Obituaries may be emailed to journal@doctorsofbc.ca. Include birth and death dates, full name and name deceased was best known by, key hospital and professional affiliations, relevant biographical data, and a high resolution head-and-shoulders photo.



Dr Johannes V. Asfeldt
1930–2019

In our medical lives, perhaps our most valued assets are our colleagues. In rural general practice few are more valued than those in obstetrics. We will always be grateful for the privilege of having worked with Dr Johannes (Johs) Asfeldt.

Johs attended medical school in Copenhagen, class of 1959, and practised there and in the US, Canada, Kenya, Tanzania, and Zimbabwe over a 41-year career. He practised in urban centres in Missouri and North Dakota and in solo rural posts in Newfoundland (Grenfell Mission based in St. Anthony), Yukon, Minnesota, Alberta, and BC. His later career was punctuated by eight lengthy trips to African hospitals to volunteer and teach. Throughout, he remained a dedicated father, husband, and grandfather, Rotarian, pilot, and Christian. Johs had a lifelong commitment to women's health in underserved areas and he was as comfortable in the left seat of his beloved plane (C-GWEU) as he was in the OR and delivery suite. Theologically liberal, he respected both life and autonomy, and served wholeheartedly wherever he had the opportunity.

We'd like to share a story from his time in Dawson Creek to help you appreciate Johs. Typically, he would be called in by an anxious and exhausted GP at 3:00 a.m., and through the -40 °C weather he came to attend an obstetrical emergency. Always prompt, a careful consult was provided and cesarean would be recommended and OR called. Five minutes later he would be fast asleep and 20 minutes later scrubbed and ready to go. How we appreciated his calm and confidence. Twenty years later, after dementia took hold, he still enjoyed reading his obstetrics texts and asking his devoted wife, Janeen, about the call schedule.

Small communities around the world benefit from dedicated physicians and surgeons. We will cherish the memory of Johs Asfeldt, an exemplar of small-town obstetrics.

—Steve Ashwell, MD
Victoria

—Ulrike Meyer, MD
Dawson Creek



Dr Mervin Leslie Hassan
1934–2018

Dr Les Hassan passed away peacefully on 24 November 2018 at the age of 84. He leaves

behind his wife of 60 years, Sylvia; his sons, Doug (Mary-Louise) and Tom (Genevieve); six grandsons, Dean, Neal, Grant, Julian, Jake, and Ryan; and his brother, Bob.

Les, a native of Vancouver, attended John Oliver Secondary School. After a time working on the railroad and in a lumber mill, he was determined to further his education. He attended the University of British Columbia and received a degree in pharmacy in 1958. In the same year he married his high school sweetheart, Sylvia, before returning to UBC where he earned his medical degree in 1963. After completing his internship in San Diego, success came quickly in his own family medicine practice in North Vancouver. Les practised there for 30 years. Family medicine was a little different back then—long nights delivering babies, rounding patients at Lions Gate Hospital, office patients, performing minor surgery, and of course house calls. His care and advice was adored by his many friends and patients. He retired in 1993.

Upon retirement, Les was honored by the Squamish Nation, for whom he had served as a physician and friend. The Squamish band celebrated his retirement with a naming ceremony and dinner. He was honored with the ancestral name Nexws-Kitlen (the Healer).

His greatest joy was his family and friends. His intelligence was never questioned. He had a great sense of humor and enjoyed conversation on almost any topic. Sometimes a lively debate would ensue. He was a full-time family doctor but also a part-time carpenter, plumber, and electrician. He enjoyed handyman projects both at home and at the family cabin on Sakinaw Lake. He and Sylvia enjoyed hosting parties, playing bridge, and golfing.

After retirement, Les continued his hobbies of home renovation, fishing, and golf. He and Sylvia spent several years traveling the world and exploring different cultures. He also loved tending to his rose garden, and he continued to golf at Capilano Golf Club and went on several fishing adventures with his sons to Haida Gwaii and Vancouver Island.

Les will be sadly missed.

—Douglas Hassan, MD
Fox Island, WA

Obituaries continued on page 294



Dr Charles Brian Warriner
1946–2019

Dr Brian Warriner graduated from medicine at UBC in 1971 and initially did general practice in Powell River, BC, and Campbellton, New Brunswick, before completing his anesthesiology residency at UBC in 1980. As a research fellow at St. Paul's Hospital Pulmonary Research Laboratory before becoming a staff anesthesiologist at St. Paul's Hospital in Vancouver, Brian had interests in several areas, including a trial involving a noncellular oxygen carrier in cardiac surgery. He was an excellent teacher of anesthesia residents, medical students, pharmacology students, and operating room nurses, and was an invited speaker at many conferences nationally and internationally. He was well regarded as a member of the Royal College of Physicians and Surgeons of Canada's exam board in anesthesiology. Brian was highly supportive to a generation of final-year UBC anesthesiology residents preparing for certification exams.

Brian also contributed extensively to the administration side as hospital department head; chair of the Medical Advisory Committee; vice president, Medical Affairs; and acting president and CEO of Providence Health Care. In 2002 he became professor and head of the UBC Department of Anesthesiology, Pharmacology, and Therapeutics. As a leader, he was instrumental in starting the first acute pain service in Western Canada, and in bringing anesthesia assistants to St. Paul's Hospital. He also provided the groundwork for development of Pain BC, a not-for-profit organization for

patients with chronic pain. Brian also led the university department to develop the annual Whistler Anesthesiology Summit conference. As a member of the College of Physicians and Surgeons of BC Committee for Non-hospital Medical and Surgical Facilities, he improved the regulations for and inspections of private surgical clinics. He reviewed other departments, and for Accreditation Canada, he surveyed many hospitals nationally. He also surveyed several hospitals internationally. For many years Brian made annual visits to Kampala, Uganda, to teach anesthesiology and to considerably strengthen the anesthesiology residency program at Makerere University. With his support and funding, several Ugandan anesthesiology trainees came to UBC.

In 2009, Brian was awarded the prestigious Canadian Anesthesiologists' Society Clinical Practitioner Award in recognition of excellence in clinical anesthesiology and for making significant contributions to the practice of clinical anesthesiology in Canada. He retired from clinical practice in 2016.

For many years Brian was a leader with Cub Scouts and Boy Scouts, taking his charges on memorable camping expeditions.

Brian was diagnosed with pancreatic cancer and passed away peacefully at home. He will be remembered for taking time to listen to medical students, residents, and colleagues with difficulties and for providing invaluable and timely support.

A memorial fund in Brian's name has been organized through the St. Paul's Foundation, supporting Brian's legacy of teaching anesthesiology in Uganda. Visit www.donate.helpstpauls.com/dr-warriner for more information.

—**Randy Moore, MD, FRCPC**
Vancouver

—**Clinton Wong, MD, FRCPC**
Vancouver



Dr Geoffrey Parker-Sutton
1930–2019

After a long, distressing illness, Dr Geoff Parker-Sutton died suddenly with his family around him on 14 March 2019. Geoff was born and grew up in Castle Donington, a small village in central England. On leaving school in 1948 he was required, as all youth were at that time, to serve 2 years of national service, and he chose to do this in the Royal Air Force (RAF).

After such a short time of service, it was rare for any national serviceman to receive a commission, but Geoff did and became Flight Lieutenant Geoffrey Parker-Sutton. While serving in the RAF he sustained a back injury from a parachute landing training exercise, and it was an injury that recurred from time to time throughout his life.

While in the RAF, Geoff decided that he wanted to be a doctor, and in 1950 he entered Durham University as a medical student, graduating in 1956. During medical school he met a social worker student, Jane Thorne, and they married in 1956 and immigrated to Canada in 1958. They traveled to New Westminster and Geoff was accepted at Royal Columbian Hospital to do a 1-year resident's course. It was then that he decided to become a GP, and on finishing his year Geoff and Jane moved to Surrey. Surrey in the 1960s was very different from today—limited residential development south of the Pattullo Bridge up to Whalley, and everything south of 88th Avenue was fields and farms. Geoff found a market at the intersection of 128th Street and 102nd Avenue, rented a

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The Fraser Northwest Nurse Debbie initiative: Bringing primary care to patients' homes

In 2015, family doctors with the Fraser Northwest Division of Family Practice identified a need for more support and services for frail elderly patients, many of whom were presenting in the emergency room with issues that could have been managed at home. The division hired a nurse—Nurse Debbie—to support family doctors in caring for these homebound frail elderly patients. This innovative role extended primary care services into patients' homes, ensuring they could receive the care they needed quickly before health issues could develop further.

This type of team-based care model has been identified as a top priority in improving care for patients around the province.¹ Health care teams are being built in patient medical homes within family practices, through primary care networks in communities, and within urgent primary care centres. These teams can take several forms and can comprise a wide array of allied health providers, including nurse practitioners, nurses, physiotherapists, dietitians, and social workers.

The home nursing team-based care model built into the Nurse Debbie initiative was so successful that the service was expanded by the Fraser Health Authority, becoming the Fraser Health Primary and Community Care Nursing Program.

Grassroots beginnings

The original Nurse Debbie began the process of supporting Fraser Northwest family doctors by meeting with them to review their patient panels and identify suitable patients. Then, under

the direction of each doctor (as an extension of the doctor's office itself), Debbie began providing care for frail elderly patients in their homes, eventually seeing an average of seven patients per day.

Between January and December 2016, Nurse Debbie saw 469 patients in their homes. This in-home primary care support prevented more than 500 patient visits to the ER and thousands of patient bed days, saving an estimated \$3.1 million in health care costs.²

Inspired by the results being achieved by the Nurse Debbie initiative in Fraser Northwest communities, Fraser Health created the Fraser Health Primary and Community Care Nursing Program. They hired Nurse Debbie to run the expanded program, as well as two other nurses to provide the same services in the region. The health authority also established a support team to streamline assessments and paperwork and create more efficient connections to patient supports.

Fraser Health and divisions also worked with GP offices to ensure that nurses are able to access physicians' EMRs in order to share patient information—a key component in ensuring the program's success. Nurses are now able to send messages to physicians within their EMR about the care they've provided, and doctors can stay up-to-date on their patients' conditions while their patients stay safely at home.

In addition to Fraser Northwest, three other divisions of family practice have now implemented the Fraser Health Primary and Community Care Nursing Program.

Chilliwack (including Agassiz-Harrison and Hope)

Twenty RN/LPN teams are now working in pairs across Chilliwack-area communities. These teams collaborate with family physicians or

nurse practitioners to support patients with advanced health care needs, and arrange support from occupational therapists, physiotherapists, and social workers as needed. Over a 10-month period, the work of the first team resulted in an estimated 19% reduction in ER visits and a 21% reduction in inpatient days.

Ridge Meadows

Twelve primary and community care nurses are now providing care in alignment with all GP offices in Maple Ridge/Pitt Meadows. An evaluation of the initial 8-month Primary and Community Care Nurse pilot program showed a reduction in ER visits and highlighted a number of positive patient stories and experiences. Providers reported that the model improves interconnectedness and accessibility of services for patients and enables them to be seen in a more timely fashion.

Surrey–North Delta

In 2018, the division partnered with Fraser Health's Home Health Program to deploy a primary and community care nursing model across the community. Through the program, nurses partner with family physicians to better support their most frail and complex senior patients, assess their safety, and assist with acute medical needs. Nurses also guide patients to self-manage their conditions and connect them to a team of allied health professionals including occupational therapists, physiotherapists, dietitians, and social workers, as well as other resources in the community.

Region-wide success

A 3-year analysis of the Fraser Health Primary and Community Care Nursing program followed 1071 patients for between 6 months and

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

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.

GP IN ONCOLOGY TRAINING

**Vancouver, 9–20 Sep and 3–14 Feb 2020
(Mon–Fri)**

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 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 centre 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.

NON NOCERE: USEFUL IDEAS AND INITIATIVES IN THE CAUSE OF PATIENT SAFETY

Vancouver, 20 Sep (Fri)

Join colleagues for plenary sessions, case studies, and interactive workshops to explore how physicians can contribute to the cause of safety in their daily work with patients. Plenary sessions will feature the perspective of a well-informed patient navigating the system, and expert insights for physicians on how to thrive despite the seemingly overwhelming demands of present-day practice. Afternoon workshops will cover caring for patients with substance-use

disorders, patient consent, antibiotic resistance, and virtual health solutions. Workshop space is limited—register early to save your seat. Event details: www.cpsbc.ca/for-physicians/professional-development/education-day-agm-2019. Register: www.cpsbc.ca/files/pdf/2019-ED-AGM-Registration.pdf.

ST. PAUL'S EMERGENCY MEDICINE UPDATE Whistler, 26–29 Sep (Thu–Sun)

Join us for the 17th Annual St. Paul's Conference. Four exciting days of learning, networking, and of course, recreation! We had over 300 attendees last year. Don't miss out! Pre-conference workshops: CASTED, HOUSE EM, CAEP AIME. Target audience: Any physician providing emergency care, emergency nurses, paramedics. Keynotes: Best Literature of the Past Year (Dr Grant Innes, Dept. of Emergency Medicine, University of Calgary); Sub-Arachnoid Hemorrhage—What the ED Doc of 2019 Needs to Know (Dr Jeff Perry, Dept. of Emergency Medicine, Ottawa Hospital); Gender and Medicine in 2019—Where Are We? Where Can We Go? How Can We Get There? (Dr Carolyn Snider, St. Michael's Hospital, Toronto); Managing Stress in a High Risk Environment (Mr Will Gadd, gold medalist, X-Games). Conference details and registration: <https://ubccpd.ca/course/sphemerg-2019>. Phone: 604 675-3777, fax: 604 675-3778, email: cpd.info@ubc.ca. Accommodation: <http://bit.ly/sph2019reservations>.

MINDFULNESS IN MEDICINE WORKSHOPS AND RETREATS

Various locations, 27 Sep–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 Physicians and Their Partners, 27–30 Sep, Long Beach Lodge Resort, Tofino; 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.

ALLERGY AND CLINICAL IMMUNOLOGY UPDATE

Vancouver, 28 Sep (Sat)

The 2019 Allergy and Clinical Immunology Update will be held at the SFU Segal Centre. Target audience: family physicians, general practitioners, pediatricians, residents, students, nurse practitioners, registered nurses. Accreditation: up to 7.0 Mainpro+/MOC Section 1. Course content: <https://ubccpd.ca/course/allergy2019#agenda>. Highlights of the 2019 update include discussion of the most common allergy and immunology issues faced by family physicians in a clinical setting. Participants will hear from leaders in the field on such topics as food allergy, drug allergy, immunodeficiency,

and asthma. Register: <https://events.eply.com/allergy2019>.

MANAGEMENT OF NOT-SO-RARE CANCERS Vancouver, 5 Oct (Sat)

The BC Cancer Agency's Surgery Network (formerly Surgical Oncology Network) invites you to take part in its 2019 annual Fall Update at the Vancouver Four Seasons Hotel. This year's event will focus on the management of upper GI, skin, and sarcoma tumors. This event is expected to be approved as an Accredited Group Learning Activity eligible for up to 7.5 Section-1 credits as defined by the Maintenance of Certification program of the Royal College of Physicians and Surgeons of Canada. This 1-day conference features topics on surgical oncology techniques, screening, pathology, quality indicators, adjuvant therapy, imaging, radiation, and other relevant information to general surgeons. The event will feature guest speakers Dr Savtar Brar (surgical oncologist, Mount Sinai Hospital, Toronto) and Dr Greg McKinnon (professor, University of Calgary), and is a must-attend for surgical oncologists and general surgeons, and of interest to related specialists. Visit www.bccancer.bc.ca/surgeon-network, email son@bccancer.bc.ca, or phone 604 877-6000 (ext. 256).

INFECTIOUS DISEASES DAY SYMPOSIUM Surrey, 19 Oct (Sat)

The 5th Annual Infectious Diseases Day Symposium will be held at UBC Lecture Hall, Floor B, Critical Care Tower, Surrey Memorial Hospital. Topics for the morning sessions, 8 a.m. to 12 noon, include didactic lectures on approach to hospital acquired infection; approach with empiric antibiotic therapy in patients with positive blood culture; approach to management of STI (resistance trend and current treatment); approach in management of TB in the era of MDR and XRD tuberculosis; approach in management of common infectious syndromes in an outpatient setting; approach in management of infectious complications of biologics in re-activations of viral, mycobacterial, and fungal infections; approach in management of common fungal infections (aspergillosis, candida, and cryptococcus); approach in management of cognitively impaired patients with infection

(delirium and dementia); and human microbiome in state of health and illness. Afternoon workshop/breakout sessions (1 p.m. to 4 p.m.) will focus on most of the above topics and will be made available on a first-come first-served basis. Each participant can choose a maximum of three sessions based on seat availability. Maximum capacity for each session is 30. Each session has two relevant cases to discuss in approach and management by professors. Early registration is encouraged. Information and registration: <https://events.eply.com/Infectious-Diseases-Day-Symposium2019>.

WORKSAFEBC's ANNUAL EDUCATION CONFERENCE

Kelowna, 19 Oct (Sat)

WorkSafeBC's Annual Education Conference for Community Physicians will be held at Four Points by Sheraton Kelowna Airport in Kelowna. Attendees can expect a full day of discussion, dialogue, and workshops relating to the role of physicians in work-related injuries, and the latest protocols in disability management. The agenda includes three plenary sessions, eight workshops to choose from, and four short-snapper sessions that feature a brief presentation followed by an opportunity for Q&A. Register before 1 Oct to get the early-bird rate of \$179 + GST for physicians and nurse practitioners, and \$89.50 + GST for students and residents. For more information, visit www.CommunityPhysiciansConference.com.

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 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 Nov 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, health care, 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

CME CALENDAR

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 Nov, at the Sheraton Vancouver Wall Centre. 22 Nov: GPO (General Practitioner in Oncology) Case Study Day, and 23 Nov: 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 www.fpon.ca or via dilraj.mahil@bccancer.bc.ca.

OBITUARIES

Continued from page 294

small room from the market, and started to practise as a family doctor. With growth of the practice he bought three lots on the opposite side of the intersection and built a modern medical clinic. With hospital privileges at Surrey Memorial and Royal Columbian Hospital he spent mornings seeing patients on the wards, in the emergency room, or in the case room, or operating/assisting in the operating room. At night he could be called to either hospital to deliver a baby.

In 1967 I was invited to join the practice, and Dr Tom Wong joined in 1973. We three practised very happily as Sandell Medical until Geoff retired in 1995. Also joining at the start was Betty Peters, just out of school, who developed into the office manager and who “ran” Sandell Medical into the next century.

Geoff's life was not limited to his work as a family doctor. He was very happily married to Jane, and they started life together in a small home close to the practice but in due course moved to Panorama Ridge. Geoff and Jane had four children and their home was an open house to their children's friends. They also bought a second home at Green Lake, which was an immense joy to them. It was there that they could relax as a family without interruption. Geoff was an immensely calm man, never seen angry or irritated and always there to help, especially in difficult times. Some months ago Jane described him as “a wonderful man.” Geoff Parker-Sutton was indeed a wonderful man.

—John O'Brien-Bell, MB
Surrey

GPSC

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3 years.³ The analysis showed that 596 ED visits were avoided and 15 464 bed days were saved between 2016 and 2019.³

There are now 29 nurses working in the Fraser Health region extending primary care services into the homes of elderly residents. Nurses see five to seven patients per day, and patients can call them directly or be referred by their family physician. Through the Primary and Community Care Nursing Program, Fraser Northwest's grassroots Nurse Debbie initiative lives on—improving quality of care and providing peace of mind for patients and providers alike.

For more information on team-based care, patient medical homes, and primary care networks, visit www.gpsc.bc.ca. ■

—Afsaneh Moradi

Director, Community Partnership and Integration, Community Practice, Quality and Integration

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COMOX VALLEY—ADULT PSYCHIATRIST, ISLAND HEALTH

Island Health is seeking a full-time psychiatrist in Comox to provide inpatient and outpatient services. Applicants must have FRCPC and be eligible for full licensure with CPSBC. Remuneration is fee-for-service, sessional billing, and MOCAP. The successful candidate may be eligible for additional remuneration through the Rural Subsidiary Agreement. Comox is a growing community located on the central east coast of Vancouver Island with a new hospital and boasts diverse

recreational and cultural opportunities within the charm of a small-town setting. Full job description can be found at <https://medicalstaff.islandhealth.ca/careers/opportunities/431/psychiatrist-300-0516>, or at www.physicians@viha.ca.

NANAIMO—EDGEWOOD, ADDICTION PSYCHIATRIST

With 100 years of collective experience in addiction medicine, EHN-Canada's dedicated treatment team takes the time to understand each client personally. We are seeking an addiction psychiatrist locum for February/March 2020, with possibility of a permanent part-time position. Duties include evaluation and treatment in residential addiction setting, particularly with clients presenting with mood and anxiety, PTSD, personality disorders, and substance use disorders. Knowledge and experience with the psychological and physical symptoms

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associated with withdrawal and trauma required. Contact Human Resources: lena.taylor@edgewood.ca.

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 FP

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

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VANCOUVER/RICHMOND—FP/ SPECIALIST

The South Vancouver Medical Clinic seeks family physicians and specialists. Split is up to 80/20. Closing your practice? Want to work part-time? Join us

to see only booked patients or add walk-ins for variety. Oscar EMR. Positions in Richmond also available. Contact Dr Balint Budai at tgr604@gmail.com.

VERNON—ER LOCUM

Long-term ER locum available July 2020 to March 2021. Approx. 12 shifts/month; fee for service plus night stipend. Collegial ER department and community hospital, endless recreation opportunities. House with pool, close to hospital, lakes, and ski hill available for rent during this time if desired. Contact lisaheidt@gmail.com.

VICTORIA—GP/WALK-IN

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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.

VANCOUVER (BROADWAY CORRIDOR)—TWO BLOCKS FROM VGH

Medical office available 1 July 2019 for one or two physicians at 943 West Broadway. Bright, well maintained 800 sq. ft. office with NW view of Burrard Inlet. Competitive rates. Terms negotiable. Contact Dr York Hsiang, 604 876-5882 (office) or york.hsiang@vch.ca.

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Kinetix Medicine, a CPSBC DAP accredited facility, is seeking to recruit full-time or part-time specialists to perform MSP-covered assessments. Licence to perform electromyography (EMG) procedures highly desired. Spacious exam rooms. Free underground parking. No set-up fees or equipment required. As a clinic that takes pride in its interdisciplinary and collaborative nature, we offer excellent opportunities and flexibility for your practice. Psychiatrists, two radiologists, physiotherapy, and kinesiology on site. Please contact Dr Case van Wyngaarden at c.vanwyn@kinetixmedicine.com or visit us at www.kinetixmedicine.com.

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Reflections of a rural family doctor

An approaching medical class reunion spurs reflections on 40 years of practice in a small coastal community in British Columbia.

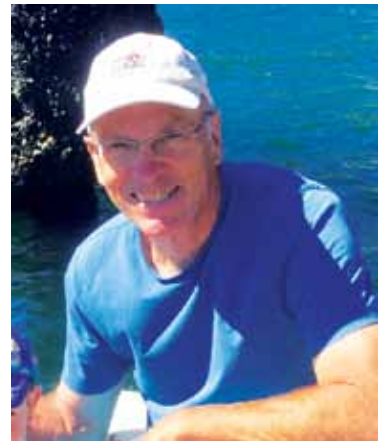
Jim Petzold, MD

This year marks the 40th anniversary of the graduation of our medical school class of 1979. A few of our enthusiastic class members are planning a reunion, where we will gather to celebrate the occasion—a September weekend event that will likely include a few didactic presentations as well as some fun activities and social gatherings.

Dr Petzold is a soon-to-be-retired rural family physician. For 35 years he practised full-service family medicine, including emergency, anesthesia, and obstetrics, on BC's Sunshine Coast. Over the past 3 years he has been doing locums as part of the BC Rural Locum Program. He and his wife, Sharon, continue to enjoy life in the idyllic seaside community of Roberts Creek.

Much as I was looking forward to seeing friends and classmates from such a meaningful time in our lives, initially it was with a degree of trepidation. The trepidation was not due to the legitimate fear of failing to recognize the faces of some whom I have not seen for many years, or of concern that I had aged in appearance more than everyone else. No, my apprehension stemmed from how poorly my career in family medicine might stack up against those of my classmates.

You see, I have spent the past 40 years mostly in full-service rural family practice in a small coastal community of British Columbia. Unlike many of my classmates, I have not traveled extensively. I have not done



any volunteering in the developing world. I have not sat on multiple committees. I have not completed a specialty and then gone on to do amazing research with papers published in leading medical journals. I have not been the head of an academic faculty at a prestigious facility or a world-renowned speaker at medical forums.

Some of my former classmates have so many letters behind their names that I need a medical dictionary to figure out what most of them mean, while I can display only the lonely letters MD behind mine. I don't even have the now obligatory CCFP. Nope, just plain old MD.

In this self-abasing frame of mind, I began questioning whether I wanted to reunite with my now rich and famous former classmates. Then, while doing the weekly grocery shop on seniors' day in the local IGA, I experienced an epiphany of sorts. I heard an excited voice yell from down the aisle, "Doctor Petzold, Doctor Petzold!" I looked up to see a young woman approaching with her 5-year-old son in tow. She wanted her son to meet the doc who helped bring him into this world.

This got me reflecting on the countless meaningful interactions I have had with patients over the years. I thought of the thousand or so joyful births attended, but also the few stillbirths where only comfort and

compassion could be given. I thought of the hundreds of epidurals that brought relief to women in labor. I thought of the many nights on ER call as a solo doc attending to the next major trauma, airway emergency, MI, or overdose to come through the door. I thought of the all-night vigils in the homes of dying patients. I thought of sharing the unimaginable grief of parents losing a child to cancer. I thought of the elderly man watching his wife of 50 years suffer through the end stages of emphysema. I thought of the hundreds of medical students and residents whose careers in family medicine I have had the privilege of helping to shape, if only in some small way.

Above all, I thought of the many, many hugs shared over the years with patients and co-workers in times of joy and sorrow. I am grateful to have had the opportunity to share in some of the most meaningful events in so many people's lives. All in all, it's been a pretty good career for *just* a GP.

Now, as the class reunion draws near, I am once again excited to attend. As I and many of my former classmates approach retirement, I look forward to hearing about their careers in medicine, just as I look forward to sharing stories from mine. ■

I am grateful to have had the opportunity to share in some of the most meaningful events in so many people's lives.

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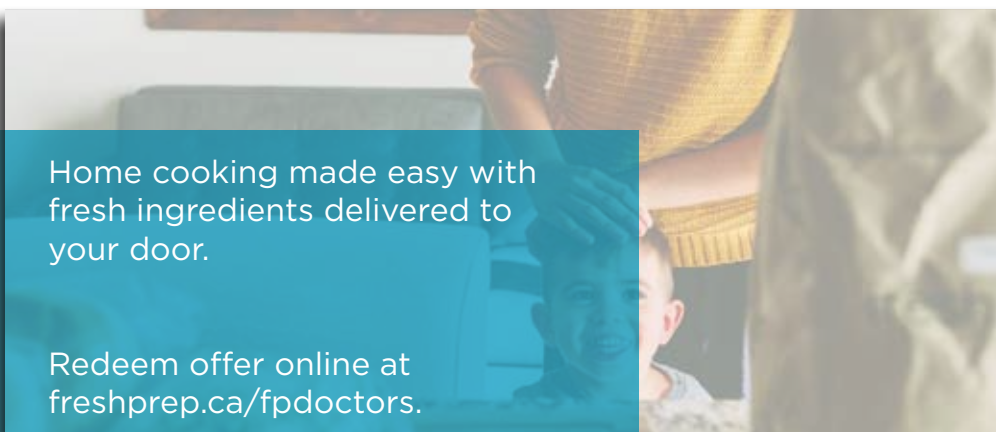
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