

# Precocious puberty: A red flag for malignancy in childhood

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The *BCM J* 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 *BCM J* is distributed monthly, other than in January and August.

**Web:** Each issue is available at [www.bcmj.org](http://www.bcmj.org).

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ISSN: 0007-0556  
Established 1959

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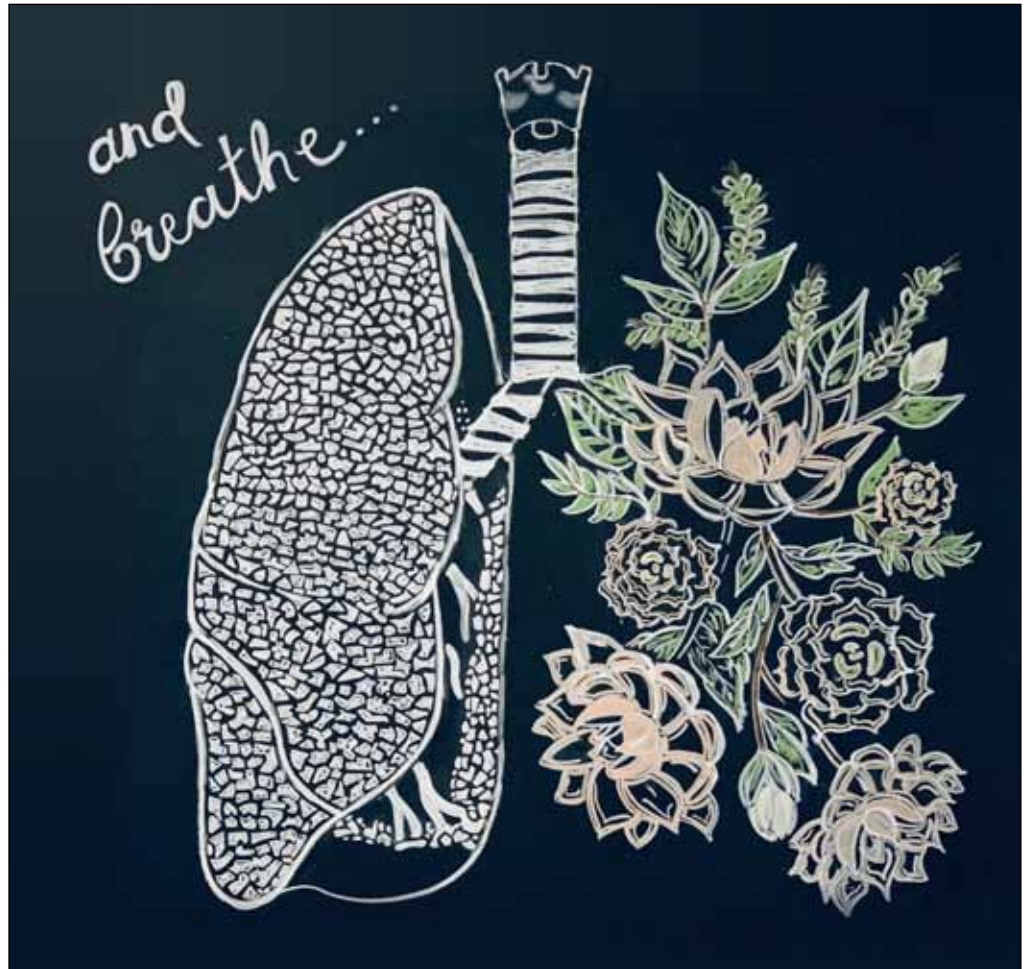
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### Environmental impact

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# Vaccine advice

I was sitting in our back clinic office with a few other doctors when a colleague entered and said, “I’m so tired of talking about the COVID-19 vaccine.” We all laughed because I had said the same thing just a few minutes earlier.

Why are we so tired? In family practice we spend a fair bit of time and effort with minimal success on educating patients about diet, exercise, smoking cessation, and safe levels of alcohol consumption. We advise about lifestyle changes, often until we are blue in the face. So what is the difference in talking to patients about the benefits of the COVID-19 vaccine? I think it’s because when we advise on lifestyle, we’re not met with contrary views, and patients do not come back at us with comments like:

- I don’t think eating healthy is safe.
- There’s a lot of controversy about stopping smoking and whether it’s good for you.

- I’ve heard the studies suggesting weight loss were rushed.
- I read that quitting drinking can lead to infertility.
- They put microchips in running shoes, you know.

In general, patients are aware that being overweight and sedentary are not good lifestyle choices. They also agree that excessive alcohol consumption and cigarette smoking can lead to adverse health outcomes. Social media is devoid of influencers discouraging individuals from giving up smoking, reducing alcohol consumption, exercising, or eating healthy. So why the deluge of content from antivaxxers and conspiracy theorists? Lately, I have become curious about the single-minded focus these individuals have against the COVID-19 vaccine. What is there to gain by disseminating unsubstantiated information that leads to fear and distrust in the population? Surveys consistently identify that around 30% of individuals are unlikely to voluntarily receive a COVID-19 vaccine, which boggles my scientific mind. This vaccine refusal likely has many factors at play, such as distrust of the medical system, a fear of science, religious beliefs, conspiracy theories, and faith

in a natural ability to fight infection, just to mention a few.

Regardless, how can a rational individual believe a vaccine that has been around only since late 2020 can cause infertility when the average human gestational age is longer than this length of time? This is a common reason younger woman of childbearing age have been giving me lately for vaccine refusal. A quick online search revealed that a German epidemiologist had theorized that since a protein found in placental tissue had minor similarities to the COVID-19 spike protein, cross-reacting antibodies

were possible. However, as expected, the unlikely development of these placental antibodies has not occurred.

Even more unbelievable are social media videos of individuals sticking fridge magnets to their upper arms postvaccine as proof of embedded microchips. I was able to stick a fridge magnet to my forehead after licking it (same as the spoon trick).

Stuff like this is making us in primary care all a little frustrated. However, we are unlikely to give up as a few changed minds could save a life. The challenge is how to change those minds without exploding ours. ■ —DRR

**Around 30% of individuals are unlikely to voluntarily receive a COVID-19 vaccine.**

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# Say my name

I was given the name Sukhjiwan; it is pronounced “Sook-Jee-Vun.” It is a Sikh name that, in Punjabi, translates to “happy life.” So, why do I go by the name Jeevyn?

When I entered elementary school, no one (not even my teachers) could pronounce my name. As a young student, I always felt anxious when a teacher read through a roll call. I became more anxious as the teacher worked down the list. It was always the same. The awkward silence before the teacher attempted to say my name, followed by the teacher’s epic failure to pronounce it, accompanied by giggles and guffaws from my peers. Sometimes, rather than obliterating my name, teachers would skip over me altogether. One classmate gave me the name Sooj or Soojiwan. This name stuck with me until grade 12. Rarely would someone take the time to ask me how my name was actually pronounced. I felt embarrassed and ashamed of my name. I blamed myself for having such a difficult name. Because of this, I felt less important than my peers.

I do realize that Sukhjiwan is not the easiest of names to pronounce. For those not familiar with the Punjabi language, I think it can be intimidating to look at. So, when I started college, I took matters into my own hands. I decided to call myself Jeevyn. This was not to far off from what I was called at home (Jiwan), so I did not perceive it as being a stretch. Jeevyn was a shorter and easier-to-pronounce version of my name. In Punjabi, Jeevyn means “life.”

My father’s name is Avtar, which means “incarnation of God” in Punjabi. Shortly after immigrating to Canada in 1969, my father started working. It was decided by his peers that he would be called Andy. Avtar was deemed too difficult to say or not reminiscent of a Canadian name. Andy is not a bad name, but it wasn’t his name. When I asked my dad about this experience, he said that he didn’t have a choice in the matter. He was renamed without his approval.

Many people have names that could be considered difficult to pronounce. Surely my story is not unique. So, why do I mention it? Because

despite us living in a multicultural world, there are many people of different races and ethnicities who shorten or change their name to fit in. However, by transforming their name, these people essentially lose their identity.

I recently listened to my sister talk about the need to craft a safe BIPOC (Black, Indigenous, People of Color) group in health. As she talked about racialization and microaggression, I realized that the mispronunciation of my name, or lack of effort to even try, was, in fact, a microaggression. By definition, a microaggression is a “verbal, behavioral, and/or environmental insult minority group members experience from the dominant culture.” Microaggressions occur on a daily basis. These insults and slights may be intentional or not on the part of the dominant-culture member. Because the minority member does not know the motive behind the act, they may feel hurt, angry, or confused.<sup>1</sup>

Although racism has always existed in Canada, recent events have shown us how racial discrimination continues to oppress many members of our society. On 10 May 2021, the Day of Action Against Anti-Asian Racism was recognized. Despite this celebration, the intrusion of COVID-19 has been met with a 700% increase in anti-Asian sentiments in cities such as Burnaby. Furthermore, the continued aggression and violence toward Black people in the United States and Canada has necessitated the need for movements such as Black Lives Matter. Finally, the *In Plain Sight* report released in BC highlighted the continued racism Indigenous people face by the health care system.

Although most people would say that they are not racist, it is important to recognize the racism and colonialism that are engrained in our societal structures, cultures, and policies.

As people may engage in microaggressions without recognizing it, we are all obligated to recognize the role we may play in perpetuating racism. For a start, we should recognize that the ignorant mispronunciation of someone’s name is, in itself, a form of microaggression. A person’s name can have strong affiliation with a

person’s culture, language, and sense of belonging. By failing to take the time to learn how someone’s name is pronounced, we show disrespect to the person. This not only results in othering the person, it can also lower that person’s self-worth.

What do I hope to leave imprinted in the mind of the reader? It is

my sincere hope that we, as physicians, take the time to understand each patient’s culture, worldview, values, and identity. This can start by learning a patient’s name, asking about a patient’s name, and learning how to pronounce a patient’s name properly. ■

—Jeevyn K. Chahal, MD

## Acknowledgment

I’d like to thank Raj Chahal, MSW, RT, for contributing to this editorial.

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**Although racism has always existed in Canada, recent events have shown us how racial discrimination continues to oppress many members of our society.**

# Letters to the editor We welcome

**original letters of less than 300 words; we may edit them for clarity and length.** Letters may be emailed to [journal@doctorsofbc.ca](mailto:journal@doctorsofbc.ca), submitted online at [bcmj.org/submit-letter](http://bcmj.org/submit-letter), or sent through the post and must include your mailing address, telephone number, and email address. Please disclose any competing interests.

## Interdisciplinary resources when patients want to leave hospital against medical advice

We commend your article “Management of vulnerable adult patients seeking to leave hospital: Understanding and using relevant legislation” [*BCMJ* 2021;63:106-111]. For consultation-liaison psychiatrists, capability assessments may be nuanced when patients have fluctuating lucidity or are under the coercive forces of addiction.

A few comments to supplement this extremely helpful article. Options include consulting the ethics service and risk management for perspectives that uphold nondiscrimination, balance harms and benefits, and respect the capable individual’s legal right to live at risk. Hospital social workers can liaise with the Re:Act team, which assesses adults when there is concern about their ability to access support in the community.

You mention the Public Guardian and Trustee (PGT) as a surrogate decision-maker either when there is no temporary substitute decision-maker (TSDM) or when appointed individuals cannot reach consensus. On your Figure, you might add the PGT at the bottom of panel #1, with an additional arrow to PGT after “NO” for emergency and “NO” for TSDM/consensus.

Documenting a second opinion is prudent if there is time before emergency treatment for which consent has not been obtained. For the middle of panel #1, we suggest: “YES” for emergency and “NO” for SDM, then “provide treatment without consent (with second opinion if possible).”

Trainees are benefiting from your superb summary of BC law. An interdisciplinary approach is ideal as there can be significant angst about limiting freedoms and failing to protect

those who have lived their entire lives with risks that we ourselves have never taken.

—**Stephen D. Anderson, MD, FRCPC**  
Clinical Professor, Department of Psychiatry,  
UBC Faculty of Medicine

—**Carol P. Anderson, MD**  
Clinical Instructor, Department of Family  
Practice, UBC Faculty of Medicine

—**Bethan Everett, MBA, PhD**  
VCH Ethicist, Clinical Professor, UBC Faculty of  
Medicine

## Re: An inside look at BC’s illicit drug market

While the case study presented in “An inside look at BC’s illicit drug market during the COVID-19 pandemic” [*BCMJ* 2021;63:9-13,19] may provide physicians who have limited knowledge of the illicit drug trade information about substance use, there are multiple problematic depictions of persons who use drugs (PWUD). The images included, a dark silhouette of a hooded figure and a person lying on the sidewalk in front of a graffitied wall, depict stereotype images of substance users, namely that they are troubled, shady, decrepit, and pitiful. The narrative presented further substantiates stigma and stereotypes, conflating substance use with addiction and poverty. John Doe is an almost contextless individual, chosen as the standard of the illicit drug trade, but why, without evidence of consultation or input from other drug user sources? Organizations like the Vancouver Area Network of Drug Users (VANDU) and the Canadian Association of People who Use Drugs (CAPUD) are instrumental in changing stereotypes of PWUD and engaging people with lived experience in the process of research and policy development.

Given that John Doe was incarcerated and undergoing psychiatric assessment at the time

of the interview, was consent informed? Further, description was provided that John Doe was admitted to the forensic psychiatric service because of evaluation following conviction for distribution of illegal substances, but what qualified him as a reliable source? Was there a pre-existing relationship between the interviewer and the interviewee? The assumption that his response was coercion-free is problematic because of the nature of the inherent power imbalance. We must question the ethics of asking people who are accessing health care services for more information in an assessment interview as a teaching tool or population insight. Vicarious information collection, potentially traumatizing the individual, may have benefit to the greater good, but does that mean clinicians should engage in this process at risk to the individual?

—**Michelle Danda**  
New Westminster

*The images that accompanied the article were chosen by the editorial team, not the authors. Images are open to interpretation, and we appreciate you sending us yours. —ED.*

## Authors reply

We appreciate Michelle Danda’s letter in response to our case report “An inside look at BC’s illicit drug market during the COVID-19 pandemic” [*BCMJ* 2021;63:9-13,19].

We wanted to note that a case report describes and interprets the experiences of a single individual. Therefore, the findings from a case report may intrinsically have limited generalizability, and this was stated in our article. However, the merits of a case report are that it presents novel, informative narratives, generates ideas to be examined in future studies, and serves as a valuable educational tool. Case

*Continued on page 237*



## Cheerleader-in-chief

A colleague recently asked if I have ever been a pastor or a motivational speaker; it's probably one of the nicest compliments I've ever received. Since stepping into my presidency, I've heard a lot about all that is unfair, unjust, and just plain wrong. Some of you have been hurting badly, even long before the pandemic struck, and our profession and our society face serious challenges ahead. As president, I feel a relentless optimism and urge to cheer the profession onward—as a cheerleader-in-chief if you will.

Driving my optimism is learning that, in spite of these uncertain times, people want very similar things in life. It doesn't matter if you ask a family physician, a specialist, a medical health officer, a ministry official, or even someone you run into on the street. Most will describe the same thing—they want respect, meaningful relationships, satisfying work, financial security, and the opportunity to fully realize their potential. The person who has different political, social, or cultural beliefs from you, the one who is currently in conflict with you, the friend who sits across the table from you, they all share 99.9% of your genes. We are more similar than we are different. And chances are that if you experienced similar childhoods, share similar family histories, faced the same challenges, or have the same responsibilities, then you might find yourselves thinking and behaving in a similar way.

I've come across a lot of different people in my life. Young people. Older people. Disadvantaged people. Privileged people. Community activists. Military veterans. City folk. Rural dwellers. Left leaning. Right leaning. But dig deep enough and they all seem to want the

same basic things. And doctors are no different. Doctors are people, after all.

Perhaps this is why I feel so optimistic about the future. No matter what our differences may be, no matter where our approach to life takes us, we all seem to have a common thread that connects us. We have seen this throughout the pandemic—our profession, our society, has come together to overcome this formidable challenge. There have been incredible feats of courage and sacrifice to save lives. A global effort yielded multiple vaccines that have brought us ever closer to our previous freedoms. The medical profession has fought this pandemic with all the skills, experience, and compassion available to us, from the Office of the Provincial Health Officer, to the BC Centre for Disease Control, to laboratories and testing sites across the province, to surgical suites and community offices, to individual relationships with patients and families. We fought this pandemic as one.

As a medical leader, my skills and abilities pale in comparison to those of all the doctors around me who are brimming with talent; doctors who will shape the future of medicine and our society. Some are young up-and-comers. Some are folks who have worked in this system for many years. Some are in underrepresented groups. Some are seemingly well represented but their ideas may not be. Unfortunately, these colleagues face some common challenges:

they feel unheard and disrespected. They face systemic barriers to meaningfully participate. They lack mentorship. They are subject to assumptions because of the demographic they belong to. If you look around with open eyes and an open mind, you will find these people—people who need barriers removed, confidence boosted, sponsorship into leadership positions, and sometimes for us to get out of their way so that they can shine.

**If you look around with open eyes and an open mind, you will find these people—people who need barriers removed, confidence boosted, sponsorship into leadership positions, and sometimes for us to get out of their way so that they can shine.**

An important part of my role as president is to be a cheerleader for the profession, especially for individuals who face challenges. That's what I mean about being a cheerleader-in-chief. My role is to motivate, enable, facilitate, sponsor,

and mentor 14 000 of my colleagues, especially those who are smarter, kinder, more skilled, and more compassionate than I am. And there are a lot of you. It makes for a busy job, but I wouldn't have it any other way. I truly am optimistic about the future, and I will continue to cheer you all on, long after my term is over.

I wish you, your families, and everyone you hold dear a glorious summer. I hope you take time to relax and recharge. Better days are upon us with many more still to come. ■

—Matthew C. Chow, MD  
Doctors of BC President

# 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](mailto:journal@doctorsofbc.ca) and must include your mailing address, telephone number, and email address. All writers should disclose any competing interests.

## COVID-19 vaccine registry for pregnant and breastfeeding individuals in Canada

While COVID-19 clinical trials with pregnant and breastfeeding individuals are now underway, initial trials did not include these populations, and the risks and benefits of COVID-19 immunization for pregnant and breastfeeding people remain largely unknown. To fill the knowledge gap, UBC researchers have launched a COVID-19 vaccine registry and survey across Canada to collect real-time data on the impact of immunization on pregnant and breastfeeding individuals.

Working with researchers across the country, and with support from the Canadian Institutes of Health Research (CIHR) and the Public Health Agency of Canada (PHAC), a UBC team is leading the national surveillance project, called CANCOVID-Preg. The project will provide those who are pregnant and breastfeeding, health care providers, the PHAC, National Advisory Committee on Immunization (NACI), and provincial vaccine advisory committees with Canadian data on safety and effectiveness to guide decisions and recommendations. It will also address unknowns surrounding COVID-19 vaccination in pregnancy and lactation, such as the immune response generated and whether or not immunity is transferred to infants.

Experts in the field, including the Society of Obstetricians and Gynaecologists of Canada and NACI, recommend individuals be offered the COVID-19 vaccine anytime during pregnancy or while breastfeeding.

The project is funded by the PHAC through the Vaccine Surveillance Reference Group and the COVID-19 Immunity Task Force. It is being conducted in partnership with vaccine surveillance efforts across Canada, including

CANVAS (<https://canvas-covid.ca>), a national web-based platform monitoring vaccine safety across all populations.

### How to take part

People who are currently pregnant or breastfeeding are invited to register to take part in the vaccine study. Participants do not have to have received a COVID-19 vaccine, nor do they have to intend to receive the vaccine. To participate in the registry and survey, visit <https://covered.med.ubc.ca>.

For additional information about pregnancy and COVID-19, interim reports from the CANCOVID-Preg study can be found at <https://ridprogram.med.ubc.ca/canCOVID-preg>.

## Limitations of infrared thermography make skin-surface temperature scans an unreliable COVID-19 detection tool

Used to generate a heat map of infrared radiation emitted by heat sources, such as body temperature, infrared thermography (IRT) scans have become the go-to for mass detection of illnesses such as COVID-19. The limitations of this technology are revealed in research findings recently published in the *Journal of Medical Imaging*.

Led by Dr Babak Shadgan, a researcher at the Vancouver Coastal Health Research Institute, the study concluded that IRT relies too heavily on detecting high fever, which is only one of several symptoms of an active and well-developed COVID-19 infection. Underlying health conditions, stress, pregnancy, certain medications, and other environmental factors, such as temperature and humidity, can also alter someone's surface body temperature. He notes that this can result in a false positive or false negative IRT reading.

Shadgan's research reviewed 17 published studies on the effectiveness of IRT screening at airports around the world between 2002 and 2021. He found that the noncontact thermometer's ability to detect SARS, dengue fever, swine flu, Ebola, and COVID-19 varied significantly. However, Shadgan admits that until a better rapid, non-invasive, affordable detection method becomes available, IRT will likely continue to be part of the disease detection toolkit.

He suggests that IRT can continue to be used if there is no other option, but that its results should not be relied upon exclusively. IRT is only really effective at detecting individuals who are symptomatic with a high fever. It does not detect asymptomatic individuals or infected individuals with only a slight rise in body temperature.

IRT has sometimes been paired with pulse oximetry to improve disease detection, which uses a fingertip sensor to detect oxygen saturation in a person's bloodstream. Oxygen levels below 95% are found among people with pneumonia—another symptom of a severe COVID-19 infection.

Core body temperature is also a more accurate indicator of a COVID-19 infection, notes Shadgan. The limitations of present screening tools do, however, pose a challenge. To address this, Shadgan is developing a novel biosensor to take COVID-19 disease detection further. The noninvasive, simple-to-use, accurate biosensing device could be used for regular and routine COVID-19 screening and early diagnosis. Individuals with underlying health conditions, such as heart or liver disease, immune deficiency, diabetes, or cancer, could use the biosensor on a regular basis to check if they have COVID-19 symptoms.

The study, "Review of the efficacy of infrared thermography for screening infectious diseases



with applications to COVID-19,” is available at [www.ncbi.nlm.nih.gov/pmc/articles/PMC7995646](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC7995646).

## Planning a birth after C-section made simpler

My Next Birth is a personalized online interactive patient decision aid now being used throughout BC to help people who have previously had a C-section make better-informed decisions about navigating their next pregnancy and birth. Over 75% of people in BC who have had a C-section are good candidates for a vaginal birth after cesarean, but families often have to wait until the next pregnancy to start discussing options with their care team. People want to learn about their options for their next birth sooner. Researchers conducted a series of qualitative studies and surveys in BC and found that families and care teams needed more support when exchanging information.<sup>1-4</sup> Families wanted to know what the reasons were for their first C-section. Was it from something unexpected that happened during labor? Is this

something that might happen again in the future? What are the options for their next birth?

The program helps them think about their preferences and jot down their questions, and it provides tailored information specific to their values and needs. It also factors in where they live in BC so they can consider what resources are available locally. After they work through the website, they receive a personalized summary to guide conversations and questions with their health care team.

The program also provides tools for health care teams, including a decision support algorithm that walks the care provider through the patient’s journey and a list of conversation prompts to guide discussions after a C-section. The hope is that the program can be a support for families to be active participants in their care.

Dr Sarah Munro, an assistant professor in obstetrics and gynecology, developed the program with her team at UBC in partnership with Perinatal Services BC, provincial health authorities, the Ministry of Health, as well as patient partners. For more information, visit [www.perinatalservicesbc.ca/health-professionals/professional-resources/birth-after-caesarean](http://www.perinatalservicesbc.ca/health-professionals/professional-resources/birth-after-caesarean).

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## LETTERS

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reports are the substrate from which larger, more generalizable studies can be justified. Some of the information may have not been new to people who work extensively in the field of addictions. However, the article was published in a general medical journal for physicians who may not have extensive experience in the field. By engaging with a person with lived experience, we were able to share his unique experiences and perspectives, which may inform areas of future research and strategies to improve health care for vulnerable populations.

We used the name “John Doe” to protect the identity of the individual. We had the information to provide much more context, but given the word count limitations of the article, the need to protect John Doe’s identity, and the fact that we were publishing in a general medical journal, we focused on reporting his observations and opinions of the illicit drug trade rather than more personal characteristics.

As for what qualified John Doe as a reliable source, he was convicted in a court of law for distribution of crystal methamphetamine and fentanyl in the Downtown Eastside during the COVID-19 pandemic. Since this was the topic of the case report, we believe that qualified him to speak about the topic. His account was consistent with external data points, such as court records and collateral sources, where available. Further, there are many examples of the experience of people who use drugs in the medical literature but very few examples of people who sell drugs. The goal of the article was to highlight the lived experience of someone who sold drugs, not people who use drugs, during a unique time in history such as the COVID-19 pandemic.

There was no pre-existing relationship between the physician interviewer and John Doe. In a forensic evaluation, the forensic psychiatrist is to maintain neutrality and objectivity in their

assessment of all patients. The forensic evaluation is done voluntarily, and before the evaluation can begin, it must be determined that the patient has the capacity to consent. During the forensic evaluation, John Doe raised the topic of illicit drug trade in the Downtown Eastside during the COVID-19 pandemic. He was then asked whether he wanted to share his insights for a case report. His participation was completely voluntary, and he was assessed to have the capacity to consent to the case report. As reported in our article, written informed consent was obtained from him. He voluntarily agreed to share his information because, in his words, “I want to provide information that hopefully can prevent overdoses and save someone’s life. I think it’ll be useful for the medical community.”

—**Nickie Mathew, MD, MSc, ABPN, FRCPC, ABPM**

—**James S.H. Wong, BSc**

—**Reinhard M. Krausz, MD, PhD, FRCPC**

# Incorporating exercise prescriptions into medical education

Exercise: the one prescription that can prevent and treat dozens of diseases.

Arielle Roberts, MD, Ron Wilson, MD, CCFP, Catherine A. Gaul, PhD

**ABSTRACT:** An exercise prescription is a critical tool that can improve patient health and prevent chronic diseases; however, substantial barriers to its use have prevented widespread adoption by physicians. A key barrier is a lack of education in the knowledge and skills required to use an exercise prescription effectively, which is perpetuated by its omission from medical education curricula. A student-led project revised the UBC Medicine curriculum to include evidence-based exercise prescription content and provide recommendations for further curriculum development, for the health of all British Columbians.

**I**n the words of exercise medicine advocate Dr Robert Sallis, what if there was one prescription that could prevent and treat dozens of diseases? Regular physical activity is known to reduce the risk of premature death and at least 35 chronic diseases, from obesity

to dementia to depression.<sup>1</sup> It has also been reported that nearly 20% of adult deaths can be attributed to physical inactivity and its associated low cardiorespiratory fitness, which is more than obesity (2% to 3%), smoking (8% to 9%), diabetes (2% to 4%), and high cholesterol (2% to 4%) combined.<sup>2</sup> The positive effects on patient health of a prescription to increase physical activity cannot be denied.

Physical activity is often more effective than prescription medications for preventing and managing chronic conditions, and it improves overall patient well-being. It is also less expensive, more accessible, and results in fewer medication interactions and side effects. Despite extensive evidence supporting the benefits of physical activity, Canadians as a whole are insufficiently active to achieve these health benefits.<sup>3</sup> With the recent publication of the groundbreaking Canadian 24-Hour Movement Guidelines for all ages (<https://csepguidelines.ca>),<sup>4</sup> there has never been a better time to discuss the importance of helping patients be more active.

Patients prefer to receive advice on physical activity from physicians, and an exercise prescription is a key, effective way for physicians to encourage increased physical activity in their patients.<sup>5</sup> While exercise and physical activity are not the same thing, the terms are often used interchangeably, and emphasis should be placed on whichever is more accessible for the patient. Despite the importance of an exercise prescription (ExRx), very little curricular time is currently dedicated to educating medical students worldwide on its effective

use for long-term patient well-being.<sup>6,7</sup> This significant gap results in new physicians not being equipped to leverage this key element of preventive medicine for optimal patient health, a concern identified by the Association of Faculties of Medicine of Canada.<sup>8</sup> With the economic burden of physical inactivity on the Canadian health care system most recently estimated at \$10 billion annually,<sup>9</sup> we can no longer ignore the health, professional, or financial consequences of neglecting the ExRx in medical curricula.

## Current challenges

Providing an ExRx involves first determining a patient's baseline physical activity levels using the Physical Activity Vital Sign,<sup>10</sup> followed by providing informed advice and direction for safe and appropriate exercise in the same manner as any pharmaceutical prescription. This includes a specific therapy (goal intensity and/or activity), dose (number of minutes at a given intensity), and dosing interval (frequency per day or week). For example, a physician may explain and provide a written prescription [Figure] outlining the following to a hypertensive patient who is currently inactive:

"I'd like to help you improve your cardiovascular fitness to better manage your hypertension. Between now and our next appointment in 1 month, your exercise prescription will be to walk for 20 to 30 minutes, at least 5 days per week. Start with 10 minutes, and once that feels manageable, increase to 20, then 30 minutes per day. Your pace should be a moderate one, where your heart rate and breathing are increased but

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*Dr Roberts is a new graduate of the Island Medical Program at the University of British Columbia Faculty of Medicine. She was a fourth-year medical student when submitting this article for publication consideration. Dr Wilson is a family physician and the theme lead for exercise in the UBC Faculty of Medicine curriculum. Dr Gaul is a professor in the School of Exercise Science, Physical, and Health Education at the University of Victoria. All are lifelong advocates for the importance of exercise to health and well-being.*

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*This article has been peer reviewed.*

you can still talk normally. I'd also recommend some gentle stretching daily, especially to get you moving at work. In addition to improving your blood pressure, you may also find that this helps to reduce your stress and improve your mood. We'll follow up on how this is going at your next appointment.”

When prescribed by physicians, an ExRx promotes increased physical activity and its concomitant health benefits for patients.<sup>11,12</sup> However, few Canadian physicians use an ExRx to help patients prevent or manage their chronic medical conditions,<sup>13,14</sup> demonstrating the significant impact of the many barriers to

implementing the ExRx.<sup>15</sup> In a systematic review of primary care providers' perceptions of the ExRx in their practices,<sup>15</sup> the most common barrier identified was a lack of time to dedicate to the process of providing an ExRx. A lack of knowledge or training in ExRx was the second-most common barrier cited, followed by the perception that patients are unlikely to change their behaviors even if provided with a personalized ExRx, and the physician's lack of confidence in their ability to use it.<sup>15,16</sup> Addressing this lack of confidence is critical to physicians overcoming other barriers and integrating the ExRx into their practice.<sup>16</sup>

Education is a logical solution to increase physician confidence in the use of the ExRx. CME workshops and courses have been reported to improve physician knowledge and likelihood of using the ExRx when opportunities are available.<sup>16</sup> Furthermore, these opportunities reduce the negative impact of the other identified barriers.<sup>16</sup>

## Exercise prescriptions in medical education

An absence of ExRx content has been consistently reported in US<sup>6</sup> and UK<sup>7</sup> medical curricula. Where it is included, it is often

## Exercise Prescription & Referral

Name \_\_\_\_\_

Date \_\_\_\_\_ Age \_\_\_\_\_

Relevant diagnoses \_\_\_\_\_

**REDUCE SEDENTARY BEHAVIOUR**

Move more / Sit less / Use stairs / Limit screen time

**PHYSICAL ACTIVITY RECOMMENDATIONS**

**AEROBIC / CARDIOVASCULAR ACTIVITY**

Frequency	1	2	3	4	5	6	7	days / week
Intensity	Light		Moderate			Vigorous		
Time	10	15	20	30	40	more	minutes / session	
Type								

**STRENGTH / RESISTANCE ACTIVITY**

Frequency	1	2	3	4	5	6	7	days / week
Type (e.g., yoga, freeweights)								

**CANADIAN PHYSICAL ACTIVITY GUIDELINES FOR ADULTS 18 YEARS AND OLDER**  
 To achieve health benefits, adults aged 18 years and older should accumulate at least 150 minutes of moderate- to vigorous-intensity aerobic physical activity per week, in bouts of 10 minutes or more. It is also beneficial to add muscle and bone strengthening activities using major muscle groups, at least 2 days per week. More physical activity provides greater health benefits.

**REFERRAL FOR ADDITIONAL EXERCISE ASSESSMENT AND COUNSELLING**

Name / Organization \_\_\_\_\_

Reason for Referral \_\_\_\_\_

**YOUR HEALTH PROFESSIONAL**

Name	Signature	Licence #
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**WHAT DO WE KNOW ABOUT EXERCISE?**

- **Physical activity will make you feel good and can be fun!**
- **Exercise is effective.** If exercise was a drug, it would be one of the most effective and safe ways to prevent and treat many chronic diseases such as heart disease, hypertension, diabetes, osteoporosis, anxiety disorders and depression!
- **Exercise is safe for your joints.** Regular low impact exercise and gradual muscle strengthening can stabilise and protect your joints from osteoarthritis and reduce the risk of falls and injuries that is associated with poor physical fitness.
- **Improving fitness is more important than losing weight.** Low cardiovascular fitness is associated with a much higher risk of disease and death than being overweight.
- **Walking is free anywhere and any day of the year!**

**WHAT ABOUT AEROBIC INTENSITY AND MUSCLE STRENGTHENING?**

How can I assess intensity?

- **Light exercise will usually not cause adults to sweat and breathe harder.** It is easy to have a conversation at this intensity. Walking is the typical example of light exercise.
- **Moderate-intensity exercise will cause adults to sweat a little and breathe harder.** It is possible to have a conversation in short sentences. Examples are brisk walking (as if you are late for the bus!) and bike riding.
- **Vigorous-intensity exercise will cause adults to sweat and be “out of breath”.** It is difficult to have a conversation. Examples are jogging, swimming laps, cross-country skiing and hiking on hills.

**What is strength and resistance exercise?**

- Strength and resistance exercises make your muscles work harder by adding weight or resistance to the movement. It is recommended to have at least one day of rest from this activity per week.

**For more information**

You can consult your health professional, an exercise professional or visit the Resources page on [exerciseismedicine.ca](http://exerciseismedicine.ca).

The development of this resource was financially supported by:

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**FIGURE.** Adapted from the Exercise Prescription and Referral Tool.<sup>23</sup> Available from [www.exerciseismedicine.org/canada](http://www.exerciseismedicine.org/canada). Copyright Exercise is Medicine Canada, reproduced with permission.

extracurricular, elective, or fails to cover all necessary topics and skills.<sup>6</sup> There has yet to be a similar survey of Canadian medical curricula, but UBC Faculty of Medicine students have identified themselves as insufficiently prepared to use the ExRx despite feeling it is relevant to their future practices.<sup>17</sup> The Canadian Academy of Sport and Exercise Medicine,<sup>18</sup> the College of Family Physicians of Canada,<sup>19</sup> and the Canadian Medical Association<sup>20</sup> have all formally recognized the importance of the ExRx to the health of Canadians and emphasized the need for it to be included in Canadian medical curricula.

Several best practice suggestions have been made for what an ExRx curriculum should contain and how it could be implemented. The Exercise is Medicine Education Committee (a partnership of Exercise is Medicine and the American College of Sports Medicine) defines four focus areas in their recommendations for the knowledge and skills medical students should have obtained by the end of their training:<sup>21</sup>

- Physical activity and fitness assessment
- Exercise prescription, implementation, and ongoing support
- Exercise counseling and behavioral strategies
- Personal physician health

A 2014 systematic review of the outcomes of physical activity prescription curricula in medical schools identified student personal physical activity behaviors, a strong conceptual base, didactic and experiential learning, and integration into other topics as key elements of an effective ExRx curriculum.<sup>22</sup> Integration into other topics is particularly important for student learning and is also an effective way to overcome some of the recognized challenges to inclusion of the ExRx in medical curricula. These include limited availability of curricular time and funding, and a zero-sum paradigm, where the perception is that something must be removed to make room for the ExRx.<sup>6</sup>

### Recommendations for curriculum development

These best practices were implemented as part of a student-led initiative to develop an ExRx curriculum for the UBC Faculty of Medicine.

Curricular content included the Physical Activity Vital Sign<sup>10</sup> assessment of patient activity levels, assessing safety to begin exercising, creating a personalized ExRx for each patient, and supporting patients to overcome barriers (with an introduction to motivational interviewing skills) or providing referrals to exercise professionals for

**Patients prefer to receive advice on physical activity from physicians, and an exercise prescription is a key, effective way for physicians to encourage increased physical activity in their patients.**

ongoing support. This content was integrated into the existing curriculum, with significant support and collaboration from curriculum leadership, achieving our critical goal of not adding any curricular time and thus avoiding any conflicts with other key curricular elements. Integration was facilitated by adapting existing sessions and including ExRx content in case-based sessions on related clinical topics. This allowed students to practise their skills and to reinforce and contextualize their learning with relevant real-world scenarios. Future initiatives will include:

- Introducing the importance of physical activity as a critical determinant of health earlier in the curriculum.
- Having tutors, preceptors, and other role models with experience in ExRx involved in curriculum delivery.
- Providing students with more opportunities to refine their ExRx skills with patients.
- Emphasizing the importance of these skills as an exit competency via their inclusion in examinations.
- Placing more emphasis on supporting students' own exercise behaviors.

### Conclusion

The role of regular exercise in reducing the risk of mortality and the health and economic burdens of chronic disease is well established.

Physicians are in the strongest position to enhance the health of their patients with an appropriate ExRx. To take advantage of this will require educating future physicians on how to use an ExRx effectively. With this foundation in place, we will fulfill our responsibility to respond to the priority health concerns facing British Columbians by using ExRx as part of a systemic change toward improved lifelong health and well-being. ■

### Additional reading

This work was completed as part of Flexible and Enhanced Learning (FLEX) in the MD Undergraduate Program at the UBC Faculty of Medicine. For more information, visit <https://mednet.med.ubc.ca/Teaching/FLEX/Pages/default.aspx>.

### Acknowledgments

The authors would like to acknowledge Dr Joana Gil-Mohapel of the Island Medical Program for her tireless support of this project, and all curriculum leads who incorporated our work into their curricular sessions.

### Competing interests

None declared.

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# Precocious puberty: A red flag for malignancy in childhood

Three clinical cases of precocious puberty resulting from rare but serious functional solid tumors in children highlight the need for physicians to identify the condition early and refer to tertiary care to minimize morbidity and optimize survival.

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*This article has been peer reviewed.*

**ABSTRACT:** Pediatric solid tumors have a range of clinical presentations, including those driven by the ectopic production of hormones secreted by some malignancies. Functional tumors lead to a variety of presentations, including Cushing syndrome, growth acceleration, abnormal virilization or feminization, and hypertension with electrolyte abnormalities. Precocious puberty, the onset of secondary sexual characteristics before age 8 in girls or 9 in boys, may be a warning sign of occult malignancy. Early referral is critical to optimize survival and limit disease- and treatment-related morbidities. Diagnostic workup and treatment should be guided by an interdisciplinary specialist team. Some tumors are associated with inherited cancer predisposition syndromes, which may have implications for surveillance and screening of family members. We describe a series of patients with rare functional tumors who presented with peripheral precocity to our tertiary referral centre at BC Children's Hospital to highlight key concepts for physicians: recognize, refer early, and review recommendations for genetic screening.

## Background

Functional solid tumors in childhood can arise from the adrenal glands, gonadal tissue, or extra-gonadal tissues. Although these tumors sometimes present with palpable testicular or abdominal masses, many do not. Functional tumors secrete hormones, leading to diverse presentations with Cushing syndrome, precocious puberty, abnormal virilization or feminization, and hypertension with electrolyte

abnormalities.<sup>1-3</sup> These tumors may present with early onset of isosexual or contrasexual puberty as a first symptom. Treatment may involve surgery, chemotherapy, and/or radiotherapy. Genetic testing or counseling may be indicated for families. Early identification minimizes disease-related morbidity and mortality and optimizes outcomes. We present illustrative cases of functional solid tumors in children from British Columbia with the aim of educating physicians about these rare but serious tumors.

## Case data

### Case 1

A previously healthy 12-year-old girl presented with a 3-year history of progressive virilization and Cushingoid features, including hoarse voice, hirsutism, central obesity, pubic and axillary hair, abdominal striae, interscapular fat pad, acanthosis nigricans, and a 6.8 kg weight gain. She was premenarchal. She had been evaluated by multiple clinicians over a period of 18 months, at which point she was assessed by a pediatrician who urgently referred her to our centre. At the time of consultation, her weight and BMI were > 99.9th percentiles, while her height was at the 20th percentile. There were no prior concerns with growth, development, or short stature. The patient's blood pressure was 122/63 (94th percentile systolic, 51st percentile diastolic). She was Tanner stage 3 for axillary and pubic hair and Tanner stage 2 for breast development. No lymphadenopathy, abdominal mass, hepatosplenomegaly, or clitoromegaly were identified.

Investigations revealed elevated serum cortisol (367 nmol/L; normal for age and time of day = 61 to 349 nmol/L) and total testosterone (2.8 nmol/L; normal for age = < 1 nmol/L) with normal electrolytes. Dehydroepiandrosterone sulfate (DHEAS) was normal. Low-dose and high-dose dexamethasone suppression tests failed to show suppression of serum and urinary cortisol. Bone age was advanced at 15 years. Abdominal ultrasound and subsequent MRI and fluorodeoxyglucose (FDG)-PET/CT revealed an FDG-avid left adrenal mass measuring 3.4 cm in maximal dimension, with no extension into adjacent structures or metastatic disease.

The patient underwent laparoscopic left adrenalectomy with perioperative stress-dose steroids. Pathology was consistent with adrenocortical adenoma with negative margins. The patient did not require adjuvant treatment. Surveillance imaging (abdominal MRI every 3 months for the first 6 months, and abdominal MRI or ultrasound annually until age 17) demonstrated no recurrence. Her symptoms resolved and she progressed with normal puberty. However, she had prolonged adrenal insufficiency. Her lack of adrenal recovery was unusual given that she had a remaining, presumably functional, adrenal gland. At the time of transition to adult care, her height was at the 14th percentile (-1.1 SD from mean) and her cortisol levels (at baseline and post-adrenocorticotropic hormone [ACTH] stimulation) remained low. Attempts to wean her off steroids were unsuccessful. At age 21, she remains on physiologic low-dose oral hydrocortisone replacement.

## Case 2

A 3-month-old infant presented to her general practitioner with secondary sexual characteristics and Cushingoid features, including hirsutism, acne, moon facies, interscapular fat pad, and body odor. She was referred to a pediatrician. While awaiting pediatric assessment, she re-presented at 6 months of age after developing new shortness of breath, orthopnea, and dyspnea while breastfeeding. The family was directed to hospital, where the child was determined to have signs of cardiac failure. Initial abdominal ultrasound revealed a left flank mass. The endocrinology service was contacted,

and the patient was transferred urgently to the pediatric ICU for stabilization. Notably, her paternal grandmother had separate cancers of the female reproductive tract at age 45 and 50 years. The paternal great-grandfather had passed away from colon cancer in his 70s.

Serum total testosterone was very high at 43.8 nmol/L (normal for age = < 0.6 nmol/L), DHEAS was elevated at 22.4  $\mu$ mol/L (normal for age = 0.2 to 1.8  $\mu$ mol/L), random cortisol was elevated at > 1600 nmol/L (normal for age and time of collection = 100 to 276 nmol/L), renin was elevated at 11.82 ng/L/s (normal for age = < 2.30 ng/L/s), and androstenedione was elevated at > 41.4 nmol/L (normal for age = 0.2 to 0.9 nmol/L). Electrolytes and aldosterone were normal (2170 pmol/L; normal for age = 135 to 2430 pmol/L). A chest X-ray demonstrated cardiomegaly, and an ECG demonstrated biventricular hypertrophy. An echocardiogram revealed septal hypertrophy with cardiomyopathy and decreased ejection fraction. Intermittent left ventricular outflow tract obstruction was noted due to the septal hypertrophy, secondary to chronic endogenous steroid excess. The patient remained unstable in the pediatric ICU, with two asystolic cardiac arrests followed by resuscitation and return of spontaneous circulation. A CT of the abdomen revealed a 7.0  $\times$  5.6  $\times$  7.7 cm heterogeneous mass arising from the left adrenal fossa, displacing the ipsilateral kidney. Thrombus was noted in the left renal vein extending into the inferior vena cava. A CT of the chest revealed three small, nonspecific nodular opacities (up to 3 mm in size) in the right upper and lower lung lobes.

The patient underwent laparotomy to obtain tissue diagnosis. In order to prevent tumor spillage, a left adrenalectomy and nephrectomy with inferior vena cava thrombectomy were performed. She experienced rebound hypertension postoperatively and was managed with a beta-blocker. The patient remained on glucocorticoid and mineralocorticoid replacement postoperatively for adrenal insufficiency. Pathology and histology were consistent with adrenocortical carcinoma with intravascular extension into the vena cava and extracapsular invasion. Following review by the multidisciplinary tumor board, the patient received modified adjuvant

chemotherapy in the setting of comorbidities. She received carboplatin rather than cisplatin to limit renal toxicity, and etoposide at 50% of the usual dose to limit myelosuppression. Doxorubicin was omitted due to cardiac toxicity risk. Daily oral mitotane was given. After two chemotherapy cycles, repeat PET-CT imaging demonstrated multiple new, small pulmonary nodules (2 to 4 mm in size). Due to concern about radiographic progression and improved clinical status, the patient was escalated to full dose cisplatin, etoposide, and doxorubicin in combination with daily oral mitotane as per the Children's Oncology Group ARAR0332 protocol.<sup>4</sup> She completed six additional cycles of chemotherapy and continued oral mitotane for a total of 18 months. Her major toxicities included mucositis requiring total parenteral nutrition, febrile neutropenia, and grade 3 (moderate to severe) bilateral sensorineural hearing loss with speech delay that required hearing aids. Pulmonary nodules were no longer present by the end of chemotherapy. Repeat echocardiogram demonstrated resolving cardiomyopathy with normalization of function (ejection fraction 63%). Ten months following initial diagnosis, secondary sexual characteristics improved clinically. Serum DHEAS and testosterone normalized within 3 to 6 months following surgery and six cycles of chemotherapy. The patient was referred to medical genetics. Family testing revealed germline TP53 tumor suppressor gene mutation (Li-Fraumeni syndrome) in the patient, her father, and paternal grandmother. The patient has two sisters, whom the family elected to test: they do not carry the TP53 variant. The patient has subsequently undergone screening per the Toronto protocol for early detection of other malignancies, including breast and thyroid cancer, leukemias, lymphomas, and sarcomas.<sup>5,6</sup> She remains well at age 9 with no recurrence, secondary malignancy, or new malignancy.

## Case 3

An 11-year-old boy presented after a noticeable growth spurt at age 8, followed by a development of a beard, axillary hair, acne, and body odor by age 9. His parents noted a plateau in his height velocity between age 10 and 11. He was seen by multiple care providers, including a pediatrician, over the course of 1 year

for advanced puberty and abdominal pain. The family was reassured that his puberty was within upper normal limits. On a subsequent visit, 5 days prior to referral to our centre, the patient disclosed an interval 3-month history of enlarging left testis. A testicular mass was palpable on examination, and scrotal ultrasound with Doppler demonstrated a  $3.1 \times 2.2 \times 1.7$  cm well-circumscribed, heterogenous mass in the left testis, with calcifications and associated varicocele. Time from symptom onset to referral was approximately 3 years; time from first physician assessment to referral was 1 year.

On physical examination, the patient's height was 161.6 cm (> 97th percentile), weight was 63.9 kg (> 97th percentile), and BMI was  $24.5 \text{ kg/m}^2$  (> 97th percentile). He had a full beard, deep voice, and axillary hair (Tanner stage 4–5), and asymmetric testes. The left testis was enlarged, nontender, and firm. Investigations were notable for elevated serum testosterone at  $26.3 \text{ nmol/L}$  (adult male range) and DHEAS at  $11.2 \text{ } \mu\text{mol/L}$  (upper normal adult male), with suppressed luteinizing hormone (LH) of  $< 0.2 \text{ IU/L}$  and low follicle-stimulating hormone (FSH) of  $< 0.7 \text{ IU/L}$ . Alpha-fetoprotein (AFP) was slightly elevated at  $8.9 \text{ } \mu\text{g/L}$  (normal  $< 8.4 \text{ } \mu\text{g/L}$ ). Beta-human chorionic gonadotropin ( $\beta\text{hCG}$ ) was undetectable. Bone age was advanced at 17 years. FDG-PET/CT was negative for metastatic disease in the chest, abdomen, and pelvis.

The patient underwent left radical orchiectomy with no complications. Pathology was consistent with a Stage I Leydig cell tumor with negative margins (T1N0M0). He was assessed in follow-up by our pediatric endocrinology service. Due to chronic exogenous androgen exposure, he would have limited skeletal growth potential, as growth plates were approaching fusion. He has subsequently shown evidence of reactivation of his central hypothalamic-pituitary-gonadal axis with normalization of serum LH and FSH. He remains well at age 13 with no evidence of recurrence; however, his height has plateaued, with a predicted final adult height around the third percentile.

## Discussion

In our series, patients presented with precocious puberty, in addition to signs of steroid excess

in those who had adrenal tumors. The first two cases highlight the continuum of functional adrenocortical tumors, from isolated, functional benign adenoma to metastatic adrenocortical carcinoma associated with Li–Fraumeni syndrome. The third case highlights a functional Leydig cell tumor, where precocious puberty predated identification of a testicular mass by several years. Adolescent patients may be hesitant to disclose signs of precocious puberty or testicular masses. Thorough history and physical examination are critical. Though not highlighted in this series, some central nervous system tumors, including ependymomas, optic gliomas, and astrocytomas, can also present with true isosexual central precocious puberty. These tumors are rare. In the first and third cases, patients experienced delays from the onset of symptoms to diagnosis and treatment. In the second case, the infant presented with life-threatening cardiac failure while awaiting pediatric assessment. All patients experienced short- and long-term morbidities, some of which are permanent.

## Background, epidemiology, and cancer predisposition

**Functional adrenocortical tumors:** Adrenocortical tumors comprise 0.2% of pediatric cancers, with an incidence of 0.7 to 2.0 cases per million in the general population.<sup>7,8</sup> There is a bimodal distribution, with peaks under age 10 and in the fourth decade.<sup>1,9</sup> In children, the median age is 3 to 4 years, with a second, smaller peak in adolescence.<sup>10</sup> Pediatric adrenocortical tumors exist on a spectrum from benign, incidental adenomas to aggressive, malignant carcinomas. Classically, adenomas are well defined, spherical, and small ( $< 2 \text{ cm}^3$ ). Carcinomas are typically larger, lobulated, and demonstrate hemorrhage and necrosis. The adrenal cortex is made up of three distinct layers: zona glomerulosa (mineralocorticoid production), fasciculata (glucocorticoid production), and reticularis (sex hormone production). Children are more likely to have isolated, functional tumors that present with symptoms; teenagers are more likely to have nonfunctional tumors that have metastatic spread at presentation.<sup>1</sup>

Pediatric adrenal tumors can be associated with inherited cancer predisposition syndromes, including Li–Fraumeni (germline TP53 tumor

suppressor gene), Beckwith–Wiedemann (alterations on chromosome 11p15 affecting imprinting of genes), multiple endocrine neoplasia type 1 (11q13 gene), familial adenomatous polyposis (with at least four associated genes), and Carney complex (PRKAR1A tumor suppressor gene causing cardiac and cutaneous myxomas and adrenal hyperplasia).<sup>11,12</sup>

**Functional sex cord-stromal tumors:** Testicular and ovarian tumors are very rare in childhood, accounting for 1% to 2% of all childhood tumors.<sup>13</sup> They can be classified into germ cell and non-germ cell tumors. Nongermline sex cord-stromal tumors can be functional and may secrete estrogen and/or testosterone. They may also present as a testicular mass or, in the case of an ovarian tumor, with abdominal pain, mass, or ascites. Of these sex cord-stromal tumors, juvenile granulosa cell tumors predominate in the neonatal period, Sertoli cell tumors present in infancy, and Leydig cell tumors present in childhood and adolescence.<sup>14</sup> Calcified Sertoli cell tumors (often seen in infants) may be associated with Peutz–Jeghers syndrome or Carney complex.<sup>15</sup> Ovarian sex cord-stromal tumors are most commonly juvenile granulosa cell tumors. Ovarian tumors of the Sertoli–Leydig cell type have been reported in patients with a cancer predisposition syndrome attributable to germline DICER1 mutations, which can also present with pleuropulmonary blastoma in childhood.<sup>16</sup> Small cell carcinoma of the ovary, hypercalcemic type, is rare but may be  $\beta\text{hCG}$ -secreting and associated with somatic and germline mutations in the SMARCA4 gene.<sup>17</sup>

**Functional germ cell tumors (gonadal or extra-gonadal):** Malignant germ cell tumors can be gonadal or extra-gonadal. They can arise in the abdomen, mediastinum, or brain (often pineal gland). Malignant germ cell tumors that secrete intact human chorionic gonadotropin (hCG), such as choriocarcinoma, can present with precocious puberty in boys, as CG activates CG/LH receptors in the Leydig cells, leading to increased testosterone production. Other functional germ cell tumors include embryonal carcinoma (CG secreting), yolk sac tumors (AFP secreting), testicular seminoma, and ovarian dysgerminoma [Table].



### Clinical presentations

Pediatric adrenocortical tumors, particularly in young children, are typically functional. The average time to diagnosis is 5 to 8 months from symptom onset. Symptoms include virilization due to excess adrenal androgens (pubic hair, acne, clitoromegaly/penile enlargement, voice changes, facial hair, and hypertension).<sup>1,18</sup> Gynecomastia and feminization can occur due to hyperestrogenism.<sup>3,19</sup> Cushingoid features can also be common due to excess glucocorticoid production, but isolated Cushing syndrome is rare (5% of patients, more commonly older children).<sup>1</sup> Many tumors secrete multiple hormones, and symptoms can overlap. Most of the sex cord-stromal tumors in boys present as painless testicular masses, but up to 20% can present with precocious puberty due to increased testosterone and DHEAS.<sup>20</sup> hCG-secreting germ cell tumors may present with modest bilateral testicular enlargement and precocious puberty in boys. Ovarian tumors can present with abdominal pain, abdominal mass, or ascites, but some may present with breast development, and/or vaginal bleeding due to excess estrogen. Children with precocious puberty (secondary sexual characteristics in girls < 8 y and boys < 9 y) should be referred urgently to a pediatrician or pediatric endocrinologist, particularly if the child is unwell or there are concerns about failure to thrive. Complete history and full physical examination (including abdominal, testicular, and neurologic assessments) are important. Tanner staging (with measurement of testicular volume or length in boys) and accurate evaluation of blood pressure for age may provide key clues on examination when less obvious signs exist.<sup>21</sup>

### Diagnostic workup and staging

Precocious puberty has a broad differential diagnosis, including primary and secondary causes. Baseline labs may include a complete blood count, electrolyte panel, liver and renal function tests. Serum levels of hormones and their metabolites may be informative. These include serum cortisol (drawn early morning to account for diurnal physiologic variation), estradiol, androstenedione, testosterone, 17-OH progesterone, aldosterone/renin ratio, and DHEAS. Serum  $\beta$ hCG and AFP levels should be sent

Table. Expected laboratory findings in pediatric functional tumors.

Tumor	Histology	Elevated (high)	Suppressed (low)
Adrenal	Adenoma	Cortisol, testosterone, estradiol, dehydroepiandrosterone sulfate (DHEAS)	Adrenocorticotrophic hormone (ACTH) (adrenal insufficiency); luteinizing hormone (LH) and follicle-stimulating hormone (FSH)
	Adrenocortical carcinoma		
Sex cord-stromal (gonadal)	Granulosa cell	Estradiol	LH, FSH
	Sertoli	Testosterone, DHEAS, 17-OH progesterone	
	Leydig		
Germ cell (gonadal or extra-gonadal)	Choriocarcinoma	Beta-human chorionic gonadotropin ( $\beta$ hCG) testosterone (secondary to $\beta$ hCG)	LH (if $\beta$ hCG secreting)
	Embryonal carcinoma	$\beta$ HCG, testosterone (secondary to $\beta$ hCG) Alpha-fetoprotein (AFP)	
	Yolk sac tumor	AFP	
	Testicular seminomas (males)/ovarian dysgerminomas (females)	$\beta$ hCG (< 25%)	
All	All	Bone age (> 2 SD above mean for age)	Cortisol-only hypersecretion can lead to delayed bone age

to screen for malignant germ cell tumors. Bone age, based on radiographs of the hand, provides invaluable objective information. Expedited abdominal ultrasound imaging to screen for adrenal masses should be considered early.

Second-line testing could include 24-hour urine-free cortisol, 24-hour urine catecholamines (norepinephrine, epinephrine, dopamine) and metanephrines (metanephrine, normetanephrine), and spot urine vanillylmandelic acid and homovanillic acid to screen for pheochromocytoma and neuroblastoma in children with adrenal masses. An ACTH stimulation test can be useful in identifying tumors as sources of excess steroids, as they will function independently of ACTH stimulation.<sup>22</sup> Similarly, dexamethasone suppression testing can be useful in identifying tumors as sources of excess cortisol.

If a tumor is identified, staging will include cross-sectional imaging with CT, PET/CT, or MRI of the chest, abdomen, and pelvis, with visualization of lymph nodes. Head imaging may be indicated if there are neurologic symptoms or if a CNS germ cell tumor is suspected. Feasibility and optimal approach to tissue diagnosis,

whether biopsy or upfront resection, should involve the surgeon performing definitive surgery for local control. Stress dose steroids (50 to 100 mg/m<sup>2</sup>/day divided every 6 hours) may be required perioperatively in patients with adrenal suppression.

### Outcomes

Five-year overall survival for pediatric adrenocortical carcinoma is 38% to 46%, > 80% in patients with fully resected disease, and < 20% in patients with metastatic disease, which emphasizes the need for early detection.<sup>23</sup> Children with functional sex cord-stromal tumors have excellent survival outcomes with surgery alone, though they may have long-term side effects of exposure to sex hormones.<sup>24,25</sup> Adjuvant chemotherapy and radiation therapy are generally not required. Long-term disease-free survival in patients with stage II–IV disease remains 93% to 99%, with the exception of patients age > 11 years with stage IV testicular tumors, which is 83%.<sup>26</sup> Patients who are inappropriately biopsied (i.e., breach of testicular tumor capsule) or incompletely staged (i.e., without peritoneal washings at the time of

resection of an ovarian mass) are upstaged.<sup>25,26</sup> These patients, with isolated tumors that may have been treated with surgery alone, require adjuvant chemotherapy, which exposes them to additional toxicities and late effects. There is a critical window of opportunity to identify, diagnose, and intervene early in order to mitigate risk of long-term hormone exposure for patients with functional tumors and to improve survival outcomes for those with malignant tumors. Physicians should recognize precocious puberty, assess for evidence of masses on physical examination or imaging, and refer to tertiary care for ongoing care. Key points are summarized in the Box. ■

### Competing interests

None declared.

### Acknowledgments

We gratefully acknowledge our patients and their families for supporting this review.

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### BOX. Key points: Recognition, referral, and recommended genetic screening.

#### Recognition

- Adrenocortical tumors exist on a spectrum from benign adenoma to metastatic carcinoma. Survival rates drop precipitously with metastases. Early detection is critical.
- Functional adrenal tumors are more common in children, and present with symptoms of hormone excess, including precocious puberty and Cushingoid features. Tanner staging and blood pressure could be key examination features.
- Males with testicular tumors may present with a mass, precocious puberty, or both. History alone may not reliably rule out testicular mass in adolescents and teenagers.

#### Referral

- Children with precocious puberty should be referred urgently to a pediatrician or pediatric endocrinologist.
- Children with adrenal or testicular masses should be transferred promptly to a tertiary pediatric centre. Avoid conducting fine needle aspiration and biopsies.

#### Recommendations for genetic screening

- Functional solid tumors may be associated with inherited cancer predisposition syndromes. Elicit any family history of malignancy. Children may be the index case in a family.
- Referral to medical genetics for counseling and/or further testing should be considered for patients and at-risk family members.
- Access cancer screening programs for Li-Fraumeni syndrome, which may improve survival outcomes.

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# Using Gastrografin to manage adhesive small bowel obstruction: A nonrandomized controlled study with historical controls

Patients with adhesive small bowel obstruction who were treated with Gastrografin had a shorter hospital stay and were less likely to undergo surgical intervention than patients who did not receive the treatment.

## ABSTRACT

**Background:** A standardized protocol for managing adhesive small bowel obstruction using diatrizoate meglumine and diatrizoate sodium (Gastrografin) was implemented at Vancouver General Hospital. Our study assessed whether this protocol improved the quality of patient care.

**Methods:** A nonrandomized controlled study was conducted. Two groups of patients were studied: a preimplementation group (historical control) and a postimplementation group that received

the Gastrografin protocol. The primary outcome was length of hospital stay. Secondary outcomes included rate of successful conservative management, need for surgery, time to resolution of the obstruction, time to surgery, readmission to hospital, rate of complications or mortality, and patient satisfaction.

**Results:** The study included 122 patients (n = 82 preimplementation; n = 40 postimplementation). In the postimplementation group, length of hospital stay was shortened (adjusted mean difference: -3.209 days; 95% CI, -5.772 to -0.645;  $P = 0.015$ ), successful conservative management was higher (odds ratio: 3.354; 95% CI, 1.129-12.600;  $P = 0.044$ ), and need for surgery was lower (odds ratio: 0.237; 95% CI, 1.129-12.600;  $P = 0.034$ ) compared with the preimplementation group. Patients in the postimplementation group were generally satisfied with their care.

**Conclusions:** The implementation of a standardized protocol using Gastrografin for managing adhesive small bowel obstruction was associated with improved quality of patient care.

## Background

Adhesive small bowel obstruction (ASBO) is one of the most common and significant complications after abdominal surgery,<sup>1-5</sup> with an

incidence rate as high as 2.4%.<sup>1</sup> Adhesions are abnormal fibrous bands between organs and/or tissues that are normally separated. They are considered to be the pathological manifestation of peritoneal healing following surgery.<sup>6,7</sup> It is estimated that 93% of patients who undergo abdominal surgery will develop some postoperative adhesions.<sup>8</sup> In most cases, the adhesions do not translate into clinical symptoms; however, they can lead to serious complications, such as ASBO.

It is estimated that more than 300 000 emergency surgeries to treat ASBO are performed in the United States every year.<sup>4</sup> In the United Kingdom, small bowel obstruction is the indication for 37.3% of emergency laparotomies.<sup>5</sup> For patients who require hospital admission, the average hospital stay is 7 days, and the in-hospital mortality rate is 3%.<sup>1</sup> Small bowel obstruction also has a high recurrence rate.<sup>9</sup> Additionally, ASBO has been associated with a high financial burden. A study conducted in the Netherlands from 2013 to 2015 estimated the average cost of hospital admission and surgical treatment at €16 000.<sup>10</sup>

The management of ASBO remains a challenge. Peritonitis, strangulation, or bowel ischemia are the typical indications for urgent surgery.<sup>11,12</sup> The treatment of patients

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*This article has been peer reviewed.*

depends on the clinical judgment of the surgeon<sup>13</sup> and typically consists of intravenous fluid rehydration, fasting, and nasogastric tube decompression.<sup>13,14</sup>

Diatrizoate meglumine and diatrizoate sodium (Gastrografin) is a water-soluble contrast agent that can be used for visualization by X-ray or CT scan, and thus serves an important diagnostic function. However, Gastrografin can be helpful as a therapeutic agent as well. Due to a strong osmotic effect, it causes a shift of water into the lumen of the bowel, thereby facilitating the passage of stool, reducing edema of the intestinal wall, and helping resolve intestinal obstruction.<sup>15</sup> This dual function has been proven in multiple studies, systematic reviews, and meta-analyses.<sup>15-23</sup> As a diagnostic agent, the appearance of Gastrografin on an abdominal radiograph within 24 hours of administration is highly predictive of nonoperative resolution of obstruction.<sup>16</sup> As a therapeutic agent, Gastrografin reduces the time to resolution of the obstruction<sup>15,17,18,21,22</sup> and reduces the need for surgery.<sup>17,18,20,22-24</sup> Furthermore, Gastrografin has been proven safe. It does not increase morbidity or mortality.<sup>16-18</sup>

The diagnostic and therapeutic value of Gastrografin shortens the length of hospital stay,<sup>15-23</sup> which in turn leads to improvements in hospital efficiency, health care utilization, quality of health care, and patient satisfaction. Standard use of Gastrografin in ASBO patients has resulted in a tenfold cost reduction in overall inpatient care.<sup>19</sup> As a result, since 2013, the World Society of Emergency Surgery has recommended the routine use of Gastrografin for the diagnosis of ASBO and as part of the nonoperative treatment.<sup>13</sup>

In June 2019, a standardized protocol using Gastrografin for the management of patients with ASBO was implemented at Vancouver General Hospital (VGH) [Figure 1]. The aim of our study was to determine whether this protocol has improved the quality of patient care. Improved quality of care has been defined as shortened length of hospital stay, increased rate of successful conservative management, reduced need for surgery, shortened time to resolution of the obstruction, shortened time to surgery, reduced surgical complications, and patient satisfaction.

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<p><b>INVESTIGATIONS:</b></p> <p>Prior to administration of gastrografin, Nurse to ensure:                  NG tube has been inserted and placement confirmed by MD                  NG tube placed on suction for over 4 hours</p> <p>gastrografin 100 mL diluted in water 50 mL and administered via NG tube                  Clamp NG tube x 2h                  Unclamp NG if patient develops nausea/vomiting                  Unclamp NG tube at the end of 2h and place on low continuous suction</p> <p>Abdominal X-ray 2 views (supine and upright) 8h post gastrografin administration                  Inform MD when abdominal X-ray completed to determine results                  If no contrast is present in the colon, proceed with abdominal X-ray 24 h post gastrografin                  If contrast is present in the colon, cancel 24h abdominal X-ray</p> <p>Abdominal X-ray 2 views 24h post gastrografin administration                  Inform MD when abdominal X-ray completed to determine results</p>	
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FIGURE 1. Gastrografin protocol for adhesive small bowel obstruction.

**Methods**

We conducted a single-centre, observational, nonrandomized controlled study with historical controls. The study was approved by the University of British Columbia Clinical Research Ethics Board and the Vancouver Coastal Health Research Institute. Two groups were studied: a retrospective preimplementation group (i.e., prior to implementation of the protocol) and a prospective postimplementation group managed with the standardized protocol. The preimplementation group was used as the historical control.

We included patients 18 years of age or older who had a primary diagnosis of ASBO.

This was defined as adhesions being the most likely cause of obstruction based on the final CT scan report by the attending radiologist. Patients admitted to general surgery from November 2017 until October 2018 were included in the preimplementation group; those admitted from July 2019 until November 2019 were included in the postimplementation group.

We excluded patients who were in need of immediate surgery (peritonitis, strangulation, bowel ischemia, and closed-loop obstruction) based on clinical signs and CT scans. We also excluded those who were treated with surgery initially without a trial of conservative

management. Patients with possible causes of a small bowel obstruction other than adhesions seen on CT were also excluded.

For the preimplementation group, management was dependent on the clinical judgment of the surgical team on call. In the postimplementation group, the Gastrografin protocol for ASBO was followed if the patient met the inclusion criteria.

Patient data were collected prospectively and were de-identified and stored in password-protected and encrypted computers. Baseline characteristics consisted of age, gender, and Charlson Comorbidity Index (CCI). We calculated the CCI value for each patient to categorize comorbidities. This is a combined age-comorbidity index that estimates 10-year survival.<sup>25</sup> The primary outcome measured was length of hospital stay, defined as the number of days from the patient's admission date to their discharge date. The secondary outcome measures were rate of successful conservative management; need for surgery; time to resolution of the obstruction; time to surgery; readmission to hospital; rate of surgical complications, aspiration, or mortality; and patient satisfaction. Multivariate linear regression models were created to estimate the mean difference in continuous variables between the two groups, while adjusting for age, gender, and CCI. The effect measure applies additively as an adjusted mean difference. Multivariate logistic regression models were created to estimate the multiplicative odds ratios of the categorical variables, while adjusting for age, gender, and CCI. Statistical significance was defined as a *P* value < 0.05. Although the models were all multivariate, only the results pertaining to the effect of postimplementation or preimplementation group were selected. We used RStudio and Microsoft Excel for our analyses.

To gather feedback prospectively on the quality of care patients in the postimplementation group received during their stay in hospital for ASBO treatment, the validated Canadian Patient Experiences Survey on inpatient care was used.<sup>26</sup> The patients completed the survey on paper prior to discharge or over the phone after discharge. Ethical consent was obtained prior to administering the survey.

## Results

The study included 122 patients: 82 in the preimplementation group and 40 in the postimplementation group. The mean (SD) age was 68 (16) years, and 59.0% of the patients were female. There were no statistical differences in the baseline characteristics between the two groups.

**Overall, the postimplementation group had a significantly shorter mean length of hospital stay than the preimplementation group (4.15 days versus 7.22 days; *P* = 0.007).**

### Primary outcome

Overall, the postimplementation group had a significantly shorter mean length of hospital stay than the preimplementation group (4.15 days versus 7.22 days; *P* = 0.007). The result remained significant after adjusting for age, gender, and CCI: length of stay of patients in the postimplementation group was on average 3.21 days shorter than that of patients in the preimplementation group (95% CI, -5.722 to -0.645; *P* = 0.015).

### Secondary outcomes

#### Successful conservative management

More patients were treated successfully with conservative management in the postimplementation group than in the preimplementation group, but the difference was not statistically significant (90.0% versus 74.7%; *P* = 0.083). However, after adjusting for age, gender, and CCI, patients in the postimplementation group had significantly higher odds of being treated successfully with conservative management compared to patients in the preimplementation group (odds ratio: 3.354; 95% CI, 1.129-12.600; *P* = 0.044).

#### Need for surgery

Fewer patients in the postimplementation group required surgery compared to patients

in the preimplementation group, but the difference was not statistically significant (7.5% versus 22.9%; *P* = 0.066). However, after adjusting for age, gender, and CCI, patients in the postimplementation group had significantly lower odds of needing surgery compared to patients in the preimplementation group (odds ratio: 0.237; 95% CI, 1.129-12.600; *P* = 0.034).

#### Time to resolution of the obstruction

The mean time from admission to resolution of the obstruction was significantly shortened for patients in the postimplementation group who were treated successfully with conservative management (1.74 days versus 2.77 days; *P* = 0.019). However, the difference was not significant after adjusting for age, gender, and CCI (adjusted mean difference: -1.059; 95% CI, -2.164 to -0.919; *P* = 0.06).

#### Time to surgery

There was no statistically significant difference in time to surgery between the two groups (3.17 days versus 3.66 days; *P* = 0.688). This persisted after adjusting for age, gender, and CCI (adjusted mean difference: -0.104 days; 95% CI, -4.547-0.910; *P* = 0.961).

#### Readmission to hospital

Fewer patients in the postimplementation group than in the preimplementation group needed readmission to hospital within 30 days of initial discharge, but the difference was not statistically significant (3.1% versus 10.1%; *P* = 0.433). There also was no significant difference between the two groups in the odds of being readmitted (odds ratio: 0.320; 95% CI, 0.017-1.909; *P* = 0.295).

#### Complications and mortality

Overall, there were no statistically significant differences in the rate of surgical complications, aspiration, or mortality between the two groups. No patients in the postimplementation group suffered from aspiration events. In the adjusted analysis, the odds ratios were not statistically significant.

#### Patient satisfaction

In the postimplementation group, 52.5% of patients (*n* = 21) rated their overall experience

during their admission with a mean grade of 8.5 on a scale from 0 to 10, where 0 was the worst hospital experience possible and 10 was the best. The measure “hospital stay helpful” received a mean grade of 9.2 out of 10, where 0 was “not helped at all” and 10 was “helped completely.” Patients generally found that they were treated with courtesy and respect by doctors, and that doctors listened carefully to them and explained things in a way they could understand. Seventy-five percent of the patients said they would recommend VGH to their friends and family [Figure 2].

**Discussion**

Length of hospital stay was significantly different between our two study groups: patients who received Gastrografin were discharged home 3 days sooner than patients who did not. This could be partially attributed to the higher odds of patients in the postimplimentation group receiving successful nonoperative management. Our finding is in line with results reported in the literature.<sup>15-23</sup> The most significant difference in length of hospital stay between a control group and study group treated with

Gastrografin was recorded in an open-label randomized controlled trial by Di Saverio and colleagues (7.8 days versus 4.7 days, respectively;  $P < 0.05$ ).<sup>22</sup> By contrast, Scotté and colleagues suggested that no benefit was gained from Gastrografin administration in patients with ASBO in terms of length of hospital stay and need for surgery.<sup>27</sup> However, the authors set a cutoff period of 48 hours for the decision to perform surgery, as opposed to the 72-hour period recommended by the World Society of Emergency Surgery.<sup>13</sup> We believe that the earlier cutoff point may have resulted in a higher rate of surgical management, which in turn could have resulted in an increased length of hospital stay in patients who received Gastrografin. Additionally, Scotté and colleagues did not use a standardized protocol for Gastrografin.

The reduced length of hospital stay in the postimplimentation group in our study may also have been due to the shortened time to resolution: patients in the postimplimentation group had their nasogastric tube removed 1 day earlier than those in the preimplimentation group. However, this difference was not significant after adjusting for age, gender, and

CCI, possibly because the sample size of the subgroup of patients who did not undergo surgery was small.

The level of satisfaction with the quality of health care received by patients with ASBO has not been studied extensively in the literature. We measured this by using the Canadian Patient Experiences Survey on inpatient care.<sup>26</sup> Previous studies that used similar surveys have shown that surgical patients had a significantly higher satisfaction rate than medical patients.<sup>28</sup> Our results could be useful as a baseline or control for future studies in quality improvement that use our tailored patient survey, with questions specifically related to the patients’ condition in hospital and the treatment they received.

A major strength of our study is our demonstration of the value of using a protocol-based approach. To our knowledge, none of the published randomized controlled trials and systematic reviews on the use of Gastrografin had such a standardized protocol. Zielinski and colleagues conducted a prospective cohort study that compared the outcomes of patients managed on- and off-protocol using Gastrografin;<sup>20</sup> however, their protocol was optional and based on surgeon discretion. Another prospective cohort study by Weiss and colleagues also had a protocol, but it was initiated in only a portion of their patient population, not universally.<sup>19</sup> Long and colleagues conducted a more recent study that included a protocol using Gastrografin,<sup>23</sup> but the study was based on a retrospective review only.

**Study limitations and recommendations**

The sample size of our postimplimentation group was small, mainly because of a time limitation in our data collection. This could explain why we did not find statistically significant differences between the two groups for all outcomes measured. Despite the limited sample size, our results are promising.

We recommend that a shared multi-institutional data registry be created so more data on more outcomes can be collected. Also, feedback about the protocol and its implementation should be gathered from the multidisciplinary surgical team so another survey can be developed and targeted toward the nursing staff.

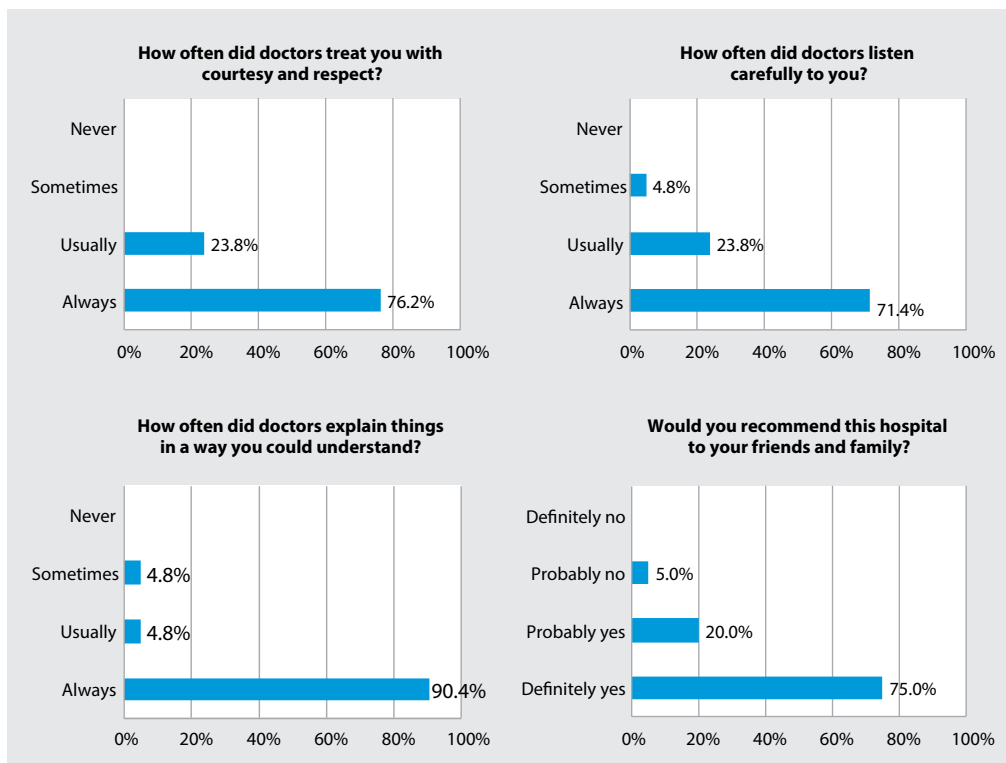


FIGURE 2. Patient satisfaction among the postimplimentation group.<sup>26</sup>

## Conclusions

An institutional standardized protocol using Gastrografin in the management of adhesive small bowel obstruction was associated with improved quality of patient care at Vancouver General Hospital. Most importantly, patients who received Gastrografin had a shorter hospital stay and were less likely to undergo surgical intervention. Patients were satisfied with the care they received. This study provided valuable benchmark data for further multi-institutional research. However, variability in the length of hospital stay, time to resolution of obstruction, and time to surgery should be further explored to identify the potential for improvement in patient care. ■

## Competing interests

None declared.

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**Most importantly, patients who received Gastrografin had a shorter hospital stay and were less likely to undergo surgical intervention. Patients were satisfied with the care they received.**

# Addressing inequities in care on the path to eliminating hepatitis C in BC

**W**orld Hepatitis Day, acknowledged on 28 July, provides an opportunity to reflect on BC's journey toward achieving the World Health Organization's target of eliminating hepatitis C by 2030. Treatment for the hepatitis C virus (HCV) is well tolerated and can achieve cure rates greater than 95% after 8 to 12 weeks. Treatment is free for anyone with PharmaCare coverage and is not dependent on fibrosis stage. While current modeling shows that BC is on track to achieve elimination by 2030, 28 607 people living with HCV in BC remain untreated.<sup>1</sup> Many have been previously diagnosed but lost to follow-up care, and they may experience various forms of social and economic marginalization.

Around 17% of people testing antibody positive in BC between 1990 and 2018 did not have a follow-up HCV RNA test to confirm current infection.<sup>2</sup> To help address this gap in care, on 13 January 2020, the BCCDC Public Health Laboratory implemented HCV RNA reflex testing on all first-time anti-HCV reactive specimens. The ability to diagnose HCV infection from a single blood sample greatly improves patient care by decreasing time to diagnosis and treatment, thereby decreasing potential loss to follow-up and related morbidity and mortality.

Recently, the Guidelines and Protocols Advisory Committee approved revisions to the BC Viral Hepatitis Testing Guideline, making BC the first province or territory in Canada to recommend one-time birth cohort screening for people born between 1945 and 1965. As this birth cohort accounts for nearly 60% of positive

hepatitis results in BC, many of whom remain undiagnosed and have not had confirmatory HCV RNA testing, it represents a key population that needs to be engaged in HCV care to reduce liver disease complications.<sup>1</sup>

Even with these changes, there are still challenges to ensuring equitable access to HCV treatment and cure in BC. Approximately 85% of new HCV infections relate to injection drug use, and a smaller number to condomless anal sex in the context of group sex and drug use.<sup>3</sup> Populations with a disproportionately high burden of HCV infection in BC include Indigenous people, people born in endemic countries, and people who are incarcerated (PWAI).

Patient-provider knowledge gaps, stigma, racism, unemployment, unstable housing, and poverty intersect in populations affected by HCV in BC, resulting in reduced access to HCV care. Health equity can be fostered by engaging and including people from affected groups in the creation and implementation of new policies and guidelines. BCCDC is partnering with BC Provincial Corrections and BC Mental Health and Substance Use Services to create policies and guidelines with PWAI and other key stakeholders. Policies and guidelines informed by patient and provider input will help to ensure care is person-centred. This work aims to increase HCV testing, diagnosis, and treatment, all of which is essential to address the gaps in care in provincial corrections programs aiming to achieve elimination targets.

Linkage to care is a major challenge for PWAI due to the absence of coordinated systematic discharge planning services and other competing priorities at release. Further efforts by community health care providers are needed to engage priority populations in comprehensive care, particularly PWAI transitioning back to community. To find those who have

been diagnosed but not successfully treated, support for community-based organizations should be increased, as they are likely to more easily engage with people not in medical care. Approaches such as using notification systems to contact people previously diagnosed are warranted, but community consultation is also needed.

With these innovative community engagement and consultation efforts, along with the recently updated provincial testing guidelines, BC will stay on the right path to addressing inequities in care and achieving HCV elimination by 2030. ■

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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.*



# Long head of the biceps tendon—the rotator cuff’s partner in crime

**C**hronic shoulder pain is a significant musculoskeletal burden on society, and rotator cuff pathology is the most common cause of shoulder disability. Between 2015 and 2019, over 1400 surgeries were performed on BC workers for rotator cuff pathology. The prevalence of rotator cuff disease increases with age, but it is often not alone in generating shoulder pain. Patients—and sometimes physicians—may question why surgery for a rotator cuff tear involves a procedure addressing the long head of the biceps (LHB) tendon.

Concomitant LHB tendon pathology is a common occurrence, with an incidence between 36% and 83% in patients who have rotator cuff tears. That the LHB tendon and rotator cuff are often partners in shoulder pain is understandable when you look at the anatomy and function of the structures.

The LHB tendon passes through the bicipital tunnel before turning around 30 to 40 degrees and heading intra-articularly to its attachment on the superior labrum and supraglenoid tubercle. The bicipital tunnel is composed of the bony bicipital groove between the tuberosities, and a soft tissue sling/pulley. The soft tissues involved include the supraspinatus and subscapularis from the rotator cuff, as well as the coracohumeral and superior glenohumeral ligaments. Previously, the transverse humeral ligament was thought to play a significant role in tunnel stability, but most authors now feel this is a continuation of fibres from the subscapularis, supraspinatus, and coracohumeral ligament. Rotator cuff pathology involving the supraspinatus and/or subscapularis can result in

LHB tendon pathology (and vice versa) due to this intimate anatomical relationship.

Functionally, the rotator cuff muscles are dynamic stabilizers of the glenohumeral joint. The LHB is generally considered a dynamic stabilizer as well, acting as a humeral head depressor similar to the supraspinatus, infraspinatus, and teres minor. Because of this shared functionality, the LHB tendon is thought by some to become a pain generator due to increased stress in the case of massive irreparable rotator cuff tears. These patients may obtain some pain relief by surgically addressing the LHB.

In patients where the usual conservative management (physiotherapy, activity modification, nonsteroidal anti-inflammatory medications, and possibly cortisone injections) fails to provide pain relief, surgical intervention can be beneficial. Tenderness over the bicipital groove and positive special tests, such as Speed’s, Yergason’s, or O’Brien’s, increase the likelihood the biceps will need to be addressed. Arthroscopic evaluation is often the final determinant.

Procedures for a painful LHB tendon include tenotomy or tenodesis. Tenodesis can be performed at various locations with various forms of fixation. Although tenodesis was traditionally performed on younger, active patients, this shifted over the last decade and is currently controversial. Traditional thinking was that tenotomy results in more cosmetic deformity (“Popeye” appearance) and muscle cramping, particularly in physically active individuals such as laborers. Tenodesis, meanwhile, requires longer rehabilitation (when an isolated procedure) and can fail, resulting in a functional

tenotomy. Recent studies have suggested the incidence of cramping or weakness with tenotomy may be less than previously thought, with some finding no significant difference between tenotomy and tenodesis, while others continuing to note higher incidences of deformity and cramping with tenotomy. Both procedures are associated with good subjective outcomes and pain relief.

To summarize, there is a high incidence of concomitant LHB tendon and rotator cuff pathology as a cause of shoulder pain. It is not unusual for patients undergoing rotator cuff surgery to also require a procedure for the LHB tendon. Both tenotomy and tenodesis are associated with good subjective outcomes. ■

—Derek Smith, MD, FRCS

—Jonathan Fenton, MD, FRCS

—J. Paul Thompson, MD, FRCS

**There is a high incidence of concomitant LHB tendon and rotator cuff pathology as a cause of shoulder pain.**

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

# BC seniors receive improved long-term care through GPSC initiative

The GPSC Long-Term Care Initiative (LTCI) recently reported significant improvement in the medical care of BC seniors who are in long-term care facilities since it was created in 2015.<sup>1</sup> The LTCI was formed through a partnership between the GPSC, divisions of family practice, health authorities, long-term care facilities, and the Ministry of Health. It was set up in response to a decline in the number of family doctors and most-responsible providers working in long-term care facilities, significant projected growth in the number of long-term care patients, and the lack of a system to plan family doctor coverage for long-term care facilities across a community. The LTCI builds on the work of the GPSC in developing physician longitudinal relationship-based care, which is shown to improve health outcomes.<sup>2</sup>

Through the divisions of family practice, the LTCI supports local family doctors to design and implement community solutions that deliver dedicated care provider services to patients in long-term care facilities. The LTCI service review report shows how the initiative made a difference for one of BC's most vulnerable patient populations:<sup>1</sup>

- Communities have developed mechanisms for patient attachment to ensure all long-term care patients are assigned a dedicated most-responsible provider.
- Emergency department transfers of long-term care patients have decreased substantially since the start of the initiative (as much as 28% in the Fraser Health Authority).
- 90% of facility survey respondents reported that the overall quality of care provided to patients during the pandemic by family

physicians and nurse practitioners was good or very good.

- Long-term care facilities are now able to routinely reach a family doctor after hours 87% of the time, an increase from 64% at the start of the initiative in 2015.
- Implementation of the LTCI is very high across BC, with an uptake of 96% across the 31 000 long-term care beds in the province.
- Proactive visits from most-responsible providers to long-term care patients have increased at the provincial level since the implementation of the LTCI.
- Attendance of a care conference by patients and their families has increased by 10% to 41%, depending on the health authority in which they receive care.

In addition, the initiative increased engagement from family doctors in long-term care by providing a network of support, continuing medical education, systems for ongoing coverage, and clearly defined expectations. It has also enabled family physicians to increase their skill sets with a quality improvement approach that regularly creates opportunities to review and reflect on quality indicators and measures directly related to the care of their patients.

To build on the success of this initiative, the report outlines key recommendations for the future of long-term care, which include:<sup>1</sup>

- Exploring how team-based care, patient medical homes, and primary care networks integrate with long-term care.
- Supporting ongoing quality improvement reviews.
- Collaborating with Indigenous partners so that their perspectives, lived experiences, and cultural safety and humility are integrated into a holistic vision of long-term care.
- Preparing for the growth in long-term care clients projected over the next 2 decades.

The LTCI demonstrates the value of the divisions of family practice, and the partnerships

between divisions and health authorities, in focusing on specific gaps in care at the community level. It shows the tangible improvements that can result when clinicians have the support of the system and administrators to implement new approaches or changes. The initiative builds on divisions of family practice as networks of family physicians who are rooted in a community, working together to address gaps in care, and provides the basis for working in partnership with a community's health authority to implement care systems and improvements to address those gaps. It also emphasizes the quality improvement approach in terms of regularly gathering information from care facilities and giving family physicians the opportunity to review and reflect on the quality indicators they receive feedback about.

Following this report, the GPSC is convening a new LTCI task group, which will further advise and oversee implementing the report's recommendations. The task group will be composed of a variety of stakeholders, including long-term care physicians, nurse practitioners, division of family practice, caregivers, the First Nations Health Authority, and regional health authority representatives. This work is funded through the GPSC, a partnership of Doctors of BC and the Ministry of Health. If you would like a copy of the report, please email [evaluation@doctorsofbc.ca](mailto:evaluation@doctorsofbc.ca). ■

—Brenda Hefford, MD

—Mitchell Fagan, MD

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

# Rural–urban inequities in palliative care

BC's rural populations are older, poorer, and have a higher chronic disease burden than urban populations.



There are significant inequities in the delivery of palliative health care between rural and urban populations in British Columbia. These inequities have, like many other areas of health care, been amplified by the current pandemic.

According to Statistics Canada, on average, BC's rural populations are older, poorer, and have a higher chronic disease burden than urban populations.<sup>1</sup> It might be thought, therefore, that the Ministry of Health and health authorities would recognize this inequity and assign palliative care resources accordingly. In fact the opposite is true, and like many other inequities, the COVID-19 pandemic has worsened this divide.

Both the 2018 Health Canada Framework on Palliative Care<sup>2</sup> and the BC Centre for Palliative Care<sup>3</sup> address the need for equity in the delivery of palliative care services. Under its guiding principles, the BC Centre for Palliative Care states that “All individuals and families have equal access to hospice palliative care services when they need it and where they need it: at hospitals, long-term care facilities, hospices, and the home.”<sup>3</sup>

*This article is the opinion of the Geriatrics and Palliative Care 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.*

Unlike other health care services (e.g., neurosurgery), palliative care services can only be effectively delivered in a patient's home community. There are many reasons why this is currently not being achieved equally across the province, including:

- Many rural communities have few or no palliative care beds. And as financial burdens increase, some health authorities are agreeing to staff new beds only if the local community pays for the design and building costs of new palliative care facilities. When built, residential hospice palliative care programs have often been at least 50% funded by charitable donations.<sup>3</sup> This discriminates in favor of urban centres where wealthy benefactors and corporations looking to make donations are more likely to be based.
- The current fee-for-service remuneration structure does not lend itself well to the increased time demands of physicians providing palliative care. Most sessional payment schemes and on-call payment arrangements exist only in urban centres. This acts as a financial disincentive for physicians who specialize in palliative care to move away from urban centres and limits the amount of time that physicians in rural areas can dedicate to palliative care. This stands in contrast, for example, with funding for medical assistance in dying assessment and provision, where physicians are adequately compensated for their work and travel.

- Unlike in urban areas, it is relatively uncommon for appropriately trained community nurses to be available on a 24-hour basis. This pushes more rural palliative care patients facing a symptom crisis to attend the emergency department and be admitted to an acute care bed, ultimately increasing global health care costs.

Rural palliative patients tend not to attract political attention. Their suffering often takes place in isolation, away from the centres of power. It can be hoped that, as health policy analysts address the inequities uncovered by the pandemic, the plight of rural palliative patients receives equal consideration. ■

—David May, MD

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# Obituaries

We welcome original tributes of less than 500 words; we may edit them for clarity and length. Obituaries may be emailed to [journal@doctorsofbc.ca](mailto: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 James Archibald McLennan 1932–2021

Jim was born on 30 October 1932 in rural Lebret, Saskatchewan. On 1 February 2021, he succumbed to COVID-19 complications as a resident of Royal City Manor in New Westminster, at age 88.

He is survived by his devoted wife, Rose; children, Jennifer and Jeffrey McLennan, Tracy and Robert Williams; and grandchildren, Aidan Geboers (Jennifer's son), Colten, Tiffany, and Avery. Jim was a favored uncle to many nieces and nephews and made regular excursions to his home town to reconnect with his roots, family, and friends.

Jim acquired his formal education in Lebret, attended Regina's Champion College, the University of Ottawa for his medical degree, and completed his internship at Hurley Hospital in Flint, Michigan. He joined Dr Roger Beaudoin and his father's general practice in Mailardville, Coquitlam. Subsequently he moved his practice to New Westminster and soon associated with freshly minted Dr Dan Metzack—a unique 30-year friendship evolved. Jim was chosen to be godfather to Dan's firstborn son.

With admitting privileges at Royal Columbian and St. Mary's Hospitals, Jim provided

cradle-to-grave care to his patients with kindness and compassion. He would tell them, "If you have a problem, you can call me at any time, day or night." After retiring from office practice, he continued to provide respite locum tenens for his senior GP colleagues until he hung up his stethoscope in 2011 after a remarkable career of 59 years of primary care.

Jim was one of those unique individuals admitted to heaven before departing earth. This was reflected in his radiant St. Jim smile, heartfelt and ever present. He exuded a zest for life and a bedside manner that emanated trust and confidence. He was open-minded and comfortable in any social situation.

Perhaps one of his greatest attributes was his infinite patience. This was most fortuitous and exemplified in his interactions with his son, Jeffrey, who is profoundly autistic. On one occasion, Jeff removed his shoes, rolled down the car window, and ejected them onto a very busy Canada Way—no chance for recovery. Jim was unfazed, smile intact and a twinkle in his deep blue eyes. Water off a duck's back!

Deeply religious, Jim, on occasion, did experience a rare slip. One of the features that likely contributed to his longevity was his longstanding love of jogging, which started in the early 1970s at the local YMCA in New Westminster, located a block from his office. He and Dan would routinely skip lunch and go for a run around Queen's Park along with the other local enthusiasts, have a steam and shower, and return to the office ready to take on the afternoon deluge. He then became a founding member of a local jogging club, SPCA (Stanley Park Crazy Assholes), whose members would jog the seawall on weekends wearing their SPCA T-shirts, followed by imbibing some liquid refreshments.

Jim could never be accused of being a moss harvester. He was an enthusiastic supporter and participating member of the Vancouver

Golf Club for many decades. He was a founding member of BC's earliest autism society, to support afflicted children in the 1970s. He also had a passion for vintage cars; at one time his stable included a rare Aston Martin DB4, the James Bond variety. In addition, his philatelic interests focused on mint Canadian specimens, and he collected early Canadian art. Jim also loved music. He would frequently entertain his guests, playing melodies on his grand piano. With a multitude of interests beyond medicine, by life's end his bucket list was long empty.

Another one of his longtime friends and former receptionist, Ericka Dellafortuna, describes Jim as the man with the smile in his voice, which she will truly miss. She has many happy memories of Jim on different adventures preserved in photo albums; life was always a fun-filled adventure for him. The final words are reserved for Rose: He lived life to the fullest and brought joy with him everywhere.

Gone but not forgotten by family, friends, and colleagues. For the many fond memories, thank you Jim! ■

—Jack and Ruth Albrecht  
Burnaby

—Rose Nahanee  
West Vancouver

—Dan Metzack  
Burnaby



## Dr Patricia "Paddy" Mark 1941–2021

It is with profound sadness that we write of the sudden and unexpected death of a long-time friend and colleague, Dr Patricia Mark. Paddy was born in Ballyshannon, Northern Ireland, in

1941. She graduated in medicine from Trinity College. She met her husband, Mark Nixon, in 1966. They emigrated to Canada in 1967 and married in 1971. They subsequently moved to Vancouver Island where Paddy practised full-service family medicine and Mark joined the department of anaesthesia. She enjoyed a long and successful career as a family physician and as one of the founding practitioners of the Sow's Ear Medical Clinic in Lantzville, BC. She very proudly practised in a full-service capacity and never shied away from challenging situations. She excelled in roles as a teacher, mentor, medical leader, and advocate, always with a seemingly inexhaustible supply of mental and physical energy. During all of this she and Mark found time to raise a wonderful family.

Paddy was a tireless advocate for those at risk. She undertook the challenging task of addiction management medicine and worked in the corrections system, taking on new responsibility there even in her final days. She practised with great empathy, always to the benefit of her patients.

Paddy extended this empathy to friends of the four-legged variety as well. She was an enthusiastic supporter and fundraiser for the BC SPCA, and her Nanoose Bay house was always home to several dogs, all of whom were adopted or rescued, sometimes from very unpleasant situations. Her annual sales drive for SPCA calendars was one of the year's salient events.

Paddy and Mark have been avid and very skilled gardeners, and those of us fortunate enough to know them were frequent visitors to their sprawling world-class rhododendron garden. Many of her friends developed a serious interest in gardening as a benefit of their friendship. They would never hesitate to share their expert advice, not to mention seedlings cuttings and full-grown plants.

For many years, the two hosted a large garden party for the medical staff and friends in their beautiful garden, a highlight on everyone's calendar. Family members and friends would contribute time and effort to hull strawberries, slice buns, and provide oven space for cooking turkeys and hams. In her usual firm manner, Paddy would recruit the surgeons to carve the meat; the occasional misguided soul considered

declining, albeit briefly.

Paddy was also an accomplished writer and historian, another interest that those who shared it found tremendously beneficial. Her suggestions and insights would have expanded personal libraries of military history books significantly. She never tired of discussing the topic over a glass of wine.

Paddy leaves behind a devastated family: husband, Mark Nixon; daughters, Ruth and Sarah (Jesse Capon); stepchildren, Clare McQuaid (Rick) and Paul (Iris); grandchildren, Hannah Nixon, Gillian Nixon, Clementine Nixon, Georgia Nixon, Elliot Capon, Luke McQuaid, and Emma McQuaid. She was predeceased by her stepson, Adam. A wide circle of friends, colleagues, patients, and animals also mourn her sudden passing.

The Irish saying "For evil to succeed, it requires only that good men do nothing" was one of her favorites. It exemplifies her credo. Godspeed dear friend. ■

—John Whitelaw, MD

Nanaimo

—Blair Rudston-Brown, MD

Nanaimo

To describe Paddy Mark in one word, I would use "passionate" as the defining mote. I only knew Paddy for a few years, yet she had a profound effect on me and my family, as she had on many people's lives. I met Paddy in the early 1990s when we moved to Nanaimo, and it wasn't long before we were invited to one of her famous garden parties. Paddy's magnificent rhododendron gardens were in full display and the party went on rain or shine every May. She knew my husband professionally, and was also our family physician; after she retired she became a personal friend. A visit to Paddy's office at Sow's Ear Clinic meant time to peruse the multitude of witty and funny comments posted on the walls.

We bonded over another of her passions when my family was torn apart by addiction; Paddy was there to encourage me, stand by me, and remind me that recovery was possible and that I should never give up. She never let go of me, meeting with me every few days during the very worst of it and encouraging me to stay the course. There were many times when I

should have and may have walked away, yet she encouraged me to stay. Her belief that family ties were retrievable was infectious, and I grew to believe in what she said.

Paddy's passion for working with the addicted population applied to people in all circumstances. She truly believed in her work and saw no difference between the a person with an addiction in prison and one in our community. She understood that the underlying problem was the same, regardless of the victim. She did not judge but she was absolutely clear about the obstacles families would face when dealing with addiction. I clearly remember her telling me that if families knew they would have to live with craziness a long while before their loved one recovered, they would not stay the course. The fact that I was able to retrieve my family from addiction is something I attribute directly to Paddy's influence. I cannot thank her enough for believing in us as individuals, and in the family as a powerful healing tool for a person with an addiction. She taught me so much about addiction and how it was possible to retrieve family bonds even though they may be changed.

When Paddy's health wavered, we shared lovely days pursuing her passion of procuring plants for her garden. Everywhere we went people knew who she was and of her magnificent gardens. It was humbling for me. Paddy's love for her family was equally intense; her love for her children and grandchildren was obvious in our many conversations at her kitchen table drinking tea, watching the hummingbirds. She hated the distance that COVID-19 imposed on all of us, and she issued a standing invitation for a glass of red wine among the rhodos to catch up when we could. I've planted rhodos in my garden in her memory and will think of her every time I look at them. ■

—Anonymous

*This obituary has been anonymized to protect the privacy of the parties involved.*

# 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](http://www.bcmj.org/cme-advertising). You will be invoiced upon publication. Payment is accepted by Visa or MasterCard on our secure online payment site.

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## PSYCHOLOGICAL PPE PEER SUPPORT BEYOND COVID-19

### Online (Wednesdays)

In response to physician feedback, the Physician Health Program's drop-in peer support sessions, established 7 April 2020, are now permanently scheduled for Wednesdays at 12 noon. The weekly sessions are co-facilitated by psychiatrist Dr Jennifer Russel and manager of clinical services Roxanne Joyce and are drop-in with no commitment required. The focus is peer support, not psychiatric care. All participants have the option to join anonymously. To learn more about the sessions and the program, visit [www.bcmj.org/news-covid-19/psychological-ppe-peer-support-beyond-covid-19](http://www.bcmj.org/news-covid-19/psychological-ppe-peer-support-beyond-covid-19). Email [peersupport@physicianhealth.com](mailto:peersupport@physicianhealth.com) for the link to join by phone or video.

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## OPTIMIZING CARE FOR GAY, BISEXUAL, AND OTHER MEN WHO HAVE SEX WITH MEN

### Ongoing

This is a short online continuing medical education course designed for family physicians and primary care providers in Canada. This course will introduce you to gbMSM health issues and implications with the intent to provide you with the knowledge and skills to improve the care of your gbMSM patients. Designed in partnership by UBC CPD, Community-Based Research Centre for Gay Men's Health, Health Initiative for Men, Interior Health, Island Health, Fraser Health, Northern Health, Men's Health Initiative, Providence Health Care, and Vancouver Coastal Health. This course can be taken anytime and is divided into four lessons: (1) Social and Political Context of gbMSM Health; (2)

Epidemiology & Life Course; (3) Safer Spaces, Language, and Communication; and (4) Case Studies. For more information visit <https://ubccpd.ca/course/gbmsm-online>.

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## ANATOMY-BASED BOTULINUM TOXIN TRAINING

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## WHAT YOU NEED TO KNOW FOR YOUR PATIENTS POST-BREAST AND PROSTATE CANCER

### 18 Sept 2021

Please join us for the third annual What You Need to Know for Your Patients Post Breast and Prostate Cancer conference on Saturday, 18 September 2021. This half-day virtual conference is brought to you by the Prostate Cancer Supportive Care Program. The conference will focus on screening, treatment, side-effect management, and emerging new therapies for breast and prostate cancer patients. Target audience: any physician or allied health provider who is involved with the care of breast and prostate cancer patients; this includes family physicians, general practitioners in oncology,

urologists, radiation and medical oncologists, nurse practitioners, and nurses. Accredited by UBC CPD for up to 4.25 MOC Section 1/ Mainpro+ Group Learning credits. To register: What You Need to Know Post Breast & Prostate Cancer CPD Conference Tickets, Saturday, 18 Sep 2021, at 8:00 a.m. on Eventbrite.

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## GP IN ONCOLOGY EDUCATION

### 27 Sept–29 Oct 2021

BC Cancer's Family Practice Oncology Network offers an 8-week General Practitioner in Oncology education program beginning with a 2-week introductory session every spring and fall at BC Cancer–Vancouver. This program provides an opportunity for rural family physicians, with the support of their community, to strengthen their oncology skills so that they can provide enhanced care for local cancer patients and their families. Following the introductory session, participants complete a further 30 days of clinic experience at the cancer centre where their patients are referred. These are 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](http://www.fpon.ca) or contact Dilraj Mahil at [dilraj.mahil@bccancer.bc.ca](mailto:dilraj.mahil@bccancer.bc.ca).

# Classifieds

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### NANAIMO—GP

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

### NISGA'A VALLEY—FAMILY MEDICINE IN BEAUTIFUL NISGA'A VALLEY

Family physicians needed to provide primary and urgent care for a population of 3500 in four communities across the traditional Nisga'a Territory. A team of three physicians works together to provide full-scope services (excluding obstetrics) in concert with other services such as home care, public health, and mental wellness and addictions. The health and wellness centres are staffed with full-time RNs who take the first call after hours. Soaring mountains, picturesque fjords, dramatic lava beds, natural hot springs, and thriving rivers offer outstanding recreation year-round. Excellent remuneration. Contact Jeremy Penner at [md@nisgahealth.bc.ca](mailto:md@nisgahealth.bc.ca).

### NORTH VAN—FP LOCUM

Busy, established physicians with stellar support staff seek part-time or full-time associates. Doctors currently needed to fill very busy telemedicine and in-office shifts. Oscar EMR with technical support. Part-time associates will be on a 70/30 split for weekend and evening shifts. Option of working from home. For further information contact Kim at 604 987-0918 or [kimgraffi@hotmail.com](mailto:kimgraffi@hotmail.com).

### NORTH VANCOUVER—FP LOCUM

Come practise on the North Shore in a busy, friendly clinic of three doctors. Excellent staff and remuneration without OB or hospital work. Looking for 3 months of locum cover per year, starting with September and October 2021. Please reply to clinic manager at [clinicmanager335@gmail.com](mailto:clinicmanager335@gmail.com) for more details.

### 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. Phone: 604 485-3927, email: [clinic@tmca-pr.ca](mailto:clinic@tmca-pr.ca), website: [powellrivermedicalclinic.ca](http://powellrivermedicalclinic.ca).

### REGINA—PRACTICE OPPORTUNITY

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### SOUTH SURREY/WHITE ROCK—FP

Busy family/walk-in practice in South Surrey requires GP to build family practice. The community is growing rapidly and there is great need for family physicians. Close to beaches and recreational areas of Metro Vancouver. Oscar EMR; nurses/MOAs on all shifts. CDM support available. Competitive split. Please contact Carol at [Peninsulamedical@live.com](mailto:Peninsulamedical@live.com) or 604 916-2050.

## CLASSIFIEDS

### SURREY (BEAR CREEK AND NEWTON)—FAMILY PRACTICE

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### SURREY CITY CENTRE—SPECIALISTS, RMTS, PHYSIO, AND DIETICIANS

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### SURREY/DELTA/ABBOTSFORD—GPS/SPECIALISTS

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The Low Intensity Rehabilitation Unit at Island Health is seeking physicians. This new centre will bring together teams in the South Island so patients are seamlessly cared for by a highly knowledgeable team; the team will help support rehabilitation care for patients as they transition home. Apply via [physicians@viha.ca](mailto:physicians@viha.ca).

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# Laboratory Services Act: What does it mean for physicians?

*This article originally appeared in the May 2016 issue of the BCMJ. As this subject continues to pose a problem, the Patterns of Practice Committee decided to rerun the article.*

The Laboratory Services Act (LSA) came into effect on 1 October 2015. The LSA replaced the Medicare Protection Act (MPA) and the Hospital Insurance Act as the authority for insuring laboratory services. It consolidates responsibilities for the governance, funding, and service delivery oversight of all publicly funded laboratory services in the province.

While the enrolment, auditing, and patterns of practice of referring practitioners remain under the MPA, the LSA reinforces an item of particular significance to physicians in Section 54: Recovery from referring practitioner(s).

You should be aware of the following facts when ordering laboratory services:

- A laboratory service is only a benefit when done at the request of a referring practitioner.
- There must be a corresponding insured benefit under the MPA for the referral to be valid under the LSA.
- A recovery can be made from a referring practitioner if a payment is made in violation of this prohibition.

Also, be aware of which payment method is selected on the lab requisition. MSP is the

default payee if an alternative payee (ICBC, WorkSafe BC, patient-pay) is not selected, and some EMRs may default to billing MSP. If an inaccurate payment method is selected it could result in the cost of the test being recovered from you, the referring practitioner.

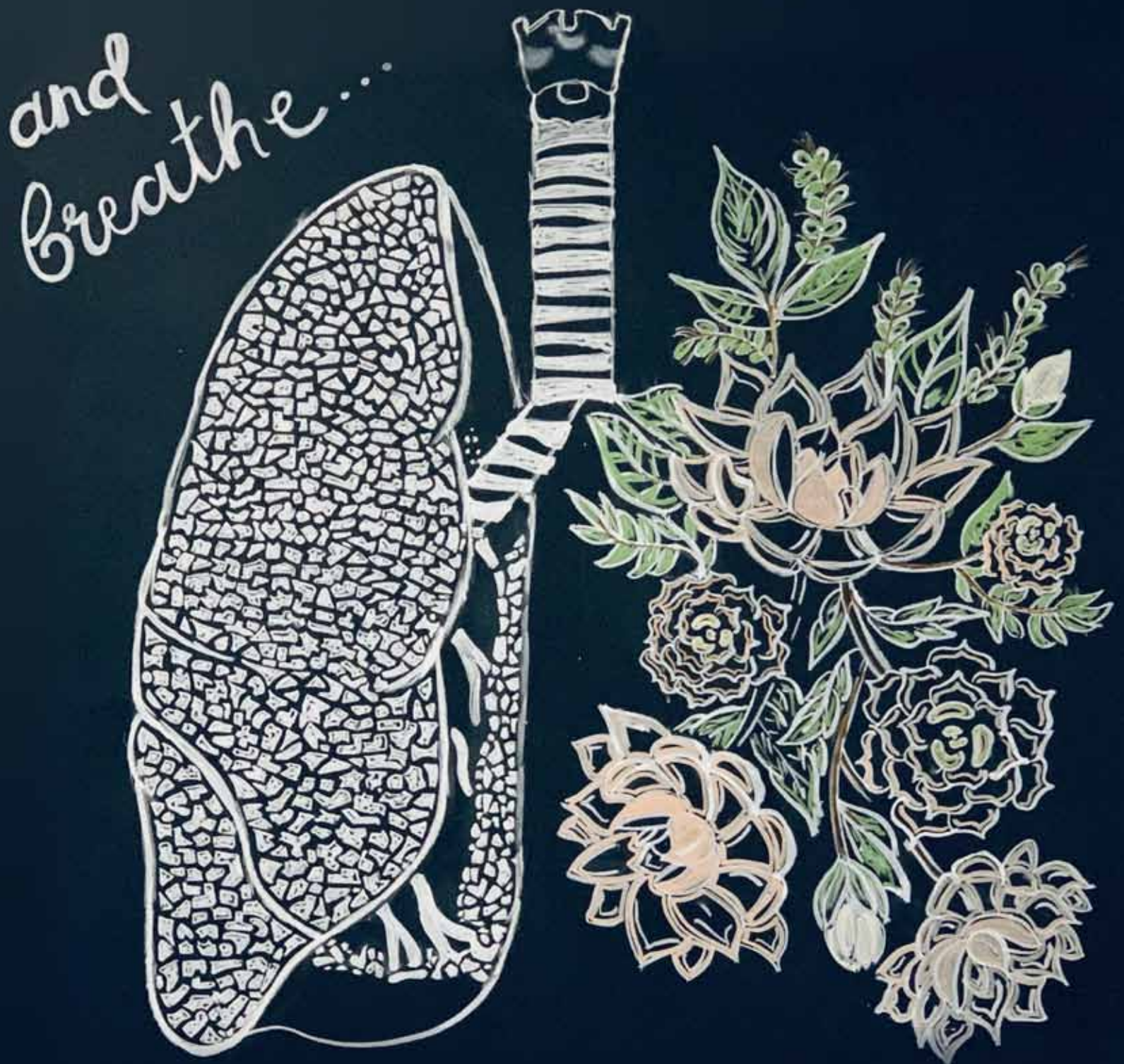
You are encouraged to read Sections 52–54 of the LSA; this information may have a significant impact on the recovery process for the cost of lab tests that are not evidence-based or are ordered as a benefit for nonbenefit visits.

For more information about the LSA, go to [www.gov.bc.ca/laboratoryservices](http://www.gov.bc.ca/laboratoryservices).

In the next issue of the *BCMJ* we will provide examples of circumstances under which recovery for lab-test costs may be sought. ■

—Janet Evans, MD, CFPC, FCFP  
Chair, Patterns of Practice Committee

*This article is the opinion of the Patterns of Practice Committee and has not been peer reviewed by the BCMJ Editorial Board. For further information contact Tara Hamilton, audit and billing advisor, Economics, Advocacy and Negotiations, at 604 638-6058 or [thamilton@doctorsofbc.ca](mailto:thamilton@doctorsofbc.ca).*



**D**r Stephanie Luongo often uses art as a therapeutic outlet during her downtime in her residency. This chalk artwork is an integration of anatomy and nature, expressing, she says, “that life is beautiful and

precious, and at times can feel delicate—much like nature itself.” When trying to alleviate the stresses of residency, COVID-19, and working as a physician, Dr Luongo finds that reminding herself to breathe can make all the difference.

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*Dr Luongo is a family medicine resident starting her second year in the Surrey South Fraser program.*



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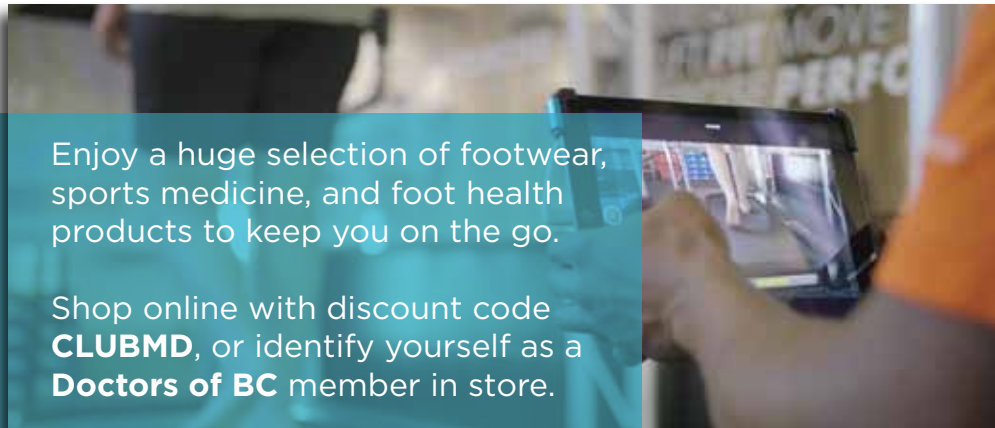
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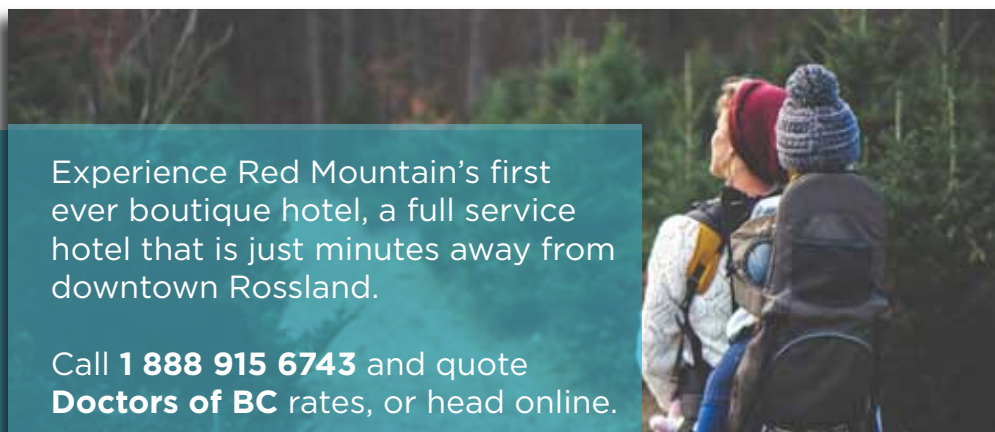
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