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Health care access and injury patterns in patients following moose– and deer–vehicle collisions in north-central BC

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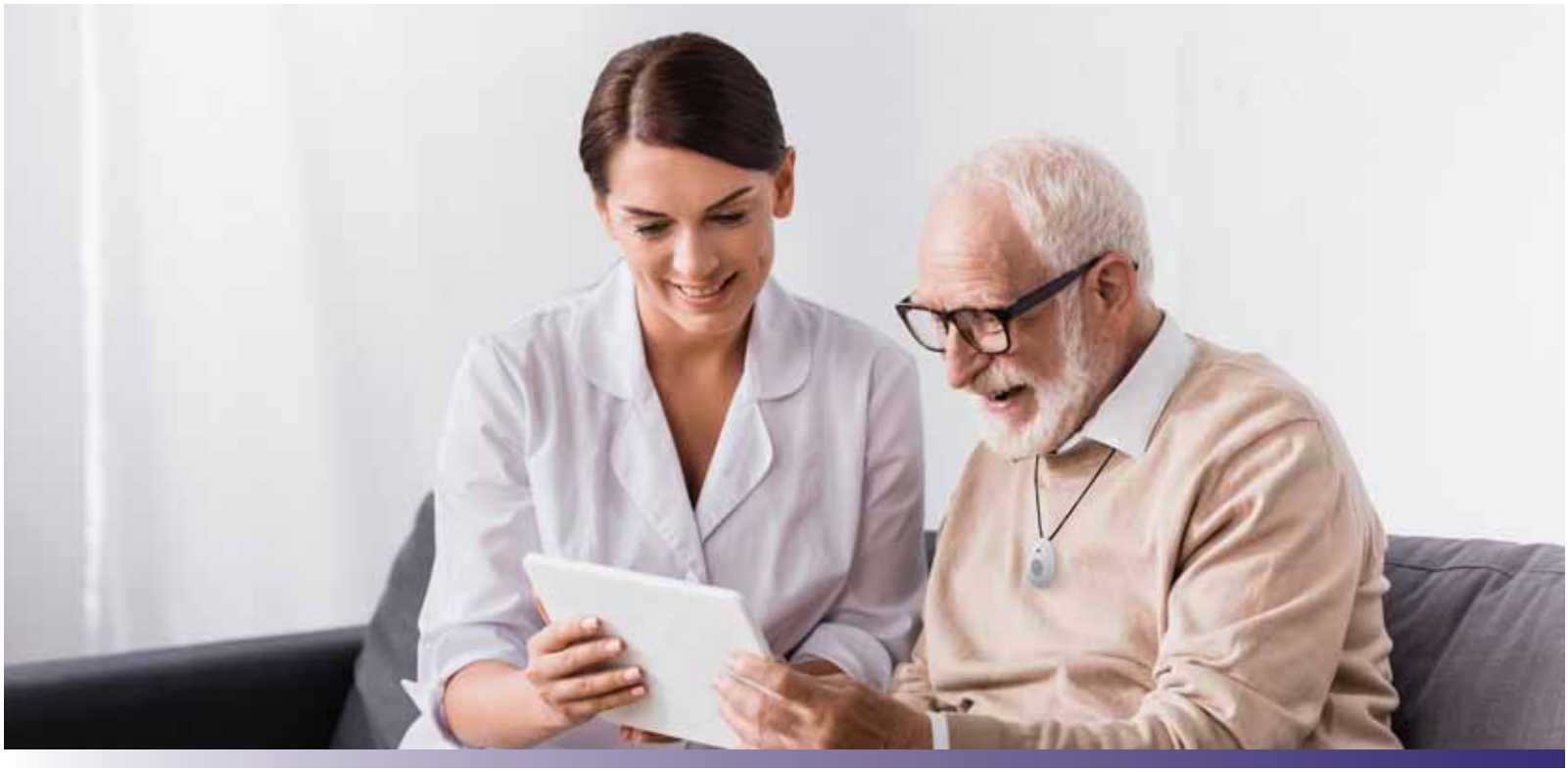

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When moose and deer collide with vehicles, the results can be catastrophic. Article begins on page 292.

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Environmental impact
The *BCMJ* seeks to minimize its negative impact on the environment by:
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ON THE COVER
An analysis of emergency department admissions indicates the time of year that doctors may need to attend to patients involved in moose– and deer–vehicle collisions, what types of injuries they may receive, and what treatments they may require. Article begins on page 292.

Dr Nadine Caron of Prince George is one of 14 exceptional people being appointed to the Order of British Columbia in 2022, the province's highest form of recognition. See page 288.

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

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Turning the page

I am honored and humbled to be considered as the next editor of the *BCMJ* by our association's Board of Directors. The previous editor, Dr David R. Richardson, dedicated the past 14 years to this position until his recent retirement from the *BCMJ*. I speak for myself and my fellow Editorial Board members when I say that he will be tremendously missed.

Dr Richardson, or DRR as you may know him from his signature, is a great leader. He infused the Board with humor, discipline, and an enduring inspiration to do our best for our readership. The work that happens behind the scenes at the *BCMJ* is enriching, educational, and fun, but it can also be detailed, arduous, and political. DRR took it all in stride. On behalf of the Editorial Board and *BCMJ* team members, I want to thank Dr Richardson for everything.

Every month Dr Richardson enlightened and entertained us with his editorials. Some were funny, like when he talked about an editor's frustration with endless abbreviations [*BCMJ* 2021;63:361-362], suggesting that the pronoun "he" was a more succinct option for referring to him than "PNME" ("picky, narrow-minded editor"). Some were raw and vulnerable, like his 2021 "Holiday message" [*BCMJ* 2021;63:405], when he reflected on a year filled with hope, as well as devastation, as a result of COVID-19 and his wife's illness.

Dr David R. Richardson, outgoing editor of the **BCMJ.**

I had the pleasure of rereading DRR's editorials as I reflected on the idea of editorship. Even though medicine has evolved over his tenure, Dr Richardson's first editorial, "Self-delusion and self-care" [*BCMJ* 2008;50:433], still resonates. Writing about his failed attempt at self-diagnosis of abdominal pain, DRR said, "The moral of this editorial is not the obvious one (that I am an idiot), but that as physicians we don't take very good care of ourselves, or for that matter each other. We give patients advice about stress management, lifestyle changes, counseling, addiction, mental health, and more, but then ignore our own advice. I wonder how many of you even have your own family physician." To me this demonstrates that either physician health is a chronic problem or Dr Richardson was ahead of his time. I think both are true. Today, perhaps even more so than in 2008, physicians are in crisis. Family physicians are in great shortage and those who are working are often overburdened, underpaid, and at risk of burnout. COVID-19 has taxed us all, and although adrenaline and camaraderie may have sustained us through waves one, two, and three, we are now facing another wave (seven? I've lost count) and we're tired. The *BCMJ* is our common ground, where we can converse, share knowledge, and discuss our experiences in the varied health care settings of this beautiful province.

The *BCMJ* is our common ground, where we can converse, share knowledge, and discuss our experiences in the varied health care settings of this beautiful province.

The *BCMJ* was first published in 1959, evolving from its predecessor, the *Vancouver Medical Association Bulletin*, which originated in 1924 and was edited by Dr J.M. Pearson. The *BCMJ* is the official publication of Doctors of BC and, as stated nearly 100 years ago, still aims to "strengthen the ideals of unity and organization among members of the profession." We are also the only provincial medical journal in Canada. Since its inception, the *BCMJ* has had only six editors: Dr Jack MacDermot, Dr Sid Hobbs, Dr A.F. Hardyment, Dr W.A. Dodd, Dr James A. Wilson, and Dr David R. Richardson. As we prepare to turn the page at the *BCMJ*, I am proud to say that, if appointed, I will be the first woman to hold the position. Building on the hard work and dedication of my predecessors, I hope to expand on the *BCMJ*'s legacy of representing our readership, which is increasingly diverse and skilled. We at the journal want to hear your voices! So please, send us your studies, share your stories, be a part of the conversation. We're stronger when we help and support each other.

With immense gratitude, I will end by recognizing Dr Richardson again and thanking him for his support and guidance. We already miss you and wish you the very best. ■

—Caitlin Dunne, MD
Acting editor

D1

Let me start by saying that he will cringe when he reads this. He has a hard time hearing nice things said about him, but as hard as I tried, I couldn't think of one bad thing to say about the outgoing editor of the *BCMJ*—Dr David Richardson, Dave, DRR, D1. He is known by multiple variations of his name.

Dr David Richardson is an outstanding family physician to many fortunate patients. He is known by his patients to be caring, compassionate, and always punctual. In his usual self-deprecating fashion, Dave describes himself as being anal about time. In September 2008 the outgoing editor of the *BCMJ* at the time, Dr Jim Wilson, said it best when he described Dave, the incoming editor, as "a well-rounded, highly energetic, very intelligent, committed physician" with a "unique brand of humor."

Dave is known to his friends and colleagues as one of the good guys. He is dependable and wise. He is very quick-witted. He is a legend in our medical community, known for his sharp sense of humor. He can also take a joke when one is played on him, but playing a joke on Dave comes with significant risk of being the recipient of one of *his* legendary practical jokes in return. He is a legend and the consummate practical joker.

I was recently told a story about when Dave worked in the emergency department of our hospital. He had to remove a nail from a patient's leg, which had been embedded in the bone from a nail gun. After successfully freeing the nail, using a variety of the patient's own tools in the process, he emerged from the cubicle brandishing a claw hammer and an axe. He looked around at the other patients in the area and said, "Next?"

Years ago, Dave blessed me with a classic piece of his wit. After introducing my new resident to him, Dave said to me with a straight face, "Dr Chapman, I didn't know that they were allowing you residents again since the incident!" My resident, who didn't know Dave and his sense of humor, looked like the proverbial deer in the headlights.

DRR has authored approximately 150 editorials for the *BCMJ* (we used to sign our editorials with our initials). He was appointed editor in 2008 by the outgoing editor, Dr Jim Wilson, as was the custom in those days. DRR modernized the process midway through his term by putting in place a selection process for the new editor, and it is through this process that Dr Caitlin Dunne was nominated as the next editor of the journal. During his tenure, DRR not only shaped the Editorial Board into being more diverse and representative of our readership, but also strengthened its healthy and respectful culture. I don't mean to suggest that it was previously unhealthy or lacked respect, but I want to underline how comfortable it has been under his watch to be a member of the Editorial Board. As acting editor of the *BCMJ* for the past few months, I have tried to emulate DRR's sense of respect and love for our Editorial Board colleagues, *BCMJ* staff, and readers.

For the last 4 years, there have been three Davids/Daves on the Editorial Board. To avoid confusion, D1 assigned call signs to the Davids/Daves. As editor and longest-serving member of the Editorial Board, he, of course, became D1. He called me D2, and when Dr David Esler joined the Editorial Board in 2018, he became D3. Even though D1 has retired from the Editorial Board, the remaining Davids/Daves are still referred to in our meetings as D2 and D3. Out of respect and love for our outgoing editor, the Editorial Board decided to retire Dr Richardson's number—there will only ever be one D1.

Thank you, Dave, for your wisdom, wit, and friendship. We will miss you on the Editorial Board. I look forward to continuing our friendship in the years ahead.

—David B. Chapman, MBChB

Dr Richardson, never afraid to get his hands dirty.

Healing in health care

On our journey toward truth and reconciliation and antiracist action in health care, we must recognize the deep need for creating space to heal. Health care is designed to protect one of the most sacred assets we have—our health—yet most Indigenous people and those from many other cultures likely find the system, institutions, training, and ideologies far from healthy. Systemic racism exists in our health care system, and while this truth may be uncomfortable, we must not shy away from it.

The hierarchical structures of our struggling health care system are only perpetuating racism. The gross interracial inequities that exist around access to care, what we learned through the *In Plain Sight* report, and what has become abundantly clear during the pandemic should be used to heighten our awareness and anchor our responsibility to advance concrete and meaningful action. It is our collective responsibility as physicians, as well as the responsibility of government and other groups that make up our health care system, to promote cultural safety and humility and antiracist action in all aspects of health care.

Indigenous cultural safety is an outcome based on respectful engagement that recognizes and strives to address power imbalances inherent in the health care system. It results in an environment free of racism and discrimination, where people feel safe when receiving services. Cultural humility is a process of our own self-reflection to understand personal and systemic conditioned biases, and to develop and maintain respectful processes and relationships based on mutual trust. It involves humbly acknowledging oneself as a lifelong learner in understanding others' experiences. Together, cultural safety and humility must be understood, embraced, and practised at all levels of our health care system, including in governance, in institutions, and within individual professional practices.

Antiracist action is a deliberate conscious commitment to take steps to end racial inequities in our daily lives, whether it be individually, interpersonally, or institutionally. We must reject discriminatory treatment, unfair policies, and biased practices that result in inequitable outcomes for racialized populations.

Antiracist action is a deliberate conscious commitment to take steps to end racial inequities in our daily lives, whether it be individually, interpersonally, or institutionally.

In order to evolve and heal in medicine, we need to understand the barriers and inequities that exist. When we increase our awareness of systemic racism, it becomes easier to confront it and develop consistent action to dismantle it. Awareness is appreciating the truth and not denouncing it in any form. Acceptance of others' personal or collective racialized experiences should be vigilantly respected and used as guidance for our evolution in health care. We know the health and well-being of racialized populations depend on our responsiveness and advocacy for them. The reasons to change and challenge the status quo in health care far outweigh the reasons to accept it as it stands. When we take ownership and accountability by consciously challenging our biases, the health of our patients, communities, and overall population will improve. Our healing and health go hand in hand. There is no health without healing our deep wounds, both individually and collectively. As we walk toward cultural safety and humility and antiracist action, we promote healing.

There is increasing awareness among physicians of systemic racism and the need for culturally safe and antiracist care. However, we, as physicians alone, cannot transform the system to be culturally safe, humble, and antiracist. We need to work together with government, other health care providers, administrators, and everyone else involved in our health care system; we need to listen to and follow the lead of Indigenous, Black, and other racialized patients and providers; and we need to be innovative, self-reflective, and willing to change.

The evolution of humanity and our collective consciousness depends on each of us demonstrating continued intentional dedication to empower, lead, and create lasting change. As physicians, we have the opportunity to create a world without hate, and to challenge our entire health care system and how we choose to participate in it, by prescribing healing, one antiracist dose at a time. ■

—Ramneek Dosanjh, MD
Doctors of BC President

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, submitted online at 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.

AccessBC: The case for no-cost contraception in British Columbia

"Doctor, can I have a Mirena IUD? I can't afford to get pregnant again," asked a postpartum patient who had multiple adverse conditions in pregnancy. "Of course, let's chat about it," I replied. "You don't understand, my OB said she might be able to get me one for free."

It quickly became apparent that the issue was not obtaining a prescription or finding a provider for insertion, it was cost. She told me that she was a single mother and could not afford the roughly $400 cost, that other contraceptives had proved intolerable, that her private insurance had denied her claim for a Mirena intrauterine device (IUD), and that her health care provider was trying to obtain a no-cost Mirena IUD when she became pregnant.

Unfortunately, scenarios like these are all too common. You name almost any permutation of unintended pregnancy and I have probably taken care of a patient with that outcome in my short career as a pharmacist and now an OB/GYN resident. Consequently, I have taken a leadership role in AccessBC, a grassroots campaign lobbying for universal no-cost contraception in BC.

I write in my own opinion today—an opinion informed by caring for people who found themselves in the working poor and in need of prescription contraception. Where their miniscule wage disqualifies them from income assistance and associated drug coverage, yet they are unable to afford the cost of contraception outright. My opinion is also informed by caring for teens. Currently, a teenager filling a prescription using their parents' private insurance has the Drug Identification Number uploaded to the insurer's platform. As you can imagine, this serves as a deterrent for many teens, as their parents could readily learn what medications they are taking. My opinion is also informed by taking care of people in abusive relationships, who may be in high-socioeconomic-status households but have no control of their finances. My opinion is informed by working on the front lines of the COVID-19 pandemic and seeing the impact on reproductive health care.

All these people, and more, would benefit from universal free prescription contraception, and the projected savings for this kind of program are well established. A 2010 study from Options for Sexual Health estimated that providing universal no-cost contraception coverage in BC would cost approximately $50 million but would save up to $95 million per year.[1] Another study in Colorado provided long-acting reversible contraceptives (LARCs) to young people (n = 43 713) at a cost of US$28 million.[2] The program demonstrated a reduction in teen pregnancy by 54% and teen abortion by 64% over 8 years, resulting in $70 million of estimated governmental savings.[2] In 2015, a Canadian cost model found roughly 180 000 pregnancies were unintended annually nationwide, representing a direct cost of over $320 million.[3] However, with increased uptake of LARCs, savings after 12 months was over $34 million.[3]

When I think back to this patient and countless others I have cared for who are unable to access contraceptives due to cost, I think of the human cost of delaying this program's implementation. I think of the cost to our health care system and the disproportionate impact that lack of access to contraception has on particular groups. I think of our calling as physicians to advocate for patients and our health care system, and to end the inequities we encounter in practice.

Universal access to contraception is a vital component of people being able to recognize their full reproductive rights; it is also fiscally responsible and equity based. Free prescription contraception was included in the three major political parties' platforms in the last election. Every month that we wait, more folks experience unintended pregnancies. I hope you will join me in upholding reproductive rights and send a letter via www.accessbc.org/the-campaign urging the government to put no-cost prescription contraception into action.

—Ruth Habte, MD
Vancouver

Dr Habte is an obstetrics and gynecology resident physician at the University of British Columbia and a former registered pharmacist. She currently

serves as campaign coordinator for AccessBC, the grassroots campaign to bring no-cost prescription contraception to BC.

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Crisis in health care

It was nice to see articles in the June *BCMJ* reflecting the seriousness of the crisis in our health care system. I have worked as an internist under a Social Credit government, Liberal government, and NDP government. They had one thing in common: they made physicians fight very hard for any improvements across all aspects of health care.

Remember reduced-activity days? That was a revolution of doctors against an oppressive, bureaucratic system, and yes, some positive changes were achieved. There is, unfortunately, only one way to make politicians listen: you get the public on your side and then you start pushing politicians so hard that they begin to fear the next election. Unions never achieved any concessions from their employers by being nice!

Canadian medical students are supposed to finance their education, but when they become doctors, they are expected to be happy to be paid poorly for their services. This is most obvious in primary care.

—J.J. Simice, MD
Comox

Informed consent for gender-questioning youth seeking gender-affirmative care a complex issue

In their guest editorial for Part 2 of the Gender-affirming care in BC series the authors state that "not all parents are supportive of their transgender youth, and some are emotionally malicious."[1] The disregard for the role of the family and the overemphasis on the adolescent's gender identity as something "only they can fully know" disregards all prominent theories of adolescent identity development and the growing understanding of the complex etiological pathways to gender dysphoria. Their position is concerning given that the field should be advancing cautiously, with the long-term best interests of the individual in mind. These authors would have us believe that those who do not immediately affirm these youth and support medical transition are causing harm.

The authors acknowledge that the care of gender-questioning youth is an area of controversy. However, they neglect to mention that the scientific evidence for gender affirmation is extremely weak. In fact, based on systematic reviews of the literature, Sweden, Finland, France, and the UK have concluded that the risks of these interventions outweigh potential benefits and are now tightly regulating medical treatments for youth under 18, in favor of psychological treatments. The Cass Review's interim report [illegible] these concerns.[2]

They also fail to mention the controversy [illegible] presentations, particularly adolescent girls, requesting gender [illegible] cohorts[3] is disregarded, as it does not neatly fit into the gender [illegible]. The increasing numbers of desisters and detransitioners suggests that gender identity is mutable and that youth, at a time of identity formation, may not fully "know who they are." The potential for permanent, iatrogenic harm is significant if we jump to the medicalized treatment youth think they need in the moment.

The concept of gender being immutable is clearly controversial. Yet this premise of immutability forms the basis of the informed consent argument described by barbara findlay.[4] If gender is mutable, however, as is evidenced by desisters and detransitioners, this argument falls apart. Further, the article avoids discussion of whether youth are capable of consenting to medical treatments that are still being studied—treatments that can cause permanent damage to sex organs and future sexual and reproductive capacity. Someone who has not gone through puberty and has not experienced an orgasm cannot understand what they would be giving up in terms of their sexual functioning. Levine and colleagues[5] provide a good review of the

This is an incorrect version of this letter. An updated version has been provided online and published in the October 2022 issue.

issues regarding informed consent for gender dysphoria.

We suggest that providers inform themselves of the current growing scientific consensus on gender-affirming medical treatments and work with youth and their families to provide the best possible care, keeping long-term health in mind. Informed consent should include a discussion of all available options for treatment, including watchful waiting and exploratory therapy. The affirmation model proposed excludes these treatments, nullifying all informed consent and leaving youth open to lifelong medicalization and harm.

—Joanne Sinai, MD, MEd, FRCPC
Victoria

—Leonora Regenstreif, MD, FCFPC, MScCH
Hamilton, ON

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A closer look at the evidence for gender-affirming care

Like Dr Joanne Sinai, I believe that transgender and gender-nonconforming (TGNC) youth deserve compassionate and evidence-based care. For this reason, I find it important to reply to her letter titled "The current gender-affirming care model in BC is unvalidated and outdated."[1]

Since I drafted this reply, Dr Sinai co-authored a second Letter to the Editor with Dr Leonora Regenstreif, titled "Informed consent for gender-questioning youth seeking gender-affirmative care is a complex issue."[2] Both letters promote the idea that TGNC youth are being treated in a way that is potentially harmful in the long term. I find this insinuation to be problematic. Drs Sinai and Regenstreif imply that care providers are failing to comprehensively assess a youth's capacity to consent to medical interventions and provide appropriate information to obtain informed consent, despite findings that 89% to 93% of youth age 10–18 have been found capable of providing medical decision-making competency for gender-affirming care based on clinical assessment and validated tools, respectively.[3] They present a limited and biased selection of the evidence and disregard the existing literature that indicates potential harm to TGNC youth when affirming care is delayed or denied.[4] While appealing for evidence-based care, these letters promote interventions that are not based in evidence and that delay affirming care. In the Premise[5] published in this issue, I summarize the available evidence and respond in two parts, the first looking at the evidence for our current model of gender-affirming care, and the second discussing specific interventions and outcomes.

—Julie Leising, MD, FRCPC
Vancouver

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Guest editors reply to Drs Sinai, Regenstreif, and Leising

As the guest editors of the two-part Gender-affirming care in BC series, we thank you for your responses.[1-3] In reply, we emphasize that the current standards of care guiding health care providers in BC (*Standards of Care Version 7*)[4] and the approach taken by the team at BC Children's Hospital require a comprehensive psychosocial assessment of an individual before providing gender-affirming hormones or surgery, especially where youth are involved. It is emphatically not "hormones or surgery on demand."

We know that for youth, the best predictor of quality of life post-transition is parental support,[5] so where a youth consents, the process mandates significant efforts to educate parents and to encourage them to support their child.

The World Professional Association for Transgender Health is expected to publish version 8 of its *Standards of Care*[6] in 2022. As BC was the first jurisdiction in Canada to follow version 7, we are confident the Ministry of Health will follow suit with version 8, which will then become the standards of care guiding physicians in British Columbia.

Like abortion, the provision of medical care to trans and gender-diverse people is controversial in some quarters, but it is the obligation of health care providers to follow the accepted standards of care.

The current *Standards of Care* (version 7) do not mandate "treatment on demand." On the contrary, they require a comprehensive psychosocial assessment, especially for youth.

We encourage health care providers to educate themselves with the best available research to provide compassionate and competent health care to transgender and gender-diverse people. Dr Leising[1] has written a detailed response[7] to the issues raised by Drs Sinai and Regenstreif.[2,3]

—Gail Knudson, MD

—barbara findlay, QC

—Daniel Metzger, MD

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News

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

Nadine Rena Caron, MD

Dr Nadine Rena Caron receives Order of British Columbia

Dr Nadine Rena Caron of Prince George is one of 14 exceptional people being appointed to the Order of British Columbia in 2022, the province's highest form of recognition. As the first Indigenous female general surgeon in Canada, Dr Caron has devoted her career to providing better access to culturally safe health and wellness care and improving medical outcomes for Indigenous patients.

A member of the Sagamok Anishnawbek First Nation, born and raised in Kamloops, Dr Caron completed her BSc in Kinesiology at Simon Fraser University and received the Gordon M. Shrum Gold Medal as a top undergraduate student before becoming the first female Indigenous student to complete an MD at the UBC Faculty of Medicine, again at the top of her class.

Dr Caron also completed an MA in public health from Harvard University, and further to surgical residency and fellowship at the University of California, San Francisco, returned to Canada to establish a clinical practice at the University Hospital of Northern British Columbia in Prince George. As a professor, she teaches in UBC's Northern Medical Program and at the Centre for Excellence in Indigenous Health.

In January 2020, Dr Caron was named the founding First Nations Health Authority Chair in Cancer and Wellness at UBC. This new position, supported by $3 million in funding, was created to improve cancer outcomes and wellness among Indigenous people by examining the stories and needs of Indigenous cancer patients and their families. Her main areas of interest are Indigenous health and Canadian health policy.

Among many professional accolades, Dr Caron is a recipient of an honorary Doctorate of Laws from the University of the Fraser Valley, an honorary degree from Simon Fraser University, and the Thomas Dignan Indigenous Health Award from the Royal College of Physicians and Surgeons of Canada. For information on all 2022 recipients, visit https://news.gov.bc.ca/files/OBC_Bios_2022.pdf.

Perils of wisdom—covering risk to your home and office

Westland Insurance Group Ltd., Doctors of BC's home- and office-insurance partner, provides advice to members on risk considerations for their home and office.

Home-insurance policies are issued on several different forms, which establish and define the causes of loss (or perils) for which coverage is provided. The best and broadest form is a comprehensive, or all-risks, form, which is the best form to insure your home with.

An all-risks form insures against all types of losses, subject to a list of exclusions specified in the policy. These exclusions outline when coverage does not apply. The onus is on the insurer to show that an exclusion applies following a loss; otherwise, coverage will be provided.

The main types of losses insured under this form include the following:

- Fire: from either inside or outside the home, including forest fires.
- Windstorm: caused by winds that damage the home or cause trees or other debris to hit the home.
- Theft and burglary: inside or away from the home, such as theft from a vehicle.
- Water damage: caused by pipes bursting, dishwashers or laundry machines failing, or bathtub or sink overflows.
- Sewer backup: the backing up of interior or exterior drains.

Depending on your geographical area, consider adding the following optional perils to your home-insurance policy:

- Earthquake: covers damage to the home during an earthquake and carries a separate, high deductible.
- Overland flood: covers the overflow of natural or manufactured bodies of fresh water (rivers and lakes). Coverage limits may depend on the location of the home.

When insuring a medical office, it is best to choose a similar comprehensive or all-risks form for office contents, equipment, and any leasehold improvements you have made to the space or for which you are responsible under the lease agreement.

In addition to the above perils, larger offices storing data on their servers should consider adding cyber insurance to cover data hacking, extortion, and ransom.

—Julie Kwan
Insurance Advisor, Doctors of BC

2021 J.H. MacDermot writing prize winners

The *BC Medical Journal* welcomes submissions from BC medical students and offers writing prizes for the best pieces accepted for publication. The winner of the 2021 J.H. MacDermot Prize for Excellence in Medical Journalism: Best article or essay is Dr Giselle Hunt, for her article "Endometriosis: An update on diagnosis and medical management." The article was chosen for the quality of the writing, importance of the topic, and usefulness to BC physicians. The winner of the 2021 J.H. MacDermot Prize for Excellence in Medical Journalism: Best blog post is Ms Elsie Wang, for her blog post "UBC medical students respond to COVID-19 pandemic with innovation and teamwork." The blog post was selected for the quality of the writing and the efforts to raise awareness of the important work being done by UBC students.

Dr Giselle Hunt

Ms Elsie Wang

Dr Giselle Hunt

Dr Hunt would like to thank Drs Catherine Allaire, Paul Yong, and Caitlin Dunne for offering their expertise in the field of women's health and providing guidance throughout the article-drafting process. Dr Hunt wrote the article as a fourth-year UBC medical student. She is now a second-year psychiatry resident in the UBC Vancouver Fraser Medical Program. She feels privileged to be able to stay in and hopefully one day work in the beautiful province of British Columbia. Her career plans are currently undecided, but she is excited by the flexibility of psychiatric work and the opportunity to work with a variety of patient populations. With broad professional interests, she foresees splitting her week between general adult psychiatry, addictions medicine, and reproductive mental health, with an emphasis on psychotherapy. Dr Hunt hopes that regardless of where or what she practises, she is able to make a lasting positive impact on the lives of her future patients.

Ms Elsie Wang

Ms Wang is a first-year medical student in the UBC Vancouver Fraser Medical Program (class of 2026). She wrote the blog post as an undergraduate student with coauthor Dr Philip Edgcumbe while health care providers and students were challenged with unprecedented circumstances during the COVID-19 pandemic. Ms Wang and Dr Edgcumbe were inspired to share the stories of innovative projects being driven by medical students.

Ms Wang is passionate about the field of digital health and is striving to improve health care access and equity for patients through technology and innovation. Her work in digital health includes evaluating Real-Time Virtual Support pathways with the UBC Digital Emergency Medicine unit and supporting the development of novel online programs for cognitive-behavioral therapy, mindfulness-based therapy, and virtual reality–based treatments at the UBC Sexual Health laboratory. To support Indigenous patients across BC, she is also engaged in the development of an appeals committee for the Quality Care and Safety Office at the First Nations Health Authority. Ms Wang aspires to become a changemaker in medicine by listening to the needs of Canadians. She is incredibly grateful for the opportunities she has been granted and hopes to stay curious, passionate, and eager to learn throughout her journey in medical studies at UBC.

BC medical students are encouraged to submit full-length scientific articles and essays for publication consideration. Prior to 2022, the *BCMJ* Editorial Board recognized the authors of the best student articles with the J.H. MacDermot Prize for Excellence in Medical Journalism in two categories: best article or essay for print, and best blog post. As of 2022, the prizes have been updated to distinguish between student articles written with and without physician coauthors. The blog-post prize has been discontinued. For more information about the prizes, visit www.bcmj.org/submit-article-award.

Register for Walk With Your Doc

Walk With Your Doc (WWYD) will take place throughout BC from 17 to 25 September 2022. Once again, this event provides a fun, simple opportunity to get your patients moving and to discuss the benefits of daily physical activity in an informal and social setting.

Register to host a walk in your community, join a walk, or download the WWYD logo files and posters at https://walkwithyourdoc.ca. For those hosting a walk: the cutoff for having WWYD materials shipped out is 8 September. Contact Patrick Higgins at phiggins@doctorsofbc.ca if you have any questions or would like additional information or resources. Note: Doctors of BC continues to monitor the COVID-19 environment and will follow any guidelines that may be put in place from the Office of the Provincial Health Officer.

National Day for Truth and Reconciliation added as holiday in General Preamble to the Fee Guide

The National Day for Truth and Reconciliation, 30 September, has been added to the definition of "holiday" in the General Preamble to the Fee Guide, Section B, for MSP billing purposes. The date commemorates the history of and ongoing trauma to Indigenous people caused by residential schools and is a time to reflect on how to best move forward and to reconcile Canada's past. BC's Minister of Finance and Minister of Indigenous Relations and Reconciliation declared BC would recognize the holiday in addition to it being a federal statutory holiday; hence the update to the General Preamble. Only public sector workplaces, banks, and schools will be closed.

Note: When preparing to submit an MSP claim, the MSP-designated holidays and close-off dates must be included as they impact claims submission. For more information on designated holidays and close-off dates, visit www2.gov.bc.ca/gov/content/health/practitioner-professional-resources/msp/claim-submission-payment/designated-holidays-and-close-off-dates.

Resources for post-COVID-19 recovery

Based on the global ECHO model (https://hsc.unm.edu/echo), the BC ECHO for Post-COVID-19 Recovery is a free virtual learning community of specialists and community health care providers who use instructive and case-based learning to improve care for patients recovering from symptoms post-COVID-19.

Each monthly ECHO session is 1 hour long and starts with a 20-minute presentation from specialists on participant-identified topics, followed by a case presentation submitted by a participant. Each session wraps up with resources, recommendations, and an opportunity for questions.

Recordings of the BC ECHO for Post-COVID-19 Recovery sessions from July 2021 through July 2022 are available at www.phsa.ca/health-professionals/education-development/bc-echo-for-post-covid-19-recovery.

New referral criteria for Post-COVID-19 Interdisciplinary Clinical Care Network

The criteria for referring patients to the Post-COVID-19 Interdisciplinary Clinical Care Network (PC-ICCN) for symptoms of COVID-19 have changed. Before referring a patient, the following must be completed: a full history, a physical examination, and relevant investigations as part of differential diagnoses and to rule out other conditions explaining the symptoms.

Review the PC-ICCN Clinical Workup Checklist for required investigations prior to referral. If a patient's symptoms cannot be explained by an alternative diagnosis, complete the PC-ICCN referral form and fax to Post-COVID Central Triage at 604 806-8809. The Network accepts patients whose persistent symptoms have lasted more than 3 months following a presumed or confirmed COVID-19 illness.

A nurse from Central Triage will contact the patient directly to review and assess their case and to determine the appropriate level of service. Not all patients will need a clinic visit. The Post-COVID-19 Recovery Clinics support patients with self-recovery tools and rehabilitation services; they do not provide diagnostic or investigative services.

For more information on the PC-ICCN and links to applicable forms, visit www.phsa.ca/our-services/programs-services/post-covid-19-care-network. If you have additional questions, email post-COVID-ICCN@phsa.ca.

Culturally informed mental-wellness supports for Indigenous families

Indigenous families with children 3 to 12 years old who are experiencing big worries and fears (known as anxiety in Western views) will have access to free, culturally grounded wellness practices through a virtual parent and caregiver coaching program. The We Are Indigenous: Big Worries/Fears Parent/Caregiver Support Program was developed with the guidance of the Indigenous advisory group Caring in All Directions and Indigenous writers in collaboration with the Canadian Mental Health Association, BC Division (CMHA BC).

The program builds on the Confident Parents: Thriving Kids anxiety program offered by CHMA BC, in which trained coaches build on skills and strategies that can be used with children and family at home and in community settings. The We Are Indigenous program is grounded in Indigenous perspectives to support First Nations, Métis, and Inuit families throughout BC and acknowledges the strong spiritedness of Indigenous families, the importance of supporting First Nations in their wellness wisdoms, and the disruptive influences of colonization on Indigenous families.

Parents, caregivers, and their children can learn about Indigenous-centred wellness practices and strategies to increase their skills and strong spiritedness to push back against big worries and fears. The program delivery includes short online videos and scheduled telephone coaching sessions to provide families with tools to discuss what they are already doing and to learn new practices and how to use these practices with their children. The program is available at no cost to parents and caregivers across BC by referral from a physician, nurse practitioner, teacher, school counselor, child and youth mental health clinician, or Aboriginal child and youth mental health clinician.

Learn more:

- We Are Indigenous: Big Worries/Fears Parent/Caregiver Support Program: www.BigWorriesStrongSpirit.ca
- Canadian Mental Health Association, BC Division: https://cmha.bc.ca
- Confident Parents: Thriving Kids: https://welcome.cmhacptk.ca
- Virtual mental-health supports: www2.gov.bc.ca/gov/content/health/managing-your-health/mental-health-substance-use/virtual-mental-health-supports
- *A Pathway to Hope: A roadmap for making mental health and addictions care better for people in British Columbia*: https://news.gov.bc.ca/files/BCMentalHealthRoadmap_2019.pdf

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Braedon Aujla, BSc, David Montoya, MD, Chris Montoya, PhD, Roy V. Rea, PhD, Gayle Hesse, BSc

Health care access and injury patterns in patients following moose– and deer–vehicle collisions in north-central British Columbia

An analysis of emergency department admissions indicates the time of year that doctors may need to attend to patients involved in moose– and deer–vehicle collisions, what types of injuries they may receive, and what treatments they may require.

ABSTRACT

Background: Moose–vehicle collisions and deer–vehicle collisions are dangerous and costly. Motorists are sometimes killed in such encounters but more often sustain injuries ranging from minor to severe. Reports of how patients of such collisions in British Columbia arrive at hospitals, the types of injuries they sustain, and the kinds of immediate and follow-up treatments they receive have not been published.

Methods: We examined hospital records of 183 patients injured in vehicle collisions with deer and moose in north-central BC between 1993 and 2014. Data analyzed included the month of collision occurrence, the number of patients transported to the emergency department via ambulance versus the number of walk-ins, the types of injuries incurred, the duration of hospital stay, and the main types of treatment interventions required: pain management, imaging, and additional interventions of a particular medical specialty.

Results: Hospital records suggested differences in seasonal patterns of moose– and deer–vehicle collisions, and in patient outcomes. Collisions with deer and moose occurred most often in August and September, respectively. Patients involved in moose–vehicle collisions had more serious injury types, received more extensive treatments, and required wider varieties of medical specialties for treatment than those involved in deer–vehicle collisions.

Conclusions: This study provides emergency responders and doctors with the information they need regarding when to expect to attend to patients of moose– and deer–vehicle collisions, what types of injuries they can incur, and what treatments they may require.

Mr Aujla graduated from the University of Northern British Columbia in 2021 and is now a PharmD student at the University of British Columbia. Dr David Montoya is a physician at the University Hospital of Northern British Columbia, Family Medicine and Emergency Medicine. Dr Chris Montoya is a tenured associate teaching professor at Thompson Rivers University. Dr Rea is a senior laboratory instructor in the Department of Ecosystem Science and Management at the University of Northern British Columbia. Ms Hesse was the provincial coordinator of the Wildlife Collision Prevention Program, British Columbia Conservation Foundation (2002–2020), and is now retired.

This article has been peer reviewed.

Background

In North America, motor vehicle collisions with wildlife (wildlife–vehicle collisions) have increased with increased vehicular traffic, and in Canada, result in approximately 45 000 reported wildlife–vehicle collisions each year.[1,2] However, the actual number of wildlife–vehicle collisions is likely much higher due to underreporting of collisions.[3-6] It is estimated that in Northern BC, 55% to 65% of both deer–vehicle collisions and moose–vehicle collisions go unreported.[4] Road, automobile, and wildlife densities all influence collision occurrence.[2,7]

Many roads in north-central British Columbia wind through mountainous wilderness terrain and boreal forests where animals move between seasonal ranges or use roadside habitats. Dozens of wildlife species are hit and killed by vehicles on BC roads, but the most common large mammals involved are moose (*Alces alces*), mule deer (*Odocoileus hemionus hemionus*), white-tailed deer (*Odocoileus virginianus*), and black-tailed deer (*Odocoileus hemionus columbianus* and *Odocoileus hemionus sitkensis*).[8-10]

In BC, deer–vehicle collisions outnumber moose–vehicle collisions by 3 to 1.[11] Although there are fewer collisions with moose, their size and high centre of gravity make them particularly dangerous in a vehicle collision **[Figure 1]**. Deer are much smaller than moose; therefore, they generally cause less damage to vehicles and fewer injuries to motorists when struck by vehicles.

From 2000 to 2014, there were 236 deaths in Canada due to moose–vehicle collisions and 123 deaths due to deer–vehicle collisions.[12] However, injuries are far more common than fatalities, with most injuries ranging from manageable to traumatic.[12,13]

From 2016 to 2020 in Northern BC, there were an average of 2700 wildlife–vehicle collisions, 210 injured victims, and 2 deaths per year.[14] Data from the Insurance Corporation of British Columbia (ICBC) for Northern BC indicate that numbers of moose–vehicle collisions peak in December and January, whereas numbers for deer–vehicle collisions peak in October and November.[11]

Pynn and Pynn[15] studied injury patterns and management in patients involved in motor vehicle collisions with large animals and summarized current prevention strategies. They found moose–vehicle collisions led to a higher number of upper body injuries, specifically to the head, due to the mechanism of the collision. When a vehicle strikes a moose, the point of contact is usually the moose's legs; thus, the torso of the moose often lands on the hood of the car and slides up and through the windshield and across the dashboard of the car, coming in contact with the upper body of the motorists.[15,16]

Although Pynn and Pynn[15] mentioned initial stabilization (treatment given when ambulances reach the crash scene) in patients involved in moose–vehicle collisions, it was available only for those who had suffered traumatic injuries in the collision. Overall, there is a paucity of published records on what happens to patients if and when they first visit an emergency room in the hours following a collision.

We examined injury and treatment patterns in patients involved in moose–vehicle collisions and deer–vehicle collisions, starting with the initial visit to the emergency room at the University Hospital of Northern British Columbia (UHNBC) in Prince George, BC.

FIGURE 1. Types of vehicle damages and risks to motorists sustained during a moose–vehicle collision (4 July 2014; permission of the Annance family).

Our objective was to elucidate injury patterns in patients following either a moose–vehicle collision or a deer–vehicle collision and to provide information to doctors and emergency responders on these patterns.

Methods

We examined UHNBC records for patients involved in moose–vehicle collisions and deer–vehicle collisions between 1993 and 2014. The records were redacted to remove identifying or confidential information before analyses were conducted. There were 183 records of motor vehicle collisions with moose and deer, of which 129 were direct collisions with moose and 27 were direct collisions with deer. We excluded 27 records of collisions that were the result of impacts with other objects (tree, ditch, etc.) when the driver attempted to avoid colliding with a moose or deer. The experiment was approved by the University of Northern British Columbia Research Ethics Board under research ethics application approval # 2013.08.01.E2013.0619.078.00.

Data were analyzed using the chi-square test to compare sets of observed and adjusted frequencies with sets of expected or predicted frequencies.[17] Our statistical methodology is available upon request.

To avoid underestimating the impact of deer–vehicle collisions and erroneously comparing the entire spectrum of moose–vehicle collisions (ranging from minor to severe) to only a few of the most severe deer–vehicle collisions, we applied the 3-to-1 ratio[11] to derive a calculated deer–vehicle collision value, and used that corrected value in the analysis. Specifically, if 129 moose–vehicle collisions caused patients to seek medical help, there would have been 3 times as many deer–vehicle collisions as moose–vehicle collisions (3 × 129 = 387) in the same time span and study area. Analyzing these data in this way provided a better real-world statistical comparison in terms of the number of deer being struck by cars but may have overestimated the overall damage caused by the average deer–vehicle collision. From a practical perspective, however, medical professionals preparing for the reception of a patient involved in a deer–vehicle collision will be better prepared for a worst-case scenario.

Data on the main interventions used to treat patients upon arrival at the emergency department were analyzed according to four

categories: pain management (administration of medication or physiotherapy), imaging (CT, MRI, X-ray), additional interventions of a particular medical specialty, and no treatment.

Results

Of the 156 hospital records examined, 53% of patients involved in moose–vehicle collisions or deer–vehicle collisions were transported to the UHNBC emergency department via ambulance, whereas 47% were walk-ins. Significantly more patients ($P < 0.001$) involved in moose–vehicle collisions arrived at the emergency department via ambulance (57%) than those involved in deer–vehicle collisions (41%). Forty-three percent of patients involved in moose–vehicle collisions were walk-ins; 59% of patients involved in deer–vehicle collisions were walk-ins.

In moose–vehicle collisions, 55% of injuries were below the neck, and 45% of injuries were to the neck and/or head. In deer–vehicle collisions, 63% of injuries were below the neck; 37% were injuries to the neck and/or head.

For patients of moose-vehicle collisions, 59% suffered traumatic brain injury; for deer-vehicle collisions, 41% suffered traumatic brain injury. Additionally, there was a significant difference in airbag deployment between moose–vehicle collisions (79%) and deer–vehicle collisions (56%) ($P < 0.001$).

Overall, records for both moose–vehicle collisions and deer–vehicle collisions indicated that most patients were admitted and discharged from the hospital on the same day. Patients admitted to the emergency department due to moose–vehicle collisions received approximately equal treatment within three of the four categories of interventions: pain management, imaging, and medical specialty. Patients admitted due to deer–vehicle collisions had more use of pain management and imaging, and less use of other medical specialties. Overall, more additional types of treatment were required for patients of moose–vehicle collisions than those of deer–vehicle collisions.

In patients of deer–vehicle collisions, 93% were treated in the emergency department without additional need of other medical specialties, while the remaining 7% required orthopaedic surgery. Most moose–vehicle collision patients (81%) were treated in the emergency department without additional medical specialties required. Significantly more moose–vehicle collision patients (26%) than deer–vehicle collision patients (8%) required multiple specialties ($P < 0.05$), with orthopaedic surgery being most common.

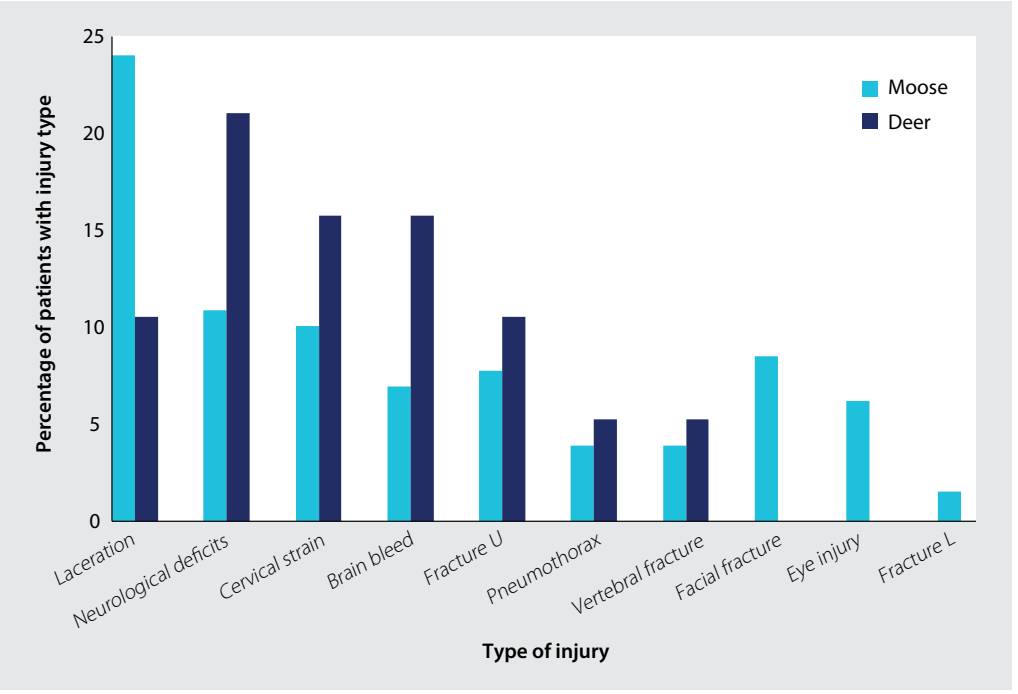

FIGURE 2. Injuries in patients who were involved in moose– or deer–vehicle collisions and were admitted to the University Hospital of Northern British Columbia, 1993–2014.
Fracture U = upper body fracture; Fracture L = lower body fracture.

Further trends in injury patterns were significantly different between patients of moose–vehicle collisions and deer–vehicle collisions **[Figure 2]**. While lacerations were most common in moose–vehicle collision patients, neurological deficits were most common in deer–vehicle collision patients. Moose–vehicle collision patients had significantly more types of injuries not seen in deer–vehicle collision patients, such as facial fractures, eye injuries, and lower body fractures ($P < 0.01$).

Our analysis suggests that August was the month with the highest percentage of deer–vehicle collisions (25%), while September was the month with the highest percentage of moose–vehicle collisions (17%). Other peak months for both moose–vehicle collisions and deer–vehicle collisions were June and December.

Conclusions

Our findings demonstrated that compared with deer–vehicle collisions, moose–vehicle collisions significantly increase both the probability of airbag deployment and the number of patients arriving by ambulance at the hospital. This is perhaps because moose–vehicle collisions result in significantly more deceleration trauma to vehicle occupants compared with deer–vehicle collisions because of the animal's size, high centre of gravity, overall mass, and trajectory.[18]

Our results also revealed a characteristic pattern of both neck and/or head injuries and below-neck injuries in patients of moose– and deer–vehicle collisions. Specifically, our moose–vehicle collision data corroborate work by Sit and colleagues,[19] who reported a characteristic pattern of head and neck injuries in patients involved in moose–vehicle collisions and deer–vehicle collisions. Understanding the prevalence of these patterns adds to reports by Pynn and Pynn[15] and may help with the prevention of injuries and emergency care requirements of patients following motor vehicle collisions with large animals.

Although our hospital stay data showed similarities in same-day discharges between moose–vehicle collision and deer–vehicle collision patients, the interventions used to treat patients upon hospital admittance were different between the two groups. Patients who suffered injuries from moose–vehicle collisions required significantly more extensive treatment than those who were injured in deer–vehicle collisions. Conway and colleagues[13] reported that differences in injuries experienced by patients whose vehicles collided with deer versus moose can be both short-term and long-lasting.

Although patients involved in deer–vehicle collisions had a higher percentage use of medical imaging than those involved in moose–vehicle collisions, only 7% needed additional medical specialty treatment. This could mean that for most patients who required medical imaging, its use may have been for precautionary reasons. In comparison, 27% of moose–vehicle collision patients required significantly more treatment from an additional medical specialty, the most common being orthopaedic surgery. This difference in injury severity between patients of moose–vehicle collisions and deer–vehicle collisions is likely due to differences in the overall mass and centre of gravity of moose and deer **[Figure 3].**

As outlined by Bjornstig and colleagues[16] and Pynn and Pynn,[15] vehicle collisions with moose can result in many upper body injuries to drivers and passengers due to the location of the vehicle's impact with the moose's body. Vehicles typically hit the legs of the animal. This results in the heavy upper body of the moose falling with high velocity on the vehicle's windshield, which can cause significant damage to the windshield and roof pillars and the vehicle occupants[15,16,19] **[Figure 1]**. The mechanism of vehicle collision with deer is similar to that of moose, but the smaller stature and overall mass of deer generally results in less and lower damage to the vehicle and less injury to vehicle occupants, which is likely why there are fewer hospital records for these types of collisions.[7] Differences between moose– and deer–vehicle collisions in what happens upon impact may reveal why we found that facial fractures, eye injuries, and some lower body fractures were documented for moose–vehicle collisions but not for deer–vehicle collisions.

There was a significant statistical interaction between the percentage of patients with lacerations and those with neurological deficits. Patients of moose–vehicle collisions had more lacerations and fewer neurological deficits than patients of deer–vehicle collisions. This may be due to the principal point of vehicle contact with the animal **[Figure 3]**. Damage in moose–vehicle collisions occurs primarily at the windshield, whereas in deer–vehicle collisions, the impact tends to occur lower down on the vehicle at the bumper or grill. In moose–vehicle collisions, damage to windshields results in increased head and neck injuries, and lacerations caused by shattered windshield glass. In deer–vehicle collisions, the lower impact location on the front of the vehicle may result in injuries such as whiplash, which may explain the higher likelihood of neurological deficits in these types of collisions.

Monthly collision trends showed that numbers of moose–vehicle collisions and deer–vehicle collisions begin to increase in May and show a small peak in June. The main peak in moose–vehicle collisions occurs in September, whereas the main peak for deer–vehicle collisions occurs in August. Our findings generally support the work of Laurian and colleagues,[20] who found that there were two peaks in the number of road crossings by moose on highways and forest roads, corresponding to May through July and September through October. Peak collision seasons vary by species and location and are generally attributed to changes in animal behavior and ecology, such as movements between seasonal ranges or use of roadside habitats, but may also be tied to other factors.[2,21-23]

Driver behavior and road conditions also influence trends in moose– and deer–vehicle collisions. From May to October, road conditions are generally good, and there are long hours of daylight. As a result, drivers may exceed speed limits, which increases the risk of both moose–vehicle collisions[24] and deer–vehicle collisions.[25] The number of human deaths due to motor vehicle crashes is highest from May to October.[26] Weather conditions begin to worsen in November. More snow and fewer daylight hours lead to more hazardous road conditions, lower driving speeds, and perhaps fewer injuries

FIGURE 3. Typical principal points of contact between animals and vehicles following moose–vehicle collisions (A; 6 July 2005) and deer–vehicle collisions (B; 2 January 2015).

or deaths due to vehicle collisions with moose or deer.

We found differences in the seasonal patterns of moose–vehicle collisions and deer–vehicle collisions when comparing hospital patient records to vehicle collision records from ICBC.[11] Our hospital records appeared to indicate that when factoring in the 3-to-1 ratio of deer–vehicle collisions to moose–vehicle collisions and then pooling hospitalizations due to both deer– and moose–vehicle collisions, September was the month with the third-highest number of collisions resulting in injury but was the month with the lowest number of collisions reported to ICBC. November was among the months with the lowest number of collisions reported in the hospital records but was among those with the highest number of collisions in the ICBC records. Differences in seasonal peaks in collisions between the two databases may be attributable to several factors, including the fact that only 156 collision records in this study were

compared with more than 1800 collision records reported to ICBC and analyzed,[11] and the two databases included different types of data (i.e., vehicle collision data reported to ICBC versus patient data collected at the hospital).

Although time of day of the collision was not recorded in the hospital records, O'Keefe and Rea[11] and Vanlaar and colleagues[12] reported that most collisions with moose and deer occur at night, when animals are most difficult to see. Reduced visibility and driver detection time of moose[24] and deer[27] during hours of darkness can result in reduced warning and braking time, and a higher likelihood of collision. Emergency responders and doctors should be aware of this, and we recommend that in the future, the time of collision be recorded in hospital records where possible.

In summary, the hospital records of patients involved in moose– and deer–vehicle collisions in north-central BC suggest that there is a significant relationship between moose–vehicle collisions and lacerations, and deer–vehicle collisions and neurological deficits. Also, our study shows that a wider variety of medical specialties are needed to treat patients who suffer injuries following moose–vehicle collisions than those injured in deer–vehicle collisions. It is our hope that by alerting the medical profession about when moose–vehicle collisions and deer–vehicle collisions are most common, how patients involved in those collisions sustain different kinds of injuries, and what types of services they require, emergency responders and doctors will have the information they need regarding when to expect to attend to patients of moose– and deer–vehicle collisions and what to expect in terms of their injuries and treatment. ■

Competing interests
None declared.

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Patients who suffered injuries from moose–vehicle collisions required significantly more extensive treatment than those who were injured in deer–vehicle collisions.

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Assessing the need for resuscitative endovascular balloon occlusion of the aorta (REBOA) for management of noncompressible hemorrhage at a Canadian urban trauma centre

The deployment of REBOA could be lifesaving or could reduce transfusion requirements in the most severely injured patients, but more prospective research is needed to determine if it improves patient outcomes.

ABSTRACT: Expert consensus suggests that resuscitative endovascular balloon occlusion of the aorta (REBOA) should be considered in the management of select trauma patients; however, there is a paucity of studies that evaluate the potential utility of REBOA in the Canadian setting. Our study objective was to evaluate the percentage of trauma patients presenting to a Canadian trauma centre that would have met REBOA criteria. We conducted a retrospective chart review of patients recorded in the BC Trauma Registry who warranted a trauma team activation at our institution. We identified REBOA candidates using criteria based on published guidelines. Fourteen patients were classified as likely candidates (2.2% of trauma team activations). Their median injury severity score was 31.5. While REBOA would be performed infrequently, it could be a potentially lifesaving procedure in a small group of severely injured trauma patients; however, the impact on the Canadian trauma system needs further evaluation.

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Massive exsanguination resulting in circulatory collapse is one of the leading causes of preventable death in trauma.[1,2] The cornerstone of the emergency management of massive hemorrhage is obtaining control of the bleeding. However, source control becomes a challenge when the source of major hemorrhage involves noncompressible regions such as the trunk and ilio-junctional regions.[3] Consequently, noncompressible hemorrhage represents most traumatic exsanguination fatalities, accounting for 45% to 60% of deaths.[4,5] Historically, the only means of attempting to control this type of bleeding was to perform a resuscitative thoracotomy as a bridge to definitive surgical management in the operating room.[3,6] This highly invasive procedure is associated with high levels of mortality and complications.[6]

Within the last 10 years, innovation has led to the development and popularization of a second option for the management of life-threatening noncompressible hemorrhage. Resuscitative endovascular balloon occlusion of the aorta (REBOA) involves inflation of a balloon in the aorta as a means of reducing blood flow to the distal hemorrhage site and preferentially directing blood flow to critical organs, including the heart and brain.[2,3,7-10] Although REBOA is less invasive than resuscitative thoracotomy, evidence of the efficacy of REBOA is conflicting, and REBOA has been associated with complications, including organ ischemia, vascular injury, and limb amputations;[11-17] nevertheless, expert consensus suggests that REBOA should be considered in select severely injured patients.[18,19]

The method for REBOA deployment first requires femoral access. The device is inserted through the femoral artery and threaded into the aorta until the deflated balloon is positioned in either zone 1 (between the left subclavian artery and the celiac trunk) for intra-abdominal or retroperitoneal hemorrhage, or in zone 3 (between the most caudal renal artery and the aortic bifurcation) for pelvic, inguinal, or lower extremity hemorrhage. The balloon is then inflated until physiologic improvement is achieved, indicating distal blood flow is occluded.

REBOA is deployed primarily by trauma surgeons in Canada; however, it is within the scope of practice of vascular surgeons, interventional radiologists, intensivists, and emergency physicians in some countries.[13,18,19] The procedure time ranges from approximately 4 to 12 minutes in the conventional models,[7,20] but newer models have recently entered the market and have a mean procedure time of 70.1 seconds.[21] The existing literature does not include the use of these newer devices, which are not yet in widespread use; therefore, it is not known if the shorter procedure time will result in improved outcomes in patients who are managed with endovascular resuscitation.

Many US centres that receive high volumes of trauma and perform regular resuscitative thoracotomies have already adopted REBOA. Globally, REBOA is available in many major centres in Europe and Japan.[13,14,17,22] However, the pattern and volume of trauma are different in Canada.[23,24] A 2021 survey found that only 21.9% of Canadian level 1 or 2 trauma centres currently have a REBOA program.[25] These centres are mainly in Ontario and Quebec, and there is one centre in British Columbia. However, there has been a paucity of studies on the impact of this tool on trauma care or its potential utility in the Canadian context,[26,27] and it has yet to be adopted as standard of care in Canada. The reason for this is multifactorial but is likely related to the implications to the overall trauma system in various health authorities that would result from implementation of this device. A recent editorial has highlighted the need for further research in the Canadian setting prior to widespread adoption of REBOA.[28] Our study is a Canadian-based trauma population–driven assessment of the need for acquisition of REBOA at a tertiary care level 1 trauma centre in British Columbia. The objective of this study was to evaluate the percentage of trauma patients at our Canadian institution who sustained injury that resulted in life-threatening hemorrhage below the diaphragm, in which case REBOA would have been indicated as a component of the emergency department resuscitation.

Methods

Study design

This retrospective descriptive study was conducted at Royal Columbian Hospital in New Westminster, BC. It is the only Canadian level 1 trauma centre in a health authority with a catchment area of 1.9 million people or more. Royal Columbian Hospital sees approximately 400 trauma consults annually. We used medical record data for trauma patients recorded in the BC Trauma Registry who presented to our emergency department between 1 January 2016 and 31 December 2018. The BC Trauma Registry is a comprehensive and organized provincial trauma surveillance and data collection system that is regularly quality checked.

Population

All BC Trauma Registry cases that were trauma team activations were screened for inclusion in this study. Trauma team activations are called for patients when there is concern about severe injury based on a set of physiologic, anatomic, and mechanistic criteria established by the health authority.

Inclusion and exclusion criteria

The inclusion and exclusion criteria for REBOA candidacy were chosen based on suggested REBOA protocols published in the literature[29,30] and the indications published in the 2018 and 2019 American College of Surgeons and American College of Emergency Physicians guidelines.[18,19]

Outcome measures

The primary outcome was identification of REBOA candidacy according to inclusion and exclusion criteria. Additionally, information on patient characteristics, clinical variables, and the traumatic event was collected for each case.

Data collection

Records for each trauma team activation were accessed through the health authority's patient care information system. Each case was screened

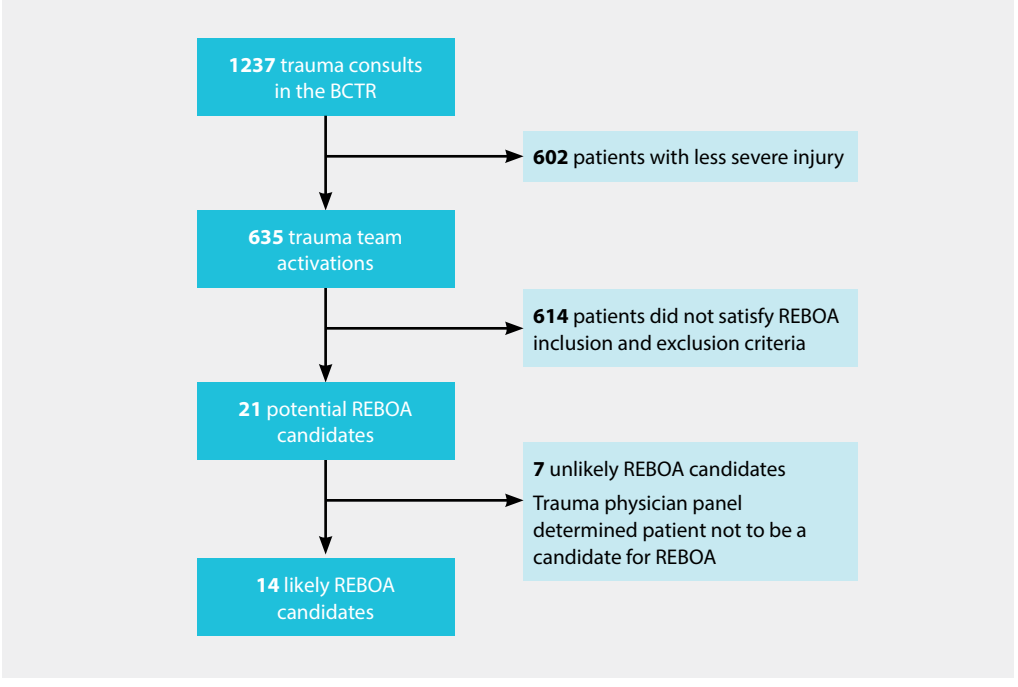

FIGURE. Flow diagram of assessment for potential and likely REBOA candidacy.
BCTR = BC Trauma Registry
REBOA = resuscitative endovascular balloon occlusion of the aorta

by one of two reviewers for inclusion and exclusion criteria, and data from each identified case were extracted using a standardized data collection form. The data were subsequently copied into a secure electronic database.

Based on the defined indications for REBOA, the reviewers classified each case as to whether the patient would have been a potential or likely REBOA candidate. Potential candidates were defined as those who met inclusion criteria without any exclusion criteria. Likely candidates were those who met criteria for REBOA candidacy and received four or more units of packed red blood cells in the first hour of arrival in the emergency department. All cases that were identified as a likely REBOA candidate were then reviewed by a panel of trauma physicians for final determination of candidacy based on expert opinion. Additionally, the two reviewers assessed a sample of 60 cases (9.4% of charts) to ensure inter-rater reliability of case analysis.

Statistical analysis

Descriptive statistics were used. Parametric continuous data were expressed using means and standard deviations (SDs), nonparametric continuous data were expressed using medians and interquartile ranges (IQRs), and categorical data were expressed using n values (%). The kappa statistic was used to express inter-rater agreement between chart reviewers.

Results

The BC Trauma Registry recorded 1237 consults to the trauma service at our centre from 1 January 2016 to 31 December 2018. In total, 635 of these consults were trauma team activations. Following review, 21 patients were classified as potential REBOA candidates (3.3% of trauma team activations; 1.7% of total trauma consults) and 14 were classified as likely REBOA candidates (2.2% of trauma team activations; 1.1% of total trauma consults) **[Figure]**.

The inclusion criteria met by the 14 likely candidates were as follows: 10 were blunt trauma with a pulse and systolic blood pressure < 90 mmHg (71.4%), 3 were penetrating trauma with a pulse and systolic blood pressure < 90 mmHg (21.4%), and 1 was blunt trauma and pulseless (7.1%) **[Table 1]**. No patients met the penetrating trauma and pulseless criterion in our cohort.

Nine of the likely candidates were female (64.3%), and the mean age of the likely candidates was 46.1 years (SD 18.9) **[Table 1]**.

The median injury severity score for the likely candidate group was 31.5 (IQR 26.8) **[Table 2]**. The mean systolic blood pressure on arrival in the emergency department was 112.7 mmHg (SD 26.4 mmHg), and then dropped to less than 90 mmHg during the emergency department stay, as per the inclusion criteria. The mean number of units of blood products administered within the

TABLE 1. Characteristics and injuries of potential and likely candidates for resuscitative endovascular balloon occlusion of the aorta.

	Potential candidates number (%)	Likely candidates number (%)
Candidates	21 (3.3)	14 (2.2)
Sex		
Male	12 (57.1)	5 (35.7)
Female	9 (42.9)	9 (64.3)
Mean age (years) (SD)	48.8 (17.8)	46.1 (18.9)
Inclusion criteria		
Blunt trauma with pulse; systolic blood pressure < 90 mmHg	17 (80.9)	10 (71.4)
Penetrating trauma with pulse; systolic blood pressure < 90 mmHg	3 (14.3)	3 (21.4)
Blunt trauma and pulseless	1 (4.8)	1 (7.1)
Penetrating trauma and pulseless	0 (0)	0 (0)
Mechanism of trauma		
Motor vehicle collision	3 (14.3)	3 (21.4)
Motorbike collision	1 (4.8)	1 (7.1)
Pedestrian struck	8 (38.0)	5 (35.8)
Fall	2 (9.5)	2 (14.3)
Crush	3 (14.3)	0 (0)
All-terrain vehicle/dirt bike	1 (4.8)	0 (0)
Gunshot wound	2 (9.5)	2 (14.3)
Stab	1 (4.8)	1 (7.1)
Main source of hemorrhage		
Pelvic fracture	9 (42.9)	6 (42.9)
Abdominal hemorrhage	13 (61.9)	10 (71.4)
Spleen injury	7 (33.3)	4 (28.6)
Liver injury	10 (47.6)	9 (64.3)
Kidney injury	3 (14.3)	2 (14.3)
Lower extremity amputation	0 (0)	0 (0)
Major vascular injury	3 (14.3)	3 (21.4)
Other	3 (14.3)	0 (0)

first hour of arrival in the emergency department was 5.5 (SD 2.3), and the mean total within the first 24 hours was 39.2 (SD 40.3) **[Table 2]**. Two of the likely candidates received cardiopulmonary resuscitation (14.3%), one received resuscitative thoracotomy with aortic cross-clamping (7.1%), four underwent angiography (28.6%), and four underwent laparotomy (28.6%) **[Table 3]**. Eight patients immediately went to either the operating room or interventional radiology suite from the emergency department (57.1%). In total, three of the likely candidates died from their injuries (21.4%) **[Table 3]**.

TABLE 2. Clinical variables of potential and likely candidates for resuscitative endovascular balloon occlusion of the aorta.

	Potential candidates	Likely candidates
Median injury severity score (interquartile range)	34.0 (17.8)	31.5 (26.8)
Mean vitals (SD)		
Emergency Health Services systolic blood pressure (mmHg)	111.8 (25.4)	112.7 (26.4)
Emergency Health Services heart rate (beats per minute)	106.1 (22.3)	104.2 (21.5)
Emergency department systolic blood pressure (mmHg)	104.8 (40.2)	108 (41.7)
Emergency department heart rate (beats per minute)	102.7 (21.0)	102.4 (22.8)
Mean blood products received (SD)		
At 1 hour	7.0 (5.0)	5.5 (2.3)
At 2 hours	7.4 (8.2)	9.1 (9.2)
At 4 hours	3.5 (4.6)	3.9 (5.4)
At 24 hours	24.2 (40.8)	26.3 (47.6)
Total	34.6 (35.6)	39.2 (40.3)

TABLE 3. Interventions and outcomes of potential and likely candidates for resuscitative endovascular balloon occlusion of the aorta.

	Potential candidates number (%)	Likely candidates number (%)
Interventions		
Cardiopulmonary resuscitation	4 (19.0)	2 (14.3)
Resuscitative thoracotomy with aortic cross-clamping	1 (4.8)	1 (7.1)
Angiography	6 (28.6)	4 (28.6)
Laparotomy	4 (19.0)	4 (28.6)
Outcome		
Survival to emergency department discharge	18 (85.7)	12 (85.7)
Death in emergency department	3 (14.2)	2 (14.3)
Survival to hospital discharge	15 (71.4)	11 (78.6)
Death in hospital (post–emergency department)	3 (14.2)	1 (7.1)

The main sources of infradiaphragmatic hemorrhage in the likely candidates were secondary to an abdominal solid organ injury in 10 patients (71.4%), pelvic fracture in 6 patients (42.9%), and major vascular injury in 3 patients (21.4%) **[Table 1]**. Ten patients had multiple sources of hemorrhage (71.4%). **Table 4** provides descriptions of each case that met the candidacy criteria.

Sixty of the cases were assessed independently by the two reviewers to determine inter-rater reliability. Good reliability was found between reviewers in identifying patient candidacy (kappa = 0.659).

Discussion

This study contributes to the evaluation of the population-driven need for acquisition of REBOA at Canadian trauma centres. We determined that over a 3-year period, 14 patients at our institution would have met the study criteria for use of REBOA during resuscitation. Those who met the criteria represented a group of severely injured patients and constituted 2.2% of the trauma team activations and 1.1% of all trauma consults. Our findings are consistent with those of two recent needs assessments on deployment of REBOA at major Canadian trauma centres in other provinces. Those studies found that 1.1% and 1.5% of major trauma patients at trauma centres in Edmonton[26] and Halifax,[27] respectively, met eligibility criteria for deployment of REBOA. Although a seemingly small number of patients met the eligibility criteria, this may be clinically significant given that trauma patients are often young, previously healthy individuals with the physiologic reserve to survive the REBOA procedure. Additionally, these patients stand to gain many potential high-quality years of life.

Our data indicate that the most common indication for the use of REBOA in our trauma population was for patients who had sustained blunt trauma, which is consistent with Canadian statistics. In comparison, the United States has a much higher rate of penetrating trauma.[23,24] Of note, the percentage of cases that met candidacy criteria in our study was greater than that in a 2019 study at a US trauma centre that used similar inclusion criteria. In that study, 0.6% of the trauma patients (29 of 4818

TABLE 4. Case descriptions of likely candidates for resuscitative endovascular balloon occlusion of the aorta.

Candidate #	Likely candidate	Inclusion criteria met	Primary source of hemorrhage	Immediate surgical intervention	Death in hospital	Case description
1	Yes	Blunt, with pulse	Abdominal solid organ injury	Interventional radiology Operating room	No	Elderly patient with fall from standing. Presented 4 days after fall. Spleen and liver lacerations. Received 38 units of blood product in 24 hours. Femoral catheterization may not have been successful due to atherosclerosis noted.
2	No	Blunt, with pulse	Abdominal solid organ injury	None	No	Dirt bike crash. Required 3 units packed red blood cells. Stabilized after.
3	Yes	Penetrating, with pulse	Abdominal solid organ injury	Operating room	No	Gunshot wound to abdomen. Liver laceration. Received 50 units of blood product in 24 hours.
4	Yes	Blunt, with pulse	Pelvic fracture	Interventional radiology	No	Pedestrian struck by a vehicle. Received 17 units of blood product in 24 hours. Interventional radiology embolization successful.
5	Yes	Blunt, with pulse	Pelvic fracture	None	Yes	Pedestrian struck by a vehicle. Arrested in the CT scanner and died.
6	No	Blunt, with pulse	Other—crush injury	None	Yes	Trapped in a truck for 3 days prior to emergency department presentation. Died of acidosis secondary to crush injury to bilateral legs.
7	Yes	Blunt, with pulse	Pelvic fracture	None	No	Run over and trapped beneath a car. Sustained pelvic and femur fractures. Received 11 units of blood product in 24 hours. Did not require urgent operating room, but REBOA may have been deployed in the setting of a pelvic fracture prior to stabilization.
8	No	Blunt, with pulse	Abdominal solid organ injury	None	Yes	Struck by a train. No clear source of hemorrhage found that would have caused death.
9	Yes	Blunt, pulseless	Pelvic fracture	None	Yes	Run over by a dump truck. Arrested and died in the emergency department. Difficulty obtaining femoral access for arterial line during resuscitation likely secondary to crush injury to pelvis.
10	Yes	Penetrating, with pulse	Abdominal solid organ injury	Operating room	No	Stab to abdomen. Direct to operating room for trauma laparotomy. Received 14 units of blood product in 24 hours.
11	No	Blunt, with pulse	Pelvic fracture	None	Yes	Run over by heavy machinery. Likely died from respiratory arrest secondary to a high spinal cord injury.
12	Yes	Blunt, with pulse	Pelvic fracture Abdominal solid organ injury	Operating room	No	Pedestrian struck by a vehicle. Direct to operating room. Received 17 units of blood product in 24 hours.
13	Yes	Blunt, with pulse	Pelvic fracture Abdominal solid organ injury	Interventional radiology	No	Motor vehicle collision. Interventional radiology embolization of right iliolumbar/lumbar arteries successful. Received 17 units of blood product in 24 hours.
14	Yes	Penetrating, with pulse	Abdominal solid organ injury Major vascular injury	Operating room	No	Gunshot wound to abdomen. Direct to operating room for trauma laparotomy. Received 33 units of blood product in 24 hours.
15	Yes	Blunt, with pulse	Abdominal solid organ injury	Interventional radiology	No	Fall from a second-story building. Underwent interventional radiology embolization for control of a liver laceration. Received 29 units of blood product in 24 hours.
16	No	Blunt, with pulse	Pelvic fracture Other—retroperitoneal hematoma	None	No	Pedestrian struck by a vehicle. Hypotension likely exacerbated by sedation. No intervention required for hemorrhage.
17	Yes	Blunt, with pulse	Abdominal solid organ injury Major vascular injury	Operating room	Yes	Motor vehicle collision. Arrested in the emergency department. Direct to operating room. Received an operating room resuscitative thoracotomy and cross-clamping of the aorta for attempted control of hemorrhage. Died in the operating room.
18	No	Blunt, with pulse	Pelvic fracture Abdominal solid organ injury	Interventional radiology	No	Pedestrian struck by a truck. Transferred from another institution. Responded to blood product resuscitation and stabilized prior to interventional radiology.

Table continued on page 302

TABLE 4 *(continued from 301)*. **Case descriptions of likely candidates for resuscitative endovascular balloon occlusion of the aorta.**

Candidate #	Likely candidate	Inclusion criteria met	Primary source of hemorrhage	Immediate surgical intervention	Death in hospital	Case description
19	No	Blunt, with pulse	Other—groin hematoma	None	No	Truck ran over legs of patient. Inguinal laceration was initially missed but was amenable to external compression.
20	Yes	Blunt, with pulse	Abdominal solid organ injury	Operating room	No	Motor vehicle collision. Sustained a grade 5 splenic injury that was taken to the operating room for definitive control. Received 57 units of blood products in 24 hours.
21	Yes	Blunt, with pulse	Abdominal solid organ injury Major vascular injury	Operating room	No	Motorcycle crash. Direct to operating room. Received 163 units of blood product in 24 hours.

total trauma patients) seen in the emergency department per year may have benefited from REBOA, and 72.4% (21 of 29 REBOA candidates) of them had sustained a penetrating traumatic injury.[11]

The main limitation of our study is that in our retrospective chart review, the identification of cases that met REBOA candidacy did not necessarily indicate that the intervention would have changed patient outcomes. It is notable that of the 14 likely candidates, 3 died from their injuries (21.4%) and 11 survived without REBOA. Furthermore, only 8 of the 14 likely candidates (57.1%) went directly to the operating room or interventional radiology suite for attempted embolization. This reflects the reality that the physician's decision to deploy REBOA is made early during patient assessment and sometimes without definitive imaging. As with any intervention, REBOA can be deployed on a case-by-case basis according to the physician's clinical judgment that it will improve the patient's outcome.

It is also notable that the mean systolic blood pressure on emergency department arrival for both the potential and likely candidates was greater than 100 mmHg. However, a patient's clinical status cannot be determined by a single value because it is representative of only a moment in their postinjury course. All these patients became hypotensive and transient responders or nonresponders to resuscitation at some point during their emergency visit. In contrast, the mean number of units of blood product transfused in the likely candidates was 5.5 in the first hour and 39.2 total in the first 24 hours. This met the criteria for massive transfusion at our institution and was indicative of the critical condition of these patients. This also suggests a potential benefit of REBOA in reducing transfusion requirements in hemorrhaging trauma patients.

While REBOA is a low-volume procedure, it could be lifesaving or could reduce transfusion requirements in the most severely injured patients; however, more prospective research is required to determine if the availability of REBOA improves patient outcomes.

Summary and future directions

Our study contributes to the evaluation of the potential value of REBOA in trauma management in the Canadian setting. We found that 1.1% of our annual trauma population would meet REBOA candidacy. While REBOA is a low-volume procedure, it could be lifesaving or could reduce transfusion requirements in the most severely injured patients; however, more prospective research is required to determine if the availability of REBOA improves patient outcomes. Furthermore, it is important to consider that using a tool such as REBOA requires major systems changes, including an increase in multidisciplinary on-call coverage, training of providers, and quality assurance. Additional future directions include conducting a formal needs assessment for the implementation of REBOA that involves a cost-benefit analysis and evaluation of the implications to trauma systems at Canadian institutions. ■

Competing interests

None declared.

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2020 BC Cancer core medical staff work engagement and burnout survey

Addressing physician burnout at BC Cancer would improve the quality, safety, and efficiency of care, and enhance patient experience.

ABSTRACT: Physician burnout remains a significant threat to the viability of Canada's health care system. Between November 2019 and March 2020, an engagement and burnout survey was completed by BC Cancer oncology physicians (n = 258) and Canadian Association of Radiation Oncology members (n = 333). The survey completion rates for BC Cancer and the Canadian Association of Radiation Oncology were 62% and 72%, respectively. We used national Canadian Association of Radiation Oncology data as a contrasting benchmark to compare the level of engagement and burnout in BC to that of national oncology staff. Eighty-eight percent of radiation oncologists, 77% of medical oncologists, and 41% of general practitioners in oncology had negative scores in at least one of the three burnout domains (exhaustion, cynicism, or inefficacy), and the full burnout syndrome (negative scores in all three domains) was recorded in 22% of BC oncology physicians, which was the highest in the country. BC Cancer oncology physicians reported the lowest work engagement in Canada and cited concerns about poor workplace efficiency, heavy workloads, lack of control and input into administrative policies, and impaired ability to provide high-quality care. A prevalent attitude of "excellent collegial atmosphere" and willingness to "try something new," partnered with an engaged administration, might enable the development of strategies to improve the well-being of the oncology physician workforce, and consequently the delivery of cancer care in BC.

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BC Cancer is a provincial, publicly funded, population-based cancer treatment and research organization operating under the umbrella of the Provincial Health Services Authority. It serves 5.1 million residents of BC and Yukon through six regional multidisciplinary, comprehensive cancer clinics: Vancouver, Victoria, Surrey, Kelowna, Abbotsford, and Prince George. The BC Cancer mandate covers the full spectrum of cancer care, including prevention, screening, diagnosis, and treatment, through to rehabilitation and survivorship, and comprehensive basic and clinical research.[1]

Due to the increasing incidence and prevalence of cancer, coupled with an aging population and treatment advances,[2] caseload and complexity in oncology are increasing at a rapid rate. In addition to mounting administrative tasks and the introduction of quality assurance programs[3] and new electronic health record systems,[4] which all physicians must address, the frequent exposure to death and suffering and the daily responsibility of administering and overseeing toxic therapies with narrow therapeutic ratios are specific factors contributing to burnout in oncology.[5,6] Despite these issues, over the last decade, the core staff full-time equivalent (FTE) funding at BC Cancer has disproportionally lagged behind the needs for cancer care in BC. Because a 2018 Canadian Medical Association national survey showed that physician health remains a significant threat to the viability of Canada's health care system,[7] we conducted a survey of BC Cancer physicians to determine the current level of workplace engagement and burnout. The survey was conducted in parallel with a survey of Canadian Association of Radiation Oncology members. We used national data as a benchmark to compare the level of engagement and burnout of radiation oncology staff in BC with that in other provinces. We postulated that comparing the oncology work environment across Canada with that in BC would provide

a more meaningful interpretation of results from the BC survey.

Methods

The BC Cancer Medical Staff Engagement Society, a Facility Engagement initiative, and the Canadian Association of Radiation Oncology funded the study, and the UBC BC Cancer Research Ethics Board approved it. Between November 2019 and March 2020 (before COVID-19), we sent a web-based consent form and survey questionnaire (using SurveyMonkey) to the entire membership of the Canadian Association of Radiation Oncology (used as a representative of a cohesive national oncology group), which includes 333 radiation oncologists working in 49 centres across Canada. The survey was administered through the national Canadian Association of Radiation Oncology office. At the same time, the survey was emailed to all 456 members of the BC Cancer Medical Staff Engagement Society through the Society's administrative office. Because 198 BC Cancer physicians are engaged in work that is not exclusive to oncology (e.g., respirologists, dentists, gastroenterologists, general surgeons, gynecologists), they were excluded from the analysis. This resulted in a target population of 258 BC Cancer oncology physicians, which included 87 radiation oncologists, 116 medical oncologists, and 55 general practitioners in oncology.

71.6% of BC Cancer physicians versus 33.7% of radiation oncologists from other provinces felt that there were not enough physicians to meet workload demands.

The 84-question survey included the formal Maslach Burnout Inventory,[8] as well as demographic, work–life balance, career satisfaction, job engagement, and specialty-specific questions. Most questions allowed responses that could be quantified using the Likert scale: "strongly agree," "agree," "neither agree nor disagree," "disagree," or "strongly disagree."

TABLE 1. Multivariable analysis of factors associated with medical oncologist and radiation oncologist burnout for BC Cancer. Since comparisons are made to radiation oncologists in other Canadian provinces, BC Cancer general practitioners in oncology are excluded.

	Odds ratio	95% CI	*P* value
Have you considered leaving your institution to work elsewhere?			
Yes vs no	8.811	3.304-23.496	< .0001
Have you considered reducing your full-time equivalent (FTE)?			
Yes vs no	2.238	0.945-5.302	0.0670
Province			
BC vs Ontario	0.822	0.328-2.059	0.1169
Alberta vs Ontario	1.106	0.241-5.064	0.1490
Quebec vs Ontario	0.245	0.048-1.251	0.3278
Other vs Ontario	0.094	0.011-0.801	0.0614
FTE distribution			
Clinical and administrative 20% to 50% vs mostly clinical FTE	0.370	0.095-1.435	0.9605
Clinical and administrative > 50% vs mostly clinical FTE	N/A	N/A	N/A
Clinical and research 20% to 50% vs mostly clinical FTE	0.395	0.112-1.398	0.9593
Clinical and research > 50% vs mostly clinical FTE	0.223	0.024-2.070	0.9695
Hours/week spent at home on work tasks			
< 5 vs no additional hours	0.282	0.018-4.413	0.2551
5–10 vs no additional hours	0.485	0.040-5.919	0.6652
> 10 vs no additional hours	0.888	0.068-11.577	0.3941
Age			
35–45 vs < 35	3.070	0.528-17.856	0.9542
46–55 vs < 35	1.807	0.299-10.932	0.9613
56–65 vs < 35	0.341	0.019-6.030	0.9835
> 65 vs < 35	N/A	N/A	N/A
Children			
Any children vs none	0.689	0.213-2.231	0.5343
Years in practice			
6–10 vs ≤ 5	0.525	0.144-1.919	0.9561
11–20 vs ≤ 5	1.313	0.296-5.819	0.9359
21–25 vs ≤ 5	0.327	0.023-4.595	0.9665
> 25 vs ≤ 5	N/A	N/A	N/A
FTE			
Full-time vs part-time	1.584	0.403-6.233	0.5102
Gender			
Male vs female	1.540	0.595-3.986	0.9829
Other vs female	N/A	N/A	N/A
Marital status			
Living common-law vs single, never married	0.917	0.086-9.776	0.9540
Married vs single, never married	0.547	0.054-5.546	0.9935
Separated/divorced vs single, never married	N/A	N/A	N/A
Widowed vs single, never married	N/A	N/A	N/A

The Maslach Burnout Inventory aligns with the World Health Organization's 2019 definition of burnout as a legitimate occupational phenomenon.[9] Three dimensions characterize burnout: (1) feelings of energy depletion or exhaustion, (2) increased mental distance from one's job, or feelings of negativism or cynicism related to one's job, and (3) reduced professional efficacy. The Maslach Burnout Inventory yields three scores for each respondent: exhaustion, cynicism, and professional efficacy. These terms from the Maslach Burnout Inventory–General Survey are parallel to the terms emotional exhaustion, depersonalization, and personal accomplishment in the Maslach Burnout Inventory–Human Services Survey, which we used. There is a continuum of frequency scores, from more positive to more negative, rather than arbitrary dividing points between "present" and "absent." The *Maslach Burnout Inventory Manual* (4th edition) recommends analyzing subscores on a continuous spectrum.[8] To facilitate comparisons across previously published studies, the most commonly used Maslach Burnout Inventory cutoff scores are 27 or greater for high emotional exhaustion, 10 or greater for high depersonalization, and 33 or less for low personal accomplishment.[8,10] Negative scores on all three dimensions indicate a "burnout profile." In order to compare our results with those of other studies, we contrasted the incidence of burnout reported by others with the incidence of physicians who are "overextended/disengaged" (high scores in the domains of exhaustion and/or cynicism).[6,11-13]

Logistic regression analysis was performed on a single variable representing burnout as a function of the covariates listed in **Table 1**. The resulting odds ratios represent the increased risk of burnout for a given physician. Backward selection was used to remove variables

TABLE 2. Demographics for BC Cancer.

	All	Radiation oncologist	Medical oncologist	General practitioner in oncology	Other
Number of responders	160	67	52	27	14
Age (years)					
< 35	13 (8.13%)	6 (8.96%)	4 (7.69%)	2 (7.41%)	1 (7.14%)
35–45	63 (39.38%)	33 (49.25%)	20 (38.46%)	6 (22.22%)	4 (28.57%)
46–55	57 (35.63%)	18 (26.87%)	21 (40.38%)	13 (48.15%)	5 (35.71%)
56–65	25 (15.63%)	10 (14.93%)	7 (13.46%)	4 (14.81%)	4 (28.57%)
> 65	2 (1.25%)	–	–	2 (7.41%)	–
Years in practice					
< 5	34 (21.25%)	17 (25.37%)	12 (23.08%)	2 (7.41%)	3 (21.43%)
6–10	34 (21.25%)	17 (25.37%)	13 (25.00%)	2 (7.41%)	2 (14.29%)
11–20	52 (32.50%)	19 (28.36%)	19 (36.54%)	10 (37.04%)	4 (28.57%)
21–25	23 (14.38%)	8 (11.94%)	6 (11.54%)	7 (25.93%)	2 (14.29%)
> 25	17 (10.63%)	6 (8.96%)	2 (3.85%)	6 (22.22%)	3 (21.43%)
Gender					
Female	88 (55.00%)	27 (40.30%)	35 (67.31%)	18 (66.67%)	8 (57.14%)
Male	72 (45.00%)	40 (59.70%)	17 (32.69%)	9 (33.33%)	6 (42.86%)
Other	–	–	–	–	–
Marital status					
Single, never married	8 (5.00%)	3 (4.48%)	4 (7.69%)	1 (3.70%)	–
Living common-law	16 (10.00%)	9 (13.43%)	4 (7.69%)	2 (7.41%)	1 (7.14%)
Married	128 (80.00%)	54 (80.60%)	43 (82.69%)	21 (77.78%)	10 (71.43%)
Separated/divorced	7 (4.38%)	1 (1.49%)	1 (1.92%)	3 (11.11%)	2 (14.29%)
Widowed	1 (0.63%)	–	–	–	1 (7.14%)

Table continued on page 307

TABLE 2 *(continued from page 306).* **Demographics for BC Cancer.**

	All	Radiation oncologist	Medical oncologist	General practitioner in oncology	Other
Children					
Age < 6 years	39 (24.38%)	19 (28.36%)	15 (28.85%)	2 (7.41%)	3 (21.43%)
Age 6–18 years	75 (46.88%)	32 (47.76%)	25 (48.08%)	10 (37.04%)	8 (57.14%)
Age > 18 years	41 (25.63%)	16 (23.88%)	8 (15.38%)	14 (51.85%)	3 (21.43%)
No children	28 (17.50%)	11 (16.42%)	11 (21.15%)	3 (11.11%)	3 (21.43%)
Full-time equivalent (FTE)					
Part-time	49 (30.63%)	13 (19.40%)	16 (30.77%)	13 (48.15%)	7 (50.00%)
Full-time	111 (69.38%)	54 (80.60%)	36 (69.23%)	14 (51.85%)	7 (50.00%)
FTE distribution					
Mostly clinical	123 (76.88%)	58 (86.57%)	28 (53.85%)	26 (96.30%)	11 (78.57%)
Clinical and administrative 20%–50%	20 (12.50%)	5 (7.46%)	12 (23.08%)	1 (3.70%)	2 (14.29%)
Clinical and administrative > 50%	7 (4.38%)	2 (2.99%)	5 (9.62%)	–	–
Clinical and research 20%–50%	7 (4.38%)	2 (2.99%)	4 (7.69%)	–	1 (7.14%)
Clinical and research > 50%	3 (1.88%)	–	3 (5.77%)	–	–
Nonworking lunch or other break during the day					
Daily	5 (3.13%)	1 (1.49%)	1 (1.92%)	1 (3.70%)	2 (14.29%)
Regularly: a few breaks per week	14 (8.75%)	5 (7.46%)	5 (9.62%)	3 (11.11%)	1 (7.14%)
Occasionally: once a week	18 (11.25%)	6 (8.96%)	7 (13.46%)	1 (3.70%)	4 (28.57%)
Rarely: once in a few weeks	33 (20.63%)	14 (20.90%)	10 (19.23%)	7 (25.93%)	2 (14.29%)
Almost never	90 (56.25%)	41 (61.19%)	29 (55.77%)	15 (55.56%)	5 (35.71%)
Exercise					
Daily	37 (23.13%)	12 (17.91%)	13 (25.00%)	7 (25.93%)	5 (35.71%)
Regularly: a few times a week	61 (38.13%)	25 (37.31%)	22 (42.31%)	10 (37.04%)	4 (28.57%)
Occasionally: once a week	31 (19.38%)	13 (19.40%)	7 (13.46%)	9 (33.33%)	2 (14.29%)
Rarely: once in a few weeks	13 (8.13%)	5 (7.46%)	5 (9.62%)	–	3 (21.43%)
Almost never	18 (11.25%)	12 (17.91%)	5 (9.62%)	1 (3.70%)	–

that were not significant or were no longer significant when controlling for the other variables of interest. Chi-square tests of association were conducted to determine if there were any relationships between the provinces and the distribution of responses to each question. All analyses were conducted using SAS software (version 9; SAS Institute, Cary, NC).

Results

In total, 337 physicians across Canada completed the questionnaire. In BC, 160 of 258 (62%) BC Cancer oncology physicians completed the questionnaire. Seventy-seven percent (67/87) of radiation oncologists, 45% (52/116) of medical oncologists, and 49% (27/55) of general practitioners in oncology completed it; 14 other specialists affiliated with BC Cancer who completed the questionnaire were excluded from the analysis. The demographics are provided in **Table 2**. In total, 241 of 333 (72%) radiation oncologists in the Canadian Association of Radiation Oncology completed the questionnaire, including 67 in BC, 24 in Alberta, 11 in Manitoba, 10 in Saskatchewan, 61 in Ontario, 53 in Quebec, 9 in Nova Scotia, and 6 in New Brunswick.

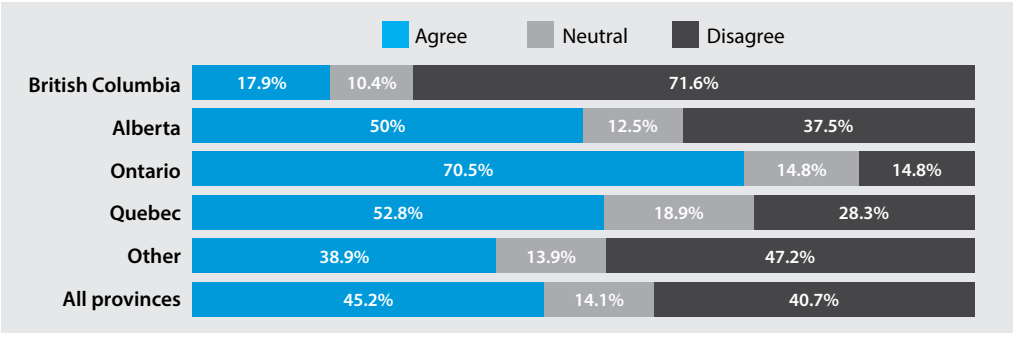

FIGURE 1. **We have an adequate number of radiation oncologists to meet the workload demand.**
Chi-square test for radiation oncologists, $P < .0001$

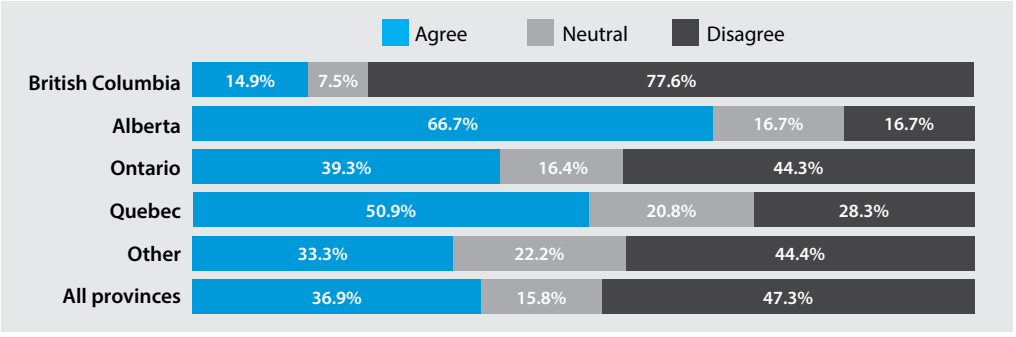

FIGURE 2. **I have enough time to complete all necessary documentation.**
Chi-square test for radiation oncologists, $P < .0001$

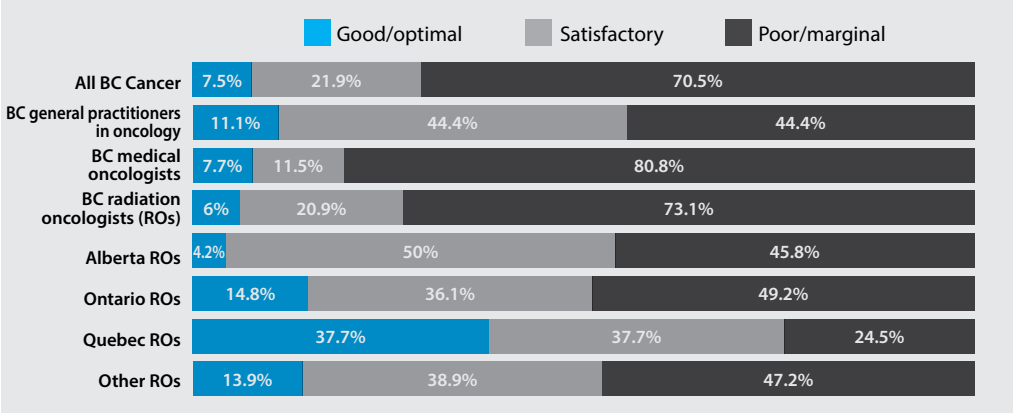

FIGURE 3. **The degree to which my workload is…**
Chi-square test for radiation oncologists, $P < .0001$

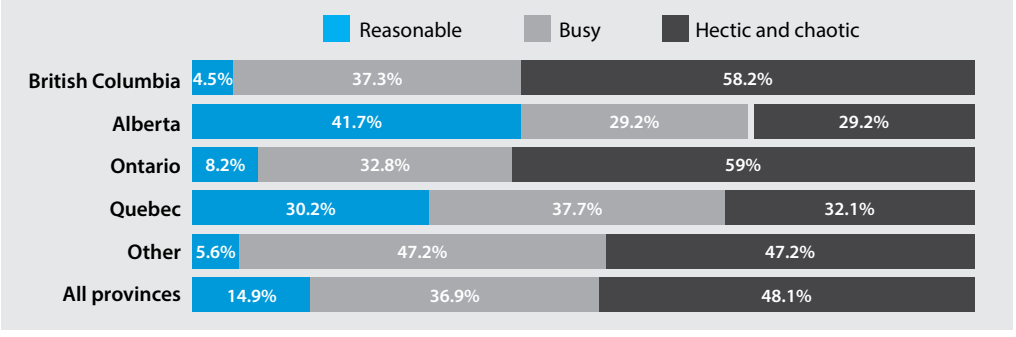

FIGURE 4. **Which best describes the atmosphere in your primary work area?**
Chi-square test for radiation oncologists, $P < .0001$

Work engagement

Work engagement of BC oncology physicians was directly compared with that of radiation oncologists across the country: 71.6% of BC Cancer physicians versus 33.7% of radiation oncologists from other provinces felt that there were not enough physicians to meet workload demands **[Figure 1]**. BC Cancer oncologists also reported that they did not have enough time to complete necessary clinical documentation **[Figure 2]**, their workplace efficiency was poor **[Figure 3]**, and their work atmosphere was mostly hectic and chaotic **[Figure 4]**; these results were significantly different from those for radiation oncologists across the country (all $P < .0001$).

Fewer oncologists in BC than in other Canadian provinces, except for Alberta and Ontario, felt they had input into administrative policies **[Figure 5]**. Fewer oncologists in BC also had a sense of control over their work environment compared with those in other provinces **[Figure 6]**. When asked if it is possible to provide high-quality care for all patients, only 27% of BC medical oncologists agreed and 52% of BC, 63% of Alberta, 54% of Ontario, and 93% of Quebec radiation oncologists agreed **[Figure 7]**. The difference between groups was statically significant (all $P < .0002$).

Only 3% of core BC Cancer physicians had the time to eat lunch at work every day, while more than 80% "almost never" or "once in a few weeks" had the time for lunch **[Table 2]**. Moreover, 70% reported poor work–life balance, which was similar across the country **[Figure 8]** ($P = .23$); 46% and 40% of BC Cancer oncologists reported spending an additional 5 to 10 hours or more than 10 hours, respectively, working outside of paid work hours. Additionally, 51% of BC Cancer physicians had considered leaving BC, and 56% considered a reduction in FTE compared with 40% and 51% nationally.

BC Cancer physicians scored higher than radiation oncologists in other provinces in terms of having a supportive network of colleagues ($P = .03$) **[Figure 9]**. Similarly, a high proportion of all BC Cancer physicians (94%) reported that they were willing to "try something new." The study participants most commonly cited four changes that were perceived to improve their work environment: more support staff

at work (nurses, medical office assistants, radiation therapists), more efficient care models, more resources available for patients (e.g., timely imaging, more radiation therapy and medical physicist human resources), and lighter workload.

Burnout

Burnout rates of BC oncology physicians were directly compared with those of radiation oncologists across the country. BC reported the lowest engagement and highest burnout among oncologists compared with radiation oncologists

BC Cancer physicians scored higher than radiation oncologists in other provinces in terms of having a supportive network of colleagues.

in other provinces **[Figure 10]**. The Maslach Burnout Inventory showed that only 12% of BC Cancer radiation oncologists and 23% of BC Cancer medical oncologists felt fully engaged in the workplace; 15% and 17%, respectively, felt cynical; 22% and 11%, respectively, were exhausted; and 29% (both BC Cancer medical oncologists and radiation oncologists) felt low professional accomplishment. Most notably, 22% and 19%, respectively, reported the full burnout syndrome (exhaustion, cynicism, and low accomplishment). In order to compare our results with those of other studies, we contrasted burnout as reported by other studies[6,11-13] with physicians who were "overextended/disengaged"[14] (high scores in the domains of exhaustion and/or cynicism); 59% of BC Cancer radiation oncologists and 47% of BC Cancer medical oncologists met the definition of "overextended/disengaged," reported as "burned out" in other reports. General practitioners in oncology were the most engaged (50%) of all physician groups. None had the full burnout syndrome, but 19% were exhausted.

Overall, 88% of BC Cancer radiation oncologists, 77% of medical oncologists, and 41% of the general practitioners in oncology had

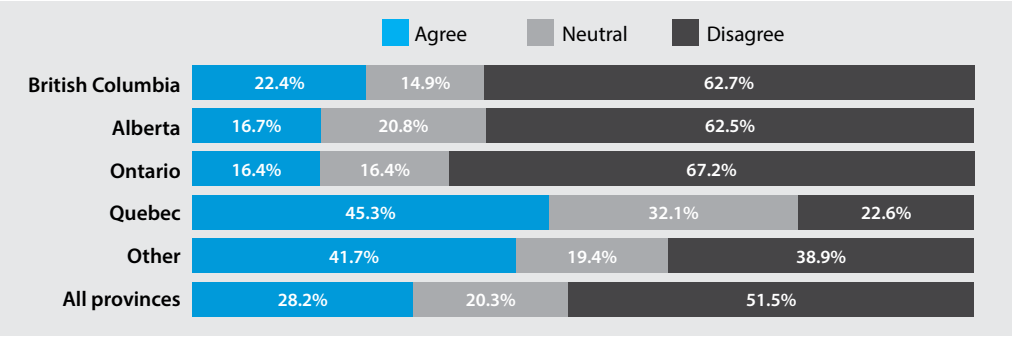

FIGURE 5. I have input into administration policies that affect my work as a physician and the health care needs of my patients.
Chi-square test for radiation oncologists, $P < .0001$

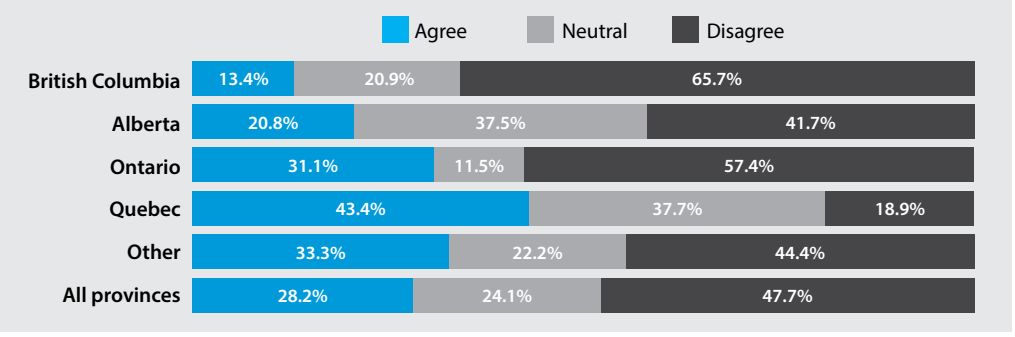

FIGURE 6. I feel that I am in control of my environment as it relates to patient care.
Chi-square test for radiation oncologists, $P < .0002$

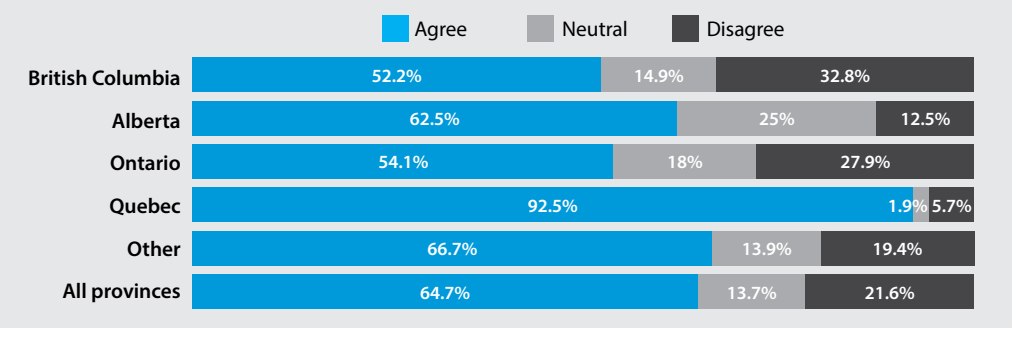

FIGURE 7. It is possible to provide high-quality care to all of my patients.
Chi-square test for radiation oncologists, $P < .0001$

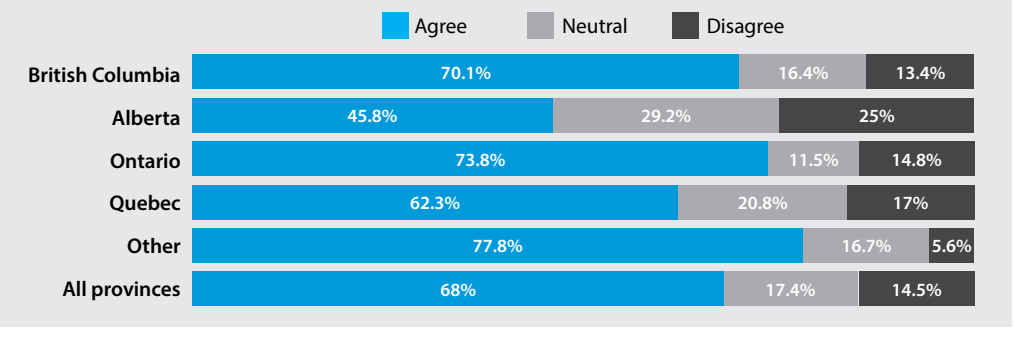

FIGURE 8. I have so much work to do on the job that it takes me away from my personal interests.
Chi-square test for radiation oncologists, $P < .2349$

negative scores in at least one of the three burnout domains. Based on multivariate analysis, answering "yes" to either of the questions "Have you considered leaving your institution to work elsewhere?" and "Have you considered reducing your FTE?" were the only predictive factors for burnout **[Table 1]**.

Discussion

The term "burnout" describes a fundamental disconnect between the worker and workplace. Engagement and burnout are the opposite ends of a relationship that one has with their work environment. Engaged physicians have vigor and dedication and are absorbed in their work. Burned-out physicians have depleted energy and exhaustion, increased mental distance from their job, feelings of negativism or cynicism, and reduced professional efficacy. Physician burnout puts organizations at a risk of increased medical error, staff turnover, higher costs, and lower quality of care and patient satisfaction. Physicians are at risk of loss of professionalism, shortened life expectancy, cardiovascular disease, chronic fatigue, cognitive dysfunction, personal life disruption, and mental health issues such as substance use disorder, depression, and suicide.[15-21] It is estimated that 30% to 50% of practising physicians suffer from burnout.[20,22] Burnout is primarily a system-level problem driven by excess job demands and inadequate resources and support, rather than an individual-level problem triggered by personal limitations and lack of resilience.[18,23,24] A recent study noted that physicians are more resilient than the general US workforce, yet 30% of physicians in the top resilience category are burned out.[25]

"Burnout" has become a popular umbrella term for whatever distresses people in their work.[26] Recently published studies consider each of the three dimensions of the Maslach Burnout Inventory as "symptoms" of burnout (high scores in the domains of exhaustion or cynicism). This implies that a negative score for any of these symptoms constitutes burnout and implicitly proposes a new definition of burnout.[6,11-13] While negative scores in any of the Maslach Burnout Inventory domains points to a challenging relationship with a workplace, this cannot be considered as a burnout syndrome.[8,26]

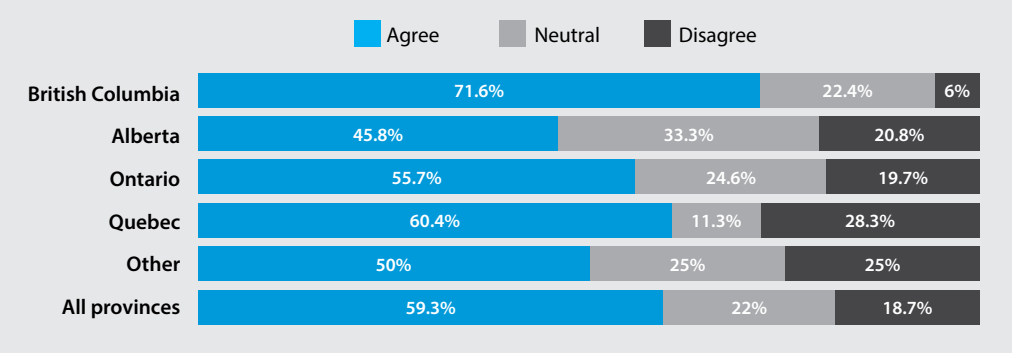

FIGURE 9. I am a member of a supportive network of colleagues.
Chi-square test for radiation oncologists, $P < .0312$

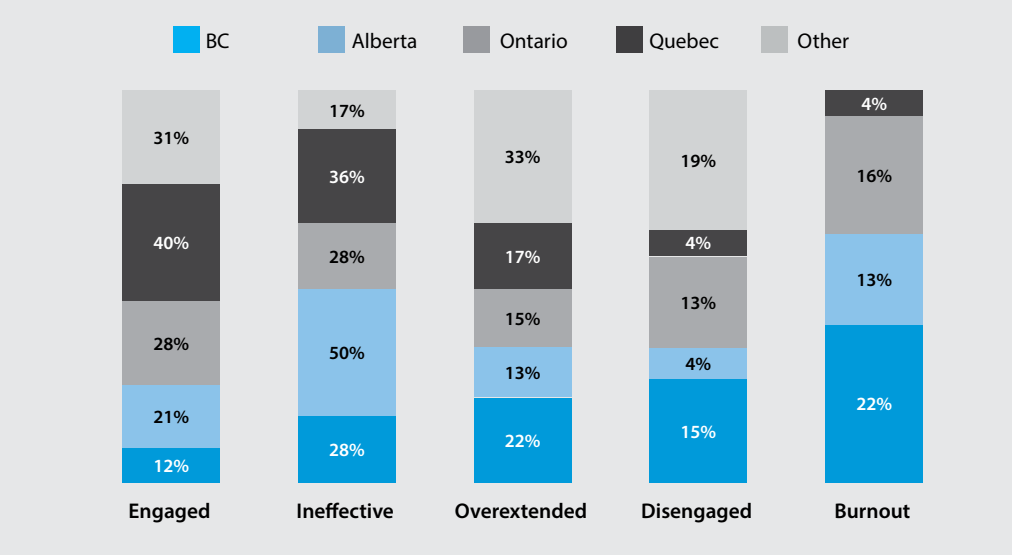

FIGURE 10. Engagement burnout among radiation oncologists across Canada.

For example, exhaustion alone is a much more straightforward problem to address because it primarily requires improving the balance of demands (e.g., caseload, paperwork, administration) with resources at work or outside of work (e.g., opportunities for rest and recovery). In contrast, addressing burnout also requires contending with cynicism and inefficacy, both of which reduce one's openness to interventions. Burned-out physicians have negative scores in all three domains and may need professional help to reintegrate into the workplace.[27]

Approximately half of BC Cancer oncologists met the definition of overextended/disengaged. Using the same overextended/disengaged profile, Shanafelt and colleagues reported that 45% of US oncologists surveyed between October 2012 and March 2013 (n = 1490) were burned out.[5] Furthermore, 73% of 362 oncologists (medical oncologists, radiation oncologists, surgical oncologists, and hematologists) in Ontario who were surveyed in 2019 were burned out; 78% of them felt that the health care system did not enable them to work to the best of their ability.[13] Significant drivers of burnout in that study included a hectic or chaotic atmosphere, feeling underappreciated, having poor or marginal control over workload, and not being comfortable speaking with peers about workplace stress. The study included a large number of surgical oncologists and did not explicitly provide separate data for the 68 radiation oncologists and the 97 medical oncologists who were surveyed. In addition, the

study used a different definition of burnout, which precludes direct comparison with the BC study.

Compared with radiation oncologists working in other provinces, BC Cancer oncologists had the highest levels of disengagement and burnout in the country (1 out of 5). BC Cancer oncologists reported serious issues with well-being, excessive workload, and work environment inefficiencies. Moreover, they had a negative perception of their professional autonomy, issues with access to resources, and decreased engagement, which resulted in a loss of confidence in their capacity to have a meaningful impact at work.

While pursuit of the triple aim in health care—improved population health, improved patient experience, and reduced per capita costs—is an established goal, a blueprint for the quadruple aim incorporates "improved well-being and engagement of clinicians and staff" as the fourth pillar of this vision.[28] Eight key work–life domains that directly contribute to this pillar are workload and efficiency, flexibility and control over work, reward, community and social support networks, fairness, alignment of individual and organizational values and organizational culture, work–life integration, and meaning at work.[19,29,30] The steps to achieving engagement are detailed in the Mayo Clinic's professional fulfillment model. The strategy requires the commitment of leadership to promote a "culture of wellness," changing the system to improve the "efficiency of practice," and supporting individuals as they build "personal resilience."[31,32] Epstein and Privitera advise reducing demands: "The approach to many well-meaning but overwhelming total expectations on clinicians, many that are in the name of patient safety, must be looked [at] through the lens of considering what is humanly possible to do without then paradoxically risking patient safety by creating conditions that increase risk of error and burnout."[31] In the recently published "Physician Well-being 2.0," Shanafelt outlines a 20-year summary of the physician occupational distress journey. He provides a clear professional, organizational, and individual path that is necessary to accelerate transformation of the system and medical culture.[33,34]

We live in a challenging time for health care systems. Even before the COVID-19 pandemic, health care leaders faced many external pressures, including financial demands, large capital expenditures, more frequent mergers and consolidations, implementation of new technologies and information systems, and application of quality metrics.[26,27] However, focusing attention on external factors only can blind the system to internal factors that threaten organizational health. It is important to note that our survey was conducted prior to the COVID-19 pandemic. The pandemic and recent implementation of a new electronic health record system in the BC Cancer – Vancouver centre have put additional pressures on staff. Physician burnout within an organization may be subtle and may go unnoticed for a period, only to surface as a challenge without a rapid or obvious resolution. Successfully navigating external and internal pressures requires conscious leadership partnered with fully engaged physicians.[20,21,23,32,34]

Physician burnout puts organizations at a risk of increased medical error, staff turnover, higher costs, and lower quality of care and patient satisfaction.

Study limitations and strengths

The limitations of this research include the survey methodology, which involved collecting data at a single point in time, and the risk of responder bias. The study's strengths include the use of a validated survey instrument for burnout, and the more than 50% response rate from BC Cancer physicians, despite their busy clinical schedules.

Summary

As a result of our survey, the BC Cancer Medical Dental Staff Association and Medical Staff Engagement Society have actively engaged with BC Cancer and Provincial Health Services Authority leadership in developing a wellness culture and strategy within the organization that focuses on improved staff well-being, improved models of care, and more efficient workflows, and on addressing staff shortages. Our survey was intended to illuminate the state of burnout in late 2019 and early 2020, inform dialogue between physicians and administration, and serve as a catalyst for co-developing strategies. The Ontario Medical Association Burnout Task Force 2021 suggests that top system-level solutions for reducing burnout in medical staff should include (1) reduced documentation and administrative work, (2) fair and equitable compensation, (3) increased work–life balance by making organizational policy changes, (4) seamless integration of digital health tools into physicians' workflows, and (5) institutional supports for physician wellness.[13] Organizations that ignore or underestimate the potential impact of staff well-being do so at their detriment.[19,20,23,28] Efforts to address physician burnout at BC Cancer would bring opportunities to improve the quality, safety, and efficiency of care, and enhance patient experience. ■

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Competing interests

None declared.

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Gender-affirming care for youth—separating evidence from controversy

A summary of available evidence in favor of providing gender-affirming care. Part 1 looks at the evidence for our current model of gender-affirming care, and Part 2 covers specific interventions and outcomes.

Julie Leising, MD, FRCPC

Correction: This article has been revised. The author provided a new citation from Turban[22] postpublication, which provides a chronological summary of the research on gender-affirming medical care and mental health outcomes. The author apologizes for the oversight; the Turban article was used as part of the search to identify relevant primary literature. (March 2023)

Part 1: Gender-affirming care: Model and evidence

Understanding the needs of transgender and gender-nonconforming (TGNC) youth begins with an understanding of transgender identities. *Transgender* describes a multitude of ways of living, expressing, and experiencing one's gender outside of the binary Eurocentric model of "man" and "woman." While a history of transgender youth is beyond the scope of this article, it is important to note that within medicine there is a long-standing history of using colonial and racialized ideas that privilege normative forms of gender to pathologize TGNC youth, leading to harmful interventions, including conversion therapy.[1]

Transition for TGNC youth and adults is often considered in three domains: medical, social, and legal. Medical care in BC is delivered according to the World Professional Association for Transgender Health (WPATH) *Standards of Care Version 7* (SOC 7). *Standards of Care Version 8* is being developed using an evidence-based approach and is set to be released this year.[2] This is in contrast to the SOC 7, published in 2012, which was "based on the best available science and expert professional consensus."[3]

When discussing evidence for the SOC 7 in her Letter to the Editor,[4] Dr Joanne Sinai referenced a systematic review by Dahlen and colleagues[5] evaluating the quality of evidence of clinical practice guidelines for the care of TGNC people. The quote she included from this review was not a critique of the quality of the SOC 7 as her letter implies, but a comment that it may not have been intended as a clinical practice guideline as defined in the review and thus was difficult to analyze as per their protocol. The review concluded that "WPATH SOCv7 is due for updating and this study should be used positively to accelerate improvement."[5]

Since the development of the SOC 7, there have been 16 quantitative studies[6-21] published to date about TGNC youth care and outcomes, summarized by Turban,[22] which, taken together, include thousands of participants. Early studies in 2011–2014 were often criticized due to small sample size and high risk of bias, though as the literature has expanded, so too has the strength of the evidence. These studies have shown statistically significant associations

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This article has been peer reviewed.

between gender-affirming care and increased general functioning[6,7] and well-being,[9] as well as decreased body dissatisfaction,[14,15] anxiety,[10,11,14,17] depression,[6,10,11,13,14,17,19,21] and suicidality.[9,10,15,19-21] A Canadian perspective is highlighted in the works of Pullen Sansfaçon and colleagues,[23] with youth reporting an improvement in well-being, mental health, happiness, and school functioning since accessing gender-affirming care. Furthermore, adults who accessed gender-affirming care in adolescence have been found to have significantly lower rates of depression and suicidality than those who did not access it until adulthood.[20] No randomized controlled trials have been performed to date as the current evidence indicates a risk of adverse mental health outcomes when gender-affirming care is denied, and thus randomizing youth into a control group would go against the ethical principle of equipoise.[22]

When considering gender-affirming care, it is important to note that the SOC 7 advises a thorough assessment of a youth's gender identity, developmental history, supports, and comorbid mental health. Dr Sinai cited a *Washington Post* article[24] by psychologists Drs Laura Edwards-Leeper and Erica Anderson who expressed concern that youth are receiving gender-affirming medical interventions without adequate assessment or provision of informed consent. They raise concerns that medical providers are "affirming" patients by prescribing puberty blockers or hormones as a panacea for all mental health issues. In their recent Letter to the Editor,[25] Drs Sinai and Leonora Regenstreif further state that affirming care excludes treatment of underlying psychiatric conditions. This is not the approach advocated by the SOC 7 or in BC's gender-affirming care model, with the SOC 7 explicitly stating, "before any physical interventions are considered for adolescents, extensive exploration of psychological, family, and social issues should be undertaken."[3] The SOC 7 requires that co-existing medical, psychological, or social problems are addressed and stabilized prior to accessing medical interventions. Affirmation is not a one-size-fits-all model, and all interventions should be carefully considered in the context of a youth's physical, psychological, and social milieu as advocated for in our current treatment guidelines.

Part 2: Gender-affirming care: Interventions and outcomes

The outcomes of gender-affirming medical interventions are not determined solely by the physiologic effects of treatments but are also influenced by a youth's developmental stage and social milieu, including parental support. Multiple studies indicate that parental support is one of the most significant protective factors for TGNC youth,[26-29] with qualitative studies showing that emotional support such as parental acceptance of identity and instrumental support such as access to medical, social, and legal interventions for affirmation are particularly important.[30,31] Drs Sinai and Regenstreif write, "If parents who support their child's gender dysphoria but question medicalization are deemed 'unsupportive,' distressed youth can become alienated from their families."[25] I am unsure as to what support of a child's dysphoria would entail; however, qualitative studies highlight that if parental support lacks acceptance of a child's identity, this may lead youth to distance themselves from parents and contribute to alienation.[30]

When considering gender-affirming care, it is important to note that the SOC 7 advises a thorough assessment of a youth's gender identity, developmental history, supports, and comorbid mental health.

Drs Sinai and Regenstreif's letter cites statistics regarding desistance. In doing so, however, they fail to differentiate between children and adolescents. This is of crucial importance as medical interventions are not offered prior to the onset of puberty. Studies of gender-diverse children have shown that the majority will "desist" and will identify as cisgender in adulthood,[32] though the methodology and relevancy of these studies has been questioned.[33,34] This research is taken into account in the SOC 7, which suggests that children can further explore their identity through social transition and that psychotherapy may be used to target a reduction in distress and dysphoria. Ages 10–13 are considered a key time for consolidation of gender identity.[35] After this, only 1.9% to 3.5% of youth receiving gender-affirming medications at specialized gender clinics discontinue treatment.[36] Furthermore, studies have found that adults who stop treatment often do so for reasons related to social discrimination and not a change in identity and that, for those reporting a change in identity, some do not express regret for their earlier transition.[37-39] Though Drs Sinai and Regenstreif discuss "increasing numbers of detransitioners," the citation they provided is a study by Littman[40] that surveyed patients who detransitioned to assess reasons for this decision. This study did not measure numbers, rates, or prevalence of detransition.

Gender-affirming medical care for adolescents includes fully reversible interventions such as puberty blockers, partially reversible interventions including hormone therapy, and irreversible surgical interventions. The main adverse effects of puberty blocking medications are decreased bone mineral density and decreased growth velocity.[41] Though their safety and efficacy have been well established in the treatment of precocious puberty, the long-term effect in treatment of gender dysphoria remains an area of active study, including possible effects on future fertility. As these medications do impact gonadal growth, their use may impact bottom surgery outcomes in the future for patients desiring vaginoplasty. This risk is listed on the Trans Care BC website for puberty blockers[42] and should be included in informed consent discussions, though alternative surgical techniques using intestinal tissue may have similar outcomes.[43] Drs Sinai and Regenstreif state that "these treatments are known to cause permanent damage to sex organs and future sexual and reproductive capacity."[25] They do not provide a citation to support this, and the only source I could identify for this claim was an opinion expressed by Dr Marci Bowers, which Dr Sinai mentioned in her first letter.[44] Conversely, early studies have shown improved sexual functioning and ability to achieve orgasm

after both hormonal[45] and surgical[46,47] interventions, though this is an area of ongoing research.

Dr Sinai referred to "gender exploratory therapy" as an alternative to affirmation. I was unable to find any definition of what "gender exploratory therapy" entails, or any evidence that this approach benefits TGNC youth.

Dr Sinai also expressed concern that therapists may be dissuaded from treating people with gender dysphoria, as "gender exploratory therapy" may be misconstrued as conversion therapy. Bill C-4, an Act to amend the Criminal Code to prohibit conversion therapy, defined conversion therapy as "a practice, treatment or service designed to: change a person's sexual orientation to heterosexual; change a person's gender identity to cisgender; change a person's gender expression so that it conforms to the sex assigned to the person at birth; repress or reduce non-heterosexual attraction or sexual behaviour; repress a person's non-cisgender identity; or repress or reduce a person's gender expression that does not conform to the sex assigned to the person at birth."[48] It also explicitly states that "conversion therapy does not include a practice, treatment or service that relates to the exploration or development of an integrated personal identity—such as a practice, treatment or service that relates to a person's gender transition—and that is not based on an assumption that a particular sexual orientation, gender identity or gender expression is to be preferred over another."[48] If a therapeutic approach cannot be clearly distinguished from conversion therapy as defined in the Criminal Code, it seems doubtful that this would be a beneficial or even nonmaleficent intervention to offer our patients. ■

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It's time to catch up on routine immunizations

Vaccination is widely credited to Edward Jenner; the familiar tale of using fluid from a milkmaid's cowpox blister to induce a boy's immunity against smallpox marked the onset of an era of undeniable success against childhood enemies such as polio, diphtheria, pertussis, and measles. This resounding public health success has in some ways contributed to paradoxical complacency about vaccine-preventable diseases and vaccine hesitancy, as many young parents have no historical memory of the diseases that were real dangers to previous generations. In fact, only 69% of 7-year-olds in BC were up-to-date with routine immunizations in 2019 and 2020.[1]

COVID-19 has resulted in further decreases in immunization rates. This decline is particularly problematic in school-age children, youth, and adults. There are multiple causes, including reduction of in-person physician office visits, physical-distancing measures, reassignment of public health nurses, delays and changes in vaccine distribution, deferral of vaccines administered in the school setting, and public perception that routine immunizations are less important during a pandemic.

In 2019, the human papillomavirus immunization rate in grade 6 girls in BC was 66.1%; this rate dropped to 28.1% in 2020. The rates were similar for grade 6 boys. Hepatitis B immunization coverage dropped below 90% provincially in 2020 for the first time in 7 years. In contrast, grade 9 pertussis immunization rates were unchanged in 2020 because the booster dose was administered early in the school year.[1] Alberta saw a 5% drop in measles immunization rates persisting into 2021.[2] Worldwide, UNICEF estimates that 23 million children missed routine vaccines in 2020 and 17 million probably did not receive even one immunization.[3] As a consequence, we are at risk of pertussis, measles, and polio outbreaks.

The current crisis in primary care with accompanying lack of access to preventive care has the potential to exacerbate decreasing immunization rates. Patients' most trusted source of immunization information is their physician. Without a primary care provider who has the opportunity to identify gaps, counsel, and recommend non–publicly funded vaccines, our patients may not have optimal vaccine health.

To close the gaps in vaccine coverage and optimize population vaccine health, effective strategizing requires recognition of the difference between lack of vaccine access and lack of uptake.

Additionally, Indigenous people, including First Nations, Inuit, and Métis, are at an even higher risk of reduced immunization rates and vaccine-preventable diseases due to vaccine hesitancy, a direct result of colonization and mistrust in a historical system that inflicted medical experimentation, abuse, and exclusion. Social and economic disparity and lack of access to primary care have also led to inequitable access and compounded trust issues.

When vaccinations are delayed, there is a lessened likelihood of subsequent catch-up. A multipronged approach to immunization catch-up in children, youth, and adults is required:

- Active measures by public health and health authorities to communicate with the public and expansion of immunization clinic hours and locations.
- Public service messaging in mainstream media and on social media.
- A uniform provincial vaccine registry that can be easily accessed and downloaded by physician office EMRs, health authority and hospital EMRs, and residential care facilities.
- Continued striving to decolonize medical care and restore the trust of Indigenous people in the medical system using culturally safe resources (e.g., https://boldly.cma.ca/blog/knowledge-is-medicine-indigenous-health-care-experts-tackle-community-covid-19-vaccine-hesitancy-2).
- Investment in the development of EMRs with smart technology to highlight vaccine opportunities in special populations.
- A national vaccine registry.
- Physicians asking and advising at routine medical appointments.
- Practice support, including support for team-based care, so that family practice clinics can provide additional clinic hours and appointments for immunizations alone.
- Increased capacity for pharmacists to administer vaccines.

To close the gaps in vaccine coverage and optimize population vaccine health, effective strategizing requires recognition of the difference between lack of vaccine access and lack of uptake. Since vaccines were first developed, vaccine hesitancy and disparity have existed alongside them. Against a background of inequalities in the distribution of material goods, we have economic and social inequalities, mistrust, and a sense of personal autonomy—all factors that

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This article is the opinion of the authors and not necessarily the Council on Health Promotion or Doctors of BC. This article has not been peer reviewed by the BCMJ *Editorial Board.*

Nutrition screening and primary care: Identifying malnutrition early in seniors

British Columbia's population is rapidly aging: the number of adults in BC who are 65 years of age or older exceeded 1 million for the first time in 2021, and those who are over 85 years of age make up the fastest-growing age group in Canada.[1] These demographic trends will create additional pressures on the health care system due to increased demands for care among the aging population. To reduce the burden on BC's health care system, it will be important to consider strategies and practices that can help older adults live healthily and independently.

Malnutrition is a common yet often overlooked health issue among older adults. It is defined by the Canadian Malnutrition Task Force as "both the deficiency and excess of energy, protein, and other nutrients."[2] One-third of Canadians 65 years of age or older are at risk for malnutrition.[3] The impact of malnutrition on older adults is well documented, including reduced quality of life, increased hospitalizations, and higher risk of mortality.[3] Malnutrition also contributes to complex health concerns, with malnourished older adults experiencing delayed wound healing, impaired functional status, weakened immune function, and increased risk of frailty and falls.[4,5] Malnourished older adults are, therefore, less likely to retain the ability to live independently and have a significantly increased risk of acute hospitalization.[3,4]

The health consequences of malnutrition among older adults also impose considerable costs on the health care system. A 2017 study of adults admitted to Canadian hospitals found patients who were malnourished experienced 18% longer stays and 31% to 34% higher costs compared with those who were well nourished.[6] On average, malnourished surgical patients incurred $2851 more in hospital costs than well-nourished patients and were nearly twice as likely to experience hospital readmission within 15 days.[6] Implementation of nutrition programs can result in considerable savings to the health care system. In one home health setting, the implementation of a multisite nutrition-focused quality improvement program resulted in a reduction in the need for patients to seek health care services such that savings amounted to $1500 per patient or $2.3 million over a 90-day period.[7] Small investments can return substantial cost savings; for every $1 spent on dietitian-led nutrition interventions, the health care system can save $5 to $99 through reductions in costs associated with hospitalizations, medications, and physician time.[8]

Malnutrition is a common yet often overlooked health issue among older adults.

Nutrition screening, which can identify patients at risk of malnutrition, helps to prioritize resources, improve referral processes for dietitians and community services, and assist care providers in targeting interventions for specific nutritional needs.[9,10] Nutrition screening tools for older adults that are valid, reliable, and simple to conduct are available, such as Seniors in the Community: Risk Evaluation for Eating and Nutrition and the Mini Nutritional Assessment.[11] Although nutrition screening for older adults is often done in acute care settings, a preventive approach that addresses the underlying causes of malnutrition requires earlier discovery and intervention in the community.[12] Family physicians and other community-based primary care practitioners may be well positioned to offer preventive nutrition screening and care.[12] Successful implementation of nutrition screening will need to address current challenges in primary care, such as time constraints and varying access to dietitians across BC. Primary care providers can advance nutrition for older adults by incorporating nutrition screening into regular care practice, collaborating with allied health care professionals such as dietitians, and mobilizing conversations and actions that raise awareness and build capacity for older adult nutrition screening. ■

—Sarah Dunn, MPH Practicum Student

—Rola Zahr, MPH, RD

—Geoffrey McKee, MD, MPH

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

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must inform our public health strategies and individual practices to achieve optimal health for all. Capitalizing on the increased vaccine literacy created by the COVID-19 pandemic is an opportunity that must be seized. ■

—Jennifer Balfour, MD, FRCPC

—Aven Poynter, MD, FRCPC
Members, Council on Health Promotion

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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. 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 William ("Bill") Henry Dealtry Fairbank

1924–2022

Dealtry Fairbank was born in England on 6 May 1924. *Bill* Fairbank died on 25 February 2022 from a cerebral hemorrhage. In 1937, Bill's father asked him what he wanted for his 13th birthday. He didn't like the name Dealtry—it was difficult to pronounce and spell—so he asked to be known as Henry. His father didn't like that moniker, so they compromised, and he became known as Bill.

It is impossible to conceive how this modest, soft-spoken, under-the-radar individual could achieve what he did in a mere 97 years. Perhaps the most appropriate explanation is that he lived a life of service.

Bill was educated at Oxford University and St. Bartholomew's Hospital in London. He met his wife, Pamela, at Oxford in 1943 playing quartets. Following his medical training, and at the end of the war, he served as a medical officer with the Royal Air Force in occupied Germany and Austria.

Before immigrating to Canada in 1952, he completed postgraduate obstetric studies in Dublin. He was one of the first interns to train at Royal Columbian Hospital in 1953. At Bill's suggestion, Pamela immigrated to Canada in 1954, and they were married in 1955. They raised four children and had six grandchildren. Pamela died in 2016 after 60 years of marriage.

From 1953 (for 4 decades), Bill provided exemplary cradle-to-grave medical care to his patients. During that time, he was an active staff member of St. Mary's, Royal Columbian, and Eagle Ridge Hospitals. He was involved with intern selection and training and served as chief of general practice at Royal Columbian Hospital and as president of the Westminster Medical Association. He also served on the Medical Advisory Committee of both Royal Columbian and St. Mary's Hospitals.

Despite Bill's tendency to keep his light under a bushel, he was recognized for his dedication to his patients, his community, and the medical profession and received numerous awards from Big Brothers of Greater Vancouver, the Canadian Red Cross Society, the Westminster Medical Association, Simon Fraser Health Region, and the Canadian Medical Association, including the C.J. Coady Memorial Medal and the Governor General's Caring Canadian Award.

Once his children were pursuing university and careers, he became a Big Brother and mentored five Little Brothers over 18 years, including outdoor activities such as hiking, camping, canoeing, and sailing.

For 25 years he was involved in Camp Artaban and volunteered 1 to 2 weeks each summer as a lifeguard, boating and swimming instructor, waterfront director, out-tripping director, and, on occasion, camp director.

Bill was an accomplished cellist and singer, participating in groups such as the New Westminster Civic Orchestra, Vancouver Philharmonic Orchestra, and Elgar Strings over the years, and he could always be called upon to form a trio, quartet, quintet, or larger group. He sang in church choirs from about age 9, including St. Mary's Sapperton, Holy Trinity Cathedral, St. John's Shaughnessy, and St. John's Vancouver. He was also a member of the Bach Choir in England and the Handel Society of Music and Gloria Dei Chorale in the Vancouver area.

In 2005 he joined the Brock House Society seniors' centre, where he was involved in its orchestra, discussion groups, bridge, cycling, and hiking. He was still an active woodworker at age 97!

While still in medical practice, Bill participated in a number of short-term medical missions in Central and South America, including six in Honduras, two in the Dominican Republic, and one each in Ecuador, Belize, and Mexico.

After retiring in 1994, Bill volunteered for 10 years, 8 to 12 weeks at a time, at Hôpital Bon Samaritain, an American Baptist hospital in Limbé, Haiti. There he would triage daily several hundred patients, including emergencies, focusing on pediatrics. To improve communication for these journeys, he took Spanish courses and acquired a working fluency in Haitian Creole.

As a final note, Bill had a lifelong infatuation with William Shakespeare. He was one of the original members of the Shakespeare Society of Vancouver (founded 1993) and brought to it his passion for life and for the playwright. To quote the Bard, Bill, "may flights of angels sing thee to thy rest."

—Jack and Ruth Albrecht
Burnaby

—Angela, Nick, Martin, and Tim Fairbank

A long-form version of this obituary is available at www.bcmj.org.

Dr Lindsay McNiven Lawson
1946–2022

With deep sadness, the family of Dr Lindsay Lawson announces that she died on 9 June 2022 at her home in Victoria of myelofibrosis. She had been attended for several days beforehand by her three children, Andrew Lawson, Dr Mark Lawson, and Fiona Fiddick, as well as her husband, Dr David Lawson.

Lindsay was born in Greenock, Scotland, to George and Kathleen Hodge, who immigrated to Canada in 1947. She grew up in Victoria and graduated from Mount Douglas Secondary School (1964), earning her Bachelor of Science degree in honours zoology at the University of Victoria (1968) and her Master of Physiology degree (1970) and medical degree (1974) at McGill University, where she was awarded the Wood Gold Medal for the most outstanding clinical performance by a graduating medical student.

After a 3-year stint in New Jersey to accommodate her husband's academic journey, she completed her residency in internal medicine in 1979, followed by a 2-year postdoctoral research and clinical fellowship in respiratory medicine at St. Paul's Hospital, Vancouver. She was appointed as a clinical instructor in 1982 and by 1997 rose to the rank of clinical professor in the Department of Medicine at UBC. Lindsay was an outstanding teacher and received numerous awards, including the Fay Dirks Award for Excellence in Teaching. At least two of her former students were involved in her care during her final weeks.

Lindsay's special areas of interest included the pulmonary complications of HIV and the management of asthma. She was one of the original members of the AIDS care team at St. Paul's Hospital and saw virtually all the patients with HIV-related pulmonary complications through the 1980s and '90s, and in so doing provided clinical support for much of the early research of the BC Centre for Excellence in HIV/AIDS. She was a coauthor of several of its early scientific publications.

In addition to her busy clinical practice, Lindsay served as medical director of the Medical Short Stay Unit at St. Paul's Hospital (1994–2010). She was actively involved in several committees of the then-BCMA, served on the Editorial Board of the *BC Medical Journal* (1994–2011), and was an examiner for the Royal College of Physicians and Surgeons of Canada. Following her retirement from hospital practice after 33 years at St. Paul's Hospital, Lindsay continued her traveling clinics in Lillooet and Powell River for her final 3 years of clinical practice.

When asked to identify her greatest achievement on the *BCMJ*'s Proust Questionnaire, she said it was "raising three children to be family-oriented, loving, accomplished adults with the help of my husband" [2012;54:438]. This was especially important to her because of the general disapproval expressed at that time of women who chose to return to work following the birth of their children.

Lindsay was an exceptional person. As busy as she was at work, Lindsay always found time to support and encourage her children. She was also highly intelligent, possessed formidable analytical skills and an amazing memory, and had a strong work ethic. During her medical residency she would leave for work early Friday morning and return Monday evening, overnighting at the hospital's resident quarters. Entering medicine at a time when it was predominantly a male profession, Lindsay was an important role model for many young women.

When it came to treating her patients who had AIDS, Lindsay was compassionate, courageous, and nonjudgmental. Before the means of transmission was understood, she spoke to David about her having to accept risks of the unknown in order to treat her patients. Lindsay treated patients who were turned away from other hospitals, knowing that their likely diagnosis was a death sentence within 2 years, stayed in contact with them, and consoled those

Recently deceased physicians
April–July 2022

The following Doctors of BC members died between April and July 2022. Thank you to their families for sharing this information with the Membership Department. If you knew any of the deceased who have not yet had an obituary published in the *BCMJ*, please consider submitting a piece to journal@doctorsofbc.ca.

Dr Philip William Asplin
1 June 1945–2 May 2022
Obituary: www.campbellrivermirror.com/obituaries/dr-philip-william-asplin

Dr Edward John Booth
21 March 1942–21 July 2022

Dr Frederick Andrew Davis
3 August 1938–30 April 2022

Dr George William Keith Donaldson
20 March 1937–19 April 2022
Obituary: https://necrocanada.com/obituaries-2022/dr-george-william-keith-donaldson-march-20-1937-april-19-2022

Dr Carol Linda Jenken
7 July 1954–8 April 2022
Obituary: www.mccallgardens.com/obituaries/carol-linda-jenken

Dr Ruth Joy Simkin
18 March 1944–13 May 2022

Dr Ralph Shulman
21 January 1929–5 May 2022

Dr Jatinder Singh Sandhu
21 September 1964–1 May 2022

Dr Andrew Nicholas van der Westhuizen
15 February 1986–1 July 2022

Dr Joshua Raj Kotaro Yoneda
29 October 1994–16 May 2022
Obituary: www.legacy.com/ca/obituaries/kamloopsthisweek/name/joshua-yoneda-obituary?pid=202039506

doctors of bc

whose families had rejected them. The grief she experienced with every patient death was apparent even 35 years later when she related her experiences from that time.

Lindsay coped with her disease with fortitude and grace, not telling most friends and family about her condition until shortly before she died so they wouldn't worry about her. She never complained or shed a tear and expressed gratitude for every caring gesture made to keep her comfortable. Lindsay was a wonderful woman, wife, mother, and physician who will be missed terribly.

Lindsay's family expresses their deep appreciation to Dr Chelsey Lane, the BC Cancer Agency staff, and the palliative care team for their compassionate care. In lieu of flowers, donations in Lindsay's name can be made to Médecins Sans Frontières, whose brave work Lindsay always admired.

—David Lawson
Victoria

A long-form version of this obituary is published at www.bcmj.org.

Latest curated reading list: Planetary health

Awareness and assessment of social determinants of health are important to ensure high-quality patient care, but it can be daunting to find information sources to ground one's practice in evidence. The College Library has curated several reading lists to this end, with the newest list recognizing the importance of environmental and climate change on patient health and medical practice, collating resources focusing on planetary health.

In British Columbia, climate crises such as 2021's summer heat dome and catastrophic flooding in the fall have highlighted how rapid and unpredictable environmental change can directly affect patient health and well-being. The planetary health list includes current articles, guidelines, online and physical books from the College Library's collection, and high-quality websites encompassing topics such as heat-response planning, mental distress as a result of climate change, and changes in patterns of vector-borne disease.

In addition to resources supporting patient care, the planetary health reading list has information about sustainability in medical practice. Links to articles that discuss suggestions for environmental sustainability applicable to the family practice office, as well as sustainable surgical practices, may be found here.

To view this and other reading lists, such as race and health equity and trauma-informed care, visit www.cpsbc.ca/registrants/library/reading-lists. College registrants can also request more specific literature searches on planetary health–related topics, or on any other desired subject, via email to medlib@cpsbc.ca or the literature search web form at www.cpsbc.ca/registrants/library/make-request. ■

—Paula Osachoff
Librarian

This article is the opinion of the Library of the College of Physicians and Surgeons of BC and has not been peer reviewed by the BCMJ *Editorial Board.*

Are you covered? Physicians and WorkSafeBC insurance

Ninety-four percent of the employed population in BC is covered by WorkSafeBC—are you?

WorkSafeBC, also known as the Workers' Compensation Board of British Columbia, is a provincial agency dedicated to promoting safe and healthy workplaces across BC. WorkSafeBC partners with workers and employers to prevent work-related injury, disease, disability, and death. Its services include education, prevention, compensation, and support for injured workers, and no-fault insurance to protect employers and workers.

If you're a physician in BC, you may be required to register with WorkSafeBC.

You are required to register if:

- You employ workers (e.g., medical office assistants or clinic staff).
- You operate through an incorporated company. The incorporated company is generally considered to be the employer, and you, the physician, are considered the worker.

Benefits of registering

Registration as an employer ensures you are not subject to lawsuits from workers or other employers—if that were to happen, the costs could be significant. Also, if you are not registered and a worker is injured, you could be responsible for both the worker's WorkSafeBC claim costs and your unpaid premiums.

If you are a physician operating through an incorporated company, you will receive coverage for health care, wage loss, and rehabilitation benefits in the event of a work-related illness or injury. However, if the corporation is not registered at the time of injury, compensation will not be provided.

You do not have to apply to register if:

- You receive a T4 Statement of Remuneration Paid or a T4A Statement of Pension, Retirement, Annuity, and Other Income from a health authority.
- You provide your services to a health authority under a salary agreement (as described in the Physician Master Agreement).

In these cases, you are most likely a worker and receive worker coverage.

You can choose how much wage-loss coverage you purchase, up to a maximum that is adjusted each year.

You may apply for personal optional coverage if:

- You operate as an unincorporated individual (proprietor or partner). For example, you provide your services to a health authority as an independent contractor in your own name.

Personal Optional Protection (POP) is an optional insurance plan designed to cover income loss and medical costs should you suffer a work-related injury or disease. If you employ workers, you must register as an employer to cover any workers; however, POP coverage is optional.

Benefits of POP

POP coverage, once accepted, will pay health care, wage-loss, and rehabilitation benefits if you can't work as a result of a work-related injury or illness. In that event, WorkSafeBC generally pays wage-loss benefits based on 90% of net average earnings (the average amount remaining after probable deductions), up to the yearly maximum.

You can choose how much wage-loss coverage you purchase, up to a maximum that is adjusted each year. In 2022, for example, the minimum monthly coverage is $2500 and the maximum coverage you can purchase is equal to your current monthly earnings or $8333, whichever is less. POP coverage also protects you from lawsuits from injured workers or employers.

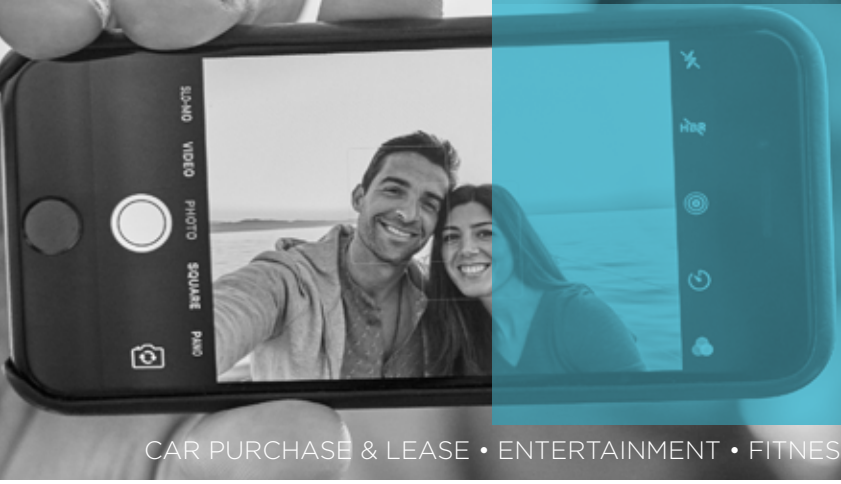
How to apply

WorkSafeBC offers physicians working in BC a streamlined process to determine whether they are required or eligible to register. To determine your status as a physician, please complete the physician registration application, which can be found by searching "1800PHPC" on www.worksafebc.com. Email completed forms to phpcreg@worksafebc.com.

For more information, review the recently released *Physician Guide to WorkSafeBC Registration and Insurance Coverage* on www.worksafebc.com, which was developed with Doctors of BC. ■

—Kimi Nomura Schwab
Research & Evaluation Analyst, WorkSafeBC

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



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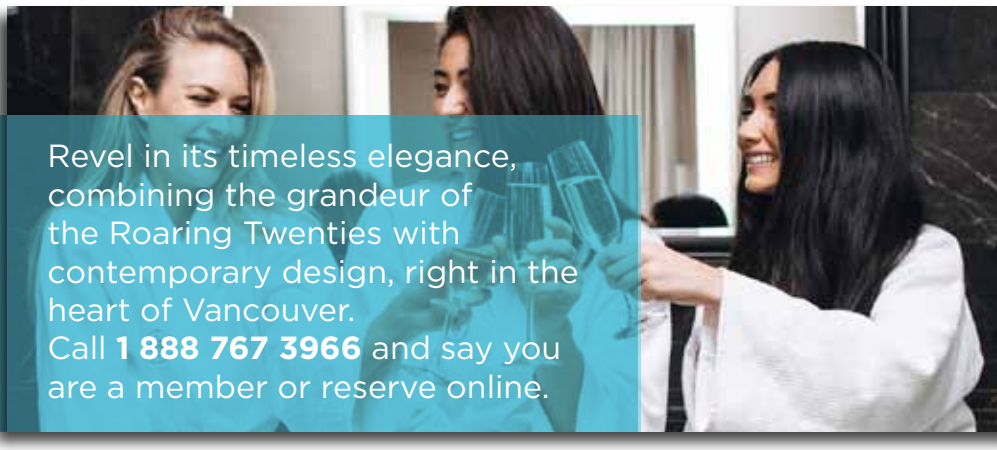

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CME calendar

Rates: $75 for up to 1000 characters (maximum) plus GST per month; there is no partial rate. If the course or event is over before an issue of the *BCMJ* comes out, there is no discount. **Deadlines:** ONLINE: Every Thursday (listings are posted every Friday). PRINT: The first of the month 1 month prior to the issue in which you want your notice to appear; e.g., 1 February for the March issue. The *BCMJ* is distributed by second-class mail in the second week of each month except January and August. **Planning your CME listing:** 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. Payment is accepted by Visa or Mastercard on our secure online payment site.

PSYCHOLOGICAL PPE, PEER SUPPORT BEYOND COVID-19

Online (every 2nd and 4th Wednesday)

In response to physician feedback, the Physician Health Program's drop-in online peer-support sessions, established in April 2020, are permanently scheduled for every second and fourth Wednesday at 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.physicianhealth.com/how-we-can-help/peer-support. Email peer support@physicianhealth.com for the link to join by phone or video.

BOTOX AND FILLER COURSE—ANATOMY AND UNIVERSITY-LEVEL TRAINING

Online/Tsawwassen (monthly)

Did you know that botulinum toxin is the #1 facial rejuvenation procedure? Are you interested in adding Botox and other injectable treatments to your practice? PTIFA has an integrative curriculum that will train you to successfully incorporate botulinum toxin treatment into your practice. Through our anatomy-based training and PTIFA's proven clinical protocols, your practice will benefit from increased practice revenue, improved patient care and loyalty, and a highly engaged team. Learn both the therapeutic (migraines/headaches) and the aesthetic (fine facial lines and wrinkles) applications. PTIFA offers anatomy-based training (20+ hours) and training recognized by the highest standard of practice in Canada. Receive the most clinically based training, including the opportunity

to inject 8+ patients. Courses held monthly in Tsawwassen, BC. Start today with the online Level 1 – Advanced Anatomy course (20 CME). Save $500 using code "BCMJonline." Register now at PTIFA.com.

MINDFULNESS IN MEDICINE WORKSHOPS AND RETREATS

Multiple locations (Sept 2022–Mar 2023)

Join Dr Mark Sherman and your community of colleagues for a transformative workshop or retreat! The workshops focus on the theory and practice of mindfulness and meditation, reviewing definitions, clinical evidence, and neuroscience, and introducing key practices of self-compassion, breath work, and sitting meditation to nurture resilience and healing. Our meditation retreats are an opportunity to delve deeply into meditation practice in order to recharge, heal, and reconnect, and to build a practice for life. Workshops accredited for 16 Mainpro+ group learning credits. Foundations of Theory and Practice Workshop for Physicians and Their Partners, 23–26 September 2022 and 20–23 January 2023 at Long Beach Lodge Resort in Tofino. Heal Thyself: A Meditation Retreat for Physicians and Health Professionals, 1–6 December 2022, online. 23 February–5 March 2023 at Bethlehem Centre in Nanaimo. Contact hello@livingthismoment.ca, or check out www.livingthismoment.ca/events for more information.

GP IN ONCOLOGY EDUCATION

Online (12–23 Sept and 3–17 Oct 2022)

BC Cancer's Family Practice Oncology Network offers an 8-week General Practitioner in Oncology education program beginning with a 4-week virtual 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 or contact Dilraj Mahil at dilraj.mahil@bccancer.bc.ca.

THE 34th ANNUAL DIABETES DIRECTORS SEMINAR

Vancouver (21 Oct 2022)

The Endocrine Research Society is pleased to present the 34th Annual Diabetes Directors Seminar—a UBC-accredited annual gathering of leading diabetes experts and caregivers across British Columbia. Join us at the Holiday Inn Vancouver-Centre (Broadway) for a full-day presentation series covering the latest and most pertinent aspects of diabetes therapeutics and clinical care. Target audience: specialists and family physicians with an interest in diabetes care, as well as nurses, dietitians, pharmacists, and other diabetes educators responsible for diabetes management within their own groups and communities. Register online now at www.endocrineresearchsociety.com/events/34th-diabetes-directors-seminar. Space is limited. Contact Sahara Frojmovic at the Endocrine Research Society for more information or with registration questions. Email saharafro.ers@gmail.com, or call 604 689-1055.

INFECTIOUS DISEASES UPDATE 2022, HOT TOPICS & WHAT'S NEW

Online (4–5 Nov 2022)

Join us for the 25th year of this very popular event. Although COVID-19 is foremost in our mind, we cannot lose sight of the other significant infectious diseases in our community. Topics will include locally relevant infectious diseases as well as global medicine. A recording of this conference will be available for future viewing for those unable to attend. This group learning program has been certified by the College of Family Physicians of Canada and the British Columbia Chapter for up to 12.00 Mainpro+ credits. Registration fees: $200 on or before 14 October 2022, $225 after 14 October 2022. Student rate, with valid student ID card: $100. Register online at https://cvent.me/GM1gxX or visit https://novaclinical.com. For more information email info@novaclinical.com.

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PRACTICES AVAILABLE

BURNABY—FULL-TIME FAMILY PRACTICE AVAILABLE

Organized, well-established family practice available. Med Access EMR; 12-year-old office building at PrimeCare Medical Centre with four FT and six PT colleagues and support of walk-in and urgent-care clinics. Obstetrics/hospital optional. Willing to consider part-time. Income split or 100% less overhead. Enquiries to ron.demarchi@primecaremed.ca or 604 520-3006.

KAMLOOPS—SOLO PRACTICE AVAILABLE FOR FAMILY PHYSICIAN

Family physician with solo practice in Kamloops is looking to turn over a fully equipped practice to a physician able to provide longitudinal care for his patients. The clinic is centrally located and is set up with a well-managed and organized EMR (Telus Med Access). Available December 2022. For further information contact Santie at 778 220-0848.

SURREY—FP

Family physician in Fleetwood looking for a part-time/full-time associate/locum with flexible hours. Busy family medicine clinic with mostly South Asian patients, and Oscar EMR. Well equipped with modern facility, four examination rooms, and experienced staff. Punjabi speaking an asset. Call 604 585-9696 or email drsohal@shaw.ca.

EMPLOYMENT

ACROSS CANADA—PHYSICIANS FOR YOU—MATCHING DOCTORS WITH CLINICS

Are you a physician looking for work or a medical facility requiring physicians? Our team works with independently licensed Canadian physicians, CFPC/RCPSC-eligible international medical graduates, and clinics across Canada. Check out our reviews and current job postings, and call Canada's trusted recruitment firm today! Visit www.physiciansforyou.com.

LANTZVILLE—IMMEDIATE OPPORTUNITY FOR FT/PT FAMILY PHYSICIANS

The Sow's Ear Medical Clinic is looking for physicians to join our family practice. We are a busy multiphysician clinic with an on-site lab and adjoining pharmacy. This is a great opportunity to join an established clinic with a built-in patient panel or to start your own patient panel in a new location! The clinic is located in Lantzville, just outside of Nanaimo on Vancouver Island. This prime location means you can enjoy an oceanfront village feel with the comforts of big city amenities only minutes away. Multiple openings available: start your own practice immediately or take over an existing practice in June 2023. For more information, contact Vicky Smith at sowsear-docs@shaw.ca.

NANAIMO—GP

The Caledonian Clinic has availability for a general practitioner (locum or permanent position). We are a well-established, very busy clinic with 23 general practitioners, one first-year resident, one second-year resident, a podiatrist, a geriatrician/internist, and an orthopaedic surgeon. Our EMR is Profile by Intrahealth. We are located in a modern new clinic in the Nanaimo North Town Centre. Lab and pharmacy services are on site within the centre. Contact Lisa Wall at 250 716-5360 or email lisa.wall@caledonianclinic.ca. Visit our website at www.caledonianclinic.ca.

NORTH VAN—FP LOCUM

Flexible hours and vacation time with no call. In-office and telehealth options available with great MOA support staff and a new competitive split; 100% to doctors for optional hospital visits, nursing home visits, medical-legal letters, etc., or sessional work. For further information contact Kim at 604 987-0918 or kimgraffi@hotmail.com.

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, website: powellrivermedicalclinic.ca.

RICHMOND/STEVESTON—OUTSTANDING LONG-TERM OWNERSHIP OPPORTUNITY

Guaranteed income: work-to-own family/aesthetic practice(s). Two turnkey strata units. Technologically advanced practice(s). Individual or group of family doctors/NPs. Can start with a guaranteed income and buy real estate earlier in your career. Tax efficiency planning. Dermatologist may be interested in aesthetic practice. For more information contact msinghalmd@gmail.com.

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 or 604 916-2050.

SURREY (BEAR CREEK AND NEWTON)—FAMILY PRACTICE
We are looking for part-time/full-time physicians for walk-ins/family practice to work on flexible shifts between 9 a.m. and 6 p.m.; option to work 7 or 5 days per week. Clinic with eight exam rooms, two physio rooms, and pharmacy on site. Competitive split. For more information, please contact Anand at wecaremedicalclinic2021@gmail.com or 778 888-7588.

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

VANCOUVER—FP/GYNECOLOGIST/PEDIATRICIAN/SPECIALIST, AND RMT
Cross Roads Clinics: Opportunity to join our large multidisciplinary clinic with excellent support focusing on family health, preventive health, and the care of women and children. Virtual care, extended flexible hours/scheduling, and vacation friendly. Modern 9000 sq. ft. facility with 34 patient rooms and gymnasium. Physiotherapy, massage therapy, naturopathic medicine, acupuncture, dermatology, minor surgery, pediatrics, women's health, infertility, contraception, menopause, and incontinence clinic on site. No need to build your practice as we have patients immediately available to you. Potential service contract for family medicine. Great opportunity to focus on patient care, whether new to practice or semi-retiring; allow us to manage the rest. Please contact admin@crossroadsclinics.com.

VANCOUVER/RICHMOND—FP/SPECIALIST
We welcome all physicians, from new graduates to semi-retired, part-time or full-time. Walk-in or full-service family medicine and all specialties. Excellent splits at the busy South Vancouver and Richmond Superstore medical clinics. Efficient and customizable Oscar EMR. Well-organized clinics. Contact Dr Balint Budai at medicalclinicbc@gmail.com.

MEDICAL OFFICE SPACE

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Fully furnished, well-equipped space with eight exam rooms (plus two offices and one surgery room), measuring 2500 sq. ft. Location is perfect for family practice or walk-in clinic. Punjabi/Hindi/Urdu speaking an asset. Incentives and attractive lease rates offered. Call 604 781-7213 or email anantmrar@gmail.com.

MISCELLANEOUS

BRITISH COLUMBIA—DOCTORCARE MEDICAL MSP BILLING SERVICES
Let DoctorCare take the stress out of your medical billings with pain-free billing management. We deliver fully transparent and detailed financial reporting, analytics, insights, and simple recommendations to ensure doctors are optimizing their revenue monthly and have peace of mind in understanding exactly how they're paid. We can also review, fix, and resubmit any claims errors and integrate with most popular EMR platforms including Oscar, Accuro, Telus, and others. Email us at info@doctorcare.ca or visit www.doctorcare.ca/msp-billing-bc to learn more.

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Medical transcription specialists since 2002, Canada-wide. Excellent quality and turn-around. All specialties, family practice, and IME reports. Telephone or digital recorder. Fully confidential, PIPEDA

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PATIENT RECORD STORAGE—FREE

Retiring, moving, or closing your family or general practice or physician's estate? DOCUdavit Medical Solutions provides free storage for your active paper and electronic patient records with no hidden costs, including a patient mailing and doctor's web page. Contact Sid Soil at DOCUdavit Solutions today at 1 888 781-9083, ext. 105, or email ssoil@docudavit.com. We also provide great rates for closing specialists.

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VANCOUVER—TAX & ACCOUNTING SERVICES

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INSOMNIA TREATMENT:

WHEN DAY TURNS TO NIGHT

CONSIDER

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DAYVIGO™ is indicated in adults for the treatment of insomnia, characterized by difficulties with sleep onset and/or sleep maintenance.

Symptomatic treatment of insomnia should only be initiated after the patient has been carefully evaluated to rule out a physical and/or psychiatric disorder.

Demonstrated efficacy[1]

- At Days 1/2, DAYVIGO 5 mg reduced sleep onset time (LPS) from baseline by 17 minutes vs. 6 minutes with placebo ($p<0.01$).[1†]

  The primary efficacy endpoint was the mean change in latency to persistent sleep (LPS) from baseline to end of treatment, as measured by polysomnography. LPS was defined as the number of minutes from lights off to the first 10 consecutive minutes of non-wakefulness.

- At Days 1/2, DAYVIGO 5 mg improved sleep maintenance (WASO) from baseline by 51 minutes vs. 18 minutes with placebo (secondary endpoint) ($p<0.001$).[1†]

  The secondary efficacy endpoint was the mean change from baseline to end of treatment in wake after sleep onset (WASO) measured by polysomnography. WASO was defined as the minutes of wake from the onset of sleep until wake time.

A proven safety profile[1]

- DAYVIGO was generally well tolerated.
- Most common adverse events were headache (5 mg: 6%, 10 mg: 4.6%), somnolence (5 mg: 5%, 10 mg: 8.4%), nasopharyngitis (5 mg: 2.8%, 10 mg: 1.7%), fatigue (5 mg: 2.1%, 10 mg: 1.5%), urinary tract infection (5 mg: 0.7%, 10 mg: 2.1%).[1]

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Covered by most Canadian private insurance plans‡

* Comparative clinical significance unknown.
‡ Data on file, Eisai Limited.

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