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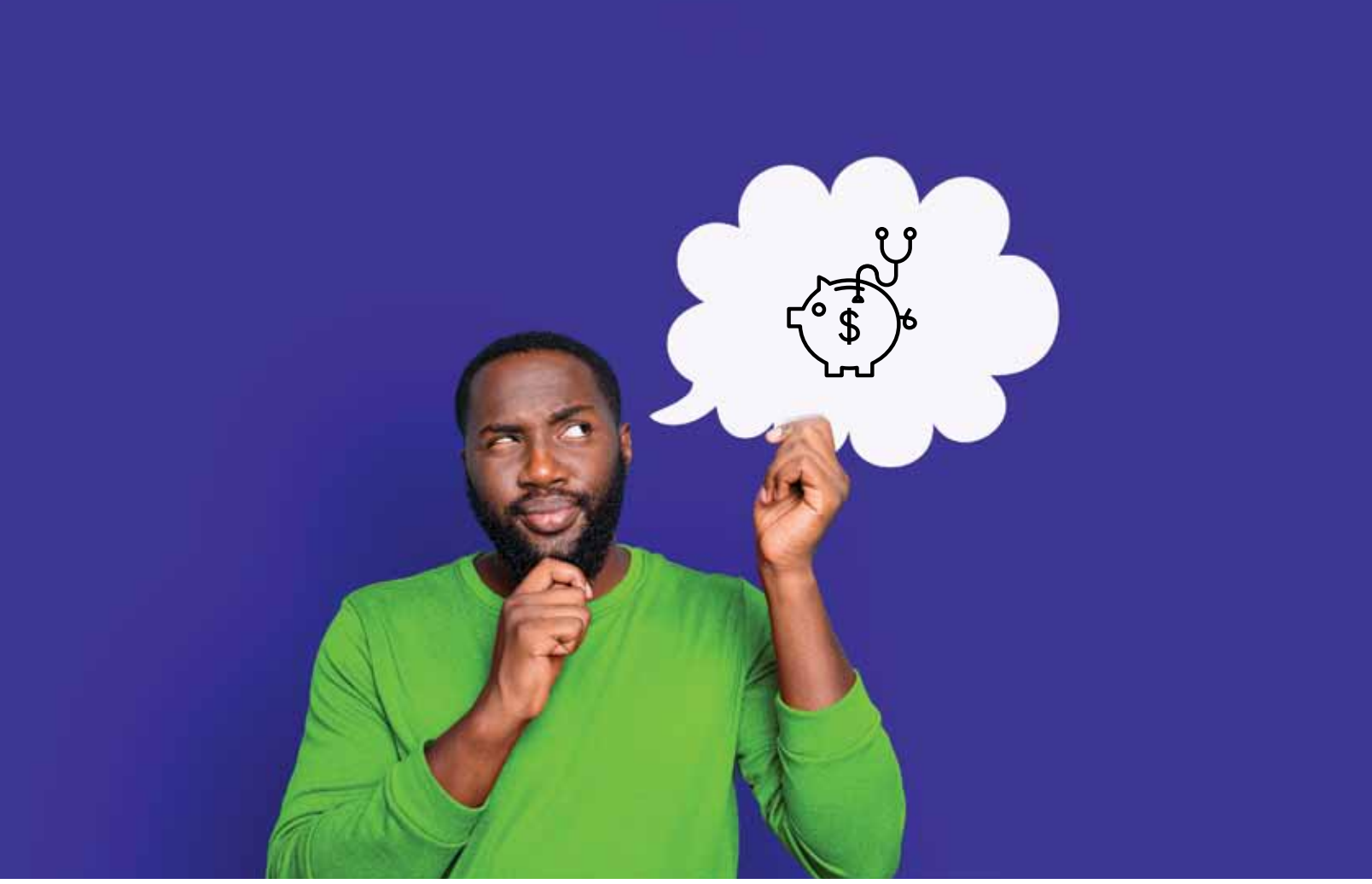

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Praise: What actually works

It's September—back-to-school time. For me, the annual "fall feeling" has never really abated, even though I have not attended school for, ahem, quite a few years now. When days get shorter and leaves start to turn, a familiar anxiety returns. It's more than just mourning another summer gone by, more than missing the carefree days by the lake and late-night s'mores. For me, the fall feeling is chest-tightening anticipation, which is undoubtedly conditioned from many years of academic pressure, long hours, and innumerable high-stakes exams. Perhaps you can relate?

These days I try to channel my anxiety into something positive, using it as a way to empathize and connect with medical students and my children. To motivate learners without adding undue pressure, I have become mindful about the power and pitfalls of praise.

My interest in praise and human motivation was sparked in a McGill University psychology class. The professor, Richard Koestner, pointed out that we tend to feel bad about giving out rewards, but we readily dole out praise. Praise, referring to the verbal-support kind, not the religious kind, is more complex than one might think, however, as it depends heavily on context. The effect of praise can be motivating, but it can also be detrimental, depending on the relationship, public nature, and specific type of praise one is given.

According to Koestner,[1] of the nine types of praise, only one works for motivation. Therefore, knowing how *not* to praise may be just as important as learning the best way. The forms of praise that are not motivating are: (1) praise as positive guidance, (2) praise as a transition ritual, (3) praise as balance for criticism, (4) praise as a peacemaker, (5) praise as a consolation prize, (6) praise after student-elicited stroking, (7) praise as attempted vicarious reinforcement, and (8) praise as a vindication of predictions.

Praise is motivational only when it comes as a spontaneous expression of admiration. To act as reinforcement, praise should be *contingent*, *specific*, and *credible*.[1,2] It is also important to note that praise is not the same as feedback.

When referring to praise as encouragement, Professor Koestner often cited a well-known psychologist, Carol Dweck, who has written about the importance of cultivating a growth mindset. In a growth mindset, children and learners are praised for the process, rather than the person. For example, we can recognize a child for their efforts and approach to school, which is entirely within their control, rather than for being good at school, which builds unrealistic expectations to always perform well.

To motivate learners without adding undue pressure, I have become mindful about the power and pitfalls of praise.

When we foster a child's intrinsic motivation, we also help them build resilience. By acknowledging their setbacks and failures, we can also strengthen their ability to persevere and develop new tools. Here are some phrases I find help illustrate this approach:[3] "You are good at trying different ways to solve a hard puzzle." "You solved the problem with great focus." "You make a difference in this." "The reason for going to school is to learn, not just to do well on tests."

Whether in medical school or grade school, feeling pressure to achieve is inevitable. But as physicians, parents, and educators, we can keep in mind that the best motivators are the goals students set for themselves. Although we can't write their tests or do surgeries on their behalf, we can empower our students to believe in their potential. ■

—Caitlin Dunne, MD

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Every child matters

The 30th of September is the National Day for Truth and Reconciliation, a recognized federal statutory holiday, which has been observed since 2021 after legislative changes were made by the Government of Canada. In 2021, Orange Shirt Day became the National Day for Truth and Reconciliation to honor children who survived residential schools and those who didn't. According to the Government of Canada, the purpose is to honor "the children who never returned home and Survivors of residential schools, as well as their families and communities. Public commemoration of the tragic and painful history and ongoing impacts of residential schools is a vital component of the reconciliation process."[1] The day is named after the Truth and Reconciliation Commission of Canada (TRC), which traveled across Canada between 2007 and 2015 to document the lived experiences of people who attended residential and day schools between 1876 and 1996. The TRC listened to over 6500 survivors and produced a report in 2015 with 94 calls to action to help move from truth-telling to reconciliation.[2] Call to Action #80 calls for the establishment of a statutory holiday to recognize the history of residential schools and to honor both survivors and those who never came home.

It took finding 215 unmarked graves on the grounds of the former Kamloops Indian Residential School for the necessary legislative changes to be made to implement this statutory holiday. The news of these little ones who never made it home deeply impacted both Indigenous and non-Indigenous Canadians. The grief was palpable. It was tangible proof of what the witnesses reported in the TRC's Final Report, which stated that at least 4000 to 6000 children who attended residential schools died.[2] First Nations people and their communities always knew the graves existed and needed to fight for the resources to recover their loved ones. Since these first children were found, more than 1700 graves have been found at or near seven residential schools across Canada.

These findings gave new meaning to Orange Shirt Day, which has been recognized on 30 September since 2013 to bring awareness to the harmful impacts of residential schools, just one of many assimilation policies aimed at eliminating Indigenous peoples' culture and languages.[3] Children were often emotionally, physically, and sexually abused in addition to being forcibly removed from their parents and communities. This trauma has been passed down across multiple generations, resulting in the health disparities we see today.[2] The color orange was chosen to recognize Phyllis Webstad's experience of having her orange shirt forcibly removed and her hair cut on her first day attending the residential school near Williams Lake. She felt like she didn't matter, which is why Orange Shirt Day's slogan is "Every child matters."[3] As Indigenous children represent over 50% of children currently in the care of the BC Ministry of Children and Family Development, our country needs this reminder more than ever.

I wear orange for my grandmother. I wear orange for my great-uncle Patrick. I wear orange for my daughter. I wear orange for justice.

My great-uncle Patrick Prince never made it home from residential school. He was my late maternal grandmother's younger brother. His parents were never notified of his passing, no details were provided, and no grave was found. My grandmother was deeply traumatized by her time at the Lejac Residential School, and although she attended the TRC events, she never gave her testimony. The few times she made any reference to Lejac, she was filled with sorrow and rage, particularly when talking about her younger brother Patrick. We will never know her story, and her unresolved trauma has become my own.

I wear orange for my grandmother. I wear orange for my great-uncle Patrick. I wear orange for my daughter. I wear orange for justice. And I hope you, too, will wear orange on 30 September to remember all that was lost due to residential schools and to stand in solidarity with Indigenous people in Canada. I also hope it will translate to a lot more reconcili-ACTION at all levels. ■

—Terri Aldred, MD

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Letters to the editor

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The importance of preventive medicine

The role of the family doctor used to be to care for the family and advise on preventive measures such as vaccinations, physical activity, and early detection of cancer, diabetes, lung disease, etc. These measures prevented acute disease and reduced fractured hips and various emergencies. Prevention is not a "Where do we get the best bang for the buck" approach; it's about long-term caring and building trust. Everyone realizes that regular car maintenance prevents catastrophic failure and that it is money well spent in the long run. We have reached a point where the health care system has become an overwhelmed human repair shop. We are told not to go to the doctor unless we are really ill, and then to go to emergency. It is imperative to find a system of primary care whose focus is prevention.

—Charles Ludgate, MD
Victoria

"Health" requires more than health care for people in supportive housing

We read with interest the article "Health care in supportive housing facilities"[1] by Dr Gibson and colleagues, published in the May issue of the *BC Medical Journal*. While we share the authors' concerns about barriers individuals in supportive housing face in meeting their health needs, we believe the article's conclusions could have gone further toward setting the stage to address the complexities that are discussed in the paper.

In 1948, the World Health Organization defined health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity."[2] As such, an exploration of health needs in the context of access to doctors and health services in supportive housing fails to live up to a more holistic understanding of health and well-being.

As the authors state, "housing alone can be insufficient in supporting individuals with complex health needs." Also noted in the article, individuals living in supportive housing can face a multitude of barriers, such as a lack of ability to navigate services, physical challenges, issues related to transportation to get to appointments, stigma and discrimination, the need for assistance with activities of daily life, and an overall lack of coordination between health and housing providers.

But achieving placement in supportive housing in the first place can be a long process. Individuals' health continues to deteriorate while they wait, increasing the complexity of their needs once they are finally housed.

Once attained, housing can be a therapeutic intervention when social support and specific environmental conditions are met. Many individuals value a sense of connectedness and belonging as a priority—more than a roof in some cases—and a sense of community can be enhanced through purposeful and coordinated approaches across a number of providers. Strengthening a sense of belonging, connectedness, and unity is a positive attribute of housing and community that is conducive to health.

Homelessness is a growing concern in BC. According to the latest point-in-time count published by BC Housing, the number of individuals experiencing homelessness increased by 11.5% in 2021 (compared with 2018), and over 40% of homeless individuals identified as Indigenous.[3] As one of the fastest-growing metropolitan areas in Canada in 2021, Kelowna has seen a rapid increase in population and an escalating demand for health, shelter, and social services.[4]

Addressing the current and future health needs of marginalized individuals, such as those at risk of or experiencing

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Truth before reconciliation; humility before truth

Undoubtedly, we have all had "where were you" moments when life-changing and historical events happened. I remember exactly where I was when Princess Diana died, and when Mother Teresa passed 6 days later. I recall, in vivid detail, the unbelievable events of 11 September 2001, and more recently when news broke about finding the remains of 215 Indigenous children on the grounds of the Kamloops residential school.

This one hit closer to home. It was 27 May 2021, and it was a moment that carried so many levels of devastation: the initial shock, and then comprehending how something like this could happen in Canada; the sadness that for years these stories went untold; and the personal connection that this discovery lay within a community I knew. This was a place where some of my patients had been students, and others were relatives of these children. This was more than just a heartbreaking national news story; this was personal. It weighed heavily on my heart then and continues to do so today.

For 12 years, I had the privilege of working alongside the Boston Bar First Nation Nlaka'pamux in an Indigenous-led primary care clinic about 200 km from Kamloops. During that time, I heard stories, understood truths, and learned teachings from my Indigenous patients that will forever hold space my heart. I thought I understood many of my patients' stories—the impact of generational trauma and the subsequent health consequences. I tried to practise what Maya Angelou articulated: "Do the best you can until you know better. Then when you know better, do better." And with the discovery of those children and the thousands since, I knew I could do better. I believe we all can.

I ask you to consider how we, individually and as a medical culture and community, can seek humility.

I have tried to change my interactions and my questions in my clinical practice to acknowledge the truths of what I now know and understand. I appreciate that without speaking truth there will not be reconciliation. That we as a profession need to acknowledge the truths of the Truth and Reconciliation Commission of Canada's reports and the *In Plain Sight* report to reconcile our country, reconcile our communities, and reconcile with our patients. I didn't attend a residential school, but that doesn't mean I can't do better than those before me who looked like me, who shared my heritage, or who shared a faith or belief system. I can do better. It starts with changing the language I use from asking "What is wrong?" to asking "What happened?" From asking "Where are you from?" to saying "Tell me about your community and who your relatives are." It is an ongoing learning process, and every day I try to do better. I will continue to seek humility before truth and understand that truth needs to come before reconciliation.

The 30th of September is the National Day for Truth and Reconciliation, also known as Orange Shirt Day, an Indigenous-led grassroots commemorative day intended to raise awareness about the individual, family, and community intergenerational impacts of residential schools. It promotes the tenet "Every child matters." The orange shirt symbolizes the stripping away of culture, freedom, and self-esteem that Indigenous children experienced across generations.

I will wear my orange shirt and attend a local event to commemorate the day. I encourage you to do the same. I ask you to consider reviewing the health-related Calls to Action (#18–#24) from the Truth and Reconciliation Commission of Canada **[Box]**, whether for the first time or the hundredth. More than anything else, I ask you to consider how we, individually and as a medical culture and community, can seek humility, because I believe that if we can reveal our collective humility, we can find a path to the truth. It is only then that we can move forward toward reconciliation. ■

—Joshua Greggain, MD
Doctors of BC President

Truth and Reconciliation Commission of Canada Calls to Action #18–#24 (health)

18. We call upon the federal, provincial, territorial, and Aboriginal governments to acknowledge that the current state of Aboriginal health in Canada is a direct result of previous Canadian government policies, including residential schools, and to recognize and implement the health-care rights of Aboriginal people as identified in international law, constitutional law, and under the Treaties.

19. We call upon the federal government, in consultation with Aboriginal peoples, to establish measurable goals to identify and close the gaps in health outcomes between Aboriginal and non-Aboriginal communities, and to publish annual progress reports and assess long term trends. Such efforts would focus on indicators such as: infant mortality, maternal health, suicide, mental health, addictions, life expectancy, birth rates, infant and child health issues, chronic diseases, illness and injury incidence, and the availability of appropriate health services.

20. In order to address the jurisdictional disputes concerning Aboriginal people who do not reside on reserves, we call upon the federal government to recognize, respect, and address the distinct health needs of the Métis, Inuit, and off-reserve Aboriginal peoples.

21. We call upon the federal government to provide sustainable funding for existing and new Aboriginal healing centres to address the physical, mental, emotional, and spiritual harms caused by residential schools, and to ensure that the funding of healing centres in Nunavut and the Northwest Territories is a priority.

22. We call upon those who can effect change within the Canadian health-care system to recognize the value of Aboriginal healing practices and use them in the treatment of Aboriginal patients in collaboration with Aboriginal healers and Elders where requested by Aboriginal patients

23. We call upon all levels of government to:
    i. Increase the number of Aboriginal professionals working in the health-care field.
    ii. Ensure the retention of Aboriginal health-care providers in Aboriginal communities.
    iii. Provide cultural competency training for all healthcare professionals.

24. We call upon medical and nursing schools in Canada to require all students to take a course dealing with Aboriginal health issues, including the history and legacy of residential schools, the United Nations Declaration on the Rights of Indigenous Peoples, Treaties and Aboriginal rights, and Indigenous teachings and practices. This will require skills-based training in intercultural competency, conflict resolution, human rights, and anti-racism.

BOX. Calls to Action #18–#24. Truth and Reconciliation Commission of Canada. 2015. https://ehprnh2mwo3.exactdn.com/wp-content/uploads/2021/01/Calls_to_Action_English2.pdf

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homelessness, particularly in rapidly growing communities like Kelowna, requires a broader vision that transcends health care and is inclusive of social change aimed at overcoming the determinants of inequities that negatively impact individuals' health. There is an opportunity to consider revisiting power relations, reconciliation with Indigenous peoples, and decision-making structures. Ultimately, new partnerships are required to foster social inclusion and community participation and to develop strategies to address health inequities.

—Michelle Hawkins, BSc (Hons)
Kelowna

—Silvina C. Mema, MD, MSc, FRCPC
Kelowna

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Does the Longitudinal Family Physician Payment Model improve health care, including sustainability?

The Longitudinal Family Physician Payment Model holds promise for improved access to and quality of primary care medicine in BC and provides an opportunity to be more efficient in the use of resources.

Gerald J.M. Tevaarwerk, MD, FRCPC

ABSTRACT: The aim of the Longitudinal Family Physician Payment Model is to provide enhanced primary care for all British Columbians. It addresses the lost capacity caused by inadequate remuneration and poor work–life conditions. Its innovative approach triples net remuneration, which has the potential to restore the productivity of existing family physicians to their 44% greater average number of patients per physician of a decade ago. It remains to be seen how much of the loss was due the introduction of electronic medical record keeping during that decade. Capacity is further stimulated by making family medicine a more attractive career choice. From an overall health care improvement perspective, the increased time per patient permits greater use of traditional physician skills, which fulfills both the first and second of the quadruple aims: improving the health of populations and enhancing the patient experience of care. The third aim, reducing per capita cost, may occur through the use of fewer tests, investigations, and referrals, and the prevention of more complicated downstream interventions. The Ministry of Health expects to achieve those goals through the fourth aim: improving the working life of health care providers. As such, the new model holds the promise of a return to the family physicians of yore: available, accomplished, affable, and admired. However, it does not include incentives to build primary care teams to increase capacity or specific incentives to be more frugal with the resources put at the disposal of clinicians. It is also silent on how contiguous primary care is to be provided on a 24-hour basis, 7 days per week. Also missing is a projection of how to sustain the increased expenses and find the funds for the much-needed upgrading of secondary and tertiary medical care. Compared with the countries of mainland northwestern Europe, British Columbia's MSP costs are similar, but fewer goods and services are delivered. This raises the question of whether we can afford to introduce new programs that may not be sustainable. The cause of the gap in benefits requires investigation and attempts to recover it if we wish to attain the world-leading status in medical care of our European colleagues.

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In fall 2022, in response to progressively worsening difficulty finding a family physician in British Columbia, the Ministry of Health announced the Longitudinal Family Physician Payment Model, developed in consultation with BC Family Doctors and Doctors of BC.[1] It addresses the lack of adequate paid time per patient encounter as a possible cause of the difficulty finding a family physician. **Table 1** presents a comparison of fee-for-service in 1982 versus 2022[2] (several oral communications with Drs Charles Faulkner, Paul Nehra, Geoffrey Inman, and Jill Norris in fall 2022). It shows a near doubling of fees and gross remuneration, yet net hourly compensation increased only from $44 to $48, the latter worth $16 in 2022 dollars after correcting for the 200% general inflation during those 40 years.[3] In 2022, operating expenses had increased to more than 30% of gross earnings because of the rising costs of office space[4] and staff[5] and the introduction of electronic medical record keeping (several oral communications with Drs Charles Faulkner, Paul Nehra, Geoffrey Inman, and Jill Norris in fall 2022). Physicians responded to the reduction in net income by increasing gross earnings by seeing more patients for shorter periods. This resulted in more time spent catching up on charting, which was made worse by the adoption of electronic medical record keeping (several oral communications with Drs Charles Faulkner, Paul Nehra, Geoffrey Inman, and Jill Norris in fall 2022). The stress of learning electronic medical record-keeping skills and the increased workload led to exhaustion, depression, and

burnout.[6,7] Family medicine productivity fell from an average of 1730 patients per practitioner in 2012 to 1203 in 2020, a 30% reduction.[8] Less time for history taking and physical examination led to ordering more tests and increasing referrals. The Ministry of Health announced the new Longitudinal Family Physician Payment Model as "an alternative to the Fee-For-Service and the Alternative Payments Program." It is "a blended payment model which compensates the physician for (a) physician time; (b) physician-patient interactions; and (c) the physician's patient panel."[1] The new model compensates family physicians with a guaranteed hourly salary and added bonuses to stimulate productivity. To assist physicians in predicting their annual compensation, the Ministry of Health has provided a compensation calculator.[1] **Table 2** is a completed version, which demonstrates how "$385 000 for a full-time equivalent physician" may be earned by spending 7 hours on patient encounters 4.5 days per week, with an average of 20 minutes per patient and an additional 9.8 minutes for charting and clinical administration at $130 per hour, and providing longitudinal primary care for 1203 patients by working 41 hours per week, 45 weeks per year. **Table 3** compares the Longitudinal Family Physician Payment Model and the fee-for-service model: assuming the time spent per patient for indirect care and clinical administration is 9.8 minutes each, the net compensation per hour of $146 for the Longitudinal Family Physician Payment Model is 3 times more than the $48 for the fee-for-service plan.

Appraisal

The aim of the Longitudinal Family Physician Payment Model is to provide longitudinal primary care for all British Columbians where and when it is needed.[1] It encourages medical students and family physicians to choose longitudinal family medicine care as a career and appears to recognize that inadequate remuneration is a cause of the current lack of capacity in family medicine. The introduction of electronic medical record keeping may have been a factor,[6-13]

TABLE 1. Family physician fee-for-service remuneration and operating expenses, 1982 versus 2022.

Activity/remuneration	Year	No.	Per day	Per year	Fee	Annually
Patient encounters per hour*	1982	4.5	32	6278	$17.00	—
	2022	4.0	28	5580	$31.72	—
Hours of direct patient care per week†	1982	31	—	1395	—	—
	2022	31	—	1395	—	—
Hours of indirect care and clinical administration per week	1982	7*	—	315*	—	—
	2022	14†	—	630†	—	—
Active longitudinal care (panel) patients	1982	Unknown	—	—	—	—
	2022	1203	—	—	—	—
Weeks worked per year	1982	45	—	—	—	$106 718 (in 1982 dollars
	2022	45	—	—	—	$176 998 (in 2022 dollars
Estimated net hourly compensation after deducting 30% operating expenses‡	1982	—	—	—	$44.00 (= $132.00 in 2022 dollars)	—
Estimated net hourly compensation after deducting $80 000 annual operating expenses	2022	—	—	—	$48.00	—

* Estimated.
† As in the Longitudinal Family Physician Payment Model.
‡ Estimated as 30% of gross earnings.
§ Adjusted for threefold general inflation plus extra cost increases for office space and staff, electronic medical record keeping, voice recognition software and hardware, Internet, security, and technical troubleshooting costs at estimated $80 000.[3]

TABLE 2. Projected average patient care activities and remuneration under the Longitudinal Family Physician Payment Model.

Activity/remuneration	No.	Per year	Fee	Per	Annually
Patient encounters per hour	3	4185	$25	Encounter	$104 625
Hours of direct patient care per week	31	1395	$130	Hour	$181 350
Hours of indirect care and clinical administration per week	10	450	$130	Hour	$58 500
Active longitudinal care (panel) patients	1203	—	$34	Patient/year	$40 902
Weeks worked per year	45	—	—	—	$385 377
Net hourly compensation after deducting the $115 610 annual operating expenses*	—	—	—	—	$146

* Estimated at 30% of gross earnings. For 52 weeks, the annual gross compensation would be $445 325.

with its new demands contributing to a "loss of motivation"[12] and a state of "vital exhaustion,"[13] which led Bodenheimer and Sinsky to suggest adding a fourth aim in the analysis of health care innovations: care of the patient requires care of the provider.[14,15] I contend that sustainability should be the fifth aim.

Aim 1: Improving the health of populations

The capacity to provide medical care is a function of the number of physicians and their average productivity. At the current average of 1203 patients per practitioner, it would take 4400 family physicians to provide longitudinal care for all 5.3 million British Columbians;[16] if the increased paid time returns productivity to the average of 1730 patients a decade ago,[8] it would take only 3064 of the 7229 licensed family physicians in BC.[17] The resulting improved access to longitudinal primary care may succeed in improving the health of BC's population. It is suggested that failure to increase productivity would warrant an inquiry into the factors preventing it. The new model has no incentives to build primary care teams, a way of increasing capacity at lower cost.[18,19] Family physician–led teams could provide practice-generated salaried positions for nurses, physician assistants, nurse practitioners, and family physicians who prefer annual salaries.[20]

Aim 2: Enhancing the patient's experience of care

The improved compensation and work–life conditions of family physicians will surely be transmitted to the patient's experience, with the extra face time per encounter offering an opportunity for less rushed appointments and more time for explanations and counseling. It is an opportunity to improve disease self-management where appropriate. Not to ensure 24/7 longitudinal family physician care may be a missed opportunity, while the average annual complexity panel fee of $34 is too modest an incentive to maximize patient retention and recruit new patients.[21]

Aim 3: Reducing per capita costs

The new model provides an average gross compensation of $385 000 for 45 weeks[1] and $445 000 for a full year. It adds $200 per patient per year to the $120 of the fee-for-service model, or $900 million for 4.5 million BC citizens. For the 1 million citizens who are currently without a physician, the annual cost is $200 plus the $120—an additional $320 million. However, for those 1 million citizens, the cost is greater yet, because for each patient, the BC MSP provides clinicians with access to the resources needed to conduct their professional activities. The actual cost of physicians' use of resources in BC is not known but may be as much as the clinician's professional compensation[22] (see Aim 5: Sustainability). It doubles the cost of care for those 1 million citizens to $640 million, for a total of $1.54 billion annually based on the new model. The calculations are theoretical predictions only: although everyone may wish to sign on as a longitudinal family physician panel patient, many would require little if any medical care in any given year, which would greatly reduce the cost. The new model has other potential per capita cost savings, discussed in Aim 5: Sustainability.

Aim 4: Improving the work life of health care providers

The Longitudinal Family Physician Payment Model, with its compensation for time, is a major step toward improving the life of longitudinal family physicians.[15]

TABLE 3. Patient care activities, overhead costs, and remuneration under the Longitudinal Family Physician (LFP) Payment Model versus the fee-for-service (FFS) model.

Activity/remuneration	Model	No.	Per day	Per year	Fee	Per	Annually
Patient encounters per hour	LFP	3	21	4185	$25	Hour	$104 625
	FFS	4	28	5580	$31.72†	Encounter	$176 998
Hours of direct patient care per week	LFP	31*	6	1395	$130	Encounter	$181 350
	FFS	31*	6	1800	$0	—	—
Hours of indirect care and clinical administration per week	LFP	10	2.0	450	$130	Hour	$58 500
	FFS	13.3	2.7	600	$0	—	—
Active longitudinal care (panel) patients	LFP	1203	—	—	$34	Patient/ year	$40 902
	FFS	1203	—	—	$0	—	—
Weeks worked per year	LFP	45	Annual gross compensation =				$385 377
	FFS	45	Annual gross compensation =				$176 998
Estimated net hourly compensation after deducting 30% annual operating expenses	LFP	—	—	—	—	—	$146
Estimated net hourly compensation after deducting $80 000 annual operating expenses‡	FFS	—	—	—	—	—	$48§

* 4 × 7 + 1 × 3 hours.
† Time-consuming age and/or complexity adjusted average fee payment of $31.72 per 15 minutes.
‡ As advised.
§ Would be more if less time spent "after hours" on indirect care and clinical administration.

The **Figure** shows the blended remuneration consisting of three-quarters hourly pay plus one-quarter commission pay. **Table 3** shows how it may generate a net hourly pay of $146, more than 3 times that of the current fee-for-service model of as little as $48. It is a return to the family practice equivalent incomes of the 1970s[2] **[Table 1]**, and it is a major step toward improving the work–life balance of family physicians and the time to rediscover the joy of practising medicine.

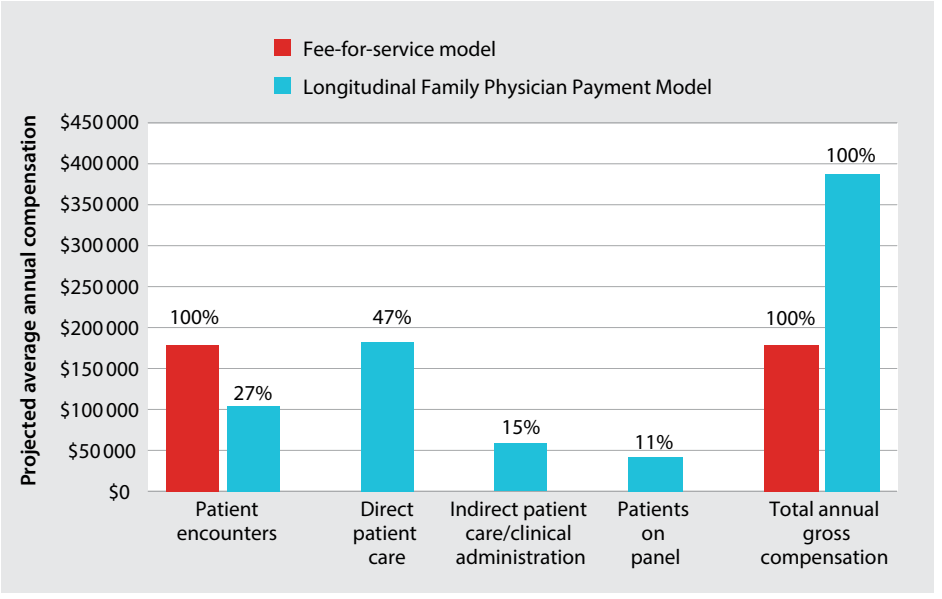

FIGURE. Projected average annual compensation by the fee-for-service model versus the new Longitudinal Family Physician Payment Model. In the latter, hours spent taking care of patients directly and indirectly plus clinical administration account for 74% of remuneration at $130 per hour. The number of patient encounters and panel patients are commission payments, which account for the remaining 26%.

Aim 5: Sustainability

The new Longitudinal Family Physician Payment Model could cost $1.54 billion annually. Even though the actual costs may be much less because some people make little use of medical services, those costs may not be sustainable unless there is an improvement in the health of the population that leads to downstream savings. For that to occur, the increase in paid time per patient encounter may be the most important factor. However, an increase in the efficiency of how that extra time is used may also be needed to ensure sustainability. There are at least three additional ways to improve cost-effectiveness: (1) providing 24/7 longitudinal family physician care, (2) reducing physicians' use of resources, and (3) using efficient electronic medical record keeping.[9-13]

Providing 24/7 longitudinal family physician care could offset the costs of emergency departments that are no longer overrun with patients needing primary care. In some jurisdictions, family physicians who are obliged to provide 24/7 primary care for panel patients have created cooperatives to provide after-hours care in rotation.[19,23] Using conveniently located facilities, usually a local hospital, care is facilitated by all members of the cooperative having the same electronic medical records, which are switched to the after-hours facility upon leaving the office for the day. This has been met with high satisfaction from both family physicians and patients.[23]

A potentially rich source of savings is the more frugal use of clinician-accessible resource expenditures for services and products provided by third parties, such as tests, hospital use, investigations, referrals, drugs, and supplies.[22] As initiators of clinical activities, physicians may be responsible for two-thirds of health care budgets. There are large variations in the use of resources for identical clinical outcomes.[22] Choosing Wisely Canada identified many tests and investigations as being of low value for the purpose for which they were ordered.[24] However, after more than 10 years, that information has been largely unsuccessful in reducing the use of low-value diagnostic interventions.[25,26] The additional time available to family physicians is an opportunity to renew that effort, including explaining to patients the futility, cost, and risks of excessive testing, including that the "normal" definition for test results uses the 95% reference range, which renders 5% of all test results false positive. This promotes additional investigations, with each additional test again having a 5% probability of being false positive.[27] Supposing that 66% of BC's 2023 health care budget of $28.3 billion spending is clinician initiated, a 20% reduction in physicians' use of resources would yield 0.2 × 0.66 × $28.3 billion = $3.7 billion in savings, a potentially major contribution to the sustainability of proven diagnostic and therapeutic interventions.

Another promising way to improve sustainability may be through increasing the efficiency of electronic medical record keeping. The current platforms have made the practice of medicine less efficient, possibly contributing to the 30% loss in the average number of patients per practitioner in the decade prior to the COVID-19 pandemic.[10,12,13,17,28] In support thereof, Rudoler and colleagues[29] reported a slowly decreasing rate in the average number of patients per practitioner from 2001 to 2010 and an increase in the rate of decline from 2010 to 2017, a period that corresponded to the widespread introduction of electronic medical record keeping in BC. If there is no return to greater productivity under the improved conditions of the new model, this may suggest that there is something at fault with current electronic medical record keeping. In that case, instead of the multiple clinician-centred electronic medical record applications that are independent of

each other, consideration should be given to using a standardized patient-centred electronic health record for common use by clinicians, one that informs and teaches and has proven benefits for clinical outcomes.[9]

Sustainability and the BC MSP

It is widely recognized that BC (and the rest of Canada) has too few hospital beds and advanced imaging facilities.[30-32] Wait lists are too long. Why, as a rich country with a well-developed economy, have those needs not been met? Comparing BC with the peer jurisdictions of mainland northwestern Europe, the Netherlands, Denmark, Norway, Sweden, Finland, Iceland, and Germany shows that they have universal health care with annual per capita costs similar to those of BC but provide better benefits.[18,31-33] For example, the Netherlands' 2019 health care budget of C$6855 per capita (10.2% of GDP) was almost identical to that of BC at C$6548 (10.8% of GDP) **[Table 4]**.[33] On the annual Euro Health Consumer Index,[18] of 35 countries that assessed overall performance based on 49 indicants, the Netherlands was first for the decade 2008–2017, during which its costs decreased by 0.5% of GDP. In 2019, the Netherlands had 3.7 physicians per 1000 capita, of which 23% were family physicians,[19] whereas BC had 2.5 physicians per 1000 capita, of which 50% were family physicians.[17,30] In the Netherlands, 7800 family physicians operated family medicine practices that provided longitudinal care for an average of 2200 patients per "huisart" (literally "home doctor"; a longitudinal family physician).[19] In contrast, in 2019, the average number of patients per practitioner in BC was 1459, with care provided by 6256 primary care physicians.[8] The longitudinal family physicians in the Netherlands were paid using a blended system of rostering fees plus fee-for-service. Most operated private practices using a team-based approach; hired family physicians, psychologists, and nurses as assistants; and provided 24/7 after-hours in-person longitudinal primary care.[23] The benefits its citizens received were the same "free" hospital and physician services as in BC. However, in the Netherlands, prescription drugs, hearing aids, dental care, and physiotherapy for children until age 18 are also covered **[Table 4]**. For the same money per capita, the Netherlands paid 1.5 times (50%) more physicians and 33% more hospital costs than BC.[19,32,33] By having three times more specialists than family physicians, there were no wait lists for secondary and tertiary care.

TABLE 4. Comparison of 2019 health care spending in British Columbia versus the Netherlands.

		The Netherlands	British Columbia
Cost	National gross domestic product	10.2% of GDP	10.8% of GDP*
		C$6855	C$6548
C$7000	50% more physicians paid		Benefits gap
C$6500			
C$6000	Free hearing aids†		
C$5500	Free physiotherapy until age 18†		
	Free dental care until age 18†		
C$5000	No fees until age 18†		
C$4500	Free prescription medications†		
C$4000			
C$3500			
C$3000	Hospital costs		
C$2500			
C$2000			
C$1500			
C$1000	Physician payments		
C$500	Administration and sundry costs		

* Canadian GDP.
† Estimated.

Summary

The introduction of the Longitudinal Family Physician Payment Model holds promise for improved access to primary care in BC. The quality of primary care medicine may also improve, because the increased time per patient encounter allows for the practice of "slow medicine," defined as "a careful evaluation of medical evidence and a desire not to 'overdiagnose' or 'overtreat.'"[34,35] The new model provides an opportunity to be more efficient in the use of resources; from my perspective, this is essential to sustainability. Compared with peer jurisdictions, BC has a gap in benefits that urgently needs to be addressed, because it does not bode well for the sustainability of new programs, ones that are urgently needed to eliminate the long wait lists for secondary and tertiary medical care. The introduction of the Longitudinal Family Physician Payment Model offers a real-life opportunity to collect evidence to test the hypothesis that the gap in benefits is the result of our inefficient use of resources. ■

Competing interests
None declared.

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NSAID-exacerbated respiratory disease: Clinical review and referral pathway in British Columbia

In BC, greater awareness of NSAID-exacerbated respiratory disease, a complex airway disease, is needed to provide early diagnosis and appropriate management.

ABSTRACT: NSAID-exacerbated respiratory disease (NERD) is a triad of asthma, chronic rhinosinusitis with nasal polyposis, and hypersensitivity reactions to NSAIDs. NERD is common, and increased awareness is needed. NERD patients have severe uncontrolled asthma and require multiple sinus surgeries. We have created a referral pathway to provide NERD patients in British Columbia with access to multidisciplinary care in order to promptly address the different aspects of the disease.

NSAID-exacerbated respiratory disease (NERD) is a non-IgE hypersensitivity reaction that causes a spectrum of symptoms, including chronic rhinosinusitis with nasal polyposis, asthma, and hypersensitivity reactions to NSAIDs (e.g., aspirin, ibuprofen, naproxen).[1] The triad of symptoms is also referred to as Samter's triad and aspirin-exacerbated respiratory disease. The pathophysiology is thought to be due to abnormalities in arachidonic acid biosynthesis. Through the COX-1 and 5-lipoxygenase pathways, there is an overproduction of cysteinyl leukotrienes and a decrease in downstream anti-inflammatory prostaglandins such as prostaglandin E2. Without the inhibitory effect of the COX-1 pathway by-products, a pro-inflammatory environment is created.[2] However, multiple mechanisms regarding the underlying pathophysiology and associated clinical consequences are currently being investigated.[1]

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Clinical presentation

NERD patients often present with a triad of symptoms: NSAID hypersensitivity, asthma, and chronic rhinosinusitis with nasal polyposis. NSAID hypersensitivity is due to COX-1 inhibition and presents with upper/lower airway symptoms. NSAID reactions can occur between 1 and 4 hours after exposure and are dose dependent. Patients may be able to tolerate 80 mg of ASA but react at 160 mg. Reactions are not always reliable; in a cohort of 28 patients who were challenged multiple times, 11 had different responses during the challenges.[3] In some cases, NERD patients can react to acetaminophen at doses higher than 1000 mg because acetaminophen is a weak COX-1 inhibitor.[4]

Asthma is difficult to control in NERD patients. A study that compared 2848 NSAID-tolerant patients with asthma and 459 NERD patients showed that the NERD patients had increased use of oral steroids and visits to the emergency department and a higher rate of intubations.[5]

Chronic rhinosinusitis with nasal polyposis presents with chronic nasal obstruction, anosmia, and recurrent facial pain. The symptoms are caused by the overgrowth of nasal polyps in the nasal cavity **[Figure 1]**.

NERD patients have a tenfold higher risk of sinus disease recurrence after surgery compared with other forms of chronic rhinosinusitis with nasal polyposis.[6] These patients also report hypersensitivity to alcohol, hearing loss, and noncardiac chest pain.[7]

NERD is common: 7.2% of patients with asthma and 8.7% to 10.0% of patients with chronic rhinosinusitis with nasal polyposis have the disease.[8] NERD has a prevalence of 0.3% to 2.5%, and it is estimated that there are 1.5 million patients in the United States.[9] Females are primarily affected, and the average age of onset is 30 years.[7] However, 3.5% to 6.0% of NERD patients may present in childhood.[10,11]

Diagnosis

NERD is a clinical diagnosis. While asthma and chronic rhinosinusitis with nasal polyposis can be easily diagnosed, NSAID hypersensitivity is more challenging. If the

history of NSAID hypersensitivity is unclear, an ASA challenge must be performed **[Table 1]**.[12] The protocol for challenge and desensitization is the same. The key difference is that patients will continue to take ASA after desensitization. The initial workup includes a complete blood count with differential, rhinoscopy, CT sinus, and pulmonary function tests.[7] Other tests, such as nasal fractional exhaled nitric oxide after ASA ingestion and urine leukotriene E4, can be elevated but are not available in British Columbia.[7]

Allergists, respirologists, and otolaryngologists often treat NERD patients in subspecialty silos. Each specialist focuses on their area of expertise and may miss the diagnosis or not address the multisystem nature of NERD.

Management

The current treatment of NERD involves a combination of medical and surgical management.[1] Medical management can involve a stepwise or often arbitrary constellation of intranasal and inhaled corticosteroids, leukotriene modifiers, aspirin desensitization therapy, and monoclonal antibodies.[1] **Table 2** provides a summary of treatment modalities. With intranasal corticosteroids, the first line of management in chronic rhinosinusitis with nasal polyposis, large-volume irrigation is preferred because it reaches deeper into the sinus cavities. Combination inhaled corticosteroids and long-acting bronchodilators are the mainstay management of moderate to severe asthma; the Canadian Thoracic Society asthma guidelines provide further details. Leukotriene receptor antagonists can be helpful in managing NERD patients, but clinicians must be aware of the black box warning and counsel patients about neuropsychiatric side effects, including suicidal ideation.[13] Surgical management usually involves a combination of polypectomies and functional endoscopic sinus surgery to open the sinuses and create a greater surface area for administering intranasal steroids.[2] Many patients require revision surgery that targets mainly the frontal sinus through an extended Draf III procedure, which involves drilling out the surrounding bone and creating a common frontal sinus cavity to aid in the delivery of topical medication postoperatively.[14] Only a few subspecialized rhinologists in BC offer Draf III.

Biologics have revolutionized the management of NERD. Currently, there are three approved biologics for NERD: dupilumab (anti-IL4 receptor alpha), mepolizumab (anti-IL5), and omalizumab (anti-IgE). A meta-analysis that compared different biologics among themselves and with ASA desensitization indicated that dupilumab showed the most significant patient and clinically meaningful outcomes.[15] There are no head-to-head studies between biologics; thus, caution should be used in interpreting the results of the meta-analysis. Yong and colleagues showed that over 10 years, per patient, appropriate medical management after functional endoscopic sinus surgery cost $54 125.31 and resulted in 2.25 revision functional endoscopic sinus surgeries, ASA desensitization after functional endoscopic sinus surgery cost slightly less and resulted in a 10% decrease in revision functional endoscopic sinus surgery, ASA desensitization with salvage dupilumab cost 2.25 times more and resulted in 17% fewer revisions, and up-front dupilumab cost 3.44 times more and resulted in 33% fewer revisions.[16] Although up-front dupilumab leads to better outcomes, it is not cost-effective. Furthermore, NERD patients will need to stay on biologics for the rest of their lives; those who come off dupilumab will have polyp recurrence.[10] Extended functional endoscopic sinus surgery, steroids, and aspirin desensitization therapy have been shown to reduce polyp recurrence rate in NERD patients, thereby reducing overall health care costs while improving patient outcomes.[17]

Aspirin desensitization therapy is a cumbersome and time-consuming procedure and requires subspecialized care, which is available only in Vancouver. Access to aspirin desensitization therapy has been very limited in BC for years. The COVID-19 pandemic made office spirometry challenging to perform due to complex infection control protocols. Aspirin desensitization therapy has risks, such as gastrointestinal

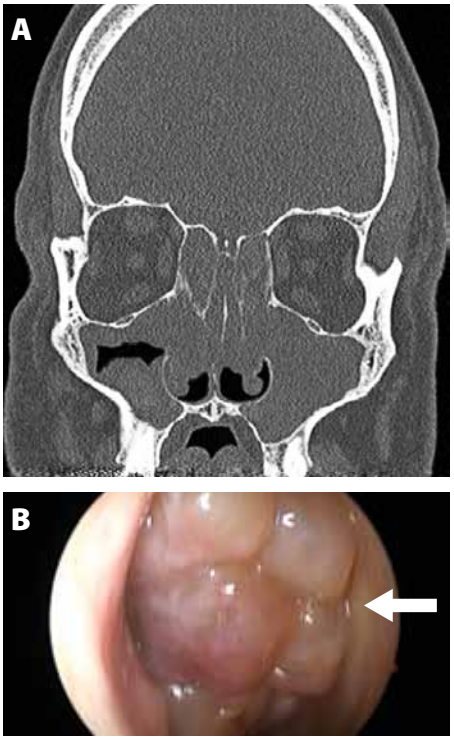

FIGURE 1. (A) Coronal section of CT sinus of a patient with NSAID-exacerbated respiratory disease. Complete opacification of the sinuses. **(B)** Endoscopic view of nasal polyps.

TABLE 1. NSAID-exacerbated respiratory disease aspirin desensitization/challenge protocol.

Time	Day 1 Hospital	Days 2–7 Home	Day 7 onward Home
9:00 a.m.	ASA 40 mg*	Continue taking ASA 160 mg by mouth twice a day* AND proton pump inhibitor prophylaxis	Increase dose enteric-coated ASA 325 mg to 650 mg by mouth twice a day AND proton pump inhibitor prophylaxis
10:30 a.m.	ASA 80 mg*		
12:00 p.m.	ASA 160 mg*		
3:00 p.m.	Discharged		

* Chewable aspirin.

Adapted from Brigham and Women's Hospital.[12]

bleeding, tinnitus, and kidney injury. We use proton pump inhibitors to prevent gastrointestinal bleeds. There are various proposed treatment algorithms, but the most common involves slowly administering increasing doses of ASA until a reaction is elicited **[Table 1]**.[12] Most protocols administer doses every 90 minutes to 3 hours and can take up to 2 days to complete. Then a maintenance dose of 325 mg to 650 mg orally twice daily is established for continued treatment.[1] Typically, aspirin desensitization therapy is started 3 to 4 weeks after the patient's first functional endoscopic sinus surgery.[1]

TABLE 2. Medical and surgical management of NSAID-exacerbated respiratory disease in adults.

	Advantages	Disadvantages/risks	Example and dosing range (> 12 years of age)
MEDICAL TREATMENTS			
Intranasal steroid spray	• Reduces polyp size and nasal congestion • Improves sense of smell • Easy to administer	• Nasal crusting • Epistaxis • Insufficient to control NSAID-exacerbated respiratory disease symptoms in isolation	• Mometasone furoate 50 mcg spray: 2 sprays on each nostril every day, twice a day • Fluticasone 50 mcg spray: 2 sprays on each nostril every day, twice a day • Azelastine/fluticasone 137 mcg/50 mcg: 1 spray on each nostril twice a day
Intranasal steroid irrigations	• Deeper penetration into sinuses • Reduce polyp size and nasal congestion • Improve sense of smell • Easy to administer	• Nasal crusting • Epistaxis • Insufficient to control NSAID-exacerbated respiratory disease symptoms in isolation	• Budesonide nasal saline irrigation: 0.5 mg/2 mL in 240 cc normal saline rinse bottle; rinse 120 cc in each nasal cavity twice a day • Mometasone 2 mg compounded into 240 cc normal saline rinse bottle; rinse 120 cc in each nasal cavity twice a day
Inhaled steroid for asthma control	• Can assist with improving bronchodilation and reducing asthma exacerbations	• Insufficient control of asthma symptoms even at higher doses for NSAID-exacerbated respiratory disease patients	• Budesonide/formoterol 200 mcg: 2 puffs twice a day and as needed • Mometasone/indacaterol 160 mcg to 320 mcg/150 mcg: 1 puff every day • Fluticasone furoate/vilanterol 100 mcg to 200 mcg: 1 puff every day
Leukotriene receptor antagonists	• Improvement in forced expiratory volume in 1 second and asthma scores	• Neuropsychiatric side effects	• Montelukast 10 mg by mouth every day
Oral steroids	• Provide rapid relief of nasal and respiratory symptoms	• Hyperglycemia • Weight gain • Endocrine, musculoskeletal, and neurologic abnormalities	• Prednisone 40 mg by mouth once daily for 7 days

Biologics	• Reduced steroid use
	• Reduced nasal symptoms and improved patient sinonasal symptom scores (SNOT-22)
	• Improved sense of smell
	• Reduced congestion and nasal polyps
	• Monthly/bimonthly dosing schedules
		• Expensive
		• Some coverage through BC PharmaCare
		• Specialist medical prescription required
			• Dosing based on each biologic
			• Options:
			  • Omalizumab
			  • Dupilumab
			  • Mepolizumab

Aspirin desensitization therapy	• Effective • Affordable	• Gastrointestinal upset and bleeds • Tinnitus • Acute kidney injury	• ASA 325 mg to 650 mg by mouth twice a day • Proton pump inhibitor prophylaxis
SURGICAL TREATMENTS			
Functional endoscopic sinus surgery +/– extended procedures	• Improved sinus aeration and access for topical medication • Removal of inflammatory tissue and polyps	• Orbital hematoma • Blindness • Cerebrospinal fluid leak • Bleeding • Infection • Recurrence of disease and scarring	

This not an exhaustive list of medications; it is strictly for learning purposes. We do not endorse the medications listed over other medications in the same drug class.

Providence Health Care

Place Patient Form Label Here

ASPIRIN EXACERBATED DISEASE (AERD) CLINIC REFERRAL

Aspirin Exacerbated Disease Clinic (AERD)

Location: ENT Clinic, Providence 2, St. Paul's Hospital 1081 Burrard Street
Phone: 1-604-806-8353 **Fax:** 1-866-308-2123

We serve patients with ASA/NSAID exacerbated disease across the province of British Columbia. The AERD multidisciplinary clinic is served by Allergy and Otolaryngology Physicians. Our hope is to provide patient centered care for those diagnosed with AERD or suspected of having AERD. The clinic runs once per month at St. Paul's Hospital.

Date of Referral: (dd/mmm/yyyy) _____

PATIENT INFORMATION:

Name: _____
PHN: _____
DOB: (dd/mmm/yyyy) _____
Address: _____
Phone: _____
Email: _____

Gender:
☐ Male
☐ Female
☐ Other: _____

Preferred language: _____
☐ Interpreter required

REFERRING PROVIDER:

Printed name: _____ MSP Number: _____
Phone: _____ Fax: _____

PRIMARY CARE PROVIDER: same as above ☐

Printed name: _____ MSP Number: _____
Phone: _____ Fax: _____

URGENCY

☐ **Urgent** ☐ **Semi-urgent** ☐ **Routine**
Reason for Urgency: _____

CLINICAL CRITERIA: *Must meet all of the following criteria, please confirm that the patient meets all the required criteria*

☐ Presence of nasal polyps OR failed sinus surgery
☐ AND history of asthma, active or previously documented
☐ AND history of an allergic reaction to NSAIDs OR unknown history of NSAID reactions

PROVIDED SERVICES/REQUESTED SERVICES:

☐ Diagnostic ASA challenge
☐ ASA desensitization
☐ Surgical consultation for advanced aeration to maximize topical medical therapy
☐ Allergy skin testing
☐ Close follow up with endoscopy

ADDITIONAL INFORMATION: *Please send the following if available*

☐ Spirometry or PFT
☐ CT Sinus scan
☐ CBC and differential
☐ Any relevant consults (Allergy, Otolaryngology, or Respirology)

FAX completed referral and all relevant supporting documents to 1-866-308-2123

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FIGURE 2. Aspirin Exacerbated Respiratory Disease Clinic referral form.
The form can be found on Pathways and Plexia.

Aspirin Exacerbated Respiratory Disease Clinic

The Aspirin Exacerbated Respiratory Disease (AERD) Clinic was started in November 2021 at St. Paul's Hospital in Vancouver to help facilitate interdisciplinary care and optimize outcomes. The clinic pays homage to the dated name of AERD over NERD because most clinicians are unfamiliar with the new term. Dr Ruiz (allergist) and Dr Thamboo (rhinologist) created the AERD clinic, which offers ASA challenge/desensitization, surgical consultation, biologics start, follow-up with endoscopy, and optimization of medical and lifestyle management. Baseline biological markers through allergy testing and serology are collected as preoperative endoscopy scores. Patients who are eligible for surgical intervention proceed with functional endoscopic sinus surgery and postoperative aspirin desensitization therapy if deemed appropriate. These patients can also participate in multiple landmark research studies that investigate AERD, aspirin desensitization therapy, and functional endoscopic sinus surgery.

Although biologics have demonstrated clinical- and patient-reported benefits, they are expensive and difficult to obtain for patients. The process is quite cumbersome and often requires facilitation by a subspecialist. The AERD Clinic acts as a referral centre for patients to be thoroughly assessed by the relevant specialists and provides the necessary treatment (aspirin desensitization therapy, surgery, and/or biologics) to manage their disease. NERD patients can be referred through Pathways or can fax the referral form **[Figure 2]**. We have adapted previously published protocols **[Table 1]**[12] to work within the constraints of the BC health care system.

Since November 2021, 10 patients have been desensitized at the AERD/NERD clinic. One of those patients has very severe sinus disease and had multiple sinus surgeries. The patient's "asthma was so bad [they were] waking up during the night to take [their] inhalers. The polyps kept growing, even after surgery. By 2021, [the polyps] got so bad, they were pressing against [their] eye, and [they] almost lost [their] vision." "[They] had surgery again and aspirin desensitization therapy in March, and it's changed everything."[11]

When to refer

Any patient with the full triad of NERD symptoms or asthma and chronic rhinosinusitis with nasal polyposis should be assessed. NSAID hypersensitivity can be difficult to elicit in history, and many patients will require an ASA challenge.

Summary

NERD is a complex airway disease that requires subspecialized care from multiple health care providers to optimize outcomes. In BC, greater awareness of NERD is needed to provide early diagnosis and appropriate management. French researchers described NERD in 1922, but it was largely unnoticed until Samter and Beers published their landmark case series 46 years later.[7] We hope to bring NERD to the forefront in BC in a timelier manner. ■

Competing interests

None declared.

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Kaitlyn Kwok, Srinivas Murthy, MD

Pediatric sepsis during the COVID-19 pandemic

Population-level preventive measures for limiting the spread of infectious diseases, such as those implemented during COVID-19, will have the greatest effect on reducing pediatric sepsis morbidity and mortality.

ABSTRACT

Background: Approximately half the global cases of sepsis, a life-threatening condition, occur in children. Infectious diseases such as influenza, pneumonia, and respiratory syncytial virus are common causes of pediatric sepsis. We assessed changes in pediatric sepsis incidence and severity following the implementation of COVID-19 health protocols.

Methods: We conducted a retrospective observational cohort study using data on pediatric sepsis cases that were admitted to the pediatric ICU at BC Children's Hospital during five periods: March 2018–March 2019, March 2019–March 2020, March 2020–March 2021, March 2021–March 2022, and March 2022–March 2023. March 2018–March 2020 were considered pre-COVID-19 years; the following 3 years were considered COVID-19 years.

Results: We assessed 514 cases. The number of admissions decreased by 24.5% in the first 2 years of COVID-19 compared with the pre-COVID-19 years. However, between March 2022 and March 2023, the number of admissions increased more than in any other year. Influenza and pneumonia cases similarly declined by 48.8% in the initial 2 years of COVID-19 yet were 44.2% higher between March 2022 and March 2023 than during the pre-COVID years' average.

Conclusions: Overall, there was an initial decrease in infection-related admissions to the pediatric ICU during the first 2 years of the COVID-19 pandemic, but the number of cases increased during the third year. Adaptations to provincial health and safety guidelines made in response to the pandemic may be related to these trends.

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This article has been peer reviewed.

Background

Sepsis is a life-threatening condition that involves systemic inflammation and organ dysfunction due to a suspected infection.[1] It is estimated that there are upward of 45 million sepsis cases globally each year, approximately half of which occur in children.[2] Sepsis can result from either a bacterial or viral infection; pneumonia is the most common cause in children and adolescents.[3] Preventive measures to reduce the burden of sepsis are crucial, given that there are limited specific therapies aside from supportive care and antibiotics.

In response to the COVID-19 pandemic in Canada, dramatic changes to social behaviors and regular hygiene practices have been made in an effort to reduce the spread of infection.[4] In British Columbia, various levels of province-wide restrictions have been employed since March 2020, when the number of community-transmitted COVID-19 cases began to increase. This has included closure of nonessential services, limits to the number of individuals permitted to gather in indoor and outdoor spaces, and routine wearing of masks. A number of restrictions have also been imposed specifically among children and adolescents, including periodic closures of BC schools and public playgrounds and changes to contact sports rules. These measures not only have limited the spread of COVID-19 but also have the potential to reduce the spread of other infectious diseases, such as influenza, respiratory syncytial virus, and other common causes of pediatric sepsis. The removal of these measures has had the capacity to alter the spread of transmission due to increased contact among individuals as they have resumed normal activities.

We conducted this analysis to determine whether there have been changes in the incidence, severity, and outcome of pediatric sepsis cases in the BC Children's Hospital pediatric ICU, a large referral ICU for children across BC, during the COVID-19 pandemic.

Methods

Study design

In this retrospective observational cohort study, we collected data on pediatric sepsis cases that were admitted to the pediatric ICU of BC Children's Hospital between March 2018 and March 2023. Cases were identified through critical care records using

the International Statistical Classification of Diseases and Related Health Problems (ICD) code system. Our definition of sepsis included any child who had an infection that required hospitalization and admission to the pediatric ICU as an indication of organ dysfunction and suspected infection. Because nearly all children in mainland BC who require advanced critical care would be admitted to this ICU, this study serves as a surrogate for population-level disease incidence during the study period. There were no exclusion criteria.

Data collection

Data were collected using a REDCap database of information and included demographics, comorbidities, ICD code, Pediatric Risk of Mortality (PRISM) score, vital signs, symptoms, laboratory data, pathogen testing, and final outcome. The presence of comorbidities was defined as having acute diabetes, an oncology diagnosis, or a cardiovascular disease. Data were collected from information documented in patient charts. Fever was defined as a temperature of at least 38.5 °C, and rapid breathing and rapid heart rate were assessed using the pediatric systemic inflammatory response syndrome, sepsis, and septic shock criteria, based on the child's age.[5]

Data analysis

Data from five periods were compared: March 2018–March 2019, March 2019–March 2020, March 2020–March 2021, March 2021–March 2022, and March 2022–March 2023. March 2018–March 2020 were considered pre-COVID-19 years; the following 3 years were considered COVID-19 years. Descriptive analyses were conducted to assess any quantifiable changes in the incidence, severity, and source of infection of sepsis between time periods. The PRISM score is calculated based on a pediatric patient's most severe vitals and lab values within the first 4 hours of pediatric ICU care to predict risk of mortality.[6] Having a higher risk of mortality was used as a surrogate for higher illness severity in this study. The main outcomes were duration of stay in the pediatric ICU and ICU disposition.

Results

In total, 514 cases that met the criteria for infection and ICU admission were included in this study. Baseline characteristics of patients are presented in **Table 1**.

The number of sepsis cases was 200 (~100/year) pre-COVID and 314 (~105/year) during COVID, which represents a 5% increase per COVID year. However, the majority of admissions (51.9%) during COVID occurred between March 2022 and March 2023. Between March 2020 and March 2022, the number of sepsis cases declined by 24.5% relative to the pre-COVID years. The trends in admissions to the pediatric ICU during the study period are shown in the **Figure**.

Changes between years in ICD codes, respiratory interventions at any point during admission, severity, and final outcomes are presented in **Table 2**. The number of ICD code diagnoses categorized as influenza and pneumonia declined from 43 (21.5/year) in the pre-COVID years to 22 (11.0/year) in the first 2 years of COVID-19. Between March 2022 and March 2023, there was an increase to 31 cases. The greatest number of total pediatric ICU admissions during COVID-19 occurred between September 2022 and January 2023 (97 cases), a trend that was also observed across Canada and around the world.[7-9] A similar trend was observed in the "Other viral disease" category, in which the number of cases declined by 50% in the initial 2 years of COVID relative to each of the pre-COVID years but increased by 214.3% in the third year of COVID.

The ICD code for COVID-19 took effect 1 April 2020. During all 3 years of COVID-19, a total of 46 admissions to the pediatric ICU were attributable to COVID-19.

Respiratory interventions were assessed as a proportion of the number of cases in each year **[Table 2]**. The proportion of respiratory interventions exhibited a decrease in invasive respiratory interventions (6.9%) and non-invasive respiratory interventions (16.9%) in the initial 2 years of COVID. Once again, there was a subsequent increase the following year (37.4% invasive, 43.3% non-invasive) relative to the pre-COVID years' average.

TABLE 1. Baseline characteristics of patients admitted to the BC Children's Hospital pediatric ICU, March 2018–March 2023.

	March 2018–March 2019 (n = 110)	March 2019–March 2020 (n = 90)	March 2020–March 2021 (n = 58)	March 2021–March 2022 (n = 93)	March 2022–March 2023 (n = 163)
Age (mean ± SD) (months)	76.81 (± 64.90)	78.84 (± 62.73)	87.10 (± 74.11)	95.37 (± 94.32)	76.55 (± 64.11)
Sex					
Male	60 (54.55%)	54 (60.00%)	31 (53.45%)	52 (55.91%)	100 (61.35%)
Female	50 (45.45%)	36 (40.00%)	27 (46.55%)	41 (44.09%)	63 (38.65%)
Previous ICU admission	10 (9.09%)	8 (8.89%)	6 (10.34%)	6 (6.45%)	8 (4.91%)
Comorbidity	22 (20.00%)	19 (21.11%)	14 (24.14%)	22 (23.66%)	25 (15.34%)

The PRISM scores throughout all pre-COVID and COVID years remained relatively unchanged, staying within the lowest score group ≤ 9 with a < 10% risk of mortality.[10]

The median duration of stay in the pediatric ICU for children with sepsis increased in the first COVID-19 year with a 15.5-day median, whereas the remainder of COVID years and pre-COVID years had medians ranging from 7.6 to 9.8 days.

Discussion

Between March 2018 and March 2022, there was an initial decline in the number of sepsis cases in the pediatric ICU at BC Children's Hospital and, by proxy, across BC. Between March 2022 and March 2023,

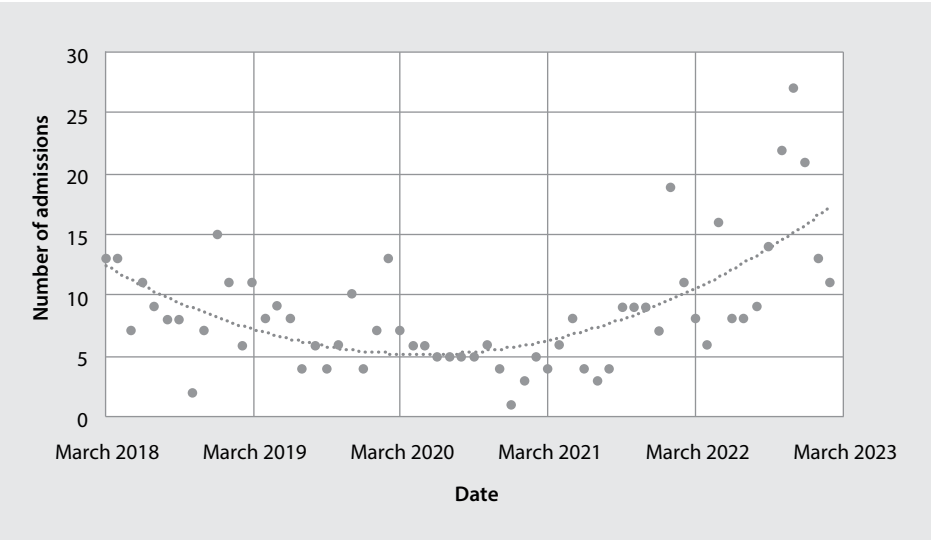

FIGURE. Monthly admissions to the BC Children's Hospital pediatric ICU due to sepsis, March 2018–March 2023.

TABLE 2. Outcomes for patients admitted to the BC Children's Hospital pediatric ICU, March 2018–March 2023.

	March 2018–March 2019 (n = 110)	March 2019–March 2020 (n = 90)	March 2020–March 2021 (n = 58)	March 2021–March 2022 (n = 93)	March 2022–March 2023 (n = 163)
ICD-10 codes					
Other bacterial diseases (A30–A49)	7 (6.4%)	10 (11.1%)	4 (6.9%)	9 (9.7%)	18 (11.0%)
Other viral diseases (B25–B34)	7 (6.4%)	7 (7.8%)	4 (6.9%)	3 (3.2%)	44 (27.0%)
Bacterial, viral, and other infectious agents (B95–B98)	27 (24.5%)	12 (13.3%)	5 (8.6%)	6 (6.5%)	14 (8.6%)
Severe sepsis with or without septic shock (R6520, R6521)	29 (26.4%)	21 (23.3%)	21 (36.2%)	23 (24.7%)	27 (16.6%)
Influenza and pneumonia (J09–J18)	20 (18.2%)	23 (25.6%)	7 (12.1%)	15 (16.1%)	31 (19.0%)
COVID-19 (U07.1)	N/A	N/A	4 (6.9%)	23 (24.7%)	19 (11.7%)
Other ICD codes	20 (18.2%)	17 (18.9%)	13 (22.4%)	14 (15.1%)	10 (6.1%)
Respiratory intervention during admission					
Invasive ventilation	54 (49.1%)	43 (47.8%)	28 (48.3%)	39 (41.9%)	99 (60.7%)
Non-invasive ventilation	51 (46.4%)	39 (43.3%)	22 (37.9%)	34 (36.6%)	83 (50.9%)
Severity					
Median Pediatric Risk of Mortality score	3.0	4.0	3.5	3.0	3.0
Final outcomes					
Median duration of stay in the pediatric ICU (days)	7.6	9.8	15.5	8.8	7.5
Discharged alive	102 (92.7%)	86 (95.6%)	57 (98.3%)	89 (95.6%)	152 (93.3%)
Death	8 (7.3%)	4 (4.4%)	1 (1.7%)	4 (4.3%)	11 (6.7%)

a resurgence in cases resulted in increased admissions to the pediatric ICU. These findings align with those from pediatric ICUs around the world, which showed an initial decline in cases in 2020 compared with previous years, particularly for respiratory syncytial virus and influenza admissions.[11-13] In addition, a subsequent rebound has been observed globally due to co-circulation of COVID-19, respiratory syncytial virus, and influenza as health and safety protocols have gradually returned to practices that are more like those that were in place pre-COVID.[7-9,14] Therefore, sepsis has been observed to be a preventable disease with population-level interventions.

At the beginning of the pandemic, the Canadian federal and provincial governments made health recommendations and regulations to limit the spread of COVID-19.[4] By encouraging mask wearing, social distancing, and increased handwashing, individuals were also preventing the spread of other common childhood illnesses that can ultimately lead to sepsis.[12] School closures and the cancellation of contact sports also reduced the opportunity for the spread of illness among children and adolescents. It is unclear which measures had the greatest impact in reducing the incidence of sepsis cases that required pediatric ICU admission. However, as mandates were gradually removed between March 2022 and March 2023, rates of admission to the pediatric ICU increased, particularly between September 2022 and January 2023, which coincided with influenza and respiratory syncytial virus season. In the coming years, it will be beneficial to observe how the trends in sepsis cases change with varying public health measures and whether rates will return to baseline pre-COVID years.

Additionally, the outcome of duration of stay appeared to show an increase in the first year of COVID (2020–2021), whereas the subsequent 2 years remained relatively stable within 2 days to the pre-COVID years. A prolonged duration of stay (12–20 days) in the pediatric ICU is associated with a higher risk of mortality.[15] A trend in health care avoidance during the first year of the pandemic may help explain the initial increase.[16] Parents may not have been willing to bring their child to the hospital unless the illness was quite severe, thus increasing the duration of stay in those who were admitted. However, any explanation for this can only be hypothesized.

The potential impact on severity of illness was also explored through the measurement of PRISM scores and whether a patient required the use of a respiratory intervention. A higher PRISM score and use of respiratory intervention would indicate a more severe illness. The PRISM scores remained relatively the same throughout the study period with medians of < 10% risk of mortality in all years (scores ≤ 9). However, the number of respiratory interventions, both invasive and non-invasive, followed the trend of an initial decrease in the first 2 COVID-19 years and subsequent increase in the final year. It is uncertain whether this was a significant change, and further study of these differences should be explored after stratifying the cases by illness to determine whether one respiratory illness may have contributed more to the number of respiratory interventions than others.

By encouraging mask wearing, social distancing, and increased handwashing, individuals were also preventing the spread of other common childhood illnesses that can ultimately lead to sepsis.

In this study, the number of influenza and pneumonia cases declined by 48.8% during the first 2 years of COVID-19 compared with the 2 previous years. During the COVID-19 pandemic, caregiver attitudes toward influenza vaccinations for children in several countries shifted positively, and it was anticipated that there would be an increased distribution of influenza vaccinations during the pandemic years.[17] Because influenza is a common cause of pediatric hospitalization and a cause of pediatric severe sepsis, these rates may have also been affected by changes in health-seeking behaviors.[11] However, it is unclear whether the subsequent increase in influenza and pneumonia cases was related to alterations in hygiene practices as mandates changed or to changes in vaccination rates. Vaccine hesitancy has historically been a point of discussion among parents regarding their children, and the COVID-19 vaccinations generated some discourse that may have influenced other vaccination rates. COVID-19 vaccinations are one of the best ways to prevent other causes of sepsis, such as multisystem inflammatory syndrome in children, a life-threatening condition that may follow infection with SARS-CoV-2.[18,19] Improving the delivery of vaccination information in terms of vaccine mechanism of action, importance, and availability may be an area of focus when considering methods to maintain relatively low rates of vaccine-preventable diseases.

Study limitations

This study had several limitations. First, our definition of sepsis included any child who had an infection that required hospitalization and admission to the pediatric ICU as an indication of organ dysfunction and suspected infection. However, the diagnosis of sepsis is based on a range of clinical signs and symptoms that are more typically diagnosed on a case-by-case basis.[20] For example, a symptom of fever may or may not be present when an individual has sepsis.[20] Therefore, it is uncertain whether our definition overrepresented or underrepresented the true incidence of sepsis. Additionally, it is unclear whether any differences in results would have been observed if more pediatric ICUs across Canada had been included in the study or if a longer time period had been assessed. Further study is needed to thoroughly assess any population-level changes in sepsis incidence. It is unclear whether our findings are significant or generalizable across Canada; however, because

this study involved a regionalized system, it likely represents province-level data on disease incidence. Additionally, because this was a retrospective observational cohort study, missing data in charts could not be collected. Some patient records did not include all vital sign measurements and laboratory results. Data on comorbidities were also collected at admission to the pediatric ICU, but they do not necessarily reflect trends throughout the duration of a patient's stay. Last, assessing the causality of public health measures on the incidence of sepsis in children who required pediatric ICU admission is difficult and any claims of a direct link are speculative; control groups in regions where there were different policy approaches would be required for that type of assessment.

Conclusions

The number of pediatric sepsis cases admitted to the pediatric ICU at BC Children's Hospital during the COVID-19 pandemic declined between March 2020 and March 2022 but increased between March 2022 and March 2023. New recommendations for hygiene practices and changes to social and health behaviors may have helped limit the spread of infection, which provides further proof that sepsis is a preventable disease and that population-level interventions will have the largest impact on reducing overall sepsis morbidity and mortality. However, the rapid increase in admissions during the process of removing public health measures also indicated that discussion is required regarding which hygiene practices may be practical long term and how recommendations can be best implemented within the pediatric population. ■

Competing interests

None declared.

Sepsis has been observed to be a preventable disease with population-level interventions.

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Addition of advanced practice providers to health care teams

Optimizing health care teams by including nurse practitioners and physician assistants would increase efficiencies and value for money spent in BC's health care system.

R. Eric Demers, BSc, CCPA, CD

A collective effort is required to deliver safe, effective, and affordable health care. Challenges to health care delivery in Canada include the country's population distribution: more than 70% of the population is concentrated in 5% of the land mass.[1] People living in rural and remote communities often have to travel long distances and contend with difficult weather to access the care they need. This results in higher negative impacts on social determinants of health in at-risk populations, including Indigenous people, who have a higher rural representation.

Policies shape how this care is delivered and how health care teams are built. Traditionally, a health care team was made up of doctors and nurses. Other positions have been added over time to increase efficiency, safety, and patient satisfaction, which has resulted in specializing, complementing, or sometimes substituting what each health professional does.

The Canada Health Act[2] guides Canada's hospital-centric health care system. It consists of five guiding principles or pillars: public administration, comprehensiveness, universality, portability, and accessibility. Fragmented responsibilities are shared between provinces, territories, and some federally insured groups, such as Indigenous peoples, the Canadian Armed Forces, and the RCMP. Coordinating and optimizing this multijurisdictional system is complex and often riddled with political strife in terms of funding and responsibilities.

Provinces also have their own regulatory responsibilities for various health professions. British Columbia has regulated nurse practitioners since 2005,[3] while Manitoba has regulated physician assistants since 1999 and nurse practitioners since 2001.[3]

Measuring health care system performance requires reliable, comparable data, such as that provided by the Canadian Institute for Health Information.[4] This overview compares BC's and Manitoba's performance in using advanced practice providers in health care teams because of their similar geographic and population challenges and similar timelines in which nurse practitioners in both provinces and physician assistants in Manitoba became regulated. Data on other western provinces are included in the tables to provide context.

Advanced practice providers

Advanced practice providers are health professionals who undertake tasks traditionally assigned to or performed by physicians, although the definition can vary because regulations differ worldwide. In this review, I focus on physician assistants and nurse practitioners. The tasks performed by these providers can range from simple to complex. Regulators and professional bodies are responsible for delineating scopes of practice.

In Canada, physician assistants are "academically and clinically educated medical generalists who practice medicine within a formalized relationship with physicians."[5] Supervision is described as "negotiated autonomy."[6] A nurse practitioner is "a registered nurse with additional educational preparation and experience who possesses and demonstrates the competencies to autonomously diagnose, order and interpret diagnostic tests, prescribe pharmaceuticals and perform specific procedures within their legislated scope of practice."[7]

Table 1 shows the number of family physicians, specialists, nurse practitioners, and physician assistants in the four western provinces per 100 000 residents in 2021, and the estimated number of available positions for each role (December 2022 for BC and Manitoba; March 2023 for Alberta and Saskatchewan).[8-11]

Provincial comparison

BC has a land area of approximately 945 000 km[12] and, as of 2021, a population of approximately 5.2 million.[13] Manitoba's land area is approximately two-thirds that of BC,[14] but its population was approximately one-third of BC's in 2021.[13] Both provinces have large Indigenous and rural populations **[Table 2]**.

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As of 2021, there were 648 nurse practitioners in BC,[4] and the provincial government wants to continue increasing that number. BC does not currently regulate or allow physician assistants to work in the public system, other than through the Canadian Armed Forces.

In 2021, there were 275 nurse practitioners and 138 physician assistants in Manitoba.[4] The low number of provincial job postings for those two categories in Manitoba in 2021 suggests that neither profession was on the rise.[9]

Structuring optimal health care teams

Creating the appropriate mix of health care professionals to maintain good-quality care can be expensive. In my opinion, a large amount of money is already spent on health care resources, and administrators must now shift from focusing on the bottom line to finding efficiencies that provide more value for money spent.[15] In 2017, in a series of reports on the value of physician assistants, the Conference Board of Canada explored the idea of increasing efficiency with the addition of physician assistants and adding value to the health care system.[16] The results showed cost and time savings, increased patient volumes, and greater system efficiency and provided insight into funding models. In 2014, an article in the *Harvard Business Review* endorsed the use of nurse practitioners and physician assistants to refocus the services of higher-skilled physicians.[17] The authors hypothesized that high health care costs are "the result of mismatched capacity, fragmented delivery, suboptimal outcomes, and inefficient use of highly skilled clinical and technical staff."

There is no single solution for how to optimize health care teams, as well described by Milewski and colleagues, who concluded that a solution that works for one pediatric orthopaedic group may not be suitable for all teams.[18] Having choices in the makeup of a health care team allows administrators to enable care team leaders and communities to shape effective teams, which can then be adjusted based on results gathered using reliable metrics, including patient input and care outcomes. Chapter 7 of *A Canadian Healthcare Innovation Agenda*[19] makes a strong argument for acquiring better comparable data to bring innovation to health care. Allin and colleagues described how system performance adjustments are dynamic and dependent on lessons learned, which requires robust, uniform information gathering.[19] The patient's role is currently undervalued in shaping the system; patient-reported outcomes and experience measures must be acknowledged and acted upon. When patients report difficulties in accessing care, health care leaders at all levels must establish clear measures that go beyond announcements. More importantly, they must

TABLE 1. Number of health professionals (2021) and available positions across BC, Manitoba, Alberta, and Saskatchewan.*

	British Columbia	Manitoba	Alberta†	Saskatchewan†
Number of professionals (per 100 000 residents)				
Family physicians	136.5	108.8	122.1	105.8
Specialists	123.1	107.7	127.4	99.8
Nurse practitioners	12.4	19.9	14.2	22
Physician assistants	0.6‡	10.0	1.2	0.1‡
Number of available positions (December 2022 for BC and Manitoba; March 2023 for Alberta and Saskatchewan)				
Physicians (family physicians and specialists)	1062[8]	103[9]	540[10]	263[11]
Nurse practitioners	153[8]	1[9]	23[10]	25[11]
Physician assistants	N/A	2[9]	1[10]	N/A

* Data from the Canadian Institute for Health Information unless otherwise cited.[4]
† Data from Alberta and Saskatchewan are included to provide broader Western Canadian context.
‡ Canadian Armed Forces physician assistants working in BC or Saskatchewan.

TABLE 2. Characteristics of populations in BC, Manitoba, Alberta, and Saskatchewan.

	British Columbia	Manitoba	Alberta†	Saskatchewan†
Total population (2021)	5.2 million	1.4 million	4.4 million	1.2 million
Rural population (2016)	13.6%	26.8%	16.4%	33.2%
Indigenous population (2016)	5.9%	18.0%	6.5%	16.3%
Seniors (65 years and older) (2021)	19.7%	16.5%	14.4%	16.7%
Percentage of the total population with a regular health care provider (2019–2020)	81.7%	84.3%	85.2%	82.8%
Perceived health‡ (2019–2020)	60.0%	60.2%	63.7%	58.9%

* Data from the Canadian Institute for Health Information.
† Data from Alberta and Saskatchewan are to provide broader Western Canadian context.
‡ The percentage of the population 12 years of age and older who reported their health to be excellent or very good.

review performance after a change is made to measure the outcomes and determine whether the change was positive.

Researchers in the UK studied the primary care practitioner mix to address three significant issues, which are relevant to the Canadian system:[20] (1) better match patient needs, (2) increase access, and (3) free up physician time. Any physician time that is gained can be used to focus on higher-needs patients or to establish a better quality of work/life.

In 2021, the Organisation for Economic Co-operation and Development (OECD) indicated that the distribution of physicians between urban and rural areas in most OECD countries was unbalanced; Canada had more than twice as many urban-based physicians as rural-based physicians.[21] In a 2010 survey of 4000 rural and remote nurses, only 4% were nurse practitioners.[3] More recent metrics on rural and remote nurse practitioners are difficult to find, but in the absence of new information, my assumption is that the percentage has not improved significantly. Solutions to creating safe, affordable rural and Indigenous health care are needed, because the costs of delivering this care are higher than the costs of delivering care in urban settings, with lower travel requirements and fewer access difficulties.[1] The disparity in who has a regular care provider across Canada varies from 24% in Nunavut to 91% in Ontario.[22]

There are also opportunities to find further efficiencies within scheduling and panel design. This was explored by Balasubramanian and colleagues,[23] using engineering concepts to reshape panels to improve access and longitudinal care. It is logical to have physicians spend less time doing paperwork and dealing with issues that could be handled by an advanced practice provider and more time performing procedures. The downside would be the increased costs of hiring advanced practice providers, but delays in accessing care can have a larger financial impact on the economy. White and colleagues compared mid-level provider use in a practice to advance this redesign.[24] They compared the "icebreaker" model (where patients are first seen by a mid-level provider, then by a physician) with the "stand-alone" model (where some of a physician's tasks are taken on by mid-level providers and there is some shared care) and concluded that the stand-alone model worked better unless the icebreaker model had lower-cost providers. In the stand-alone model, advanced practice providers completed some of the physician's tasks, and interactions between the physician and advanced practice providers were kept to a minimum. In this case, physician assistants have negotiated autonomy, where responsibilities are shared and care remains guided by the physician, and nurse practitioners may work independently of physicians.

"Robbing Peter to pay Paul" aptly describes some health care resource management practices. In 2022, Howlett and colleagues reported that the number of family physicians in Canada had increased by 24% since 2011, which outpaced population growth.[25] However, primary care access continued to worsen. A combination of factors could explain this, but it is difficult to assess them without adequate metrics. It could be that more family physicians were working in areas where their services were needed but not where policymakers wanted them to practise. Some family physicians have reduced their services to a narrower scope in response, which may negatively impact rural and Indigenous populations' access to adequate care. Other factors, such as compensation, work conditions, and job satisfaction, also play a role in where physicians can afford to live and how they balance professional and life responsibilities. **Table 1** lists the number of job vacancies in various health care professions in BC, Manitoba, Alberta, and Saskatchewan. BC boasts significantly more vacancies than Manitoba and has higher ratios of providers with higher health care costs per capita. Health care resourcing efforts must consider system-wide innovations when there are shortages of people to fill roles; national coordination of professional regulation would be a good start. As demonstrated by the nursing shortage,[7] when individuals shift from one role to another (e.g., nurses to nurse practitioners), the shortage is not eliminated; it is repositioned. An effective ratio of various health care professionals is required to meet the needs of a community. Repeating the same cycle of solutions by adding more of the same professions is not sustainable, nor does it help create more effective teams.

The OECD reported that Canada was just outside the top three countries in per capita health care spending in 2020.[21] In 2022, BC spent $8790 per capita for health care, which represented a 2.4% increase from the previous year.[26] Manitoba reduced its health care expenditures by 1% to $8417 per capita.[26] **Table 2** shows that in 2019–2020, similar percentages of the populations in BC and Manitoba had a regular health care provider and "perceived health,"[27] which is a measure of the percentage of the population aged 12 years and older who reported their health to be excellent or very good. In 2016, Manitoba had higher percentages of rural and Indigenous populations than BC, whereas in 2021, BC had a slightly larger population of seniors. Although not conclusive, Manitoba appears to have created more value with its policy decisions regarding advanced health care providers in that its health indicators are comparable to BC's, it spends less on health care per capita, and it has a slightly higher percentage of the population with a regular health care provider **[Table 2]**, despite having a population base that is more susceptible to social determinants of health. This especially appears to be the case considering that Manitoba had 43.1 fewer physicians (family physicians plus specialists) per 100 000 residents than BC in 2021 **[Table 1]**. As of 2021, Manitoba had more physician assistants and nurse practitioners than BC **[Table 1]**, which likely reduced the demands on Manitoba physicians to meet the province's health care needs.

Adding a variety of advanced health care practice providers, including physician assistants, to BC's health care system would increase efficiencies and value for money spent by creating an overlap of skills that would help bridge the wide gaps in health

care. The initial costs of creating these efficiency gains would be a first step toward improving access, sustainability, and better team-based care.

The use of physician assistants allows for a realignment of teams. Surgical first assists and some hospitalists can be redirected to primary care, which would leave surgeons and a core of hospitalists to supervise physician assistants. The reach and capacity of primary care can be increased by providing physician-level care by physician assistants, who are supervised by physician leaders, and would maintain the physician relationship with the patient. Manitoba, which uses a variety of advanced practice providers, demonstrates better performance for access and affordability compared with BC, and similar health outcomes.

Conclusions

Prevention, prompt treatment, and safety are essential to health, as is offering the care that we all deserve. The evidence-based and holistic approach used for patients should extend to health care systems management. It needs to be adaptive and to put more value on measurable outcomes. To increase workforce efficiency and apply innovations, comparable metrics in Canada's interlinked health systems need to be gathered. The use of advanced practice providers adds value because a diversified workforce improves long-term affordability by safely multiplying the existing physician workforce. Adjusting the ratio of the various types of providers in health care teams will help keep costs down and maintain good-quality care. In Canada, provinces will continue to be slow in human health resource innovation without a coordinated approach to professional regulation.

Dr Katharine Smart, former Canadian Medical Association president, stated that "In an optimal situation, every family doctor would be paired with a [physician assistant]."[28] As a physician assistant, I cannot disagree, but I would rephrase this to be more holistic in terms of our entire health system. Every care team, across both primary and specialist care, would benefit from administrative flexibility, including the option to create teams that best serve the community and team members. Rural and Indigenous care is expensive and would benefit most from more collaborative primary care and specialist outreach using a balanced approach to advanced practice providers. ■

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Mental health and well-being among pandemic-era youth in British Columbia: Risk and protective factors

At the onset of the COVID-19 pandemic, health professionals hypothesized that a shadow pandemic of mental illness was imminent.[1] Mental health issues among adolescents have been increasing steadily in Canada since 2011.[2] Concerns regarding the impact on adolescent mental health[3] of school closures and limiting in-person contact with peers were warranted. Research indicates that adolescents were among the populations whose mental health has suffered the most during COVID.[4-8] Developmental resilience science provides insight for supporting youth mental well-being during this challenging time; more than 5 decades of evidence has demonstrated that positive experiences with families, with peers, in schools, and in communities act as protective and promotive factors for youth mental health.[9]

Data collected through the Youth Development Instrument (YDI) offer insight into pandemic-era adolescent mental health and well-being in BC.[10] The YDI is an annual self-reported survey administered in BC secondary schools that asks youth ages 15 to 17 about their mental health and well-being. The YDI also measures risk and protective factors for mental health and well-being in individual, family, peer, school, and community domains.[11] The YDI was piloted in the spring of 2020, and youth participation has increased each year since its inception. To date, YDI participation has included approximately 26 000 youth from 33 school districts and 28 independent schools across all five health regions in BC **[Table 1]**. Here we highlight key mental health and well-being challenges and opportunities elucidated by YDI research during the pandemic.

BC adolescent subjective mental well-being appears to have declined since the onset of the pandemic **[Figure]**. As well, in our latest wave of data collected from January to March 2023, 38% of youth screened positive for moderate to severe symptoms of depression, and 38% of youth screened positive for generalized anxiety disorder **[Table 1]**. YDI results suggest that some populations of youth in BC are experiencing poorer mental health and well-being than others. Analyses of 2022 YDI data indicated that youth with pre-existing mental health issues, those who report lower family affluence, and those living in rural areas of BC have poorer mental health and well-being compared with their peers **[Table 2]**. LGBTQIA2S+ youth and those identifying as female or nonbinary reported poorer mental health and well-being than those who identify as heterosexual or male. Similar to 2022 data, preliminary analyses of 2023 YDI data identified youth with pre-existing mental health conditions as having the poorest mental health and well-being of YDI participants. These findings align with extant research that suggests these groups have been experiencing poorer mental health and well-being prior to and during the COVID pandemic.[7] Thus, addressing social and structural inequities is paramount to population mental health.[12]

A motivating factor for creating the YDI was to identify malleable protective and promotive factors for youth mental health and well-being. In our analyses of 2021 YDI data, important correlates of mental health and well-being for BC adolescents included sleep, positive home experiences (e.g., supportive adults at home, positive communication with family), supportive peers, positive school experiences (e.g., school belonging,

TABLE 1. YDI mental health and well-being trends over 3 years (2021–2023).

Year	N	Depression (PHQ-8)	Anxiety (GAD-2)	High mental well-being	Six to seven positive childhood experiences
2021	2 295	40%	43%	27%	35%
2022	9 255	40%	41%	23%	37%
2023	14 596	38%	38%	20%	32%

Notes: Scores of 10 or greater on the Patient Health Questionnaire-8 (PHQ-8)[18] indicate moderate to severe depression. Scores of 3 or greater on the Generalized Anxiety Disorder-2 (GAD-2)[19] indicate generalized anxiety disorder. High mental well-being constitutes youth who score at least 28 out of 35 on the Warwick-Edinburgh Mental Wellbeing Scale[20] (i.e., 80% or more of the scale's maximum value). YDI research indicates having six or more positive childhood experiences is a protective factor for depression and anxiety and a promotive factor for mental well-being.[5]

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school safety), and social and emotional competencies, such as self-concept and optimism, after controlling for demographics such as racial identity, gender identity, sexual orientation, and family affluence.[13] YDI results for 2022 were similar: positive childhood experiences, such as having supportive families, peers, and teachers, were linked to significantly greater mental well-being and life satisfaction and significantly lower symptoms of depression and anxiety among youth.[14] Moreover, we found that having six or more positive childhood experiences protected youth with adverse childhood experiences, such as neglect or abuse, against poor mental health and well-being. Thus, finding ways to increase positive experiences at home, among peers, at school, and in the community may serve as an important population-level strategy for promoting mental well-being and preventing mental illness among youth. Similar to extant research conducted among adults,[15] we observed that positive childhood experiences are additive: the more of them that youth experience, the better their self-reported mental health and well-being on the YDI.[14]

Implementing evidence-based policies and programs that promote positive childhood experiences has been shown to lead to better mental health and well-being outcomes—for example, whole-school social and emotional learning programs that include student, teacher, parent/guardian, and community components.[16] Furthermore, addressing social determinants of health, such as poverty and discrimination, may lead to more positive childhood experiences and reduce the number of adverse childhood experiences, thus positively influencing mental health and well-being among youth.[17] Many of these initiatives are already underway in BC schools (e.g., the Mental Health in Schools Strategy, the sexual orientation and gender identity curriculum, the K-12 Anti-Racism Action Plan). Similar initiatives for supporting families and communities and in health care are necessary to promote mental health and well-being at a population level. ■

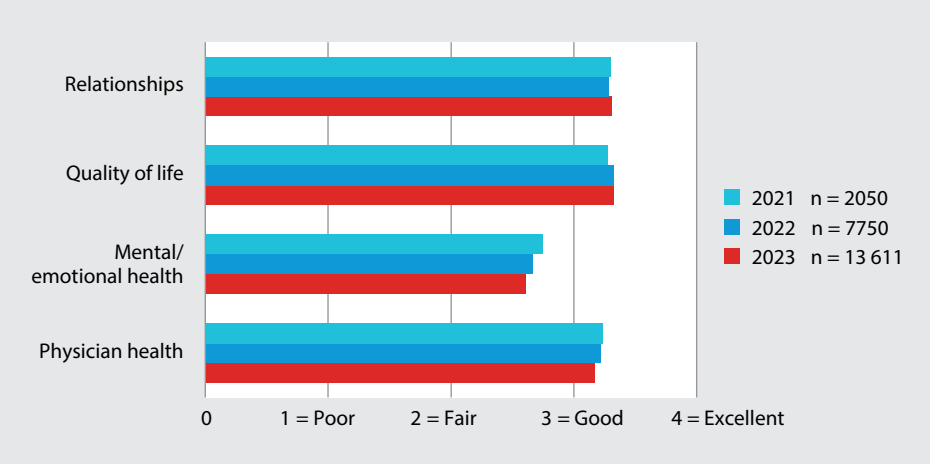

FIGURE. Subjective well-being among YDI participants (2021–2023).

TABLE 2. Subpopulation analyses of 2022 YDI data.

Subpopulation	n	Depression (PHQ-8)	Anxiety (GAD-2)
Pre-existing mental health condition	2615	73%	72%
LGBTQIA2S+	2192	64%	61%
Heterosexual	7063	33%	34%
Female or nonbinary	4654	53%	56%
Male	4583	26%	35%
Low family affluence	1461	50%	49%
Medium or high family affluence	7358	38%	39%
Rural	1102	45%	46%
Urban	8099	39%	40%

n = the number of people from the total 2022 YDI sample (N = 9255) who identified as being in each subpopulation. The table includes the proportion of each population that screened positive for moderate to severe depression on the Patient Health Questionnaire-8 (PHQ-8) or for generalized anxiety disorder on the Generalized Anxiety Disorder-2 (GAD-2).

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Shifting access to apps—availability through the College Library

The CPS app from the Canadian Pharmacists Association and the Essential Evidence Plus app are no longer available from the Canadian Medical Association after closure of the CMA Library due to a change in the organization's focus. Another medical app, Epocrates, has exited the Canadian market. College registrants with Library access may be interested in the following alternatives.

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.*

The CPS app, a Canadian source of drug and therapeutics information, is available via the College Library at www.cpsbc.ca/registrants/library/drug-tools. The web-based version of the app and the drug interaction checker Lexi-Interact can also be accessed from that web page.

Alternatives to the decision-support apps Epocrates and Essential Evidence Plus include *BMJ* Best Practice and DynaMed, which are available via the College Library's point-of-care web page at www.cpsbc.ca/registrants/library/point-care-tools. UpToDate is available through the Divisions of Family Practice, the Specialist Services Committee, and health authorities. The alternatives are not identical to Epocrates, but there are similarities, particularly for *BMJ* Best Practice in terms of streamlined text.

Essential Evidence Plus contains decision support and content from the Cochrane Database of Systematic Reviews. Individual Cochrane reviews may be accessed via the Read by QxMD app, along with many other articles, or the entire database may be searched online at www.cpsbc.ca/registrants/library/databases.

Instructions for accessing all mobile apps through the College Library are on the Mobile Apps page: www.cpsbc.ca/registrants/library/mobile-apps. ■

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Abilities-focused language: Seeing the possibilities

Word choice and usage can have a powerful impact on someone's thoughts and perception of their situation, particularly in clinical settings.[1] Given this effect, WorkSafeBC has shifted to abilities-focused language when we discuss recovery, return to work, and return to function, both orally and in writing. This language is meant to help injured workers identify possibilities at home and at work and to be seen for what they *can* do, not what they can't. Employers, in turn, have a much easier time finding a place for an injured employee when provided with a list of functional tasks the worker can perform.

Recently, we adjusted the language on many of the report templates used to document injured workers' progress. These reports are completed by contracted treatment providers who deliver programs and services such as physiotherapy, mental health treatment, and occupational rehabilitation. Ideally, the worker's attending physician is copied on such reports, which now use this abilities-focused language, meaning words with negative connotations have been replaced with more neutral terms. For example, *limitations* and *barriers* are now *considerations* and *factors*, respectively. This allows contracted treatment providers to speak to injured workers' functional abilities and to facilitators that would support a safe and timely return to appropriate work duties.[2]

When treatment reports are written through a lens of inability, exclusively identifying return-to-work barriers and limitations, they can foster a belief that return to work may not be possible.[1,2] Reports that speak to supportive interventions and the worker's functional abilities foster a belief that recovery and return to work will occur. This information equips all clinicians, including attending physicians, with a better understanding of what the worker can do. Attending physicians can then readily encourage a return to safe and appropriate work duties and have more meaningful conversations with the injured worker about their recovery.

Reframing recovery in a positive light supports an earlier return to preinjury function.

Focusing on an injured worker's abilities doesn't mean that injuries aren't recognized or symptoms aren't validated. It simply allows injured workers to see possibility where before they may have only seen inability.[2] Given the well-known negative health effects of prolonged inactivity and being out of work,[3] reframing recovery in a positive light supports an earlier return to preinjury function, helping mitigate these negative effects. To support this initiative, we've held workshops with contracted treatment providers throughout BC about the importance of and reason for this change.

Each practitioner involved in a worker's care postinjury has a shared responsibility to do everything possible to support a return to preinjury function in a timely manner.[4] Recent legislative changes will soon add a legal duty and obligation for employers to cooperate in the worker's safe and timely return to work and to ensure that it occurs whenever possible.[5] Word choice can, at first glance, seem inconsequential, but research has shown us otherwise.[1] Together, let's be mindful of using positive language when engaging with injured workers in the recovery and return-to-work process.

For more information

To learn more about the programs and services we offer to injured workers, visit www.worksafebc.com/en/health-care-providers/rehabilitation. If you'd like to speak with a WorkSafeBC medical advisor about your patients who are injured workers or if you have questions about being copied on treatment reports, call the RACE line at 604 696-2131 or toll-free at 1 877 696-2131.

Partners in Care webinar

Shifting to abilities-focused language is just one way we're striving to support injured workers and their clinicians. Learn about WorkSafeBC supports and resources at our Partners in Care webinar on 21 September 2023. Register at https://ubccpd.ca. ■

—Karen Takai, MSc
Program Manager, Health Care Programs, WorkSafeBC

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

Obituaries

We welcome original tributes of less than 700 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 Mary Hallowell

1926–2023

Dr Mary Hallowell graduated from Leeds Medical School in 1950. She worked in many United Leeds Hospitals, mainly in internal medicine and pediatrics, while preparing for higher qualifications in these subjects. Official training programs were non-existent, and higher qualifications in internal medicine were necessary to become a pediatrician in England. In 1956, she was admitted as a Member of the Royal College of Physicians of Edinburgh, and a few years later she was elected to the fellowship. She subsequently worked for 2½ years in Birmingham Children's Hospital, renowned at the time for its work on celiac disease. Intestinal biopsy had just been introduced, and she carried out many of these procedures.

Dr Hallowell immigrated to Canada in 1960 and set up the first consulting pediatric practice in New Westminster. Initially she worked mainly in the hospitals in New Westminster, Surrey, and occasionally Maple Ridge. She treated many sick children with acute gastroenteritis, respiratory infections, meningitis, leukemia, and complications from infectious diseases. It was a great time to work, as hospital beds were easily accessible. As many childhood diseases became controlled by immunization and medicare became universally available, the incidence of very sick children decreased. Allergic disease became more common, and in 1976 children's allergies became the focus of her practice. Dr Hallowell finally retired from solo practice in 1986. A few months later, she started part-time work at Care Place Medical Clinic in Surrey, where she worked for the next 12½ years.

Part-time work allowed her to pursue her love of tennis. In 1996 Dr Hallowell won the Canadian seniors doubles championship in the 70+ age group, and in 2002 the singles championship in the 75+ age group. She won many seniors tournaments in BC and some in the Pacific Northwest. She was privileged to play in two seniors Friendship Cups, in Suzuka, Japan, in 1997, and in Pörtschach am Wörthersee, Austria, in 2002. She was president of the BC Senior Women's Committee, represented BC on the PNW Senior Women's Committee, and was on the board of the World Medical Tennis Society for 25 years. The latter enabled her to compete with doctors from many different countries. At age 88, Dr Hallowell sustained a bad shoulder injury and had to give up playing, but she was fortunate to find an excellent physiotherapist and returned to the court 17 months later. After 80 years on the court, she finally hung up her tennis racket.

Dr Hallowell traveled extensively both with and without her tennis racket. Much to the surprise of her travel agent, she continued to travel until age 94, when COVID-19 saw the cancelation of a final trip to Portugal.

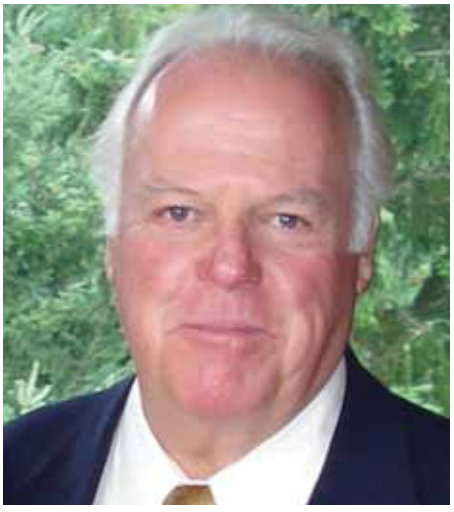
After moving to Vancouver in 2002, Dr Hallowell began attending courses at Simon Fraser University's downtown campus and joined the SFU Seniors Lifelong Learners Society. She took courses in history, geography, comparative religion, economics, and art history. She also enjoyed attending operas and concerts at the Orpheum. She always remained interested in advances in pediatrics and changes in medical practice and was a member of the Federation of Medical Women of Canada.

Dr Hallowell also enjoyed wining and dining her friends, using the Vancouver Lawn Tennis Club as her venue. She held a last soiree on 7 July, which was a celebration

of life with her in attendance. Suffering from chronic renal failure and no longer living the active life she loved, she remained in charge, deciding when she would leave the Earth. She did so peacefully on 18 July 2023, surrounded by friends.

Dr Hallowell was a local trailblazer. She trained and worked in times when women in medicine were by far in the minority. The concept of work life–home life balance did not exist, and she often worked 24/7, looking after very sick children. She leaves behind many grateful parents whose children's lives were saved by her dedication and care. She will be missed.

—Shelley Ross, MD
Burnaby



Dr Andrew "AJ" Moore
1942–2023

On 14 June 2023, Dr Andrew J. Moore, in his 81st year, passed away peacefully at Hilltop House hospice in Squamish, BC, surrounded by his loving wife and family. He was affectionately known as "Andrew" to his beloved wife, Pru, and as "Andy," "Doc," or "AJ" to family, colleagues, and friends, near and far.

AJ was born in Fife, Scotland, and immigrated to Canada in August 1952 at age 10, settling in London, Ontario. AJ's academic prowess started early; he earned accolades at every school he attended. While he planned on a career as a fighter pilot, AJ changed direction and graduated from the University of Western Ontario's Faculty of Medicine, class of '66. AJ did his internship in Winnipeg before caring for patients across northern Canada as a medical officer in the Canadian Armed Forces. He concluded his military service at the National Defence Medical Centre in Ottawa and then moved his family to Vancouver, where he completed his residency in urology at Vancouver General Hospital.

AJ established a large and flourishing practice at St. Paul's and Mount Saint Joseph Hospitals and enjoyed teaching interns and residents as an associate clinical professor in the UBC Faculty of Medicine. I was personally privileged to have Andy as my mentor, partner, and friend. Together with the late Dr Zelick (Zeke) Perler, Andy welcomed me into his practice as a young faculty member, and we spent 10 years together managing many interesting, challenging, and satisfying surgical cases. He was a master surgeon and was loved and respected by his patients and all the OR and ward staff members. I don't know of anyone who ever disliked the man!

Outside of medicine, AJ participated in a wide range of activities, athletic and otherwise. He loved football, golf, and hockey, the latter as a long-time member of the "old-timers" Vancouver Flames Hockey Club, playing in tournaments across Europe and North America. He was a highly accomplished alpine skier, one of the "originals" at Whistler Mountain in the early 1970s, when he would coax his Seville to conquer the winding road from Vancouver, listening to a wide variety of tunes. AJ created deep friendships and fond memories hosting large, wild gatherings at his home, filled with warmth and generosity, and became a well-known member of the West Vancouver and Whistler communities. His home and its backyard oasis became the cherished gathering place for anyone who wanted one, including annual parties for all the urology residents and students, many of whom were newcomers to the West Coast.

AJ is predeceased by his parents, George and Margaret. He is survived by his wife, Prudence; sons, Scott and David, and their mother, Barb; son, Christopher (Daviana); grandchildren, Riley, Maddison, Theodore, and Harper; beloved brother, Jim (Joan); sister-in-law, Jan; nephew and niece, Brad (Carrie) and Andrea (Dean); and their families.

AJ's family would like to extend their sincere appreciation and gratitude to the doctors, nurses, and staff at Hilltop House hospice for their compassionate and competent care and for making his last days as comfortable and peaceful as possible for him and his family. A celebration of AJ's life was held at Gleneagles Golf Course & Clubhouse on 20 August 2023.

Dr Andrew Jenkins Moore was a beloved husband, father, brother, grandpa, uncle, loyal friend, teacher, and colleague. His was a life well lived.

—Larry Goldenberg, MD
Vancouver

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Dementia and assistance in dying: A catch-22

Persons suffering from dementia are not eligible for medical assistance in dying, and this is inhumane.

George Szasz, CM, MD

In February 2023, the Parliament of Canada's Special Joint Committee on Medical Assistance in Dying released its second report, recommending, among other things, "that a person of full age and capacity be permitted to make an advance request for medical aid in dying following a diagnosis of a serious and incurable illness leading to incapacity."[1] Persons suffering solely from a mental illness who meet all other eligibility criteria will become eligible for medical assistance in dying (MAID) in Canada as of 17 March 2024.[2] Regrettably, neither of these options will be available to those suffering the symptoms and signs of dementia, which presents a catch-22 situation when it comes to eligibility for MAID. A patient must possess the capacity to provide informed consent for MAID immediately prior to the procedure, but because patients who are suffering from dementia lack the capacity to give informed consent, they are ineligible for MAID.

Currently, persons must meet all the following criteria to be eligible for MAID:

- Be 18 years of age or older and have decision-making capacity.
- Be eligible for publicly funded health care services.
- Make a voluntary request that is not the result of external pressure.
- Give informed consent to receive MAID, meaning that the person has consented to receiving MAID after they have received all information needed to make this decision.
- Have a serious and incurable illness, disease or disability (excluding a mental illness until March 17, 2024).
- Be in an advanced state of irreversible decline in capability.
- Have enduring and intolerable physical or psychological suffering that cannot be alleviated under conditions the person considers acceptable.[2]

My wife's case history might help explain the problems related to these eligibility requirements.

Sixty years into our marriage, the four horsemen of dementia—amnesia, aphasia, apraxia, and agnosia—grabbed hold of my vital, healthy partner. Over a 9-year period, she was devastated and destroyed mentally and physically. Her earliest signs of dementia included forgetfulness, anxiety when left alone or when in a large group, being disorganized when packing for a trip, and losing her way in previously familiar territory. She lost her driver's licence after failing the Montreal Cognitive Assessment test for dementia. She became furious with her medical advisor, and with me, accusing us of colluding. She had no insight into her unfolding dementia. I could no longer leave her at home alone. I took her shopping with me, watching that she did not take inappropriate items off the shelves or grab other shoppers' carts. While in the company of others, she could not follow the conversation and often broke in with inappropriate comments. I had to excuse us from invitations. Gradually, I needed help to help her with bathing, dressing, and going to the bathroom.

Over the next 5 years, we had a rotation of 56 dedicated shift-working caregivers assisting us around the clock. During those years she gradually lost her speech and comprehension abilities and no longer recognized who was who. When touched, she would reflexively hit back; she screamed when being washed or bathed; she became incontinent; and she often needed manual help to empty her bowel. At night she became panicky; she yelled out, punched the air, and often hit herself. Our medical advisors thought she was most likely suffering

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Dr Szasz is a member of the Order of Canada and professor emeritus in the Department of Psychiatry in the UBC Faculty of Medicine. For the first 10 years of his career, he was a family physician on the North Shore. In the following 6 years, he was a faculty fellow of the Milbank Foundation, assisting medical dean Jack McCreary's development of the "health team" concept through experiments in interprofessional education programs. In 1970 he cofounded the Faculty of Medicine's Sexual Medicine Clinical, Teaching, and Research Unit. His clinical focus for the next 25 years was on the sexual and reproductive rehabilitation of persons with physical disability. After retiring from UBC, he was a member and chair of the Medical Advisory Committee of the Library of the College of Physicians and Surgeons of BC. Now in his 95th year, he continues rowing at the Vancouver Rowing Club and writing for the BCMJ.

This article has been peer reviewed.

Continued from page 269

from a frontotemporal disorder or perhaps a vascular problem. She did not have any insight into her worsening condition. She lived in a different world.

At about the 5-year mark she fell and fractured her hip. When she came back from the hospital 3 days after surgery, we had a hospital bed installed with an overhead sling lift to get her into and out of bed. Physiotherapy was ineffective; she had no ability to comprehend rehabilitation. She was essentially helpless, as she could not move around in bed and could not feed herself. With the need for more intensive care, we then had live-in caregivers looking after her for almost 2 years. Her physical and mental deterioration was rapid. To avoid COVID-19 infection, she was transferred to a long-term care facility. I visited her daily, and from time to time I helped feed her. She opened her mouth as the spoon came near, then chewed and chewed the small bit of food while seemingly sightlessly looking up at the ceiling. She had no recognition that I was there. On her last day she had a small bit of food at dinner time, then put her head on the pillow, and like the elegant person she used to be, she closed her eyes, went to sleep, and never woke up.

As this sad case history illustrates, a diagnosis of dementia is not an exact science. Medical opinions may vary, or time may be required to observe the unfolding symptoms and signs of the condition. An informed request for assistance in dying and consent that is given far in advance of any signs or symptoms of dementia would not be accepted because of the complications arising out of who would activate the request and at what stage of the disorder, while consent for assisted dying would not be considered "informed" if given once the patient was at the earliest stages of dementia because of their memory and comprehension deficits at that point.

We must find a way to provide persons suffering from dementia the option to escape this inhumane and intractable condition with medical assistance. Having biometric measurements that indicate when the brain's functioning has been reduced to a vegetative state would be of great value. That indicator, along with a legally documented prior request for a medically assisted end to life, might provide the signal for a humanitarian exit.

A year and a half after her unassisted death, the memories of her suffering still haunt me. Her experiences were inhumane. ■

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