



VOLUME 4  
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**The Mental Health Impact of the COVID-19 Pandemic on  
Nurse Practitioners in British Columbia**

**Helping Your Patients Stay on  
Their SGLT2 Inhibitor**

**Clinical Consult: Diagnosing and Treating  
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mCRPC=metastatic castration-resistant prostate cancer; mCSPC=metastatic castration-sensitive prostate cancer; nmCRPC=non-metastatic castration-resistant prostate cancer.

Reference: 1. XTANDI Product Monograph. Astellas Pharma Canada, Inc. January 24, 2022.

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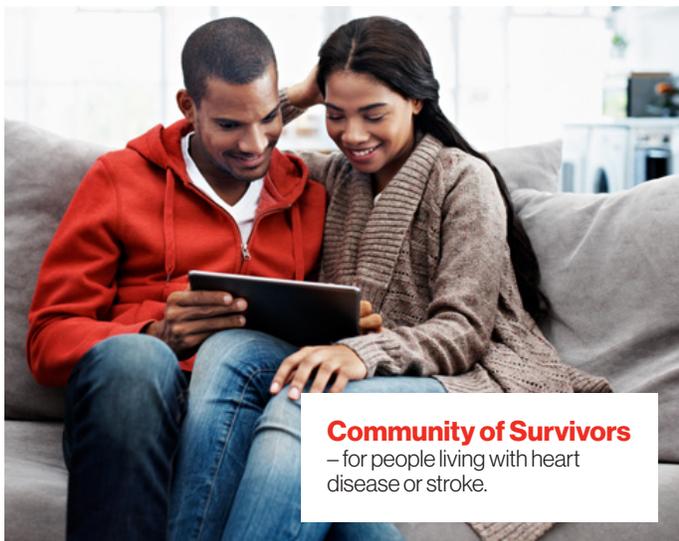
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# The Mental Health Impact of the COVID-19 Pandemic on Nurse Practitioners in British Columbia

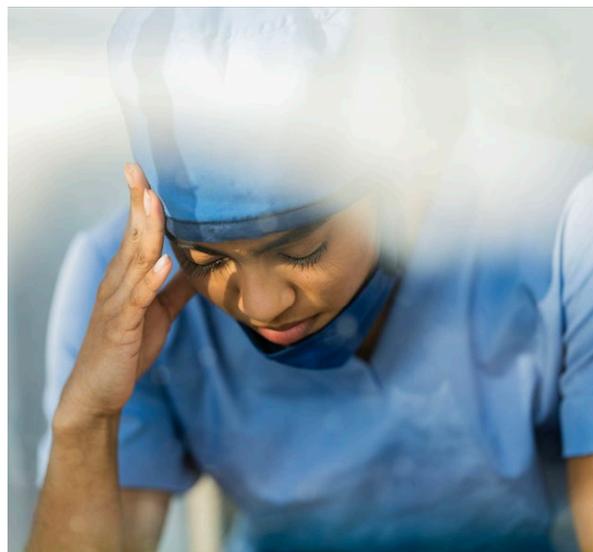
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## ABSTRACT

**Objective:** Focusing on Nurse Practitioners (NPs) working in British Columbia, the study objectives were to examine the impact working during the pandemic had on NPs' mental health and quality of work life.

**Research Design:** This was a mixed-methods study using an online cross-sectional survey and integrating closed- and open-ended survey data.

**Main Outcome Measures:** The survey consisted of three validated questionnaires: the Impact of Event Scale–Revised, the Depression, Anxiety, and Stress Scale, and the Professional Quality of Life Scale (ProQoL), as well as four optional open-ended questions.

**Results:** 51 NPs from across British Columbia participated in the study. 27% of participants experienced symptoms of PTSD at the time of the survey, 75% reported moderate to high burnout, and 49% experienced moderate to high secondary traumatic stress. The qualitative analysis revealed three main themes: (1) mental health challenges arising from stressful work environments, (2) frustration with failed leadership, and (3) a desire to continue to show up for their patients and colleagues.

**Conclusion:** NPs have experienced higher than usual rates of burnout and secondary traumatic stress, and have struggled with a wide variety of workplace issues that are increasing the burden on their professional quality of life and wellbeing. These results afford an opportunity to raise awareness and promote changes to practice.

**KEYWORDS:** Nurse Practitioner, Mental Health, Pandemic, Survey

## Introduction

After its discovery in late 2019, COVID-19 created a public health emergency experienced worldwide (Mahase, 2020; Wang et al., 2020). The effect of this pandemic has been felt far and wide by patients, families, and healthcare providers alike. Since the World Health Organization (WHO) declaration of a global pandemic, healthcare workers have

been grappling with the adverse effects of practicing in a time of uncertainty (Crowe et al., 2021; Mahase, 2020; Wang et al., 2020). Numerous studies have now documented the psychological burden felt by healthcare providers, particularly nurses, since the beginning of the pandemic (AlAteeq et al., 2020; Alharbi, Jackson, Usher, 2020; Gomez et al., 2020; Havaei et al., 2021; Shaukat, Ali, Razzak, 2020; Vizhen et al., 2020).

Nurse practitioners (NPs) are advanced practice nurses working in various clinical settings, from community-based primary care and specialty clinics to acute care hospital wards. NPs are critical members of the healthcare system that deliver quality care to various patient populations, including those impacted directly by the COVID-19 virus and patients indirectly affected because of the rapidly changing service delivery model's responses to the pandemic (Rosa et al., 2020). NPs have worked throughout the pandemic to ensure the care needs of patients have been met; however, little is known about the effect of working during the pandemic on their mental well-being. This study aimed to examine the impact of working as an NP during the COVID-19 pandemic on NPs' mental health and quality of work life.

## Methods

### Study Design

This was a mixed-methods study using an online cross-sectional survey and integrating closed- and open-ended survey data. We surveyed NPs across British Columbia, Canada, from February 2022 to April 2022. This period was considered to be the fourth wave of the pandemic. This study was approved by the Fraser Health Research Ethics Board (Ethics # 2022015). The first page of the online survey on the platform Checkbox explained that proceeding with questionnaire completion constituted implied consent. No identifying data was collected from participants.

### Setting and Sample

In Canada, a public healthcare system provides universal coverage for medically necessary healthcare services. For this study, NPs working in an NP role during the COVID-19 pandemic in British Columbia were invited to participate. A study invitation was emailed to all NP members through the Nurses and Nurse Practitioners of British Columbia Association and multiple NP provincial leadership teams. The invitation to participate contained a link to the online survey.

### Data Collection and Analysis

We collected online survey data with three validated questionnaires: the Impact of Event Scale-Revised (IES-R), the Depression, Anxiety, and Stress Scale (DASS-21), and the Professional Quality of Life Scale (ProQoL) (Creamer, Bell, Falilla, 2002; Lovibond, Lovibond, 1995; Stamm, 2012). We also included four open-ended, free-text optional questions.

The three validated questionnaires have demonstrated strong reliability and validity when used in previous nursing studies, including two studies conducted by the principal investigator (Crowe et al., 2021; Crowe et al., 2022). Used in the past to assess the effect of a public health crisis, the IES-R measures the psychological impact of an event, providing a brief snapshot in time of the participant's response to a crisis, and capturing symptoms of post-traumatic stress disorder (PTSD) (Wang et al., 2020; McAlonan et al., 2007; Weiss, 2007). This 22-item scale asks participants to reflect on how difficult a statement was in the past seven days, with response options ranging from not at all (0 points) to extremely (4 points) (Creamer et al., 2002). All 22 items are summed; a score of under 24 indicates no clinical concern, 24 to 32 indicates the presence of some PTSD symptoms, 33 to 36 indicates a cut-off for a probable diagnosis of PTSD, and a score of more than 37 indicates significant symptoms (Creamer et al., 2002).

“

This study aimed to examine the impact of working as an NP during the COVID-19 pandemic on NPs' mental health and quality of work life.

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Also used in previous pandemic research, the DASS-21 measures symptoms of depression, anxiety, and stress (Wang et al., 2020; McAlonan et al., 2007). The 21-item questionnaire asks participants to reflect on how a specific statement applied to them over the past week, with response options ranging from did not apply to me (0 points) to applied most of the time (3 points) (Lovibond, Lovibond, 1995). The three sub-scale scores are summed and interpreted for depression [normal (0 to 9), mild (10 to 13), moderate (14 to 20), severe (21 to 27), and extremely severe (over 28)], anxiety [normal (0 to 7), mild (8 to 9), moderate (10 to 14), severe (15 to 19), and extremely severe (over 20)] and stress [normal (0 to 14), mild (15 to 18), moderate (19 to 25), severe (26 to 33), and extremely severe (over 34)] (Lovibond, Lovibond, 1995).

The ProQoL measure was chosen as it includes the constructs of compassion satisfaction, burnout, and secondary traumatic stress (Stamm, 2012). It is commonly used to measure the negative and positive effects of helping others who experience suffering and trauma (Stamm, 2012). The 30-item ProQoL asks respondents to reflect on their experiences over the past 30 days, with response options ranging from never (1 point) to very often (5 points) (Stamm, 2012). The three subscales are each summed and interpreted as compassion satisfaction [low (22 or less), average (22 to 41 points), and high compassion satisfaction (42 or more points)], burnout [low (22 or less points), average (23 to 41 points), and high burnout (42 or more points)], and secondary traumatic stress [low (22 or less points), average (23 to 41 points), and high secondary trauma (42 or more points)] (Stamm, 2012). Due to the small sample size, no further statistical analysis was possible to examine subgroup differences (e.g., differences between practice settings, age groups, and years of experience) for each questionnaire.

Following the three questionnaires, we included optional open-ended, free-text questions asking participants to (1) briefly describe how the pandemic has impacted them professionally and / or personally, (2) describe their positive experiences, (3) describe their negative experiences, and (4) if they could share something about this experience with the public or leadership, what would it be? The responses were analyzed using an inductive thematic approach that involved open coding of the participants' comments, the creation of a coding framework, grouping and regrouping data into larger categories, and the eventual construction of overarching themes that described the participants' experiences. All investigators completed the process until consensus was achieved, and manuscript preparation was guided by the consolidated criteria for reporting qualitative research (COREQ) checklist (Norwell et al., 2017; Tong, Sainsbury & Craig, 2007).

## Results

### Participant Demographics

In total, 51 NPs participated in the study (Table 1). The participants ranged from 29 to 64 years of age, with years as an NP ranging from 1 to 23 years and a mean of 4.15 years in their current position. The majority (96%) were directly employed by a British Columbian provincial health authority, with similar representation from acute care and the community.

Type of employment:	Health Authority – 49 (96%) Private – 2 (4%)
Type of setting:	Community – 25 (49%) Acute Care / Hospital – 22 (43%) Other – 4 (8%)
Age:	Range: 29 to 64 years Mean: 43 years
Gender:	Female – 47 (92%) Male – 4 (8%)
Number of years spent in healthcare:	Range: 7 to 36 years Mean: 19.9 years
Number of years as an NP:	Range: 1 to 23 years Mean: 7.4 years
Years in current position:	Range: 0.1 to 16 years Mean: 4.15 years
Employment type:	Full-time: 38 (75%) Part-time: 12 (24%) Casual: 1 (2%)

### Questionnaire (IES – R, DASS – 21, and ProQoL) Results

The IES – R responses indicated that 27% of participants experienced symptoms of PTSD at the time of the survey, while 73% were below the cut-off for PTSD symptoms

(Table 2). This is not diagnostic of PTSD but represents a snapshot in time.

Less than 24 – Below cut-off for PTSD	37 (73%)
24 to 32: Presence of some symptoms of PTSD	7 (13%)
33 to 38: Probable diagnosis of PTSD	1 (2%)
39 or above: Significant symptoms of PTSD	6 (12%)

Similarly, participants reported low levels of depression, anxiety, and stress. The majority reported normal or no signs of depression (84%), anxiety (96%), or stress (96%) (Table 3). However, the participants reported moderate to high burnout (75%) and moderate to high secondary traumatic stress (49%) (Table 4). Despite these results, 92% of participants reported moderate to high compassion satisfaction.

### Qualitative Results

A majority (78%) of participants elected to write comments in response to the open-ended questions. The comments ranged from brief single-line answers to lengthy detailed paragraphs. Despite some of the positive findings from the questionnaires, the comments depicted the tremendous toll the pandemic has taken on NPs in British Columbia. The impact of the pandemic on NPs centered on three themes, including (1) mental health challenges arising from stressful work environments, (2) frustration with failed leadership, and (3) a desire to continue to show up for their patients and colleagues.

### *Mental Health Challenges arising from Stressful Work Environments*

The NPs described the stressful environments they were and are working within and how this has impacted their mental health. Their mental health challenges stemmed

	Depression		Anxiety		Stress	
	Scores	N (%)	Scores	N (%)	Scores	N (%)
Normal	0 – 9	43 (84%)	0 – 7	49 (96%)	0 – 14	49 (96%)
Mild	10 – 13	5 (10%)	8 – 9	0	15 – 18	1 (2%)
Moderate	14 – 20	3 (6%)	10 – 14	1 (2%)	19 – 25	1 (2%)
Severe	21 – 27	0	15 – 19	0	26 – 33	0
Extremely Severe	28+	0	20+	1 (2%)	34+	0

	Compassion Satisfaction N (%)	Burnout N (%)	Secondary Traumatic Stress N (%)
Low – 22 or less	4 (8%)	13 (25%)	26 (51%)
Moderate – 23 to 41	35 (69%)	36 (71%)	23 (45%)
High – 42+	12 (23%)	2 (4%)	2 (4%)

from feeling overwhelmed, initially with the fear of the unknown when COVID-19 first began. They reported initial distress with accepting personal risk when caring for COVID-19 patients and concerns over infecting their own families. Then, the changing processes in their clinical practice and delivery of care (e.g., implementing new personal protective equipment and changing to virtual care) were disruptive and challenging to navigate, further compounding feelings of being overwhelmed and stressed at work. The NPs described how more recently, they were tasked with providing COVID-19 vaccine-related patient education and dispelling misinformation. The NPs reported their dismay with conspiracy theories, vaccine misinformation, difficulties coping with personal safety issues, and concerns over protests and verbal abuse. One participant wrote,

*“Personally, I feel the public who are non-vaccinate[d] have a huge disregard how they impact staff and others. It saddens me that a year ago they would honk horns at 7 pm for all the work we do and now [they are] interrupting and blocking care.”*

Several participants expressed the negative impact of isolation, loneliness, and disconnection on their mental health. Several also described feeling overwhelmed, exhausted, and burnt out, citing the continuation of above-normal work demands due to lack of primary care providers and a sicker patient population despite declining COVID-19 case numbers.

### **Frustration with Failed Leadership**

Frustration with failed leadership was evident in numerous NP accounts; however, the cause varied. NPs reported experiencing unequal treatment both within the NP community but also in comparison to similar work conducted by their physician counterparts. They described doing more work than their colleagues who were either similarly compensated (other NPs) or receiving substantially higher compensation (physicians). Subsequently, they felt disrespected, underappreciated, undervalued, disappointed, and frustrated with the leadership of their health authorities and the provincial government that accepted this. One NP shared her frustration:

*“NPs need to be paid more. While it's not only about the money, but it's exhausting to know that I could take a private role, and work with easier patients and make more money through the PCN [primary care network] than I can working with highly acute or vulnerable patients. This isn't fair, and it isn't right and it makes me and my team feel undervalued. Also, it's extremely frustrating that private providers, [PCN NPs, private NPs and private physicians] have the option to just work from home forever, and only work virtually. This results in these private providers telling patients to come and see us in employed clinics... and it's so disheartening to see our patients suffer from this.”*

Many NPs commented on the increased demands that were largely uncompensated, unrecognized, and that had become an expectation, as evidenced by the comments:

*“Professionally, I feel undervalued, profoundly unpaid, and overworked. I don't feel seen or heard, even though I keep showing up to care for patients”*

and

*“I feel that my employer has not acknowledged the amount that I have gone over and above to care for people. Feel very burned out”.*

NPs in British Columbia are a growing workforce that many still feel are invisible and under-appreciated by multiple levels of leadership. One NP shared,

*“There has been little to no recognition by senior leadership of the role nurse practitioners have played in the pandemic response. We are invisible to the organization. We need a public and health system campaign to show people our value. NPs have been in BC for over 15 years and we are still under-recognized.”*

Other NPs commented on their disappointment at the higher provincial and federal government levels, which they believed failed in handling the multiple waves of the pandemic. The NPs expressed confusion and frustration with the inconsistent public health rules and the government's approach to the pandemic. These inconsistencies, in turn, created more chaos and animosity within their practices. They also expressed their disappointment in government leadership who failed to engage with NPs and instead engaged only with physicians.

### **Desire to Continue Showing Up for Their Patients and Colleagues**

The third theme in NP comments was their desire to continue showing up for their patients and colleagues. While the pandemic had many negative impacts across healthcare, such as distress, feeling overwhelmed, unclear leadership, and resource shortages, many NPs also reported a sense of pride in the NP community as they developed new and innovative solutions to support their patients. Many described a sense of accomplishment in being a part of history and the shared experience of responding to the COVID-19 pandemic. Others wrote about newfound provincial collaborations that arose out of necessity but continue to be of tremendous value. One nurse shared,

*“seeing my colleagues unite and band together in some trying and difficult circumstances was very humbling. The public displays of support were amazing. I've made some great personal friends and created lasting personal bonds out of working with colleagues during adversity in a professional capacity.”*

Others shared that the pandemic forced them to re-evaluate their professional priorities, enabling them to create more time for themselves, set boundaries around their work, and ultimately better work-life balance, reducing their overall stress.

## **Discussion**

The impact the COVID-19 pandemic has had on the well-being of healthcare workers continues to be felt in the two and a half years since it began (AlAteeq et al., 2020; Crowe et al., 2021; Crowe et al., 2022; Havaei et al., 2021). This study provides insights into the unique experiences of NPs from various practice settings in British Columbia. While our study did not demonstrate the same degree of stress, anxiety, depression, or symptoms of PTSD that previous studies with other healthcare providers have reported, our study reported moderate to high burnout and secondary traumatic stress levels. Complementing this data were the narrative descriptions of the mental health toll experienced by NPs due to the increased stressful work environments they found themselves working in, along with their sense of failed leadership. Unlike in previous studies, the NPs in our study described a positive association with providing care during the COVID-19 pandemic; they describe a sense of pride and desire to continue showing up for their patients and colleagues.

There is a paucity of data published about general NP practice as a whole, in terms of burnout, professional quality of life, and mental health implications of practice currently. Before the pandemic, one study reported NP burnout to be approximately 25%, whereas other general nursing studies have found moderate to high burnout rates (Abraham et al., 2021; Austin, Saylor & Finlay, 2017; Sacco et al., 2015). Studies conducted during the pandemic with registered nurses reported higher levels of burnout and secondary trauma (Crowe et al., 2021; Crowe et al., 2022). Our survey findings identifying high levels of burnout and secondary traumatic stress provide evidence of the pandemic-related strain shouldered by NPs. While the rates reported in our study are not as high as in other groups, the level of burnout in these NPs was still consistently higher than pre-pandemic levels. The differences identified between registered nurses and the NP group may be partly due to the wide variety of practice settings where NPs work (e.g., community to acute hospital). The participants worked in various settings, some virtual, while others worked directly with COVID-19 patients, which likely impacted the overall results. The timing of the data collection was also important to consider. The data was collected two years after the beginning of the pandemic, and many early stressors had started to ease (e.g., more information available, development of the vaccines).

Overall, the findings of this study provide an overview of the impact the pandemic has had on British Columbian NPs' mental health working in a variety of settings. Not only have they experienced higher than usual rates of burnout and secondary traumatic stress, but they have also struggled with a wide variety of workplace issues that are increasing the burden on their professional quality of life and well-being. These results afford an opportunity to raise awareness and promote changes to practice.

## Strengths and Limitations

The strengths of this study lie in the representation of a professional group that is often underrepresented in the literature. There is little published on the overall well-being of NPs. The high response rate to the optional qualitative questions is another strength of the study in that the richness of the data extended and complemented the survey results, providing a deeper understanding of the experiences of NPs. A limitation of the study was the sample size. Self-selection might have resulted in NPs with specific experiences (good or bad) deciding to respond. Although the NP population in British Columbia is growing, it is still a relatively small group with a wide variety of practice settings.

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PATIENT NAME: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

PRESCRIPTION:

*choose  
Taro Generics  
no substitutions*

SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

# Helping Your Patients Stay on Their SGLT2 Inhibitor

Ria Torr, MN, NP, CDE

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Southlake Regional Health Centre

Cardiovascular Surgery

Within Canada, the prevalence of type 2 diabetes (DM2) and pre-diabetes is increasing. Sodium-glucose cotransporter-2 inhibitors (SGLT2i) have demonstrated benefits in these patient populations who also have cardiac and renal risk factors. In our practice as Cardiovascular Nurse Practitioners (NP), some people who were started on a SGLT2i report that they stopped therapy because of what were described as adverse events. A poor experience makes it challenging for NPs to reinstate therapy due to patient hesitancy; to avoid this situation and improve compliance, prescribers should screen patients for potential problems and address these issues prior to initiating SGLT2i therapy.

“

... prescribers should screen patients for potential problems and address these issues prior to initiating SGLT2i therapy.

”

Diabetes is a chronic endocrine disease that manifests via inadequate insulin production or utilization resulting in elevated blood glucose levels. The poor delivery of glucose to cells for energy synthesis leads to potential complications, including cardiovascular disease, neuropathy, nephropathy and retinopathy (Leblanc et al., 2019). It is estimated that among Canadians ages 20 to 79 years, 12.4% have pre-diabetes and 7.5% have DM2. The prevalence of both pre-diabetes and DM2 increases with age (Hussein et al., 2019).

The Diabetes Canada Clinical Practice Guidelines were updated in 2020 to include SGLT2i in the first line of medication, after metformin, for patients whose glycated hemoglobin (HgbA1c) is greater than 1.5% above target, and in patients who have one or more of the following; atherosclerotic cardiovascular disease (ASCVD), chronic kidney disease (CKD), or heart failure (HF); and in patients over the age of 60 years with two cardiovascular risk factors (Lipscombe et al., 2020). The updated guidelines reflect the cardiovascular (CV) benefits SGLT2i provide to patients who have cardiac risk factors but are not yet diagnosed with ASCVD. SGLT2i also are effective in slowing the progression of CKD, reducing the risk of hospitalization for patients with HF and their use has been associated with weight loss, which can be of further benefit to some patients with DM2 (Lipscombe et al., 2020).

## Addressing Common Issues that Prevent Compliance with SGLT2i Use

### Urinary Tract and Yeast Infections

SGLT2i function by inhibiting the reabsorption of glucose in the proximal tubule of the loop of Henle, which results in the excretion of excessive glucose in the urine. The resulting higher glucose concentration in the perineum increases proliferation of both bacteria and yeast, especially in women (Khan et al., 2020). Therefore, people who are already at risk of urinary tract infections (UTI) may report more frequent UTI after starting SGLT2i therapy (Khan et al., 2022). Recent studies have demonstrated, however, that for patients who do not already suffer from frequent UTI issues, the risk of developing an infection while using a SGLT2i was no higher than the placebo group (Sarafidis & Ortiz, 2020). The onus therefore, falls on the prescriber to identify all pre-existing UTI risk factors and address/provide health teaching to reduce the occurrence of UTI (Table 1) prior to initiating SGLT2i therapy.

### Hypotension and Dehydration

SGLT2i are effective in heart failure management primarily due to the diuretic effect, decrease in intravascular volume, and the promotion of natriuresis (Lopaschuk & Verma, 2020). Studies have also identified a 4.9% to 10.4% reduction in systolic blood pressure for patients on SGLT2i (Kario et al., 2021; Weber et al., 2015). Both mechanisms of action, however, can lead to volume depletion, dizziness, and an increased risk of accidents, such as falls (Pittampalli et al., 2018; Lopaschuk & Verma, 2020). SGLT2i therapy, therefore, should not be initiated on patients with pre-existing hypotension or hypovolemia. Prescribers must be aware of this action and be cautious when starting a SGLT2i, closely monitoring the effect on BP as the patient reaches their target and then decreasing or eliminating other anti-hypertension agents and diuretics as needed (Lam & Shaikh, 2021). The objective is a slow and consistent improvement in BP and blood glucose management in order to help the patient establish and maintain confidence in the SGLT2i agent. Patients should receive health teaching regarding the potential for dizziness, the importance of adequate fluid intake and monitoring their BP.

### Hypoglycemia

Due to the mechanism of action; eliminating excess glucose from the blood stream via the kidneys and excreting it in urine; the risk of hypoglycemia for patients on SGLT2i is very low. However, this risk increases for patients using insulin or insulin secretagogues (Lipscombe et al., 2020) and the guidelines from Diabetes Canada suggest caution when adding a SGLT2i to these patients' treatment regime. If the SGLT2i is being added for its renal and cardiovascular benefits, other medications that increase the risk of hypoglycemia should be stopped or their dose reduced (Lam & Shaikh, 2021; Lipscombe et al., 2020). Patients should also be educated about blood glucose monitoring, and preventing, detecting, and treating

**Table 1: Addressing Common Issues that Prevent Compliance to SGLT2i Therapy**

Issue	Possible Solution
Urinary Tract Infection	<ul style="list-style-type: none"> <li>• Improve washroom hygiene, including wiping front to back for women</li> <li>• Increase water intake</li> <li>• Urinate regularly; avoid holding urine for long periods of time</li> <li>• Improve peri-care and encourage voiding after sex</li> <li>• Correct use of antibiotics</li> <li>• UTI prevention plan (i.e. cranberry juice daily)</li> </ul>
Yeast Infection	<ul style="list-style-type: none"> <li>• Choose loose fitting cotton garments instead of synthetic fabrics</li> <li>• Keep genital areas dry and maintain good hygiene</li> <li>• Treat with over-the-counter products such as clotrimazole at the first sign of infection</li> </ul>
Dehydration	<ul style="list-style-type: none"> <li>• Awareness of signs of dehydration</li> <li>• Awareness of dizziness and actions to minimize effect</li> <li>• Adequate oral intake of water</li> <li>• Limited intake of coffee, tea, and soda drinks</li> <li>• Monitor output and increase fluid intake</li> <li>• Awareness of effect of increased activities in hot, humid environment</li> </ul>
Hypotension	<ul style="list-style-type: none"> <li>• Monitor blood pressure</li> <li>• Awareness of dizziness and act to minimize its effect</li> <li>• Frequent follow up with practitioner</li> </ul>
Hypoglycemia	<ul style="list-style-type: none"> <li>• Prescriber caution when adding to a medication regimen with risk of hypoglycemia (i.e. risk medication such as insulin or sulfonylureas)</li> <li>• Glucose monitoring</li> <li>• Hypoglycemia health teaching (signs, symptoms, and treatment)</li> <li>• Frequent follow up with practitioner</li> </ul>
EDKA	<ul style="list-style-type: none"> <li>• SADMANS health teaching</li> <li>• Sick day management health teaching</li> <li>• Importance of telling care providers you are on a SGLT2i, especially if having surgery or have an infection</li> <li>• Patients who have had bariatric surgery are at greater risk</li> </ul>

hypoglycemia. If mealtime insulin is added, begin with one meal injection per day and consider stopping any sulfonylureas (Lipscombe et al., 2020).

### Euglycemic Diabetic Ketoacidosis (EDKA)

EDKA is a clinical syndrome whereby a patient presents with euglycemic (normal) blood glucose levels, however, is suffering severe metabolic acidosis. In patients taking SGLT2i, the general state of carbohydrate deficiency results in a decrease of serum insulin while simultaneously having

excessive counter-regulatory hormones such as glucagon, epinephrine, and cortisol. The increased glucagon to insulin ratio leads to elevated lipolysis and increased free fatty acids resulting in ketoacidosis (Plewa et al., 2020). Serum glucose levels remain normal and do not elevate as would be seen in typical cases of diabetic ketoacidosis however, because glucose is secreted by the kidneys and eliminated in the urine, which is the normal mechanism of action of SGLT2i. Upon patient presentation to a care provider or in the emergency department, the signs of the resulting anion gap and metabolic acidosis presents as nausea, vomiting and respiratory compensation, with a normal blood glucose level, making an accurate diagnosis of EDKA easy to miss (Plewa et al., 2020).

Education about sick day management is paramount and needs to be reviewed at every patient encounter. SADMANS, which is an acronym identifying medications that should be temporarily stopped when a patient has an illness that puts them at risk of dehydration; for example high fever, vomiting, and/or diarrhea; includes SGLT2i class on its list. (Table 2) Patients therefore, should be instructed to hold administration if they feel unwell. Despite any nausea the patient may feel, fluid intake should be stressed and patients should continue to monitor blood glucose levels; if within normal range they should continue to take in carbohydrates as liquids or food (Lipscombe et al., 2020).



Patients should also be educated about blood glucose monitoring, and preventing, detecting, and treating hypoglycemia.





Education about sick day management is paramount and needs to be reviewed at every patient encounter.



Table 2: SADMANS medications	
<b>S</b>	= Sulfonylureas, other secretagogues
<b>A</b>	= ACE inhibitors
<b>D</b>	= Diuretics direct renin inhibitor
<b>M</b>	= Metformin
<b>A</b>	= Angiotensin receptor blockers
<b>N</b>	= Nonsteroidal anti-inflammatory drugs
<b>S</b>	= SGLT2 inhibitors

SGLT2i have demonstrated benefits for patients with ASCVD, HF, and renal complications who also have diabetes, as well as assisting people in managing their chronic disease through weight loss. An assessment of the potential side effects prior to initiating SGLT2i therapy, followed by proactive medication changes and patient health teaching, offers increased therapy compliance, which in turn, provides the greatest value for patients who would benefit from SGLT2i treatment.

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# Clinical Consult: Diagnosing and Treating Environmental Allergies

Dr. Wendy Gould

Dr. Wendy Gould has a clinical practice in allergy and immunology in Toronto ON.

She is dual-board certified by the American Board of Internal Medicine (ABIM) and the American Board of Allergy & Immunology (ABAI).



## What are environmental allergies?

Environmental allergies have been increasing in prevalence around the world. This increase is thought to be related to increased environmental exposure to air pollution and aeroallergens like pollen and mould.<sup>1</sup>

In Canada, the most common pollen-induced allergies are from trees, grasses and ragweed. Ragweed is found mostly in Ontario and Quebec with birch and grasses common across the country. Grass and tree pollen are the most common allergens causing seasonal allergic rhinitis.<sup>1</sup>

Allergic rhinitis is a risk factor for the development of asthma with over 65% of people with asthma allergic to aeroallergens. Exposure to these allergens can then be triggers for asthma exacerbations.

The symptoms of allergic rhinitis can have significant impact on quality of life including sleep, ability to function at work and school.<sup>2</sup>

## How should environmental allergies be diagnosed?

**Step 1** is to take a detailed clinical history focusing particularly on:

- Specific symptoms patient is experiencing and frequency of symptoms
- Age of onset
- Timing during the year
- Possible triggers including occupational exposures

- Any co-existing conditions they may have (ie: asthma, eczema, food allergies, etc.)

**Step 2** is a physical exam to rule out conditions that mimic rhinitis/allergies.

It is important to evaluate for possible mimickers of rhinitis with a physical exam that includes both upper and lower airway, eyes, ears and skin. Some important mimickers of rhinitis include:

- Nasal septal deviation
- Turbinate hypertrophy
- Nasal foreign body and nasal/sinus tumour
- Nasal polyps
- CSF leak
- Systemic diseases including vasculitis and sarcoidosis

## Common Allergic Rhinitis Symptoms

Sneezing  
Drippy nose  
Nasal congestion  
Itchy nose  
Watery, itchy, red eyes

### Atypical Ones in Kids:

Sore nose, throat, eyes, or ears  
Sleep disturbance, irritability,  
and/or



A line or crease across the bridge of the nose from swiping the nose



Bags and the Denie-Morgan sign (double inferior crease in lower eyelid)



Skin-prick tests are used to definitively diagnose environmental allergens. A small amount of a suspected allergen is placed under the skin (epicutaneously) through a series of small pricks and then observed for a local wheal (due to localized histamine release) at the prick site that represents evidence of IgE-mediated sensitivity to a specific allergen. Typically, the allergens tested include tree pollen, grass pollen, ragweed pollen, dust mite, mould and animal dander.

## How are environmental allergies treated?

While allergen avoidance is recommended where feasible, it is impossible to completely avoid exposure to environmental allergens. Thus, people with allergic rhinitis will require therapeutic treatment for relief of symptoms.

What can patients do to help manage their environmental allergies?

- Trigger avoidance where possible
  - dust mite avoidance strategies
  - keeping pets out of the bedroom
- Practical hygiene precautions
  - Air conditioning
  - Close windows during pollen season
  - Monitor pollen counts

Intranasal corticosteroids are the preferred medication when using monotherapy for allergic rhinitis. The intranasal corticosteroids approved in Canada have similar efficacy in controlling both nasal and ocular symptoms of allergic rhinitis. Compliance can be a concern as burning, stinging, dryness and epistaxis are common local adverse effects.<sup>4</sup>

**Table 1: Intranasal Corticosteroids in Canada**

Name
Beclomethasone dipropionate
Budesonide
Ciclesonide
Fluticasone furoate
Fluticasone propionate
Mometasone furoate
Triamcinolone acetonide

Antihistamines are a cornerstone of therapy and have a long history of use. Recently, the Canadian Society of Allergy and Clinical Immunology released a position statement recommending first-generation antihistamines be replaced by second-generation antihistamines as 1<sup>st</sup>-line treatment of allergic rhinitis due to improved safety.<sup>5</sup>

In Canada, there are 6 second-generation antihistamines available, 3 by prescription. There are convenience benefits to OTC medications with easy accessibility; however, prescription medication allows for closer



It is estimated that ~7.7 million Canadians, over 20% of the population, suffer from allergic rhinitis.<sup>3</sup>



**Table 2: Second-Generation Antihistamines Available in Canada**

Brand/Generic Name	Prescription	OTC	Pediatric Indication
Bilastine	✓		✓
Cetirizine	✓	✓	✓
Desloratadine		✓	✓
Fexofenadine		✓	
Loratadine		✓	✓
Rupatadine	✓		✓

monitoring of use and ensures patients are using a second-generation antihistamine vs inadvertently picking up a first-generation OTC.

## What to Consider When Choosing A Prescription Antihistamine

Medication choice should be individualized for the patient and consider both clinical and pharmacokinetic factors.

Second-generation antihistamines are less-sedating and longer-lasting than first-generation antihistamines. A second-generation antihistamine is chosen based on the patient's perceived efficacy, side effects experienced, additional medications taken, pregnancy and age.

Although some patients will mention a tolerance to their second-generation antihistamine and that rotating with another similar antihistamine is helpful, there is not much data to support this finding.

### Pharmacology & Metabolism

The prescription antihistamines all have a similar onset of action of approximately 1 hour.

Rupatadine is metabolized by the cytochrome P450 system (CYP450). Cetirizine is less extensively metabolized and is excreted 60% unchanged. Bilastine is not metabolized and does not interact with the CYP450 system.

### Somnolence

The degree of somnolence associated with the second-generation prescription antihistamines may be a consideration for individual patient response. Table 3 shows the somnolence rates seen in registration trials from the respective product monographs.

**Table 3: Product Monograph Somnolence Rates for Second-Generation Antihistamines vs. Placebo**

	Bilastine – SAR/CSU	Cetirizine – SAR/CSU	Rupatadine – AR/CSU
Somnolence	20 mg: 4.08% vs. 2.63%	10 mg: 9.63% vs. 5.0%	AR 10 mg: 8.8% vs. 2.0% CSU 10 mg: 4.4% vs. 2.7%
		20 mg: 23.9% vs. 7.7%	

Information from respective product monographs

## Food Interaction

Cetirizine and rupatadine can be given with or without food; bilastine is recommended to be taken 1 hour before or 2 hours after food due to reduced bioavailability. In a randomized, open-label two-period crossover study, once-daily bilastine 20 mg administered under fed conditions showed no reduction in antihistaminic activity despite reduced bioavailability.<sup>6</sup>

## Immunotherapy

Allergen immunotherapy is a somewhat underutilized approach to allergic rhinitis.

There are two types – sublingual immunotherapy (SLIT) in the form of tablets, and subcutaneous immunotherapy (SCIT). This approach is generally considered if symptom management, through avoidance strategies and pharmacotherapy, has not provided adequate relief.

Patients who may benefit from this approach can be referred to an allergist for assessment and treatment.

## Treating Allergic Rhinitis in Pregnancy

The choice of medications to treat rhinitis in pregnancy are made on an individual basis after weighing risks and benefits.

There are second-generation antihistamines that are more likely to be recommended in pregnancy due to our clinical experience with these medications including cetirizine and loratadine. Due to insignificant systemic absorption, intranasal corticosteroids can be used in pregnancy.

Subcutaneous immunotherapy (SCIT) can be continued during pregnancy, if the patient has reached and is tolerating maintenance dosing. However, SCIT is not usually started if the patient is pregnant, nor is the dose escalated during pregnancy should the patient not yet have reached maintenance.

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## Do allergies get worse over time?

The allergic march refers to the natural history or progression of allergic diseases that begins early in life, with the development of atopic dermatitis, food allergy, asthma and then allergic rhinitis. However, a study from the *Journal of Allergy & Clinical Immunology* in 2022 supported that not all children follow what is known as the traditional allergic march.<sup>7</sup>



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- Monitor for growth in children and adolescents
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- Signs of adrenal insufficiency and withdrawal can accompany the replacement of a systemic corticosteroid with a topical corticosteroid; patients should be carefully monitored. Rapid decreases in systemic corticosteroid dosages following long-term treatment may cause a severe exacerbation of symptoms in patients with asthma or other clinical conditions
- Use with caution, if at all, in patients with untreated local or systemic fungal or bacterial infections, viral or parasitic infections, or ocular herpes simplex
- Use caution in patients with known hypersensitivity to other corticosteroids

- Rare instances of wheezing, nasal septum perforation, cataracts, glaucoma, increased intraocular pressure have been reported with intranasal corticosteroid use
- Not approved for use in patients younger than 12 years of age
- Greater sensitivity in some older individuals cannot be ruled out

#### **For more information:**

For important information on conditions of clinical use, contraindications, warnings, precautions, adverse reactions, drug interactions and dosing, please consult the product monograph at <https://health-products.canada.ca/dpd-bdpp/index-eng.jsp>. The product monograph is available by calling Covis Pharma Canada Ltd. at 1-833-523-3009.

**REFERENCE:** 1. OMNARIS® (ciclesonide) Product Monograph. Covis Pharma GmbH, February 2021.

\* Official Mark of the Régie de l'assurance maladie du Québec



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MO-06-2022-002-E



**Powerful AR relief.  
Excellent tolerability profile.**

### Primary Care for Everyone: Report finds 6.5 million in Canada without primary care

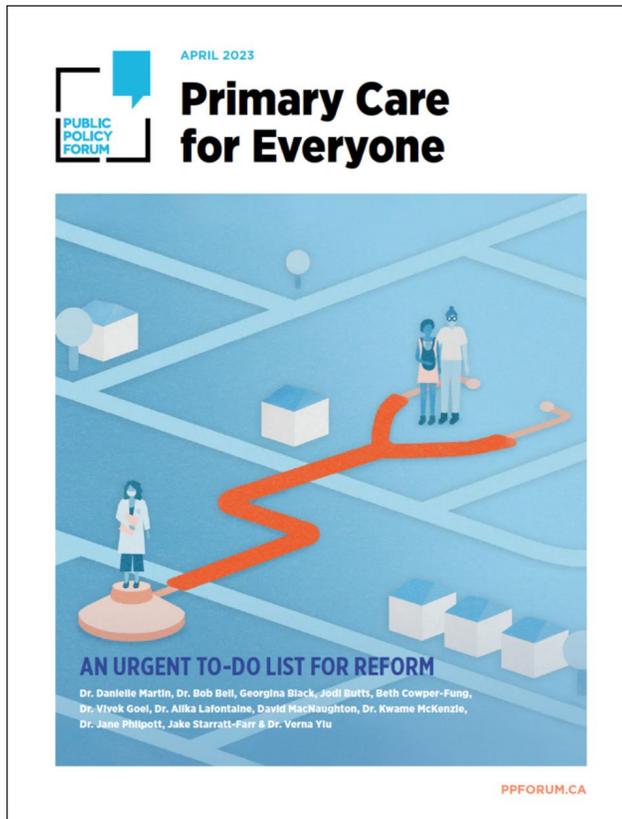
The Public Policy Forum, an independent, non-partisan, non-profit organization focused on bridging diverse opinions in policy-making is engaged in a year-long project to help address Canada's healthcare crisis. They released their second report in April, entitled *Primary Care for Everyone*.

The first report found that 6.5 million people in Canada lack access to primary care, and called for timely access to local primary care, analogous to access to public education in all communities. In the second report, the signatories proposed a to-do list of 10 action items for healthcare reform, focused on: More equitable healthcare, more efficient primary care, and more effective primary care.

The report emphasized the value of team-based healthcare. It called for improvements in equitable access to care across all communities, particularly ones that have been underserved in the past, and a focus on care-based activities and the leveraging of data and evidence to improve efficiency and effectiveness in primary care delivery.

The full report can be seen at:

<https://ppforum.ca/publications/primary-care-for-everyone-an-urgent-to-do-list-for-reform/>



### Healthy Habits Delay Memory Decline Even in Presence of Alzheimer's Gene

The impact of 6 healthy lifestyle habits were investigated in a 10-year prospective cohort study of 29,000 people aged 60 years and over. The 6 habits were healthy diet, regular exercise, active social contact, active cognitive activity, no smoking or drinking.

People who practiced at least 2-3 of the healthy habits experienced a slower decline in memory function even when they carried the apolipoprotein E gene, associated with Alzheimer's disease.

For further study details, see the publication by:

Jia J et al. Association between healthy lifestyle and memory decline in older adults: 10 year, population based, prospective cohort study  
BMJ 2023; 380 :e072691 doi:10.1136/bmj-2022-07269

### Cannabis Poisoning in Children: Reducing the Risks

Accidental cannabis poisonings are on the rise and Health Canada has produced a pamphlet with information on reducing the risks and recognizing symptoms of cannabis poisoning in children.



Appropriate storage and the choice of legal cannabis in child-resistant packaging can greatly reduce the risk of accidental exposure for young children. Illegal cannabis products, especially edibles, can have much higher levels of THC and other unknown intoxicants compared to regulated products.

Parents should remember that accidental exposure can happen anywhere and know how to recognize cannabis poisoning. The signs and symptoms can include vomiting, confusion, unresponsiveness, slurred speech and unsteadiness, drowsiness, slowed breathing, and in rare instances, seizure.

More information is available at: <https://www.canada.ca/en/health-canada/services/drugs-medication/cannabis/health-effects/poisonings-children.html>

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Pr **BLEXTEN**<sup>®</sup>

**Indications:**

**Seasonal Allergic Rhinitis**

BLEXTEN<sup>®</sup> (bilastine) is indicated for the symptomatic relief of nasal and non-nasal symptoms of seasonal allergic rhinitis (SAR) in patients 4 years of age and older with a body weight of at least 16 kg.

**Chronic Spontaneous Urticaria**

BLEXTEN<sup>®</sup> (bilastine) is indicated for the relief of the symptoms associated with chronic spontaneous urticaria (CSU) (e.g. pruritus and hives), in patients 4 years of age and older with a body weight of at least 16 kg.

**Contraindication:**

- History of QT prolongation and/or torsade de pointes, including congenital long QT syndromes

**Relevant warnings and precautions:**

- QTc interval prolongation, which may increase the risk of torsade de pointes
- Use with caution in patients with a history of cardiac arrhythmias; hypokalemia, hypomagnesaemia; significant bradycardia; family history of sudden cardiac death; concomitant use of other QT/QTc-prolonging drugs
- P-glycoprotein inhibitors may increase plasma levels of BLEXTEN<sup>®</sup> in patients with moderate or severe renal impairment; co-administration should be avoided
- BLEXTEN<sup>®</sup> should be avoided during pregnancy unless advised otherwise by a physician

- A study was performed to assess the effects of BLEXTEN<sup>®</sup> and bilastine 40 mg on real time driving performance compared to placebo. Bilastine did not affect driving performance differently than placebo following day one or after one week of treatment. However, patients should be informed that very rarely some people experience drowsiness, which may affect their ability to drive or use machines.

**For more information:**

Please consult the product monograph at <https://www.miravohealthcare.com/wp-content/uploads/2021/08/Blexten-PM-ENG-Aug2021.pdf> for important information relating to adverse reactions, drug interactions, and dosing information which have not been discussed in this piece. The product monograph is also available by calling 1-866-391-4503.

<sup>‡</sup> As of August 31, 2021, the estimate from internal data of patient exposure is based on units sold of the defined daily dose of 20 mg bilastine and the mean treatment duration of 3 weeks.

**Reference:**

1. Blexten<sup>®</sup> Product Monograph. Aralez Pharmaceuticals Canada Inc. 2021.

Pr **BLEXTEN**<sup>®</sup>  
bilastine tablets 20 mg

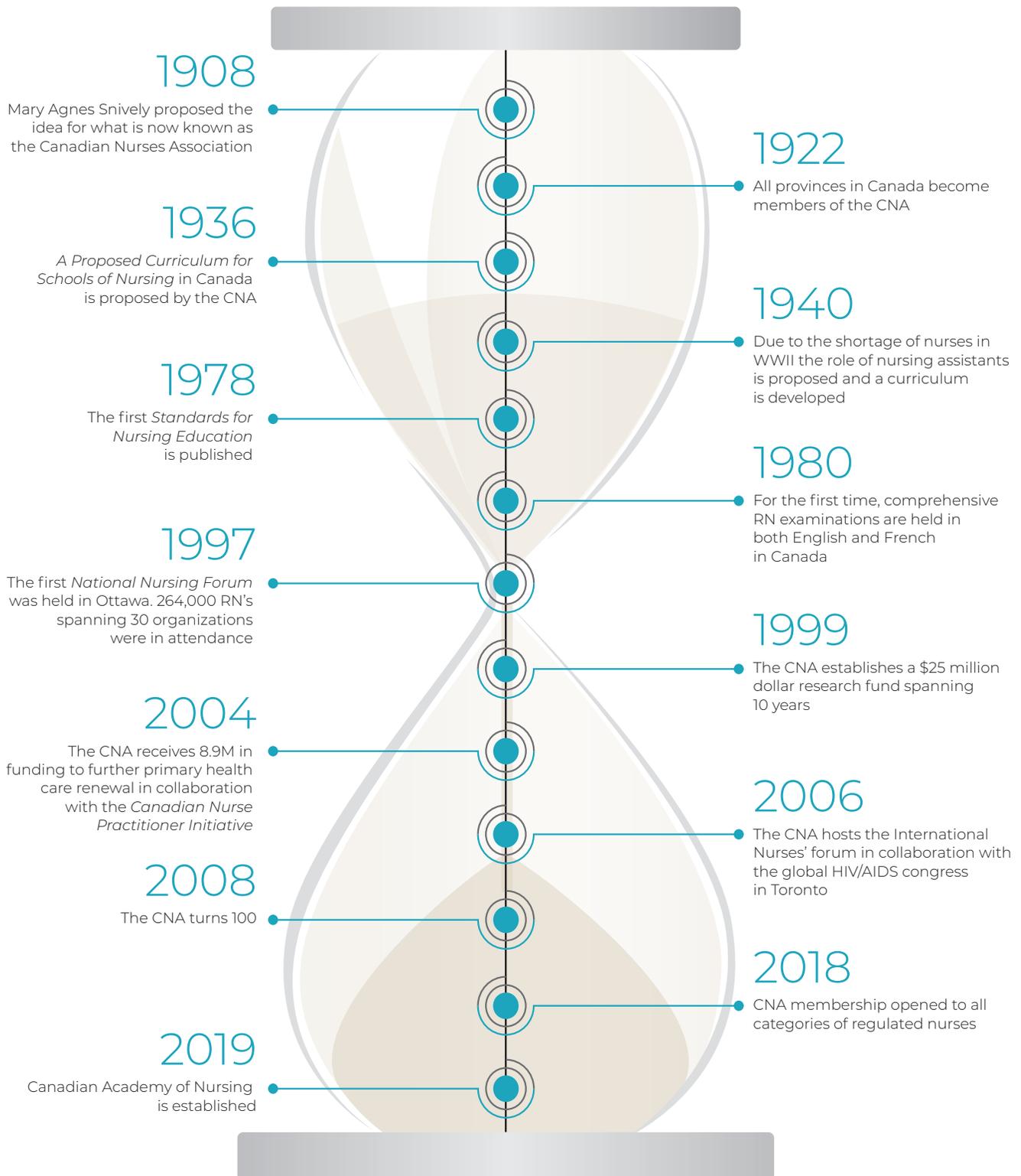
Aralez Pharmaceuticals Canada Inc.\*  
6733 Mississauga Road, Suite 800  
Mississauga, Ontario L5N 6J5  
\*d/b/a Miravo Healthcare  
MA-65 - 02-15-2023-E



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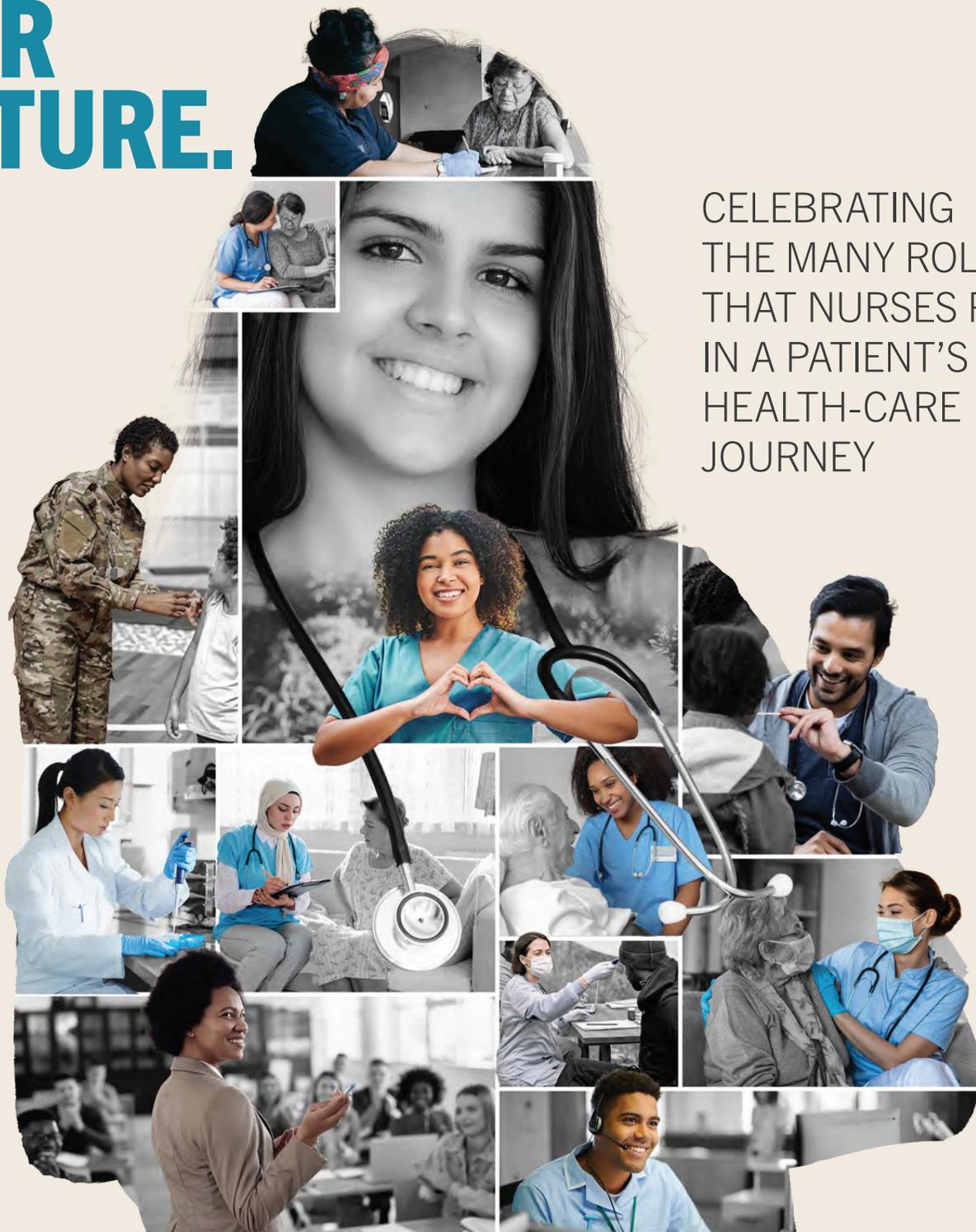
# Milestones in Nursing



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