



Early Cancer Diagnosis Initiatives in Canada: Final Report

Summary of Scoping Review and Environmental Scan Findings

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Acknowledgement of Traditional Land

We wish to acknowledge this land on which the Knowledge Translation Program operates. For thousands of years it has been the traditional land of the Huron-Wendat, the Seneca, and most recently, the Mississaugas of the Credit River. Today, this meeting place is still the home to many Indigenous people from across Turtle Island and we are grateful to have the opportunity to work on this land.

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Definitions

Underserved populations: Individuals in a certain population who may find it more difficult to obtain needed care, receive less or a lower standard of care, or experience different treatment by healthcare providers. This may include rural populations.

- **Rural populations:** Populations that may live any area that is outside of a population centre (1). They often do not have access to the same services as those who reside in more urban areas.

Indigenous populations: First Nations, Inuit and Métis peoples living in Canada.

Initiative: Refers to the early cancer diagnosis initiatives included within the environmental scan and the interventions discussed in the literature included in the scoping review.

Initiatives are grouped under the following or can include the components listed below:

- **Centralized or coordinated diagnostic service:** Brings together various tests/procedures and care providers needed to determine a definitive diagnosis at one location (e.g., a centralized referral initiative that coordinates and centralizes patient care to one initiative; and a contact point for patients and staff engaged in the initiative).
- **Initiatives in diagnostic services:** An initiative that aims to improve diagnostic services within a jurisdiction (e.g., an initiative focused on reducing wait times for a definitive diagnosis of lymphoma).
- **Multidisciplinary team:** Working with multiple departments, such as diagnostic imaging, pathology, medical oncology, and research.
- **Patient navigator:** A function or initiative component to help facilitate and coordinate access to services for patients through the cancer journey (e.g., through testing, appointments, health literacy, etc.). Literature also referred to this as a 'nurse navigator'.
- **Rapid referral pathway:** Provides urgent access to specialists and/or diagnostic services for patients.
- **Standardized care pathway:** Shares information about how to provide what care at each point of diagnosis and beyond. Pathway sets expectations for cancer care based on evidence and is often integrated into the current health system.
- **Education for primary care providers:** Focused on educating and supporting primary care providers on care pathways and how to care for individuals presenting with potential cancer symptoms.
- **Target:** A figure used as a goal by jurisdictions to measure progress towards the desired outcome of an initiative.
- **Benchmark:** A figure used to compare how other jurisdictions are performing relative to each other.
- **Technology to support diagnosis process:** Technological innovations to enhance efficiency of initiatives.



EXECUTIVE SUMMARY

In 2019, the Canadian Partnership Against Cancer (the Partnership) refreshed the [2019-2029 Canadian Strategy for Cancer Control](#) (hereafter called 'Strategy'). The Strategy identified the need to quickly and accurately diagnose cancer at an earlier stage as one of its eight priorities. To identify and better understand existing initiatives that optimize early cancer diagnosis of symptomatic patients across the country, the Partnership engaged the SPOR Evidence Alliance to complete an environmental scan of the current early cancer diagnosis efforts being implemented across Canada and a scoping review of the recent literature. The objective of the environmental scan was to determine the current landscape of early cancer diagnosis initiatives across Canada. The main objective of the scoping review was to summarize contemporary initiatives focused on improving accurate and timely cancer diagnoses among symptomatic individuals. This report summarizes the findings of the scoping review and environmental scan and compares Canada's current early diagnostic initiatives with evidence-based findings. Diagnosing cancer faster, accurate and at an earlier stage is a key priority of the Strategy. Over the next five years, the Partnership will leverage findings from the both the environmental scan and the scoping review, as one of several inputs, and partner with Canadian jurisdictions to continue to test innovative models of care that expedite cancer diagnosis, especially for Indigenous and underserved populations.

Initiatives identified in the scoping review as well as those identified via the environmental scan used a multi-stakeholder and multi-initiative approach (e.g., patient navigator and coordinated diagnostic services). At this time, it is unclear which of these approaches is the most effective solution for early cancer diagnosis pathways. However, the use of multidisciplinary teams and patient navigators (referred to as nurse navigators in literature) were consistently identified as part of the implementation or sustainability strategies. Lung cancer was the most common cancer type considered in the initiatives in both the environmental scan and scoping review. Across the environmental scan and the scoping review, five key findings emerged.

1. There was limited literature about initiatives targeting underserved and Indigenous populations; this finding was mirrored in the environmental scan.
2. Primary care education initiatives were found in the environmental scan (specifically regarding guideline uptake); however, evidence suggests that knowledge uptake may be limited using this method.
3. Limited patient engagement in the development, implementation, and sustainability of initiatives was observed in both the scoping review and environmental scan.
4. While some initiatives across Canada have begun to collect evaluation data, the type and frequency of data being collected are varied. The literature also indicated a need for common evaluation metrics.
5. There were limited plans for sustainability and/or scale up; where plans existed, there were concerns about funding capacity. The scoping review did not identify studies that highlighted the sustainability of early cancer diagnostic initiatives.

Based on the findings from the scoping review and environmental scan, recommendations are provided and/or research opportunities that the Partnership can consider integrating into planning for future work and funding (see **Table 1**). These recommendations present components that were identified either as strengths or barriers to initiative implementation and sustainability, or opportunities for additional research.

Table 1. Summary of various initiative components highlighted for further considerations to the Partnership based on the environmental scan and scoping review findings..

Initiative components	Innovative Models of Care Opportunities for the Partnership
Multidisciplinary teams	<ul style="list-style-type: none"> • Continue to encourage and invest in multidisciplinary teams • Determine the factors that optimize success of multidisciplinary cancer teams
Patient navigator	<ul style="list-style-type: none"> • Consider including a navigation model or role within future initiatives (e.g., nurse navigators, community connectors or health representatives, etc.) • Evaluate the effectiveness of patient navigators within the initiative • Role typically fulfilled by a nurse through findings in the scoping review and environmental scan
Underserved or Indigenous populations	<ul style="list-style-type: none"> • Co-design funding initiatives that have a focus on addressing inequities and barriers that underserved and Indigenous populations often experience (e.g., patient literacy, language accessibility, and culturally safe, trauma informed care) • Encourage collaboration with representatives from specific populations at initiative onset (i.e., encourage co-design) • Encourage use of virtual elements and telehealth (e.g., ehealth) to provide more options for care for underserved and Indigenous populations
Primary care education and support	<ul style="list-style-type: none"> • Continue to encourage education among primary care providers • Use a co-creation approach and include participant feedback following education sessions • Implement tailored strategies to facilitate the use of new guidelines for primary care providers (e.g., identifying a champion to promote guidelines, implementing an easy-to-use checklist)
Patient engagement	<ul style="list-style-type: none"> • Encourage patient engagement from initiative planning, including patient advisors embedded at all levels of the initiative (e.g., patients, provider, administration) • Consider evaluating patient experience and satisfaction and incorporate patient-relevant outcomes
Evaluation	<ul style="list-style-type: none"> • Consider developing common outcome metrics to facilitate evaluation across initiatives and/or regions • Consider providing funding to early cancer diagnostic initiatives to support sustained evaluation. Funding can include resources for personnel, or technology to support evaluation (e.g., EMR systems) • Conduct routine process and outcome evaluations to determine factors and challenges to implementation and impact/effectiveness of initiatives • Evaluate the sustainability of initiatives
Digital or virtual elements	<ul style="list-style-type: none"> • Consider developing and evaluating the impact of initiatives that embed a digital or virtual element that improves the process for the care pathway • Encourage the use of digital or virtual elements to streamline the processes of the initiative, when appropriate

Initiative components	Innovative Models of Care Opportunities for the Partnership
Sustainability	<ul style="list-style-type: none"> • Projects should have a dedicated sustainability section which highlights plans for sustaining the initiative and potential for scale-up • Encourage sustainability planning from the project onset

The scoping review included 88 unique published peer-reviewed articles and 16 unique unpublished articles (grey literature) from January 2017 to January 2021. Study designs varied, including case-control (most common), cross-sectional, before-and-after, mixed methods studies, and randomized controlled trials. The peer-reviewed articles originated from various countries, although the majority were from the United Kingdom and nine articles were from Canada. The review found nine initiatives (centralized or coordinated diagnostic services, interventions in diagnostic services, multidisciplinary team, patient navigation, rapid referral pathway, standardized care pathway, support for primary care providers, target or benchmark for wait times, and technology to support diagnostic process) to streamline an accurate, timely early cancer diagnosis. The most commonly reported performance metrics included: time from presentation to diagnosis (where presentation is defined as when a patient presents to a primary care provider with symptoms), time from referral to specialist consultation, patient-reported satisfaction, and quality of life. Finally, a common theme among effective initiatives involved multidisciplinary cooperation and a patient navigator (often referred to as nurse navigator). There was minimal reporting on initiatives for underserved populations and none focused on Indigenous populations.

The environmental scan included 22 participants representing 17 initiatives across 8 Canadian provinces. The methods to collect data consisted of key informant interviews and a document review. Due to the limited scope of the scan, there may be additional innovative initiatives that may be in development or were implemented in Canada, which may not be captured in this report. Of the 17 initiatives, 11 were patient facing initiatives. A total of 8 initiatives in the scan focused on the provision of care for underserved or Indigenous populations. Participants in the scan noted challenges to evaluating data and lacked the capacity, funding, and resources to collect data routinely. Additional barriers for implementation or sustainability of early cancer diagnosis initiatives included lack of access to primary care, delays in time to diagnosis, lack of access to diagnostic services, lack of cooperation from colleagues and/or organizational buy-in, lack of governmental buy in, limited staff capacity, information gaps and lack of knowledge by providers, burden on primary care providers, lack of data availability, and limited funding and/or resources. Common facilitators included data availability, leadership and organizational buy-in, leveraging networks, multidisciplinary teams, patient navigators, smaller organizing groups, stakeholder buy in at the provider level, streamlined or centralized referral system, and incorporation of virtual elements. Participants perceived engagement of primary care providers, multidisciplinary teams, stakeholder buy-in, leadership engagement, integration of initiatives within the health system, streamlined processes for evaluation, collaborative development, and use of patient navigation models to be opportunities for strengthening early cancer diagnostic initiatives in Canada. Additionally, participants highlighted the importance of providing tailored support to underserved and Indigenous populations.

Background

Cancer is the leading cause of death worldwide, including Canada where cancer accounts for 30% of deaths (2,3). High human development index (HDI) countries, such as Canada, will likely experience the greatest increase in new cancer cases with an estimate of over 4 million new cases in 2040 compared with 2020 (3).

The diagnostic interval – the interval between first patient presentation with suspicious symptoms and definitive diagnosis – is a critical part of the cancer care continuum. This interval is complex and often fragmented, characterised by long waits (e.g., for diagnostic testing) and lack of provider coordination (e.g., referral to a cancer specialist) (4,5). Such problems are often exacerbated for underserved and Indigenous populations (3). Optimization of this interval (also called the pre-diagnostic phase) can not only lead to early cancer detection but can also result in improved patient experience and faster time to cancer treatment (2,3,6). Diagnosis at earlier stages of disease reduces stress and anxiety for patients, may contribute to improved effectiveness of available treatment options, and decreases costs to the health system (2,3,6,7).

As a result of the COVID-19 pandemic, there is concern among the clinical community about how cancer diagnosis has been, and will continue to be, impacted. While pan-Canadian data on the impact of COVID-19 on cancer is developing, there have been early and notable trends across Canada related to early cancer diagnosis since March of 2020. At the beginning of the COVID-19 pandemic, service restrictions on cancer care and interrupted screening for breast and colorectal cancer were part of the initial pandemic response. Recent modelling has shown that a 3-month interruption in screening across Canada could cost approximately 20 000 life years lost, and a surge of diagnosed cancer cases once screening resumes (8). If there is a continued reduction in screening capacity for an additional two years, up to 100 000 life years lost could be observed (8). Further, there have been fewer patients presenting symptomatically in primary care or emergency departments, as well as a reduction in access to cancer related services across Canada (9,10).

In 2018, the Canadian Partnership Against Cancer (the Partnership) commissioned an environmental scan to better assess the strategies and initiatives on early cancer diagnosis in Canada and around the world. The following year in 2019, the Partnership refreshed the 2019-2029 Canadian Strategy for Cancer Control (hereafter called ‘Strategy’) (7). The Strategy defines the need to quickly and accurately diagnose cancer at an earlier stage among one of five top priorities. Now with the COVID-19 pandemic impacting early cancer diagnosis, there is a stronger call to action to address this priority in the Strategy. To identify and better understand current initiatives that optimize early cancer diagnosis of symptomatic patients across the country, the Partnership engaged the SPOR Evidence Alliance to complete a refresh of the environmental scan for current efforts being implemented across Canada and a scoping review of the current literature.

This report will cover the key summary points of the scoping review and environmental scan, and will compare Canada’s current early diagnostic initiatives for symptomatic patients with evidence-based findings. Over the next five years, the Partnership will leverage findings from the both the environmental scan and the scoping review, as one of several inputs, and partner with Canadian jurisdictions to continue to test innovative models of care that expedite cancer diagnosis, especially for Indigenous and underserved populations.

Methods

This report is a synthesis of the findings from the scoping review and environmental scan. The scoping review followed the Joanna Briggs Institute's methodological framework for the conduct of scoping reviews (11). An experienced librarian designed a search strategy to identify relevant literature to address the key research questions. Both published and unpublished articles in English from January 2017 to January 2021 were included. Two reviewers independently screened the titles, abstracts and full text articles and 104 articles were identified for inclusion in the scoping review. A brief description of the study and population characteristics are included here, and complete details can be found the scoping review Report.

The environmental scan included both key informant interviews and document reviews. Key informant interview participants (n=22) for the interviews were purposefully recruited and identified by the Partnership team. A snowball sampling approach was used to identify additional participants. The KT Program staff conducted 45-60 minute semi-structured interviews, which were recorded and transcribed verbatim. Researchers double coded 20% of data until >75% agreement was achieved. Any disagreements were resolved by a third researcher. Researchers then independently coded the remaining data to generate key themes. A member check process was conducted to share findings back with participants to validate information and interpretation of initiative findings. **Detailed methodology for the scoping review and environmental scan can be found in their respective reports.**

To generate a summary of recommendations for the Partnership's consideration, two researchers reviewed the findings from the environmental scan and the scoping review. The researchers compared findings from the scoping review to what was currently being implemented in practice in Canada, identified via the environmental scan.

Summary of Results from the Scoping Review

The scoping review explored initiatives focused on improving accurate and timely cancer diagnosis among symptomatic individuals. The review included 88 unique published peer-reviewed studies and 16 unique unpublished studies (grey literature; representing 18 different reports). Study designs varied significantly across publications including case-control (n= 35, 40%), cross-sectional (n= 26, 29%), before-and-after (n= 19, 22%), randomized controlled trials (n= 6, 7%), and mixed methods (n= 1, 1%) studies. Studies identified in this review came from several countries, however approximately half of all identified published literature and 83% of the identified unpublished (grey) literature was from the United Kingdom. Effectiveness, or ineffectiveness, of an initiative was abstracted on the reported outcome by study authors.

The scoping review identified nine initiatives and strategies to streamline and enhance accurate and timely cancer diagnoses (see **Table 2**).

Table 2. Summary of the initiative types identified in the scoping review along with the number of studies demonstrating their effectiveness/ineffectiveness

Initiative Type ¹	No. of published studies found effective	No. of published studies found ineffective
Centralized or coordinated diagnostic service*	9	0
Initiative in diagnostic services*	10	2
Multidisciplinary team*	1	2
Patient navigation*	3	0
Rapid referral pathway*	12	6
Standardized care pathway*	6	5
Education and support for primary care providers*	0	4
Target or benchmark for wait times*	5	2
Innovative health technology (e.g., text messages, e-health, machine learning) and approaches*	13	4

¹Please see the scoping review report for full details on the included studies.

*Please see the section on [Definitions](#) to see explanations of what each initiative entails.

Most of the initiatives were evaluated in lung cancer patient populations. Rapid referral pathways and technology for supporting and streamlining the diagnostic process were the two most commonly studied initiatives. There was scant reporting on initiatives for underserved populations and none focused specifically on Indigenous populations. Time from presentation to diagnosis (where presentation is defined as when a patient presents to a primary care provider with symptoms) and from referral to specialist consultation were the most consistently reported metrics across initiatives. Performance metrics to measure patients' experience mainly centered on patient-reported satisfaction and quality of life. None of the performance metrics were equity focused.

Many initiatives studied were complex and organization specific. For example, most initiatives had multiple components in place and were unique to the organization; studies were unable to decipher the degree to which each initiative component contributed to outcomes. However, use of multidisciplinary cooperation and patient navigators (called nurse navigators in literature) were common components of effective initiatives. None of the educational support packages (e.g., for primary care providers) were found to be effective. Studies demonstrated a general lack of awareness of referral guidelines and associated knowledge by primary care providers. Finally, there was little patient input in the design, development, and implementation of initiatives.

Please refer to the scoping review for additional details and the complete summary of findings.

Summary of Results from the Environmental Scan

The environmental scan identified 17 early cancer diagnosis initiatives across 8 Canadian provinces. Of the 17 initiatives, 8 provided an aspect of care focused on serving underserved populations (e.g., Indigenous, rurally located). Across the 17 initiatives, targeted disease sites included lung (and other

thoracic cancers), breast, pancreatic, cervical, endometrial, ovarian, and melanoma. Two initiatives focused on all cancers.

Via the environmental scan, we identified four regional trends*. First, Western and Central Canada (British Columbia, Alberta, Manitoba, Saskatchewan) focused on engaging, supporting, and educating primary care physicians on timely referral of patients presenting with suspicious symptoms. Primary care engagement ranged from educational programming to including primary care representatives in the development of early diagnosis initiatives. Second, participants from Ontario highlighted the benefits of engaging key stakeholders early for successful implementation of the initiative. Early buy-in (including from government organizations and health organizations) was critical as it facilitated collaboration. Additionally, this buy-in typically included individuals in leadership roles, which helped to facilitate a culture and climate that encouraged the implementation of the initiatives. Third, participants from Eastern Canada noted a lack of primary care access as a key barrier to early cancer diagnosis efforts. Fourth, across Eastern Canada it was noted smaller organizing groups involved in planning and implementation of the initiative allowed for faster communication and collaboration for both implementation and subsequent changes.

Additionally, we identified ten common barriers and nine common facilitators to implementing and sustaining early cancer diagnosis initiatives focused on symptomatic patients.

Common barriers across initiatives included:

- Lack of access to primary care (e.g., patients did not have access to primary care providers),
- Delays in time to diagnosis (e.g., long wait times between referral and diagnosis),
- Lack of access to diagnostic services due to geography (e.g., distance to a provider or diagnostic center),
- Lack of cooperation from colleagues and/or organizations to implement the initiative (e.g., colleagues did not change current practices),
- Lack of governmental buy-in to support the initiative (e.g., no “sign-off” by governmental bodies)
- Limited staff capacity (e.g., completing administrative tasks),
- Information gaps and lack of knowledge by providers on referral/diagnostic criteria (e.g., difficult to follow and adapt practice to frequently changing guidelines),
- Burden on primary care providers to manage multiple needs for early cancer diagnosis (e.g., completing proper referrals, tracking new guideline releases),
- Lack of data availability (e.g., unable to collect and/or evaluate initiative impact without data or proper analysis) and,
- Limited funding and/or resources to implement and sustain the initiative (e.g., staff salary, equipment).

Common facilitators that led to *perceived* success across initiatives included:

- Data availability to assess initiative impact (e.g., demonstrate value of the initiative),
- Leadership and organizational buy-in (e.g., support with roll-out and initiative endorsement),
- Leveraging networks to maintain ongoing communications (e.g., expedite referrals and communication across care sectors),

* The term ‘trends’ was defined through discussions with the Partnership. Please note that these themes identified via key informant interviews; however, the limited sample size prevents the research team from being able to conclusively report these trends.

- Multidisciplinary teams (e.g., multiple care providers involved in the diagnosis of a patient; in the development and implementation of an initiative),
- Nurse navigators (e.g., point of contact for the patient, handles administrative tasks),
- Smaller organizing groups (e.g., easier communication),
- Stakeholder buy-in at the individual/provider level (e.g., engaging primary care providers to improve implementation),
- Streamlined or centralized referral system (e.g., faster referral and diagnosis) and,
- Incorporation of virtual elements (e.g., streamlining the diagnostic process, data collection).

Participants recommended intervention components and implementation considerations for development and sustainment of early cancer diagnosis initiatives. Recommended intervention components included: engagement of primary care providers, multidisciplinary teams, stakeholder buy-in, leadership engagement, collaborative development, and use of patient navigation models. Additionally, factors that were recommended to support implementation of these initiatives included tailored support for underserved and Indigenous populations, streamlined processes for data collection and reporting, and integration of the initiative within the health system.

Please refer to the environmental scan for additional details and the complete summary of findings.

Integration of the Scoping Review and the Environmental Scan

This section highlights key findings from a comparison of evidence from the scoping review and current early diagnosis initiatives across Canada from the environmental scan. They are first presented with the initiative components that have demonstrated strengths from both sources and should be considered for continued support. Following this is a section on key gaps and barriers for further development.

Initiative implementation facilitators for continued support

A. Multidisciplinary teams

The use of multidisciplinary teams was found to be a strength or initiative facilitator in both the environmental scan and the scoping review. Interview participants highlighted that having cooperation with stakeholders across a variety of disciplines helped to move their early diagnosis initiatives forward. These participants highlighted the need to facilitate buy-in from several stakeholder groups (e.g., working with administrators as well as those on the front-lines).

B. Patient navigator

The scoping review identified the presence of a patient navigator as a common and potentially effective strategy to promoting success of early cancer diagnosis initiatives. Interview participants also noted the importance of this role in benefitting patients, providers, and the health system. The patient navigator also played a role as the go-to person (for both patients and providers) for any questions related to the initiative being implemented. The patient navigator role in both the scoping review and environmental scan was commonly fulfilled by the role of a nurse.



Initiative barriers for development, implementation, and/or sustainability across Canada

A. Underserved and/or Indigenous populations

The environmental scan identified few initiatives that targeted specific care or were dedicated to serving underserved and Indigenous populations. Rather, initiatives aiming to incorporate this focus were still in the early planning phases such as establishing relationships. Similarly, there was little data identified through the scoping review on initiatives for underserved populations and no data identified from the literature for Indigenous populations.

B. Primary care education and support

An area that requires further investigation is the impact of current primary care provider-targeted education initiatives, which commonly created in response to primary care providers' lack of awareness of referral guidelines. They were not found to be effective in the scoping review; studies showed minimal impact on providers' awareness or knowledge of guidelines following the initiative. Several interview participants reported implementing educational initiatives for primary care providers, including online informational resources, educational conferences, and a helpline for providers, however there was minimal indication of evaluation of these initiatives in the Canadian setting.

Primary care educational initiatives were not found to be effective in the scoping review. These initiatives were commonly created in response to primary care providers' lack of awareness of referral guidelines, however studies show minimal impact on provider awareness or knowledge of guidelines following dissemination of these initiatives.

C. Patient engagement

Some interview participants highlighted that they included patients in the development of their early cancer diagnosis initiative, with some collecting outcome data on patient experience. However, the scoping review provided little evidence of patient involvement in the design, development, or implementation of initiatives.

D. Evaluation metrics and data analysis

A limitation found in both the scoping review and environmental scan was a lack of data on health equity or patient specific outcomes. Interview participants identified a lack of resources (e.g., funding, infrastructure) as a barrier to routinely collecting and analyzing impact data. Some Canadian initiatives reported collecting data on patient experience.

Based on the findings of the scoping review, metrics consistently used to evaluate initiative impact included time from presentation to diagnosis (where presentation is defined as when a patient presents to a primary care provider with symptoms), and time from referral to specialist consultation. Similar to the findings of the environmental scan, performance metrics identified in the scoping review mainly centered on patient-reported satisfaction and quality of life.

E. Digital or virtual elements

Interview participants perceived technology to be beneficial to early cancer diagnosis initiatives, particularly in supporting primary care providers (e.g., streamlining the referral process; use of Electronic Medical Record (EMR) systems, supporting routine data collection). However, technological innovations that did not consider the needs and time constraints of staff (e.g., completing multiple online referral forms) were challenging to implement.

The scoping review identified studies on the implementation of technology to supporting and streamlining early cancer diagnosis. This was one of the top two most commonly reported initiatives in the scoping review. Most (13/17) of the included studies demonstrated effectiveness. Examples of successful initiatives incorporating technology to support the diagnostic process included text message reminders for patients or incorporating machine learning into the diagnostic process.

F. Sustainability

There was a lack of data in both the environmental scan and scoping review that discussed or evaluated sustainability of early cancer diagnosis initiatives. Interview participants noted that their initiatives were mostly in the planning or early implementation phases. Some participants were planning to develop sustainability plans, and few had plans to scale up. The most significant barrier to initiative sustainability was funding.

Considerations for the Partnership

This section of the report is intended to highlight key areas that the Partnership can consider prioritizing as they continue to support early cancer diagnosis initiatives across Canada. Strengths and key gaps were developed based on data from the scoping review and environmental scan. There were two identified strengths and five gaps related to early cancer diagnosis initiatives in Canada.

Areas of strength for continued support

Both the scoping review and environmental scan identified two areas of strength: the routine use of multidisciplinary teams and a patient navigator to facilitate early cancer diagnosis initiatives. Interview participants perceived these initiative components to be effective and a factor for success. Of note, a patient navigator (i.e., nurse navigator) was not the focus of any of the included studies but was present in twelve different studies that demonstrated effectiveness. There are several Canadian examples of these initiatives identified in the environmental scan. These areas of strength should be explored further and continue to be developed when planning, implementing, and/or sustaining early cancer diagnosis initiatives.

In the scoping review, multidisciplinary teams were described as involving a number of disciplines across and throughout the initiative development, planning, implementation, and sustainability. Multidisciplinary teams described in the review varied in structure and function depending on the context and disease site. Multidisciplinary teams as an initiative design were highlighted in three studies and were mentioned as a component of two additional effective initiatives. Specifically, these two articles originated from Canada. One study (see scoping review for study details) assessed the effectiveness of a multidisciplinary team-based initiative for lung cancer demonstrating that a surgeon guided, multidisciplinary care group focused on thoracic cancers, expedited the time from suspicion to diagnosis from 44 to 34 days (12). Another study (see scoping review for study details) including a multidisciplinary component showed a decline in wait times from first abnormal imaging to biopsy from 61 to 36 days through care provided by a multidisciplinary team (13).

A patient navigator was a noted component in twelve studies, described as a key facilitator to enhance coordination of diagnostic pathways. Responsibilities of the patient navigator ranged from providing

culturally appropriate resources and care, coordination of care, scheduling appointments, inputting data, and referral processes among other tasks to improve efficiency and streamline care. Dedicated navigator roles act as a liaison for both the patient and the provider. One study demonstrated that use of a patient navigator improved wait time targets with those receiving a diagnosis within 28 days increasing from 47% to 75% (14). Patient navigators were often included as one component of a multi-component initiative; therefore, this poses a limitation to evaluating patient navigation as a standalone approach.

Key gaps across Canada

There were key gaps that should be considered in early cancer diagnosis efforts across Canada moving forward. This report identified five notable gaps, which include lack of initiatives specifically co-designed with underserved and Indigenous populations; limited patient engagement throughout initiative planning and implementation; limited evidence of impact of primary care provider education initiatives; lack of routine data collection and evaluation of the intervention; and the need for plans and resources to support initiative sustainability.

The scoping review identified four published research articles focusing on underserved populations and no studies for initiatives engaging or tailored to Indigenous populations. Across the Canadian initiatives, the key informant participants often indicated they did not specifically focus on care for underserved or Indigenous populations and initiatives aiming to develop this focus were in early stages. Of the 17 initiatives identified from the environmental scan, two were providing some focused care for Indigenous populations.

There was also limited patient engagement identified in the co-designing and implementation phases of the initiatives across the environmental scan and scoping review. Few participants from the interviews highlighted that they have made efforts to engage patients in the development, implementation or evaluation of their initiatives. The environmental scan identified one initiative that included patients (individuals with lived experience of cancer) as advisors. Patient advisors sat on the initiatives' committees and working groups, and participated in the creation of deliverables, such as education materials. The scoping review identified only one published article highlighting patient involvement.

Education targeting primary care providers, such as educational events focusing on clinical practice guidelines, was highlighted as a focus across three Canadian early diagnosis initiatives identified in the environmental scan. The scoping review identified four published initiatives for primary care education, however there was limited impact of education approaches on primary care providers' knowledge or uptake of guidelines/processes of cancer assessment and diagnoses. It will be important for Canadian initiatives currently using these educational approaches to closely monitor and evaluate effectiveness and impact on improving provider knowledge, streamlining diagnostic processes and improving patient care. Additional research and work should be focused on determining the knowledge gaps and needs of primary care providers. Further, future research used to determine implementation quality of these initiatives and to identify barriers to success is warranted. Building on the results, implementation strategies and education can be co-designed with primary care providers.

Another key gap identified in the environmental scan and scoping review is the lack of evaluation of the impact of early diagnosis initiatives. Many initiatives identified in the environmental scan (13/17) were collecting data; this data varied across initiatives. Further, it was noted by participants that sustainability

of the initiative is often dependent on proof (e.g., quantitative data) of impact; however, limited resources precluded the ability to routinely collect required impact data to provide a rationale for sustainability.

Additionally, there was a lack of common outcomes or metrics used across provinces. Based on results from the scoping review, initiative impact was determined based on the study authors and not consistent across studies. Table 2 in the scoping review report has more information on specific metrics reported from articles in the scoping review. Articles that reported data to evaluate initiative impact most commonly reported, time from presentation to diagnosis (where presentation is defined as when a patient presents to a primary care provider with symptoms) and time from referral to specialist consultation; this was consistent with the findings of the environmental scan. There is a demonstrated need to develop a common set of metrics to be included within initiative implementation and sustainability. These could be provincial or nation-wide metrics.

Finally, a key gap noted across the data sources was focused on challenges to initiative sustainability. Several initiatives (8/17) in the environmental scan noted they were developing or had early plans to address sustainability however, many were concerned about lack of funding to sustain the initiative. The scoping review did not identify research indicating effective (or ineffective) methods or any metrics to evaluate for sustainability purposes. There is a need to develop research and pragmatic strategies to support sustainability of early cancer diagnosis initiatives.

Considerations for the Partnership

Below are recommendations that the Partnership can consider integrating into the Strategy to support early cancer diagnosis initiatives across Canada. The suggestions are grouped by initiative components that were identified either as strengths or barriers to initiative implementation and/or sustainability, or opportunities for additional research.

Table 3. Various initiative components highlighted for further considerations to the Partnership based on the environmental scan and scoping review findings.

Initiative components	Description and operationalization	Innovative Models of Care Opportunities for the Partnership	Evidence (identified via the scoping review)
Multidisciplinary teams	<ul style="list-style-type: none"> Requires working with all stakeholders involved in the care pathway (i.e., primary care providers, leadership, administration, front-line staff, patients) Early engagement of team members from project onset Primary care providers are key stakeholders in the early cancer diagnosis pathway A collaborative/co-creation approach to building the tools and documents relevant to the initiative 	<ul style="list-style-type: none"> Continue to encourage and invest in innovative models of care that leverage multidisciplinary teams Determine the factors that optimize success of multidisciplinary cancer teams 	<ul style="list-style-type: none"> Five included articles researching multidisciplinary team Three focused on a multidisciplinary initiative organization Two that included multidisciplinary components Three articles indicated effectiveness For example, resulted in an expedited time from suspicious finding to diagnosis (34 vs 44 days, p=0.027) (15)

Initiative components	Description and operationalization	Innovative Models of Care Opportunities for the Partnership	Evidence (identified via the scoping review)
Patient navigator	<ul style="list-style-type: none"> • A function to help facilitate and coordinate access to services for patients through the cancer journey • Patient navigator may be fulfilled by the role of a nurse • Responsibilities of the patient navigator ranged including, providing culturally appropriate resources and care, coordination of care, scheduling appointments, inputting data, referral processes, patient assessment, liaison for patients and providers 	<ul style="list-style-type: none"> • Consider including patient navigator role within future initiatives • Focus research in order to evaluate their effectiveness within the initiative 	<ul style="list-style-type: none"> • 12 included articles (3 published, 9 unpublished) • 9/12 articles reported results of intervention effectiveness with positive results • Initiatives highlighted below included a patient navigator as one of the initiative components • Examples: a clinic with a patient navigator decreased patient feelings of high anxiety before diagnosis (16) • An initiative that incorporated a patient navigator improved wait time targets from 47% to 75% (14) • An initiative that incorporated patient navigators found to have decreased time to surgical consultation for malignant (36 vs. 59 days) and benign diagnoses (32 vs. 95 days) (17)

Initiative components	Description and operationalization	Innovative Models of Care Opportunities for the Partnership	Evidence (identified via the scoping review)
Underserved or Indigenous populations	<ul style="list-style-type: none"> • Scoping review and environmental scan showed that there is not enough evidence on initiatives that focused on care for underserved or Indigenous populations • Co-design and co-evaluate initiatives with and for Indigenous and underserved communities, with a focus on addressing inequities 	<ul style="list-style-type: none"> • Consider funding initiatives that are led by underserved and Indigenous communities • Encourage collaboration with representatives from the specific populations at initiative onset (i.e., encourage co-creation) • Encourage use of virtual elements and telehealth (e.g., ehealth) to provide more options for care for underserved and Indigenous populations 	<ul style="list-style-type: none"> • There was no identified research on initiatives targeting Indigenous populations • There were five articles focused on underserved populations • One of five articles indicated some success • Example: one initiative increased the proportion of patients (who were defined as underserved) who obtain a specialized consultation within 3 months after enrollment (18)

Initiative components	Description and operationalization	Innovative Models of Care Opportunities for the Partnership	Evidence (identified via the scoping review)
<p>Primary care education and support</p>	<ul style="list-style-type: none"> • Provide education and support to primary care provider regarding early cancer diagnosis guidelines • There are challenges with implementation of new clinical guidelines or datasets for assessments among primary care providers 	<ul style="list-style-type: none"> • Work collaboratively with primary care providers to determine gaps in knowledge and needs • Continue to encourage education among primary care providers, however, consider evaluating the effectiveness of these initiatives and their sustainability • Include participant feedback following education session/ use a co-creation approach • Implement additional strategies to facilitate the use of new guidelines for primary care providers 	<ul style="list-style-type: none"> • Three Canadian initiatives are currently implementing education efforts among primary care providers • Scoping review included four articles • Scoping review evidence suggests limited impact of these efforts on knowledge/uptake • Four different education and/or support packages were researched and none of the packages for primary care providers were found to be effective • A common theme was a lack of awareness of referral guidelines and associated lack of knowledge by the primary care physicians despite the information being provided

Initiative components	Description and operationalization	Innovative Models of Care Opportunities for the Partnership	Evidence (identified via the scoping review)
Patient engagement	<ul style="list-style-type: none"> Co-design initiatives with patients in development and implementation of care initiatives 	<ul style="list-style-type: none"> Encourage patient engagement right from initiative planning, including patient advisors embedded at all levels of the initiative (e.g., patients, provider, administration) Consider evaluating patient experience and satisfaction and incorporate patient-relevant outcomes 	<ul style="list-style-type: none"> Out of 17 published studies on innovative initiatives/approaches, there is limited evidence of early cancer diagnostic initiatives involving patients in their design, development, and implementation
Evaluation	<ul style="list-style-type: none"> Implement common outcome measures for evaluating the initiatives 	<ul style="list-style-type: none"> Consider developing a common data set of outcome metrics to be evaluated across initiatives Consider funding data collection processes (e.g., technology, administrative role) Encourage use of routinely collected data to identify challenges/gaps and iteratively revise/address these 	<ul style="list-style-type: none"> A total of 37 evaluation metrics were identified in the scoping review Time from presentation to diagnosis and from referral to specialist consultation were the most commonly reported evaluation metrics

Initiative components	Description and operationalization	Innovative Models of Care Opportunities for the Partnership	Evidence (identified via the scoping review)
Digital or virtual elements	<ul style="list-style-type: none"> • Digital or virtual elements (e.g., electronic medical records) can support with data collection, care provision, referral processes, and communication • Consider whether the digital or virtual element will improve the speed and efficiency of the team involved. Is this format acceptable to patients/providers? • Initiatives incorporated technology in various ways such as, using text message reminders, online assessments, online forms, machine learning to diagnosis head and neck cancer, and/or teledermoscopy 	<ul style="list-style-type: none"> • Consider developing and evaluating the impact of initiatives embed a digital or virtual element that improves the process for the care pathway, specifically focusing on underserved and Indigenous populations • Encourage the use of digital or virtual elements to streamline the processes of the initiative if acceptable to the target populations 	<ul style="list-style-type: none"> • 17 articles assessed the impact of digital/virtual elements; 13 demonstrated effectiveness of initiative • Examples: online form completion rates were improved from 44 to 99% and time spent processing forms decreased from 96 to 35 seconds (19) • Text messages were perceived as an acceptable strategy for safety netting patient with low-risk cancer symptoms (20) • Machine learning accurately and effectively classified patients referred with suspected head and neck cancer symptoms (21)

Initiative components	Description and operationalization	Innovative Models of Care Opportunities for the Partnership	Evidence (identified via the scoping review)
Sustainability	<ul style="list-style-type: none"> • There was little to no evidence of initiatives that implemented sustainability plans 	<ul style="list-style-type: none"> • Initiatives should have a dedicated component sustainability section to highlight plans for sustaining the initiative and potential for scale-up • Encourage sustainability planning from the project onset 	<ul style="list-style-type: none"> • The scoping review did not identify any articles focused on sustainability of early cancer diagnostic initiatives

Limitations

The environmental scan interviews were limited to 22 pan-Canadian participants and representation was lacking from the territories and two Maritime provinces. Participants from the remaining provinces and territories either did not respond to recruitment or lacked representation in the initial contact list. Therefore, the data included in this report may not be representative of all early cancer diagnosis efforts across the country. Further, not all participants shared documents on their initiative to inform the document review and only 19/22 participants completed the member-check.

The scoping review findings were limited to evidence from the last five years and from English-language bibliographic databases and organizational websites. As such, potentially eligible articles could have been missed. Further, the eligibility criteria for inclusion was not limited to comparative studies. As such, the focus of some of the included studies was not specifically on the assessment of effectiveness of an initiative, and effectiveness of initiatives as reported in this review was based solely on the reported outcome in the articles. Risk of bias assessment was not conducted since this was a scoping review. Furthermore, the review did not assess effectiveness of initiatives across cancer patient types and jurisdictions/regions. This would have allowed assessment of any differences in intervention effectiveness by patient type and study jurisdiction.

It is important to note that the recommendations for the Partnership were generated based on a compilation and comparison of findings from the scoping review and the environmental scan, each of which hold limitations. Many of the initiatives in the scoping review and environmental scan were complex and exist within a complex organizational and systems structure. It is unclear at this time whether a single approach can be determined as an effective solution to streamlining early cancer diagnosis initiatives. Rather, the identified strengths and suggestions can be considered as a starting point to guide implementation efforts and future research.

Conclusion

This report is a final summary of the findings from the scoping review and environmental scan on early cancer diagnosis initiatives for symptomatic patients. We identified current strengths in Canada related to early diagnostic programs; however, outstanding gaps were also identified. Canadian jurisdictions can leverage the findings to develop and implement strategies adapted to local health system needs to improve the pre-diagnosis phase.

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