

1 ENVIRONMENTAL SCAN

2 **Models of Care for Chronic**
3 **Pain**

4 [Publishing to insert disclaimer and other bibliographic / corporate information below. This includes all authors and any
5 acknowledgements.]

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Abbreviations

33		
34	CBT	Cognitive behavioral therapy
35	ISEAC	Interprofessional Spine Assessment and Education Clinic
36	ECHO	Extension for Community Healthcare Outcomes
37	MAC iOPS	Medication Assessment Centre Interprofessional Opioid Pain Service
38	OCM	Oncology Care Model
39	OT	Occupational therapy
40	PCN	Primary Care Network
41	TAPMI	Toronto Academic Pain Medicine Institute
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47 Summary

- 48 • The purpose of this Environmental Scan was to provide information on models of care for patients with chronic pain and
49 non-pain indications used in Canada and internationally
- 50 • The findings of this Environmental Scan are based on a literature review and 15 stakeholder consultations. The
51 consultations included participants from 10 Canadian provinces and territories, who were primarily health care providers and
52 health consultants.
- 53 • For chronic pain, 1 hub-and-spoke model and 4 stepped care models for the delivery of care for chronic pain in Canada and
54 internationally were identified and described. No information was found on the use of the Oncology Care Model for chronic
55 pain.
- 56 • For non-pain indications, 9 stepped care models, 5 hub-and-spoke models, and the Oncology Care Model for the delivery of
57 care for chronic non-pain indications in Canada and internationally were identified and described.
- 58 • The main patient-related outcomes that were associated with models of care for chronic pain were measures of pain,
59 psychosocial outcomes (e.g., anxiety, depression), functional outcomes (e.g., disability, employment status), and health
60 care utilization (e.g., opioid prescriptions, health care visits).
- 61 • Various barriers and facilitators to providing care for patients with chronic pain were identified in the consultations and the
62 literature. The most common factors that influenced the provision of care for patients with chronic pain pertained to funding,
63 support and collaboration from the government and locally, having a centralized intake and referral system, and leveraging
64 existing resources.
- 65 • In Canada, the provision of care for patients with chronic pain varies substantially across the country and includes provincial
66 models, regional models, local models, local programs, and some regions with no formalized approach.

67 Context

68
69 Chronic pain is defined as pain lasting longer than three months that is associated with significant emotional distress and/or
70 significant functional disability.¹ People living with chronic pain often experience reduced quality of life, decreased mental health,
71 reduced ability to fully participate in their personal and professional lives, increased fatigue, and increased health care utilization.²
72 Chronic pain is difficult to cure, and management of chronic pain often involves physical, psychological, and pharmacological
73 therapies as part of a multidisciplinary pain management plan.² CADTH has compiled an Evidence Bundle on pain management,³
74 which includes reports on various treatments of chronic pain (i.e., pharmacological, physical, psychological, multidisciplinary), and
75 has published a previous Environmental Scan on the access and availability of non-pharmacological treatments for chronic non-
76 cancer pain in Canada.⁴ It is estimated that chronic pain affects approximately 19% of adults in Canada,⁵ resulting in substantial
77 physical and psychological morbidity, and cost to the healthcare system. There is lack of cost information for Canada, however, data
78 from the United States (i.e., estimated annual costs related to chronic pain between \$560 and \$600 billion⁶), can be used to estimate
79 of the economic burden of chronic pain in Canada (e.g., approximately \$56 to \$60 billion per year⁷).

80
81 The widespread presence of chronic pain in the population and its associated burden underlies the need for optimal strategies to
82 manage and provide care for this condition. There are ongoing efforts in various Canadian jurisdictions to identify and implement
83 effective approaches within the health care system to tackle the problem of chronic pain, and there is interest across Canada in
84 learning about models of care delivery that could be used for the provision of care for chronic pain. Notably, in 2019, the federal
85 government established the Canadian Pain Task Force which is mandated “to provide advice and information to guide government
86 decision-makers towards an improved approach to the prevention and management of chronic pain in this country.”² In October
87 2020, the Canadian Pain Task Force published a report which identified numerous gaps and challenges in the management of
88 chronic pain in Canada, including lack of access to primary care physicians, unclear care pathways, lack of publicly funded care, and
89 the current fee structure that favours the treatment of individual symptoms rather than multidisciplinary treatment plans.⁸ This report
90 also identified some of the best and promising practices for care for chronic pain in Canada, including patient-centered care models
91 that adapt care based on the patient’s needs, community-based care, rapid access to care, and clear referral pathways.⁸ The report
92 found that improved coordination and implementation of multimodal models of care was needed, and suggested organizing care
93 using a stepped- or tiered-care model, with clear referral pathways, patient navigators, and centralized intake and triage hubs.⁸ The

94 report acknowledged that more work is needed to understand which models of care work best for the provision of care for chronic
95 pain.⁸

96
97 There is no standard and widely accepted definition of the concept of 'model of care'.⁹ For the purpose of this Environmental Scan,
98 the definition that served as a guide was as follows: "a model of care is an overarching design for the provision of a particular type of
99 health care service that is shaped by a theoretical basis, EBP [evidence-based practice] and defined standards. It consists of defined
100 core elements and principles and has a framework that provides the structure for the implementation and subsequent evaluation of
101 care."⁹ The purpose of this Environmental Scan was to gather information on models of care that are currently used in Canada and
102 other countries to address the care needs of adult and pediatric patients with chronic pain (cancer-related and non-cancer). This
103 scan focuses on 3 selected models of care (i.e., hub-and-spoke, the Oncology Care Model [OCM], and stepped care) that were
104 identified as priority models of interest as they are currently used in Canada and internationally for pain, mental health, and oncology.
105 The hub-and-spoke model involves a network of service providers or health care institutions, and usually consists of one centralized
106 'hub' which offers specialized services, complemented by secondary clinics, the 'spokes', which provide more limited care.¹⁰ In this
107 model, patients are routed to the hub for more intensive therapies, or to a spoke for routine follow-up.¹⁰ The OCM by centres for
108 Medicare and Medicaid in the US is a model of care that is based around an alternative payment model for the provision of oncology
109 care; it is based on 6-month episodes of cancer care and combines fee-for-service payments and performance-based payments.¹¹
110 Stepped care is a model in which interventions are organized into a series of steps with progressively increasing intensity, and
111 patients receive the most effective and least intensive therapy first and care is either stepped up or stepped down as needed.¹²
112 This scan will also include information on the selected models for other chronic, non-pain conditions as information on the programs
113 and services that are offered in the selected models for other health disciplines could be used to inform the implementation of these
114 models for populations with chronic pain. This Environmental Scan also identifies other models of care that are being used for
115 chronic pain in Canada and internationally.
116
117

118 Objectives

119 This Environmental Scan was initiated to provide information on existing models of care delivery for chronic pain to inform the
120 development of strategies and programs to respond to the care needs of individuals affected by chronic pain in Canada.

121 The key objectives of this Environmental Scan are as follows:

- 122 1. Describe the following selected models of care that are used in the delivery of care for chronic pain and other clinical
123 conditions: hub-and-spoke, Oncology Care Model, and stepped care.
- 124 2. Summarize the main patient-related outcomes that are associated with the selected models of care delivery.
- 125 3. Summarize key issues, challenges, and lessons learned in implementing the selected models for the delivery of care for
126 patients with chronic pain.
- 127 4. Identify other models of care delivery for chronic pain specifically, including programs and services offered, that are being
128 used in Canada and other countries.

129 This Environmental Scan does not include an assessment of the clinical or cost-effectiveness of the identified models of care. Thus,
130 conclusions or recommendations about the value of these models of care or their place in treatment are outside the scope of this
131 report. In addition, models of care for non-chronic conditions (e.g., acute pain) were beyond the scope of this report.

132 Research Questions

133 The Environmental Scan aimed to address the following research questions:

1. How are selected models of care—i.e., hub-and-spoke, the Oncology Care Model, and stepped care— being implemented in Canada and internationally in delivering services for chronic pain and non-pain indications? What are the programs and services offered under these models?
2. What are the main patient-related outcomes associated with the selected models for the delivery of care for patients with chronic pain ?
3. What are key issues, challenges, and lessons learned related to the selected models for the delivery of care for patients with chronic pain?
4. What other models of care delivery are used for chronic pain specifically in Canada and internationally?

Methods

A limited literature search and focused consultations with select stakeholders were used to inform this report. A description of these two components follows. Table 1 outlines the criteria for information gathering and selection.

Table 1: Criteria for Literature Screening and Information Gathering

	Inclusion	Exclusion
Population	<p>Question 1: Adults and pediatric individuals with chronic pain or non-pain indications</p> <p>Questions 2 to 4: Adults and pediatric individuals with chronic pain</p>	<p>Questions 2 to 4: Adults and pediatric individuals with non-pain conditions</p>
Intervention	<p>Questions 1 to 3: Three models of care delivery used in treatment of chronic pain and other clinical conditions, specifically: - Hub-and-spoke^a - Stepped care^b - Oncology Care Model (Centres for Medicare and Medicaid Services)^c</p> <p>Questions 2 and 3: Hub-and-spoke model, stepped care, the Oncology Care Model, or other modules used in treatment of chronic pain specifically</p> <p>Question 4: Other models of care delivery used in treatment of chronic pain specifically</p>	<p>Question 1: Other models of care</p>
Settings	Publicly funded health care facilities	
Types of Information	<p>Question 1: Identification and description of the selected models of care delivery for chronic pain and non-pain indications.</p> <p>Question 2: Description of main patient-related outcomes for the selected models of care delivery</p> <p>Question 3: Identification of key issues, challenges, and lessons learned related to the selected models of care delivery.</p> <p>Question 4: Identification of models of care delivery for chronic pain</p>	

Note: The definition that served as a guide for 'model of care' states the following:

"a model of care is an overarching design for the provision of a particular type of health care service that is shaped by a theoretical basis, EBP [evidence-based practice] and defined standards. It consists of defined core elements and principles and has a framework that provides the structure for the implementation and subsequent evaluation of care."⁹

^a Hub-and-spoke model involves a network of service providers or health care institutions, and usually consists of one centralized 'hub' which offers specialized services, complemented by secondary clinics, the 'spokes', which provide more limited care.¹⁰

^b Stepped care is a model in which interventions are organized into a series of steps with progressively increasing intensity.¹²

153 ^o The Oncology Care Model is a model of care that is based around an alternative payment model for the provision of oncology care and is based on 6-month episodes of
 154 cancer care.¹¹

155
 156 **Literature Search**

157 A literature search was conducted to address specific research questions related to the objectives of the report. A limited literature
 158 search was conducted by an information specialist on key resources including MEDLINE, Cumulative Index to Nursing and Allied
 159 Health Literature (CINAHL), the Cochrane Library, the University of York Centre for Reviews and Dissemination (CRD) databases,
 160 the websites of Canadian and major international health technology agencies, as well as a focused internet search. The search
 161 strategy was comprised of both controlled vocabulary, such as the National Library of Medicine’s MeSH (Medical Subject Headings),
 162 and keywords. The main search concepts were models of care, Oncology Care Model, Stepped Care Model, Hub & Spoke Care
 163 Model, and chronic pain. No filters were applied to limit the retrieval by study type. Where possible, retrieval was limited to the human
 164 population. The search was also limited to English language documents published between January 01, 2010 and November 02,
 165 2020.

166
 167 **Screening and Study Selection**

168 One author assessed titles and abstracts from the literature search for eligibility. Articles were selected for full-text review and
 169 inclusion using the components outlined in Table 1. Articles were excluded if they were published prior to January 1, 2010 or they
 170 were published in a language other than English. References lists of selected articles were also scanned for potentially relevant
 171 records. Literature sources that were referenced by informants were retrieved and assessed for eligibility (see section titled
 172 Consultations

173). No restrictions were made regarding study design or type of publication.

174 **Data Extraction**

175 Relevant information from the retrieved citations was extracted into tables that were organized by objective by one reviewer. This
 176 information was then used to inform the current report. Data that were extracted included information on: the structure, organization,
 177 coordination, programs, and services for relevant models of care; main patient-related outcomes for models of care for chronic pain;
 178 and the challenges and lessons learned for the selected models of care. Any available information was used to inform the research
 179 questions and objectives in a narrative format.

180
 181 **Consultations**

182 Targeted consultations with key Canadian stakeholders (i.e., informants) were conducted between December 21, 2020 and March 1,
 183 2021. The purpose of these consultations was to fill knowledge gaps identified following the review of the literature. Consultation
 184 contacts were identified by CADTH’s Liaison Officer team, through stakeholder suggestions, and other available networks. Pre-
 185 planned consultation questions were developed (Appendix 1) and the consultations were conducted in the form of semi-structured
 186 one-on-one interviews using an online video conferencing platform. One team member conducted the consultation interviews.
 187 Potential informants were not limited to any particular profession. Those involved in the administration, study, or provision of care for
 188 people with chronic pain were eligible to participate. Informants were asked for consent to include their responses in aggregate form
 189 in the report. Only feedback from respondents who gave consent to use their consultation information was included in the report.

190
 191 **Synthesis Approach**
 192

193 Relevant findings from the literature search were grouped thematically according to the objectives of the report. Consultation
 194 recordings were subsequently transcribed for analysis, and information from the consultations was summarized and sorted into
 195 relevant categories based on the objectives of this report and then integrated into the report. For objective 1, data were categorized
 196 by type of model and clinical condition. For objective 2, data were categorized by model of care. For objective 3, data were organized

197 thematically by barriers and facilitators to providing care. For objective 4, the data were sorted by country (i.e., Canadian or
 198 international models), and the Canadian models were further sorted into 4 categories based on the organizational structure for care
 199 for chronic pain used in the jurisdiction (i.e., provincial, regional, or local strategies, or areas with no formalized approach). Within
 200 these categories, the data were reported by province or territory (organized alphabetically where needed), and by the target
 201 population for care (i.e., adult, or pediatric). Data were presented narratively and in tables, with additional details provided in
 202 appendices. References were provided where the source of the information was from the literature search, and otherwise the source
 203 was the consultations. Literature sources and online resources that were referenced by informants were retrieved and integrated into
 204 the report where relevant.

205 Stakeholder Feedback

206 The draft report was posted on the CADTH website and sent to consultation participants to elicit stakeholder feedback. Relevant
 207 stakeholder feedback will be incorporated into the final version of this report based on input received.

210 Findings

211 The findings presented are based on the results of a literature search, and targeted video consultations with select stakeholders.
 212
 213
 214

215 Summary of Information Sources

216 Literature Search Results

217 The literature search retrieved 1051 potentially relevant references, and 107 full-text papers were retrieved for further evaluation. In
 218 addition, 13 papers were retrieved from the grey literature or other sources. Of the 120 full records screened, 38 were ultimately
 219 included in the findings of this Environmental Scan. The 38 sources of information include 14 case reports or descriptive studies, 7
 220 narrative reviews, 5 policy reports, 3 quality improvement reports, 4 websites, 1 randomized-controlled trial, 1 survey, 1 study
 221 protocol, 1 non-randomized study, and 1 evidence brief.

222 Consultations

223 Invitations to participate in the consultations were distributed to 29 contacts in all provinces and territories, except for Nunavut and
 224 Yukon, as no potential contacts were identified. Seven contacts declined participation but recommended alternative, more
 225 appropriate, contacts. Four contacts did not respond to the invitation, and 2 contacts were interested in participating but were unable
 226 to attend a consultation. One potential contact declined participation as they had already participated in numerous provincial and
 227 federal consultations without meaningful improvements, and did not want to take more time away from caring for patients.

228 Findings are therefore based on 15 consultations with 17 informants conducted between December 2020 and March 2021 (1
 229 consultation included 3 representatives from the same institution in Ontario). The consultations included representatives from Alberta
 230 (2), British Columbia (1), Ontario (5), Saskatchewan (1), New Brunswick (2), Nova Scotia (1), Newfoundland and Labrador (1), Prince
 231 Edward Island (1), Quebec (2), and Northwest Territories (1). Consultations were not held with informants from the remaining
 232 province or territories, which is an acknowledged limitation of this report. Participants were from 12 individual hospitals or clinics (2
 233 pediatric and 10 adult centres), 2 provincial health authorities, and 1 not-for-profit health charity. Informants included representation
 234 from the following roles: anesthesiologist (5), pain physician (2), registered nurse (1), psychologist (3), physiotherapist (2), clinic
 235 manager (1), pain consultant (1), health consultant (1), and executive director (1). All of the informants (100%) gave their consent to
 236 use their consultation information in the report.

237 The consultations for this Environmental Scan occurred 9 months after the COVID-19 pandemic was declared. The informants
 238 described their model of care for chronic pain based on how care was provided prior to the pandemic, and some informants reported

239 the direct impacts that the COVID-19 pandemic had on their approach to care. The main body of this report describes these models
 240 of care prior to the pandemic, and a summary of the specific changes because of the pandemic are summarized in Appendix 2.

241 **Objective #1: Describe the following selected models of care that are used in the delivery of**
 242 **care for chronic pain and other clinical conditions: hub-and-spoke, Oncology Care Model,**
 243 **and stepped care.**

244 This objective was addressed by research question 1 with findings from the literature and the consultations. The findings are
 245 presented separately for chronic pain and non-pain conditions.

246 **Selected Models of Care for Chronic Pain**

247 Resources identified in the literature search and from 2 consultations provided information on the use of the hub-and-spoke model
 248 and the stepped care model for chronic pain. No information was identified on the use of the Oncology Care Model (OCM) for the
 249 delivery of care for chronic pain.

250 *Hub-and-Spoke Model of Care for Chronic Pain*

251 This Environmental Scan identified 1 hub-and-spoke model in Canada for delivering services for chronic pain: Toronto Academic
 252 Pain Medicine Institute (TAPMI). Information on TAPMI was gleaned from the TAPMI website¹³ and from 1 informant from the
 253 consultation process (a physician from one of the spokes of TAPMI). TAPMI is a virtual network of pain management services in
 254 Toronto, Ontario, Canada. The network consists of 1 central virtual triage ‘hub’, and 5 academic tertiary pain management hospital
 255 ‘spokes’.¹³ Services provided through TAPMI are fully funded through public health care. The informant reported that TAPMI is the
 256 overarching governing body for care for adults with chronic pain in the region, and that the model is organized and administered
 257 locally. TAPMI is used to streamline referrals for chronic pain services in the region. The informant reported that a goal of the network
 258 is to simplify care by reducing the number of pain centres to which patients are referred (i.e., patients are referred to 1 or 2 centres
 259 where they receive all pain-related care, and then the patient re-engages with their family doctor for follow-up care). According to the
 260 informant, when TAPMI was formed, the hope was that it would become the model for a province-wide chronic pain network that
 261 would include hubs and spokes throughout the province.

262 Patients can be referred to TAPMI via their primary care provider using the online referral form.¹³ The central hub receives all of the
 263 referrals, and referrals are triaged by nurses. Triage is based on the level of urgency, diagnosis, patient and provider preferences,
 264 clinic specialization, and wait times. Once triaged, an individualized care plan is developed based on the patient’s needs, and the
 265 hub determines which spoke(s) the patient should be referred to. The 5 TAPMI spokes are as follows: the University Health Network
 266 Comprehensive Integrated Pain Program, the Women’s College Hospital Self-Management and Interventional Pain Management, the
 267 Centre for Addiction and Mental Health Chronic Pain Treatment, the Sinai Health System Chronic Pain Program, and St. Michael’s
 268 Hospital Interventional Pain Program.¹³ Within a given spoke, individual care plans can include a range of treatment options,
 269 including patient education, medical interventions, medication reviews, social work consults, and treatment for substance misuse.
 270 According to the informant, this initial intake and triage process at the hub requires a lot of work to determine the most appropriate
 271 program(s) for the patient. For patients who were previously triaged at the hub, and who are receiving services within the TAPMI
 272 network but require additional services, a streamlined referral form and system is used to circumvent patients needing to wait in the
 273 hub for a second time.

274 According to the informant, TAPMI provides a wide spectrum of pain services across the 5 spokes in the network. All of the spokes
 275 have interdisciplinary teams, and composition of the teams are specific and unique to the programs offered at the spokes.¹³ The
 276 programs and services offered at the spokes within TAPMI are summarized in Table 2. TAPMI also has an element of stepped care
 277 built into their model; they have developed a host of online learning modules covering a variety of topics (e.g., pain education, goal
 278 setting, mental health, physical activity, communication, alternative therapies), that can be accessed online by anyone.¹⁴ These
 279 online, self-management tools can serve as the first ‘step’ of a stepped care model.

280 Health care providers within the network communicate across spokes to ensure patients are receiving high quality care and to
 281 maintain continuity of care. The informant was unsure whether the hub tracks patients after their initial referral from the hub to a

spoke(s); for instance, if a doctor at a spoke refers patients to another provider it is unclear whether the hub is tracking these metrics. After receiving services within TAPMI, if a patient's pain stabilizes, patients are discharged back to their referring physician for ongoing care with continued support from TAPMI.¹³

Table 2: Programs and Services Offered at the 5 Spokes of the TAPMI Hub-and-Spoke Model of Care¹³

University Health Network	Women's College Hospital	The Center for Addiction and Mental Health	Sinai Health System	St. Michael's Hospital
<ul style="list-style-type: none"> Comprehensive Integrated Pain Program Interventional Pain Service therapies (e.g., injections, nerve blocks) Rehab Pain Services for widespread and neuropathic pain Transitional Pain Service (offers support before and after surgery). Program includes medication management, psychotherapy, physiotherapy, and complementary therapies (e.g., yoga, acupuncture) 	<p>Self-management options:</p> <ul style="list-style-type: none"> pain education group programs physiotherapy group exercise CBT Mindfulness group <p>Pharmacy consultation</p> <p>Interventional therapy: ultrasound or fluoroscopic guided nerve blocks, radiofrequency ablation</p>	<ul style="list-style-type: none"> Pain and addiction recovery clinic Pain medication reduction services 	<p>Management of wide range of pain:</p> <ul style="list-style-type: none"> Neuropathic Widespread Headache Craniofacial Dental Temporal mandibular joint Musculoskeletal <p>Services include:</p> <ul style="list-style-type: none"> Pre- and post-surgery pain management Opioid management Nerve blocks CBT Education 	<ul style="list-style-type: none"> Interventional pain management Neurostimulation program

CBT = cognitive behavioral therapy.

Oncology Care Model for Chronic Pain

This Environmental Scan did not find any information on the use of the OCM for the provision of care for patients with chronic pain.

Stepped Care Model for Chronic Pain

This Environmental Scan identified 4 stepped care models that are implemented in Canada and internationally for delivering services for chronic pain. For 3 of the models of care (the Veteran Affairs Stepped Care Model for Pain Management,¹⁵⁻¹⁷ the Australian National Pain Strategy,¹⁸ and the South Australia Chronic Pain Model of Care^{19,20}) the 'steps' of the model are based on the level of care of the facility (e.g., primary, secondary, and tertiary care centres). In these 3 models, patients progress sequentially through the steps. For the fourth stepped care model, at the Ottawa Hospital Pain Clinic,^{21,22} the 'steps' are based on the type of care provided (e.g., education modules, workshops, individual therapies), as all care takes place in a tertiary care hospital. In this model, the steps do not need to be accessed in a sequential manner.

Veteran Affairs Stepped Care Model for Pain Management

303 Information on the Veteran Affairs Stepped Care Model for Pain Management was found in the literature.¹⁵⁻¹⁷ This model was
 304 established in 2009 and is implemented across Veterans Health Administration facilities in the US. This is a 3-step model based
 305 around 3 levels of care: primary care; consultations with pain specialists; and interdisciplinary pain centres. In this model, treatments
 306 are based on individual patient needs, and patients progress sequentially through the steps. The 'gateway provider', usually the
 307 primary care provider, provides first line pain therapies, and refers patients for more specialized care as needed. The programs and
 308 services offered within the 3-steps of the Veteran Affairs Stepped Care Model for Pain Management model are summarized in Table
 309 3.

310 **Australian National Pain Strategy**

311 Information on the Australian National Pain Strategy stepped care model was found in the literature.¹⁸ This model was established in
 312 2011, and it is a pain management network in Australia. This is a 4-step model that is based around 4 levels of care: community
 313 care; primary care; secondary care; and tertiary care. Interdisciplinary care is offered at all 4 steps. The programs and services
 314 offered within these 4 steps are summarized in Table 3. Patients move stepwise through the 4 levels, and movement between steps
 315 can occur in both directions. Patients can be referred to steps 3 and 4 (i.e., secondary and tertiary care) via their primary care
 316 providers, non-pain specialists, or from a primary level pain centre. A standardized triage tool is used to triage patients to the
 317 appropriate level of care based on the complexity of their pain. The pain clinics have pre-specified criteria to discharge patients back
 318 to community care.¹⁸

319 **South Australia Chronic Pain Model of Care**

320 Information on the South Australia Chronic Pain Model of Care was found in the literature.^{19,20} This stepped care model was
 321 developed in 2016 and implemented in South Australia by the state government. This 3-step model includes population level prevention
 322 and early intervention, as well as two tiers of care (i.e., primary health care for low pain severity, and secondary/tertiary care for
 323 moderate to high pain severity). The third step in this model combines general hospitals with specialist services due to the smaller
 324 population of South Australia. The programs and services offered within these 3 steps are summarized in Table 3. Patients progress
 325 sequentially through the steps (i.e., patients must receive pain management in primary care prior to referral to a pain specialist).
 326 General practitioners are provided guidelines that include defined pathways for specialist consultations. There is a centralized
 327 statewide referral and triaging system to improve access and reduce wait times. This system includes a comprehensive referral form
 328 that referring general practitioners must complete. This model also includes predefined clinical pathways for various types of
 329 pain.^{19,20}

330 **Ottawa Hospital Pain Clinic Stepped Care Program**

331 Information on the Ottawa Hospital Pain Clinic stepped care program was from the literature^{21,22} and from a joint consultation with 3
 332 informants from the Ottawa Hospital Pain Clinic. This pain clinic is housed within the Ottawa Hospital, a tertiary care centre in
 333 Ottawa, Ontario, Canada, and the clinic is partially funded through the Ontario Chronic Pain Network via the Ontario Ministry of
 334 Health and Long-Term Care. The clinic has an interprofessional team consisting of anesthesiologists, a physiatrist, pain medicine
 335 specialists, nurses, psychologists, a social worker, a physiotherapist, and an occupational therapist.²¹ One informant reported that
 336 the mandate of the clinic is to support primary care providers in caring for their patients with chronic pain.

337 The development and implementation of the stepped care program was locally driven by clinicians at the pain clinic in 2017 after
 338 observing that they could not meet the needs of their patients using the previous approach to care. The stepped care program at the
 339 Ottawa Hospital Pain Clinic borrows heavily from a stepped care model for mental health (i.e., Stepped Care 2.0 for mental health¹²),
 340 and was tailored to meet the needs of patients with chronic pain via collaboration with one of the individuals involved in the
 341 development of the mental health care model. This stepped care program for chronic pain is an 8-step model that provides access to
 342 a variety of interventions and programs across a range of intensities.^{21,22} This program leverages online material, community
 343 resources, and in-house programs; a description of the programs and services provided across the 8 steps is provided in Table 3.
 344 The steps in this model are not considered sequential, and patients can access higher intensity therapies without needing to
 345 complete the lower intensity steps, and multiple interventions from different intensity steps can be combined to meet the needs of the
 346 patients.

347 Patients are referred to the pain clinic by their primary care provider using the online referral form.²² The informants reported that the
 348 clinic employs a full-time nurse who is responsible for reviewing the referrals to ensure they meet the eligibility criteria, triaging the
 349 patients, and liaising with the referring physicians. Patients are either offered admittance to the pain clinic, an e-consult between their
 350 primary care provider and a pain specialist, both options, or neither option. A letter is sent to all referring physicians to inform them of
 351 their patient’s eligibility for the clinic; this letter also includes pain-related resources that they can share with their patient. This letter
 352 leverages resources that can easily be shared with patients, including the “Living Healthy with Chronic Pain” program²³ through the
 353 Ontario Online Self-management Program,²⁴ and resources from other jurisdictions, such as Pain BC²⁵ and TAPMI.¹³

354 Once admitted to the program, all patients follow the same initial pathway.^{21,22} First, patients attend a 90 minute orientation session
 355 which provides basic information on the pain clinic and the stepped care program (e.g., programs available at the clinic and in the
 356 community), and complete and intake form and Brief Pain Inventory questionnaire. The clinic runs this orientation session once a
 357 week. After completing the orientation session patients can start accessing various components of the stepped care model (e.g.,
 358 online resources, workshops). Second, patients attend a 2.5 hour interprofessional group education session, which provides
 359 additional information on pain neuroscience and self-management skills. During this session, patients complete a comprehensive set
 360 of questionnaires, and are asked to start reflecting on their goals for the pain program. Third, patients meet one-on-one with a
 361 physician for additional assessments, to develop a care plan that integrates different components of the stepped care model, and to
 362 determine whether they should be referred to the interprofessional team (i.e., occupational therapy (OT), physiotherapy, psychology,
 363 social work, and pain medicine physician) within the pain clinic. Each patient has a “most responsible physician” who tracks their care
 364 and progress through the program, but the clinic does not have any case managers.

365

366 **Table 3: Stepped Care Models – Description of Programs and Services Offered at Various Steps**

Steps	Veteran Affairs Stepped Care Model for Pain Management ^{15-17,26}	Australian National Pain Strategy ¹⁸	South Australia Chronic Pain Model of Care ¹⁹	Ottawa Hospital Pain Clinic ²¹
Step 1	Primary Medical Care <ul style="list-style-type: none"> Primary care clinicians manage common pain conditions Routine pain screening Comprehensive pain assessment Low-intensity interventions Self-management strategies (e.g., weight management, exercise, relaxation) Patient and family education An Integrated Pain Clinic was introduced in 2012 to facilitate pain assessments, and improve interactions between primary care and specialists²⁶ 	Community Care <ul style="list-style-type: none"> Education about chronic pain Provision of self-help resources Support groups 	Population Level Health <ul style="list-style-type: none"> Prevention and early intervention Evidence based information available to all patients and health care providers Mass media campaigns 	Educational Modules <ul style="list-style-type: none"> Self-directed online educational modules Trusted resources on: pain education, mental health, and recovery stories Presented to patients as needed Pain clinic website includes links to online resources,²² such as websites, book recommendations, and community resources

<p>Step 2</p>	<p>Specialist Consultations</p> <ul style="list-style-type: none"> • Consultation with specialists for complex cases (e.g., physical therapy) • Pain medicine management • Mental health support (e.g., CBT) • Multidisciplinary pain clinics • Substance misuse programs • Referral for virtual pain specialist (as of 2013)¹⁶ 	<p>Primary Care</p> <ul style="list-style-type: none"> • Education and training on chronic pain for all general practitioners • General practitioners with specialty training in chronic pain • Interdisciplinary pain centre (e.g., physiotherapists, OT, psychologists, nurses) with specialty pain training 	<p>Primary Health Care</p> <ul style="list-style-type: none"> • Multidisciplinary teams (e.g., general practitioners, nurses, psychologist, physiotherapist) • Chronic disease management model with appropriate referral pathways 	<p>Peer-led Self-management Programs</p> <p>Patients are provided information to access peer led self-management programs.</p>
<p>Step 3</p>	<p>Tertiary Interdisciplinary Pain Centres</p> <p>For patients with chronic pain who require more involvement with pain management team.</p> <p>Centres have 3 components:</p> <ul style="list-style-type: none"> • Interdisciplinary team (e.g., physician, psychologist, pharmacist, physical therapist) to provide advanced diagnostics and interventions • Chronic pain rehabilitation programs • Capacity to assess and treat those with chronic pain and substance misuse 	<p>Secondary Care</p> <ul style="list-style-type: none"> • Pain medicine specialists work with an interdisciplinary team (structured similarly to the interdisciplinary team in primary care) 	<p>Secondary/ Tertiary Care</p> <ul style="list-style-type: none"> • Referral pathways to and from primary care • Multidisciplinary team of pain specialists and allied health professionals (e.g., psychologists, occupational therapists, physiotherapists, pharmacists) • High-intensity pain interventions • Tertiary specialists include: cancer, palliative care, rehabilitation, rheumatology, orthopedics, mental health, substance misuse • Pain management program • Pain education program 	<p>Interactive Workshops</p> <ul style="list-style-type: none"> • Online or in-person group-based workshops led interprofessional health care providers • Workshops help address the areas impacted by pain • Topics include: how to exercise with chronic pain; ergonomics and body mechanics; CBT boosters; depression and anxiety • Offered 1 to 2 days per week • Patients can attend as many workshops as needed • Informants reported that the clinic offers 15 to 20 different workshops
<p>Step 4</p>	<p>NA</p>	<p>Tertiary Care</p> <ul style="list-style-type: none"> • Interdisciplinary pain centre within a major hospital • Pain medicine specialists working with the interdisciplinary team 	<p>NA</p>	<p>Online Therapist-assisted Self-directed Therapy</p> <ul style="list-style-type: none"> • Mindfulness-based pain management program • Bi-weekly video-based coaching sessions a psychologist • Other trusted online resources may be used

		<ul style="list-style-type: none"> • Complex pain assessments • Interventional therapies (e.g., nerve blocks, cordotomy) • Centres provide education, training, and research on chronic pain 		
Step 5	NA	NA	NA	<p>Group therapy</p> <ul style="list-style-type: none"> • Informants reported that the clinic offers at least 12 different groups • Online or in-person • Discipline-specific • Psychology groups: <ul style="list-style-type: none"> ○ Pelvic pain ○ Mindfulness ○ CBT for insomnia ○ Depression and anxiety • Physiotherapy groups: <ul style="list-style-type: none"> ○ Aqua therapy ○ Exercise for pelvic pain ○ Qi gong ○ Yoga • OT groups: <ul style="list-style-type: none"> ○ Mindfulness-based pain management ○ Pacing • Social work groups: <ul style="list-style-type: none"> ○ Parenting ○ Young adults ○ Family focused
Step 6	NA	NA	NA	<p>Interprofessional Chronic Pain Program</p> <ul style="list-style-type: none"> • Low Intensity Treatment and Education chronic pain management program • Interprofessional rehabilitation program • 8 weekly sessions that include 1 hour each of OT, physiotherapy, and psychology • Includes a consult with a social worker • Patients can be referred for a further intensive chronic pain management at the rehabilitation centre

Step 7	NA	NA	NA	One-on-one treatment <ul style="list-style-type: none"> • Individual therapies for patients requiring intensive therapy • Each discipline has specific referral criteria • Informant reported that medical interventions include guided injections, infusion therapies, nerve blocks, radio frequency ablation, and medication management. • Consultations for medication management (i.e., provide comprehensive recommendations to the primary care provider who initiates the pain medications with the patient)
Step 8	NA	NA	NA	Case management <ul style="list-style-type: none"> • Complex case management • Most intensive care for patients with the highest need

367 CBT = cognitive behavioral therapy; NA = not applicable; OT = occupational therapy.

369 Selected Models for Non-Pain Indications

370 Resources identified in the literature search provided information on the use of the hub-and-spoke model, the OCM, and the stepped
371 care model for the delivery of care for chronic non-pain indications (i.e., other clinical conditions).

372 *Hub-and-Spoke Model of Care for Non-Pain Indications*

373 This Environmental Scan identified 5 hub-and-spoke models that are implemented in Canada or internationally for delivering services
374 for chronic non-pain indications.²⁷⁻³¹ These models are for pediatric patients with complex conditions,²⁷ spinal disorders in rural
375 settings,²⁸ cancer,³⁰ and opioid use disorder.^{29,31} The traditional hub-and-spoke model where the hub is a tertiary care centre that is
376 linked with community care centres or regional hospitals (the spokes) is used by 2 of the identified models.^{27,30} In these models, the
377 hubs serve as the central coordinator for care. In the hub-and-spoke model for spinal disorders in rural settings, the model shifts the
378 direction of the patient flow through the model, whereby patients receive lower intensity care at the general hospital ‘spokes’, and are
379 referred to the tertiary care hub for more comprehensive care and follow-up.²⁸ At both hub-and-spoke models for opioid use disorder,
380 multiple agencies or treatment programs serve as hubs which partner with community health providers that serve as the spokes, and
381 transfer of patients between hubs and spokes is bidirectional.^{29,31} The programs and services offered by 2 of the hub-and-spoke
382 models were not reported in the literature.^{27,28} An overview of the programs and services offered at the other 3 hub-and-spoke
383 models is provided in Appendix 3, Table 6.

384 *Oncology Care Model for Non-Pain Indications*

385 This Environmental Scan identified information in the literature search that indicates that the OCM is currently used for the provision
386 of care for patients with cancer in the US.^{11,32-34} For cancer care, the OCM is designed to encourage practitioners in physician group
387 practices to provide care that is higher-quality and better coordinated. Participation in an OCM occurs at the medical practice level,
388 whereby the practices commit to providing superior care coordination and navigation, and enhanced treatment for patients receiving
389 chemotherapy for cancer. The model is centered around a 6-month episode-based payment model in which practices are reimbursed

at US\$160 per-beneficiary-per-month for the provision of monthly enhanced oncology services. This cost covers all care (oncology and non-oncology related) provided to the patient during the 6-month period. The 6-month interval was selected to reflect the high initial costs of cancer treatment (i.e., the initial two months after chemotherapy initiation) and stabilized costs in months four to six; the 6-month episode begins when patients first receive outpatient non-topical chemotherapy. Patients are eligible for an additional 6-month episode if additional chemotherapy is required after the initial episode. The physician group practices are also eligible to receive performance-based payments based on the practices' quality metrics and their actual expenditures compared to risk-adjusted episode target prices. Practices following the OCM must also commit to the following: ensuring patients have access to providers who have access to the patient's medical records 24 hours a day, 7 days a week; treating patients following current national guidelines; providing detailed care plans for patients; using certified electronic health records; and using data for continuous quality improvement.^{11,32-34}

400 *Stepped Care Model for Non-Pain Indications*

401 This Environmental Scan identified 9 stepped care models that are implemented in Canada or internationally for delivering services for chronic non-pain indications; 8 of these models are for mental health^{12,35-41} and 1 is for insomnia.⁴² For all 9 of these models, the 'steps' are based on the type of care provided (e.g., self-help, group treatments, one-on-one therapies), rather than the level of care of the facility (e.g., primary, secondary, or tertiary care). The number of steps in the models ranges from 4 to 12 steps. Movement through the steps is sequential or based on symptom severity in 4 models,^{35,36,38,42} not-sequential in 2 models,^{12,39} and was not reported in 3 models.^{37,40,41} In general, the lower steps include population level approaches such as education and websites, followed by self-help resources and group therapies, with progression towards higher intensity interventions such as cognitive behavioral therapy (CBT), and referrals to specialists. An overview of the steps provided within these models is provided in Appendix 3, Table 7.

409

410 **Objective #2: Summarize the main patient-related outcomes that are associated with the selected models of care delivery.**

412 This objective was addressed by research question 2 with findings from the literature and consultations.

413 Patient-related Outcomes by Model of Care

414 Patient-related outcomes that were associated with the selected models of care were identified in the literature and from 1 consultation on each of stepped care and hub-and-spoke models. Because no information on the use of the OCM for the provision of care for chronic pain was identified, no patient-related outcomes were identified for the OCM. This Environmental Scan also identified other models of care for chronic pain (Table 4), and the patient-related outcomes associated with these other models were informed by the literature and the consultations. The specific outcomes identified in the literature and by the informants for the selected models and the other models are summarized in Table 4. The specific tools to capture the outcomes are reported when they were provided.

420

421 **Table 4: Patient-Related Outcomes by Model of Care**

Outcome category	Model of Care		
	Stepped Care	Hub-and-Spoke	Other Models ^a
Pain	<ul style="list-style-type: none"> • Pain intensity (1 informant) <ul style="list-style-type: none"> ◦ Rating scale (0 to 10)^{26,43} • Pain scores¹⁶ • Duration of pain condition (1 informant) • Pain interference (1 informant) • Brief pain inventory^{17,21} • Pain Catastrophizing Scale²¹ 	<ul style="list-style-type: none"> • Pain intensity (1 informant) • Pain interference (1 informant) • Pain catastrophizing (1 informant) 	<ul style="list-style-type: none"> • Pain intensity (3 informants) <ul style="list-style-type: none"> ◦ Pain intensity visual analog scale (Integrated Care)⁴⁴ • Pain scores⁴⁵ • Brief pain inventory (IMGV,⁴⁶ Whole-Person Integrated Model of Care,⁴⁷ Multi-modal care.⁴⁸) (1 informant) • Pain self-efficacy questionnaire (IMGV,⁴⁶ Whole-Person Integrated Model of Care⁴⁷) (1 informant)

			<ul style="list-style-type: none"> • Pain interference <ul style="list-style-type: none"> ◦ Roland-Morris Low Back Pain and Disability Questionnaire (Multi-modal care)⁴⁸ • Pain catastrophizing (2 informants) • Risk of chronicity (STarT BACK questionnaire) (1 informant)
Psychosocial	<ul style="list-style-type: none"> • Coping <ul style="list-style-type: none"> ◦ Strategies - catastrophizing scale¹⁷ ◦ Generalized Anxiety Disorder Scale-7 (GAD-7)²¹ • Depression (1 informant) <ul style="list-style-type: none"> ◦ Patient Health Questionnaire-9 (PHQ-9)²¹ • Anxiety (1 informant) <ul style="list-style-type: none"> ◦ Generalized Anxiety Disorder Scale-7 (GAD-7)²¹ • Stage of Change Questionnaire²¹ • Goals²¹ • Distress <ul style="list-style-type: none"> ◦ Brief symptom inventory 18 (BSI-18)¹⁷ • Fear <ul style="list-style-type: none"> ◦ Scale of Kinesiophobia²¹ • Sleep Disturbances (1 informant) <ul style="list-style-type: none"> ◦ Insomnia Severity Index²¹ 	<ul style="list-style-type: none"> • Mental health (1 informant) 	<ul style="list-style-type: none"> • Stress <ul style="list-style-type: none"> ◦ Stress management (IMGV)⁴⁶ ◦ Perceived stress scale (IMGV)⁴⁶ • Depression (IMGV,⁴⁶ Multi-modal care⁴⁸) • Anxiety <ul style="list-style-type: none"> ◦ Hospital anxiety and depression (Multi-modal care)⁴⁸ ◦ Generalized Anxiety Disorder-7 (Multi-modal care)⁴⁸ • Distress <ul style="list-style-type: none"> ◦ Kessler Psychological Distress Scale (Whole-Person Integrated Model of Care)⁴⁷ • Sleep (1 informant) <ul style="list-style-type: none"> ◦ Pittsburg sleep quality index (IMGV)⁴⁶ <ul style="list-style-type: none"> • Satisfaction⁴⁵ • Global treatment satisfaction (Multi-modal care)⁴⁸ <ul style="list-style-type: none"> ◦ Patient satisfaction with treatment (Multi-modal care)⁴⁸ ◦ Patient satisfaction (3 informants) • Mental health (1 informant)
Function	<ul style="list-style-type: none"> • Functional disability <ul style="list-style-type: none"> ◦ Oswestry disability index¹⁷ ◦ Limitations in Daily Activities Scale²¹ • Physical functioning (1 informant) • Employment status (1 informant) 	<ul style="list-style-type: none"> • Disability index (1 informant) 	<ul style="list-style-type: none"> • Disability index (1 informant) • Functional status <ul style="list-style-type: none"> ◦ Roland-Morris Low Back Pain and Disability Questionnaire (Integrated Care)⁴⁴ ◦ Functional status (2 informants) • Health-related quality of life <ul style="list-style-type: none"> ◦ EQ-5D-5L (Scottish Service Model)⁴⁹ ◦ Quality of life⁴⁵ (3 informants) • Health Status <ul style="list-style-type: none"> ◦ Short form 12 health survey (SF-12) (IMGV)⁴⁶ ◦ Short form 36 (SF-36) (Multi-modal care)⁴⁸ • Work status <ul style="list-style-type: none"> ◦ Sick leave due to pain (Integrated Care)⁴⁴ ◦ Return to work⁴⁵ (1 informant)
Health care utilization	<ul style="list-style-type: none"> • Prescription of any opioid^{16,26} • Level of opioid prescription⁴³ • Long-term opioid therapy (>90 consecutive days of prescriptions)^{16,26} 	Not reported	<ul style="list-style-type: none"> • Opioid prescription (multi-modal care)⁴⁸ • Self-reported pain medication use (IMGV)⁴⁶ • Medication use (1 informant) • Opioid misuse

	<ul style="list-style-type: none"> • Prescriptions for other medications^{26,43,50} • Frequency of primary care visits²⁶ • Documented referral for specialty health care services^{26,50} • Number of visits to specialty health care services^{26,43} 		<ul style="list-style-type: none"> ○ Common opioid misuse measure (IMGV)⁴⁶ • Non-pharmacological treatments for pain (IMGV)⁴⁶ • Hospital visits⁴⁵
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422 ^a For the other models of care identified in the literature, if the outcome was associated with a specific model(s), then the name(s) of the model(s) is provided in
 423 parentheses after the outcome.

424 GAD-7 = Generalized Anxiety Disorder Scale-7; IMGV = Integrated Medical Group Visit.

425

426 **Core Outcome Sets for Chronic Pain**

427 During the consultations, 5 informants spoke to the development or use of standardized core outcome sets for chronic pain. These
 428 core outcome sets include a standardized battery of questions or tests such that the same outcomes could be measured in the same
 429 way for all patients with chronic pain. The outcome sets are intended for provincial or national use and are not specific to a model of
 430 care.

431 One informant indicated that the Chronic Pain Network of Canada is developing a minimal common outcome set for adult and
 432 pediatric patients with chronic pain.⁵¹ At the time of writing, this outcome set was in the process of being finalized. The informant
 433 connected the research team for this Environmental Scan with the lead investigator for this outcome set, who provided a list of the
 434 current set of domains and subdomains that are included in the minimal outcome set for adults. The patient-related outcomes from
 435 this minimal outcome set are: pain body location; circumstances of the onset of pain; duration of pain condition; frequency of pain
 436 symptoms; neuropathic pain component; pain intensity; pain interference; physical functioning; sleep disturbances; depression;
 437 anxiety; and current employment status. The specific measurement tool to use for each outcome is identified as part of the outcome
 438 set (Pr. Manon Choinière, Research Centre of the Centre hospitalier de l'Université de Montréal, Montreal, QC: personal
 439 communication, Feb 02, 2021). The informants from the Ottawa Pain Clinic stepped care model reported using this minimal clinical
 440 outcome set.

441 From the pediatric perspective, 1 informant reported that they have collaborated with researchers to help develop a National Core
 442 Outcomes Agreement for pediatric chronic pain clinics, so that all clinics are collecting the same outcomes related to children with
 443 chronic pain and their families. This outcome set has not yet been published.

444 One informant from Quebec reported that there has been an effort to standardize pain outcome measures across the province.
 445 These outcomes will be aligned with The Quebec Pain Registry,⁵² an online administrative and research database with standard
 446 outcome data pertaining to patients with chronic pain. The standardized outcomes in this registry are: pain characteristics and impact
 447 on activities of daily living; specific pain diagnoses; mental health; pain catastrophizing; health related quality of life; medical history
 448 including pain treatments; patient expectations; patient global impression of change; and socio-demographics.⁵² The standardized
 449 tools for measuring these outcomes were not published in the Quebec Pain Registry.⁵²

450 One informant from Alberta reported that there is a working group with the Alberta Pain Strategy that is developing a core outcome
 451 set for adult pain services. The outcomes include: health status, depression, life satisfaction, fatigue, brief pain inventory, pain
 452 disability index, pain catastrophizing, and pain self-efficacy.

453 **Objective #3: Summarize key issues, challenges, and lessons learned in implementing the**
 454 **selected models of care delivery.**

455 This objective was addressed by research question 3 with findings from the literature and consultations.

456 **Barriers and Facilitators**

457 This Environmental Scan identified numerous barriers and facilitators to implementing models of care for chronic pain, many of which
 458 were common across jurisdictions. This information was mainly gathered through the consultations with key stakeholders, with some
 459 additional information found in the literature. Several the factors that were identified exist on a continuum where the presence of the
 460 factor can serve as a facilitator (e.g., adequate government support), while the absence of the factor is a barrier to providing care
 461 (e.g., inadequate government support). These factors include: support and collaboration; building capacity; having a formalized
 462 intake and triage system; tracking program metrics; and the approach to care. Additional barriers that influence the provision of care
 463 for patients with chronic pain include: consideration for which discipline has ownership over chronic pain; inadequate funding; lack of
 464 health care providers; lack of clarity regarding where chronic pain therapy should be provided and by who; challenges in managing
 465 patient and provider expectations of care; a gap in the transition from pediatric to adult care; a gap in the transition from acute to
 466 chronic pain; and inequitable provision of care or challenges related to diversity (e.g., language-barriers) in care. The use of flexible,
 467 iterative models was also identified as a facilitator to providing care for patients with chronic pain. The following describes the
 468 individual barriers and facilitators in more detail.

469

470 *Which Discipline has Ownership of Care for Patients with Chronic Pain*

471 The question of which medical discipline should be responsible for the care of patients with chronic pain was raised by 4 informants.
 472 One informant reported that providing care for patients with chronic pain is complicated as it requires knowledge of all the other
 473 health care disciplines, which is why a multidisciplinary approach to care is needed. An informant from 1 jurisdiction reported that it is
 474 harder to implement solutions for chronic pain given that care for patients with chronic pain is not the sole responsibility of one
 475 medical specialty. In another jurisdiction, care for patients with chronic pain was placed under the primary care service; the informant
 476 did not believe this was appropriate given the need for hospital-based clinic space for some pain specialists (e.g., anesthesiologists)
 477 and procedures (e.g., nerve blocks), which is not available under primary care.

478 *Support and Collaboration*

479 A need for better collaboration and support between providers, disciplines, departments of health, and regional and provincial
 480 governments was identified by informants from 5 jurisdictions.

481 **Government Support**

482 A lack of collaboration between provincial and regional governments was perceived to have resulted in the absence of a province-
 483 wide model for chronic pain in some provinces and unequal access to services within and across provinces. Informants reported
 484 contributing to multiple discussions to develop provincial strategies, but that this has yet to result in any meaningful changes. It was
 485 reported that there is a need for better direction from provincial governments to drive a standardized approach, and for coordinated
 486 system-wide efforts to improve care for patients with chronic pain. One informant reported that in their jurisdiction that some targeted
 487 efforts were made to tackle individual problems without considering the system-wide impacts of these tactics. In some cases, this
 488 piecemeal approach was perceived to have resulted in reduced access to some services (e.g., accreditation of facilities is perceived
 489 by some to have reduced access to some interventional treatments for pain).

490 In contrast, one informant credited the support and guidance from the provincial government for the successful development and
 491 implementation of their model. It was reported that the government paid for one coordinator per health region to help establish the
 492 programs and services within the model to reflect the local characteristics and needs of the region, and allowed for the flexibility to
 493 build capacity based on their needs.

494 **Local Collaboration**

495 A lack of coordination between local providers and administrators was reported to contribute to challenges implementing system
 496 changes. One informant reported that the development of secondary-level pain programs in their jurisdiction was left to the local
 497 leadership, and as a result this informant felt that some programs drifted away from the intended model causing some variability in
 498 the programs and services offered across the jurisdiction. This was reported to create a problem for the tertiary center, as there was
 499 no longer consistent messaging across all levels of care, and the tertiary center was then required to offer certain types of secondary
 500 care that was otherwise missing at some of the local pain programs. The informant described challenges to gaining support for new

501 programs and to implement them without the full support from a local health care system, particularly for new programs that alter the
 502 traditional approach to health care. One informant reported that this lack of support may have caused some reluctance to adopt and
 503 accept a new process that was implemented in their jurisdiction. It was also reported that staff turnover, especially in leadership
 504 roles, can create difficulties in ensuring that programs or models of care continue to be implemented.

505 In contrast, informants from 9 jurisdictions credited local collaborations and local champions as contributing factors to the successful
 506 implementation of their models or programs. It was reported that having a good relationship and buy-in from the local hospital was
 507 important for establishing models of care and staffing pain programs. Support from both management and people in leadership
 508 positions at the hospital were also important for implementing new approaches to care. In addition, networking with people in the
 509 jurisdiction and developing open communication and trust across providers was valuable for developing and implementing new
 510 models of care. One informant reported that close relationships between primary care providers and specialists at the leadership
 511 level and the clinician level were important for establishing their model of care. These close relationships allow the providers to be
 512 supportive of the changes while being sensitive to the demands the others were experiencing (e.g., long wait lists for specialist
 513 consults). It was reported that some physicians experienced success at increasing care for patients with chronic pain in their
 514 jurisdictions by making local connections and taking ownership of the changes (e.g., via community outreach, finding online
 515 programs, increasing local capacity) rather than continuing to wait for guidance from the provincial government. In addition, strong
 516 teams that are open to innovation and that are willing to work together to solve problems were also reported as being important for
 517 successful programs and models. Informants described their successful teams as being high-functioning, enthusiastic, passionate,
 518 and dedicated.

519 *Funding*

520 **Program funding**

521 A lack of funding and resources for chronic pain programs and services was highlighted by 8 informants from across Canada.
 522 Underfunding was perceived in some cases to contribute to programs being understaffed and thus struggle to meet the needs of
 523 their patients (e.g., could not afford to hire a patient coordinator to assist patients in accessing services), as well as a lack of physical
 524 space, which was seen to restrict the availability of certain procedures (e.g., fluoroscopy). A lack of adequate funding was also
 525 reported as a contributing factor to jurisdictions not being able to use their preferred model of or approach to care, such as having a
 526 collaborative multidisciplinary team, or conducting interdisciplinary patient assessments. Funding support for information technology
 527 infrastructure was also noted as something that was lacking in some jurisdictions, limiting their ability to appropriately track and
 528 analyze program metrics. Informants also noted that there was a lack of resources to fund self-management programs, and a lack of
 529 administrative support and office space for providers. In provinces with multiple health regions, different funding models was seen to
 530 contribute to regional disparities with substantial variation in the programs and services offered for chronic pain across the province.
 531 Two informants emphasized that large portions (e.g., up to half) of the funding for their pain programs came from philanthropic
 532 donations or private foundations, which was felt as placing their programs in precarious positions as the funding is not guaranteed. A
 533 lack of stable funding for the Veterans Affairs Stepped Care Model for Pain Management was also identified in the literature as a
 534 barrier to providing the stepped care model for chronic pain.⁵³

535 One informant reported that the creative funding strategy used by a program in their jurisdiction could be viewed as both a strength
 536 and weakness of their model. This funding model combines funding from various sources (e.g., borrowed time from other
 537 departments) rather than operational funding from one stream. This was described as a weakness as the other department could
 538 stop letting the program borrow time if they could no longer spare the resources, but it was also described as a strength as there is
 539 no single funding body that can revoke all the funding from the program. The informant suggested that variations of this funding
 540 model could be used to build capacity for care for patients with chronic pain without needing to fund expensive tertiary pain clinics.

541 **Publicly Funded Allied Health Professionals**

542 A lack of access to publicly funded allied health professionals within the community and in secondary and tertiary hospitals was
 543 perceived as a barrier to providing good-quality care for patients with chronic pain by 6 informants. Services provided by allied health
 544 professionals are often recommended as part of chronic pain therapy (e.g., dietetics, counseling, psychology, supervised exercise
 545 therapy, massage therapy, OT) and in some areas these professionals are either not publicly funded (i.e., only private providers are
 546 available in that jurisdiction), or there are very long wait lists (e.g., 6 to 12 months) to see the publicly funded professionals due to

547 small numbers of these service providers. For patients who cannot afford private services (e.g., psychological or physiotherapy
 548 services), the cost of these services could be a big barrier to accessing treatment. Having sustainable funding available for
 549 multidisciplinary pain services was also identified in the literature as a major gap at the publicly funded Pain and Wellness Center.⁵⁴

550 *Availability of Professionals*

551 Informants from 7 provinces spoke about a lack of health care providers, both primary care providers and pain specialists, as a
 552 barrier to providing quality care for patients with chronic pain.

553 **Primary Care Providers**

554 There is a two-fold impact on care for chronic pain due a lack of family doctors. First, access to many of the pain clinics or programs
 555 in Canada requires referral from a primary care provider to ensure that the patient is fully supported outside the pain clinic. Patients
 556 who do not have a family doctor therefore have unequal access to these clinics. Second, informants reported that they cannot
 557 discharge patients from tertiary pain centres if the patient does not have a family doctor, as the family doctor is needed to manage
 558 prescription pain medicines. As a result, the clinic continues to see these patients which may limit the clinic's capacity to see new
 559 patients and extending the wait list for services.

560 In addition, informants reported that there is a lack of pain education and training for providers was seen to create challenges in
 561 forming a multidisciplinary team with expertise in chronic pain. One informant reported that they felt that there is a need for additional
 562 support, mentorship, and education about pain for primary care providers in order to support a comprehensive pain management
 563 program. Similarly, another informant noted that they perceived that the lack of pain education starts in medical school where pain is
 564 not a main component of the curriculum and students graduate without sufficient knowledge of chronic pain. There is a risk that this
 565 absence of knowledge may continue if physicians do not have adequate time for continuing education courses on the topic of chronic
 566 pain. A lack of provider training and knowledge about pain was also identified as a barrier in the literature by the Veterans Affairs
 567 Stepped Care Model for Pain Management⁵³ and by the Whole Person Care Model.⁵⁵

568 **Pain Specialists**

569 A lack of specialists with expertise in pain was also perceived as a barrier to providing timely care for patients with chronic pain, with
 570 some areas reporting very long wait times to see specialists (e.g., up to 5 years), and other areas reporting a complete lack of certain
 571 specialties resulting in patients needing to be referred outside their jurisdiction for specialist care.

572 *Provision of Chronic Pain Therapies – Who and Where?*

573 Challenges regarding who should provide care for patients with chronic pain and where these services should be provided was
 574 raised by 7 informants. It was reported that there is resistance by some primary care providers to renew opioid prescriptions, and that
 575 these providers rely on specialists to manage these medications for their patients. This was seen to create issues for discharging
 576 patients from tertiary pain programs if the patient's primary care provider is not comfortable prescribing opioids. Discharging patients
 577 from chronic pain programs was described as challenging due to the chronic nature of their condition, and the reliance of some
 578 patients on interventional procedures to keep them functional. Findings in literature on The Ottawa Hospital Pain Clinic stepped care
 579 model also identified that the process of discharging patients from the interprofessional team as a challenge, due to the involvement
 580 of multiple programs and providers.²¹ The clinic is in the process of developing discharge criteria to improve this process.²¹

581 Several informants also discussed issues regarding where certain pain therapies should be offered. For instance, one tertiary pain
 582 program offers a variety of programs and services that the informant felt do not need to be housed in a tertiary hospital. As there is
 583 nowhere else for these programs and services to be offered in the region, it was reported that these services will stay at the tertiary
 584 centre for now, but the informant wonders whether there might be a better avenue to provide these services. The location of services
 585 was raised as a contributing factor to unequal access to pain services within provinces and across the country. In some provinces,
 586 the central location of pain services was described as challenging for patients who live in rural or remote areas. In addition, there are
 587 jurisdictional restrictions that affect the availability of services (e.g., online programming or virtual health care visits) outside the host
 588 province, despite the demand for these services from patients in other provinces.

589 *Building Capacity*

590 As not all patients with chronic pain can be treated at tertiary pain centres, informants from 8 jurisdictions spoke about their
 591 experience with or the need to build capacity for care in other disciplines and in the community. For instance, providing additional
 592 training and professional development in the management of chronic pain, or giving primary care providers the ability to consult with
 593 pain experts to expand their scope of practice, are examples of capacity building. In one clinic, when they first launched their pain
 594 program, they invited a guest speaker to provide non-pharmacological pain education for the whole team. This 2-day workshop was
 595 described as having brought the whole team together and helped ensure everyone received the same education, which was useful in
 596 developing a coordinated approach across disciplines to treat chronic pain. At another tertiary pain clinic, in order to increase
 597 capacity in the community, a pain preceptorship program was developed which allowed them to work with around 170 family
 598 physicians, and see close to 500 patients in the community. In this program, primary care providers who had referred 5 or more
 599 patients to the pain clinic were identified, and then visited by a multidisciplinary team (i.e., physician, addictions specialist, and
 600 psychologist) from the tertiary centre to develop the treatment plans together.

601 Using online resources that are freely available and do not require referrals was mentioned as a way to build capacity for the care of
 602 patients with chronic pain. The informants mentioned that there is no need to create new resources if it is possible to leverage
 603 previously established resources. For instance, one pain clinic leverages free resources developed by the Federal government (e.g.,
 604 Wellness Together Canada⁵⁶) and by other pain clinics (e.g., TAPMI's online resources¹⁴). However, it was reported that it can be a
 605 challenge to distribute online resources; for example, in one region they struggled to disseminate an online pain neuroscience
 606 education resource that they developed to all the primary care providers in the jurisdiction. Another informant mentioned that while
 607 virtual programming may remove barriers to participation (e.g., travel) and increase access to these services, it was perceived that
 608 the downside is that participants lose out on peer interactions that they would normally receive with in-person groups.

609 The informants spoke about the need to take initiative to address the needs in their communities, even if the steps taken are small.
 610 For instance, one informant was successful in developing a local pain education program. Another informant reported on the success
 611 they experienced through community outreach and travelling to local communities to provide services for patients in remote areas.

612 Finally, two informants mentioned that building capacity within the community or as part of a model is a long process and that there is
 613 still a long way to go for providing care for people with chronic pain.

614 *Intake and Triage*

615 A lack of a centralized intake and triage system was described as a barrier to providing care by 3 informants. There are concerns that
 616 without a formalized system, identifying the correct specialist becomes the responsibility of the referring physician, which may result
 617 in patients waiting a long time to see the incorrect specialist, or patients being referred to and being seen by multiple specialists.
 618 Without a triage system, it was felt that there is no way to ensure that urgent cases are prioritized.

619 In contrast, in one province with a centralized intake system there is the concern that this system could be overwhelmed. An
 620 informant reported that initially the centralized intake system reduced wait times, but as a higher volume of referrals started being
 621 directed to the central intake it was described as becoming challenging for the system to handle the referrals in a timely way. The
 622 strain on the centralized intake system could also be compounded if the clinics or providers do not respond in a timely manner as to
 623 whether they will accept the patient, thus creating a bottleneck at the central intake.

624 Three informants spoke about the value of having an efficient intake and triage system for providing efficient care. One informant
 625 reported that an electronic system to monitor referral volumes and wait times has been a key success factor for their pain clinic.
 626 Another informant reported that having a full-time triage nurse who is responsible for communicating with the primary care providers
 627 is very important for preventing a bottleneck at the referral and triage stage of their clinic. In another region, by implementing a
 628 centralized intake system that only collects the minimal data required to triage patients, they were able to cut the wait list at the
 629 tertiary centre from 2 years to 6 months

630 *Expectations and Preferences for Care*

631 **Patient-Centered Expectations and Preferences for Care**

632 Informants from 2 provinces reported challenges with managing patient expectations and preferences. One informant believes there
 633 is room for improvement regarding managing patient expectations for care. They believe that physicians struggle to admit that it is

634 not always possible to fix chronic pain, however it is important that patients have realistic expectations (e.g., anticipated outcome) to
 635 move forward with their care. Another informant spoke about managing patient expectations around the ability to reschedule
 636 appointments. This informant reported that they perceived that patients do not necessarily understand the issues created by
 637 repeatedly cancelling and rescheduling their appointments; these issues impact the both the clinic and the ability to provide care to
 638 the patient and to other patients.

639 Two informants spoke about the challenge of managing patient preferences for the types of treatments they would like to receive,
 640 particularly when patient preferences conflict with the care plan developed by the care provider(s). Both informants mentioned that
 641 they felt that patients in their clinics were more likely to decline the psychological component of therapy (versus the physical or
 642 pharmacological components), and that this can be challenging for the care team if they have determined that the patient would
 643 benefit from all 3 aspects to manage their pain.

644 To support patient-centered care, one informant reported that offering programming at times that best suited the patient's schedule
 645 resulted in better attendance. Two other informants spoke about the importance of engaging with patients and their families to
 646 develop better solutions for pain, both in the development of individualized care plans, and in the development of resources in
 647 collaboration with people with lived experience with pain.

648 **Provider-Centered Expectations and Preferences for Care**

649 Two informants reported that misaligned expectations and a lack of understanding by referring physicians regarding what the pain
 650 programs have to offer has created challenges in providing high-quality care. One informant felt that a lack of understanding of the
 651 eligibility criteria for the program has contributed to a high volume of inappropriate referrals, which was seen to take time and
 652 resources away from the patients the program is designed to help.

653 Similarly, misaligned expectations of primary care providers with respect to what programs and services are offered at these pain
 654 programs was seen as an obstacle to patients receiving appropriate care. For instance, one informant reported that some providers
 655 in their jurisdiction believe that the pain clinic only manages opioid prescriptions and are unaware of the multimodal therapies offered
 656 at the clinic. This could result in physicians not referring their patients, who might otherwise benefit from non-pharmacological
 657 treatments, to the clinic.

658 *Transition for Pediatric to Adult Care*

659 Informants from 3 provinces reported that there is a perceived gap associated with the transition from pediatric to adult pain services,
 660 with no clear pathway for this transition in many circumstances. Patients who transition from pediatric to adult services may
 661 experience challenges, such as difficulties accessing the therapies they need (e.g., psychology, physical therapy), or having the
 662 same model to care (e.g., interdisciplinary versus multidisciplinary). In addition, many adult pain programs may not be designed for
 663 young adults and lack the specific services needed by this populations, such as vocational or family planning, or there could be very
 664 long wait lists for these services. In one region, they developed a process map for what the transition from pediatric to adult chronic
 665 pain services should look like, but they acknowledge that there are still some gaps in the process.

666 Similarly, 1 informant reported that chronic pain tends to run in families, but they felt that there does not seem to be any
 667 considerations for the familial components of chronic pain or whole-family efforts to manage chronic pain. This was described as
 668 particularly important for pediatric patients, where parents play a vital role in the child's ability to cope with chronic pain, and the
 669 informant reported that if a parent's pain is poorly managed it reduces the likelihood that the child will benefit from their pain
 670 treatment.
 671
 672
 673

674 *Evidence and Program Metrics*

675 The importance of measuring outcomes and tracking program metrics for improving patient care was mentioned by 3 informants. It
 676 was emphasized that it is important to track metrics that are informative and important to the patient. One informant reported that
 677 they felt as though some metrics that are required by the ministry of health may not be valuable to patients. For instance, the ministry
 678 requires that they track how quickly patients received an appointment date after their referral is submitted. The informant does not
 679 believe that this metric is useful and it would be more valuable to track how long it takes for patients to actually be seen in the clinic.
 680 It was also reported that tracking these metrics and patient outcomes could be challenging if there are not adequate systems in place

681 to manage the data. One informant emphasized the importance of integrating research into clinical practice. In their clinic, they
 682 measure and track everything they can, including having patients complete numerous questionnaires at every visit. The informant
 683 reported that these outcome data are then published in scientific journals to demonstrate the clinical effectiveness of their programs
 684 and to justify funding requests. However, it was noted that it has become more common that evidence from randomized controlled
 685 trials is required (rather than observational data) to make changes to health care, and that this was perceived as causing delays in
 686 innovation. Findings from the literature on The Ottawa Hospital Pain Clinic Stepped Care Model suggest that the clinic routinely
 687 collects data to allow for continuous evaluation and improvement of the program.²¹

688 *Transition from Acute to Chronic pain*

689 Informants from 3 jurisdictions spoke about the need to prevent acute pain from developing into chronic pain, particularly for post-
 690 surgery pain in pediatric and adult patients. One informant reported that there have been discussions regarding where a transitional
 691 pain service might fit within the health system. Another informant suggested that there may be a need to develop indicators that help
 692 predict who may be prone to developing chronic pain, and that there should be efforts to identify and treat these patients early in their
 693 pain trajectory rather than focusing solely on investing in tertiary pain clinics.

694 *Flexible Models*

695 Rather than developing a new model, 2 informants recommended using successful models of care for other chronic diseases to
 696 develop models of care for chronic pain, such as building off of the Stepped Care 2.0 model for mental health.

697 With respect to developing their models, two informants emphasized that there is not one best approach that will meet the needs of
 698 all regions or patients. Due to the diversity of patients with chronic pain, and the unique attributes of different regions (e.g.,
 699 geographic size, population density, available services), it is important that any provincial guidance for models of care allows for
 700 flexibility in building regional models to best meet the needs of different areas. Harmonizing the approach to care across a province
 701 does not always work and it was suggested that government recommendations should allow for individualized approaches to treating
 702 patients.

703 Informants from 2 other jurisdictions supported the need for flexible models and approaches to care. It was felt that guidance from
 704 the government cannot be too rigid, as it should leave room for patient autonomy in what therapies they choose, and the models
 705 should consider patient readiness for change with respect to accessing services. One informant reported that there used to be a pain
 706 clinic in their jurisdiction based on a rehabilitation model which followed very rigid 6-week program for treatment. This program was
 707 described as physically and mentally challenging for patients and the clinic has since closed.

708 The importance of using an iterative approach to continuously improve models of care was discussed by 3 informants. Gathering
 709 feedback on the model from everyone (e.g., patients, referring physicians, tertiary care team) and incorporating it to improve the
 710 system is an important step in the development of models of care for chronic pain. Two informants mentioned that their models have
 711 undergone multiple modifications, with the current models looking very different from their initial approaches. Both regions recorded
 712 the process of developing their programs, and updated their manuals with each subsequent change. These manuals are designed to
 713 be used to develop future programs and clinics in their jurisdictions, providing structure and guidance in determining which
 714 components are necessary and which are optional.

715 *Approach to Care*

716 **Multimodal Care**

717 It was the opinion of one informant that the health care system needs to evaluate the approach to treating patients with chronic pain.
 718 This informant mentioned that there are a lot of interventions in Western medicine that will temporarily alleviate pain (e.g., injections)
 719 but they do not solve the underlying problem. This informant stated that the cure rate for chronic pain is close to zero, and that they
 720 felt that there is a need for a more holistic or whole person approach to caring for patients with chronic pain. Similarly, since chronic
 721 pain is a lifelong condition, one informant felt that it should be treated accordingly by following a chronic disease management model
 722 (e.g., building self-management skills with patients), and they reported that patients and providers are happy since they shifted
 723 towards this model and moved away from a rehabilitation model. The importance of incorporating self-management into treatment
 724 plans was emphasized by 2 other informants. Informants from 2 jurisdictions reported that the involvement of a multidisciplinary team

725 is essential for caring for patients with chronic pain. However, it may be difficult to shift away from only using medical management
 726 for pain, with 1 informant reporting that they initially encountered some difficulties at their facility when they started using alternative
 727 non-pharmacological approaches to managing pain.

728 **Appointment Style**

729 Informants from 2 regions felt that not only was access to a multidisciplinary team and therapies important, but that an
 730 interdisciplinary approach to patient assessment and treatment planning was also valuable. It was suggested that this
 731 interdisciplinary approach, where providers from multiple disciplines evaluate the patient together, is important for communication
 732 between the patients and the providers. It helps ensure that the whole team receives the same information from the patient, which
 733 minimizes potential conflicts that could arise if patients provide different information to different providers. It also helps to make sure
 734 that patients receive consistent messaging from all team members. Team messaging reinforces the importance of all components of
 735 the care plan which is helpful for preventing patients from dismissing certain aspects of their treatment. One informant mentioned that
 736 people with chronic pain often experience fear avoidance (e.g., avoid physical activity due to fear of pain), and that an
 737 interdisciplinary approach to treatment (e.g., psychologist seen in tandem with physiotherapist) may be useful in assisting patients in
 738 overcoming fear avoidance, which supports the functional rehabilitation model.

739 Consideration of the length of time spent with patients was discussed by 1 informant. Their program prioritizes longer (i.e., up to 2
 740 hours) but infrequent (i.e., every 6 weeks) patient assessments, compared to the standard approach in their discipline of frequent but
 741 short patient visits. The informant feels that this allows for more time for the provider to conduct an in-depth assessment, to identify
 742 underlying issues, to provide patient education, and for the patient to ask questions and feel heard.

743 **Rapid Access**

744 One informant reported on the experience of their program in providing rapid access (i.e., within 2 weeks of referral) to all eligible
 745 patients for a thorough assessment and the provision of some conservative pain management therapies. Preliminary data collected
 746 by the program show that providing this rapid access was successful at reducing the number of patients with moderate or high risk of
 747 a poor clinical outcome due to the chronicity of their pain. However, this program was designed for a very specific population and has
 748 strict eligibility criteria which allows enables the 2-week turnaround for seeing referrals. The informant reported that if they had wider
 749 eligibility criteria for the program then they would not be able to meet their 2-week target, and that it would simply serve to transfer
 750 the wait list that exists elsewhere in the health care system to their program.

751 *Equity and Diversity*

752 One informant felt that there remains a lot to be done in terms equity and diversity with regard to how providers discuss pain with
 753 their patients, the types of treatments provided, and the structure of pain services. They noted that marginalized populations are
 754 underrepresented in the patient populations who attend tertiary pain clinics and that there needs to be efforts to rectify this. Another
 755 informant reported that they noticed that their program does not see very many patients from rural or remote communities, and they
 756 believe that these patients are underrepresented in their clinic.

757 Language barriers were also discussed by 2 informants. Due to capacity issues in some jurisdictions, pain services and pain
 758 education are only offered in English, which was perceived as a barrier for those who speak other languages (e.g., French,
 759 Indigenous languages).

760 **Objective #4: Identify other models of care delivery for chronic pain specifically, including** 761 **programs and services offered, that are being used in Canada and other countries.**

762 This objective was addressed by research question 4 with findings from the literature and consultations.

763 **Other Models of Care used in Canada**

764

765 Resources identified in the literature search and 15 consultations from 10 Canadian provinces and territories provided information on
 766 the use of the other models of care delivery, and the programs and services offered, for the management of chronic pain in Canada.

767 The provision of health care is provincially organized in Canada, and within many provinces there are multiple health zones or health
 768 networks which are responsible for the organization of care for that jurisdiction. The organization of care for chronic pain varies
 769 substantially across the country. There are province-wide strategies, health zone specific (i.e., regional) models, and local hospital or
 770 clinic specific approaches; each of these are described separately in this report. There are also areas with no formalized approaches,
 771 which are also identified and described. In addition, the approach within a jurisdiction may vary between adult and pediatric care.
 772 Given the complexity of health care organization in Canada, this scan does not include information from every provincial, regional, or
 773 local strategy for chronic pain. The following is a summary of the various approaches to the provision of care for patients with chronic
 774 pain across Canada that were identified from the literature and consultations; a table summarizing this information is included in
 775 Appendix 3 (see Table 8).

776 **Provincial Strategies**

777 This Environmental Scan identified 1 provincial strategy for the provision of care for patients with chronic pain in Quebec. No other
 778 provincial or territorial models for chronic pain in Canada were identified, although Ontario has an informal provincial chronic pain
 779 network. This information is based on findings from the consultations.

780 *Quebec*

781 One informant from Quebec reported that the provincial government reorganized pain services in the province around 15 years ago,
 782 creating an overarching provincial strategy for chronic pain. The strategy is based off the model of care used for trauma care, which
 783 is a pyramid model, where first level of care is provided by general practitioners, the second level of care is at regional hospitals, and
 784 the third level is at centres of expertise. There are 4 health regions in the province of Quebec, each centered around a major
 785 university (i.e., McGill, Laval, Sherbrooke, and Montreal), with centres of expertise for pain management at tertiary hospitals. As part
 786 of the provincial strategy for chronic pain, the government provided guidance to each of the health regions regarding how to develop
 787 a model of care for chronic pain, and required each region to develop a tertiary pain centre (i.e., the centre for expertise). The
 788 informant reported that each of the health regions interpreted the guidance from the province differently, and that each region
 789 established their own model of care for pain based on the local attributes of their region (e.g., geographic size of the area, density of
 790 the population). As part of this environmental scan, we spoke to informants from 2 of the health regions: Montréal, and McGill.

791 *Ontario*

792 There is no provincial model of care for chronic pain in Ontario, however, one informant from the Toronto Central health network
 793 provided some of the provincial perspective on chronic pain in Ontario. According to the informant, Canada has 11 pediatric chronic
 794 pain programs, of which 5 are located in Ontario (4 outpatient pediatric pain programs, and 1 intensive inpatient pediatric pain
 795 program). This informant reported that they worked with the Ontario provincial government to secure funding for these pediatric pain
 796 programs, which is why Ontario has more pediatric pain programs than any other province in Canada. Ontario has also formed the
 797 Ontario Chronic Pain Network, which is an informal network that links all of the academic adult and pediatric chronic pain services in
 798 Ontario. The network aims to reduce variability in care for patients with chronic pain across the province, to improve access to care,
 799 and to improve capacity for care in the community. The informant also reported that this network helped to secure funding for project
 800 ECHO (i.e., Extension for Community Healthcare Outcomes) to help build capacity for care for patients with chronic pain in the
 801 community and in remote regions via video consultations with specialists. This network does not have a website.

802 **Regional Strategies**

803 This Environmental Scan identified 4 provinces with regional strategies for the provision of care for patients with chronic pain
 804 (Alberta, Ontario, Nova Scotia, Quebec). This information is based on findings from the consultations and the literature. For the
 805 purpose of this scan, 'regional strategies' were considered ones where the model of care applied to the whole health region or health
 806 zone (as defined by the province).

807 *Regional Strategies within Alberta (adult)*

808 An informant from Alberta explained that the chronic pain strategy in Alberta is very zone-based. There are 5 health zones in Alberta,
 809 and people living in different zones have different access to care for chronic pain. This informant provided details of the model used
 810 in the Calgary zone for adults living with chronic pain. This model is called the Calgary Pain Program and was developed around 15

811 years ago. The Calgary Pain Program was initially designed to be a hub-and-spoke model, but developed into more of a 'hub-and-
 812 spoke-and-spoke' model. The model includes a tertiary pain centre (i.e., the hub), primary care network (PCN) pain programs (i.e.,
 813 the primary spokes), and care centered in family practice (i.e., the secondary spokes, termed "medical homes"). The model also
 814 integrates some components of stepped care. Care provided within this model is publicly funded health care.

815 In the Calgary Pain Program, the tertiary chronic pain clinic (i.e., the hub) has 24 physicians, and uses an interdisciplinary approach
 816 for treating patients. This clinic supports the PCNs in developing their pain programs, and provides support to the medical homes as
 817 needed. The tertiary hospital also offers an in-hospital chronic pain consultation service with nurse practitioners, and a transitional
 818 pain service for patients who are post-surgery. There are 7 PCNs in the Calgary zone, 4 of which have developed their pain
 819 programs, with 1 more PCN pain program currently in development. All of the PCN pain programs are structured differently (e.g.,
 820 multidisciplinary or interdisciplinary approach), but the aim is that each PCN pain program has a team with specialist knowledge in
 821 managing chronic pain housed in the PCN. The PCN pain programs provide support to the medical homes. The medical home is a
 822 model of primary care where most of the patient's care is centered around a family practice (i.e., family doctor and their
 823 multidisciplinary team), with specialists and services brought in to support the patient where needed. In the Calgary Pain Program
 824 model, the medical home is the key coordinator for patients; the medical home is responsible for keeping track of which specialists
 825 their patients see. In Calgary zone, they are currently focused on developing capacity for care for patients with chronic pain in the
 826 medical home. This model also recognizes the importance of pain neuroscience education for all patients with chronic pain. They are
 827 trying to incorporate an online resource into the medical home, so that all patients have access to educational materials prior to
 828 referrals to the PCN or tertiary pain programs. This education component is similar to the first level of care in a stepped care model.
 829 The details of the programs and services offered within the Calgary Pain Program model are summarized in Table 5.

830 In this model, family physicians have the option of referring patients to the PCN pain program or directly to the tertiary pain center. In
 831 the PCNs that do not have a pain program, patients are referred directly to the tertiary pain center. To be referred, patients must
 832 have a family physician. The PCN pain programs triage referrals to ensure that patients meet the programs' eligibility criteria (which
 833 varies by PCN), and offer an intake visit with care providers. Movement through the PCN program varies by PCN, but usually
 834 includes functional goal setting and recommendations for therapy based on these goals. Tertiary pain programs triage patients to
 835 ensure they meet the eligibility criteria, and to determine which aspects of the program are needed by the patient. Patients who are
 836 not eligible for the program may be offered an e-consult between their family physician and a pain specialist, or a phone appointment
 837 with a provider (to avoid unnecessary clinic visits). Visits to the tertiary centre include an initial intake visit where the program is
 838 described, goals are set, and a care plan is established. The PCN and tertiary pain programs have case coordinators or case
 839 navigators who oversee the patient's care while they are in that program. In addition, the PCN and tertiary pain programs have
 840 regular case rounds where providers who are not directly involved in a patient's care can offer suggestions for additional services
 841 that might benefit the patient.

842 **Table 5: Programs and Services Offered within the Calgary Pain Program 'Hub-and-Spoke-and-
 843 Spoke' Model of Care**

Tertiary Pain Center (The Hub)	PCN Pain Programs (Primary Spokes)	Medical Homes (Secondary Spokes)	Pain Education
Multiple disciplines: <ul style="list-style-type: none"> • family medicine • anesthesiology • psychiatry • gynecology • nursing • psychology • physiotherapy • kinesiology • OT • pharmacy • dietetics • social work 	All PCN pain programs are structured differently Basic components include: <ul style="list-style-type: none"> • 1-on-1 visits with multidisciplinary team members • group education (e.g., self-management, exercise) • physician with chronic pain expertise for medication management 	Family physician with access to a multidisciplinary team. Family doctors receive chronic pain education to enable: <ul style="list-style-type: none"> • discussions around pain self-management and pain neuroscience • offer limited self-management and rehabilitation skills 	<ul style="list-style-type: none"> • Online pain neuroscience education resource • Available to all doctors to share with patients prior to referral for pain programs

<p>Treatment options include:</p> <ul style="list-style-type: none"> • Individual visits • group education • Interventions (e.g., nerve blocks, neuromodulation) 	<ul style="list-style-type: none"> • psychologist or behaviour health consultant for counselling and CBT • social workers • rehabilitation experts (e.g., physiotherapist, kinesiologist, occupational therapist) 		
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844 CBT = cognitive behavioral therapy; PCN = Primary care network; OT = occupational therapy.

845

846 *Regional Strategies within Ontario (adult)*

847 As part of the consultations, we spoke to informants from 2 of the 14 health networks in Ontario, representing 3 different chronic pain
 848 services (2 for adults and 1 for children). One informant was from the Toronto Central health network and provided information on the
 849 regional model for adults that is used in their health network; this is the TAPMI hub-and-spoke model (as discussed in the section
 850 titled Hub-and-Spoke Model of Care for Chronic Pain

851).

852 One of the informants from the Ottawa Hospital Pain Clinic in the Champlain health region reported that, although there is no
 853 regional chronic pain model in their jurisdiction, there is a regional pain advisory committee. This advisory committee aims to bring
 854 awareness to chronic pain issues in the area, leverage existing resources, and building connections among those with an interest in
 855 chronic pain. This committee includes stakeholders from the pain clinic, the rehabilitation center, the acute pain service, the ISAEC
 856 program, palliative care, the addictions and substance use program, the research and evaluation program at the hospital, family
 857 health teams, and a patient partner.

858 *Regional Strategies within Nova Scotia (adult)*

859 An informant from Nova Scotia reported that there is no organized provincial model for chronic pain, and that the 4 health zones
 860 within the province each have a different approach. This informant spoke about the model used in the Central Zone of Nova Scotia
 861 and did not comment on the other zones. In the Central Zone of Nova Scotia, the goal is to use a hub-and-spoke model to deliver
 862 care for patients with chronic pain; however, the present model can be considered a modified hub-and-spoke model. This model
 863 includes a tertiary chronic pain clinic for complex cases, and secondary centres in the community (e.g., community hospitals or
 864 community clinics). The provision of care at the secondary centres is physician-driven and is local to the specific sites. The tertiary
 865 centre provides interventional care for pain (e.g., nerve blocks, treatment under fluoroscopy), social work consults, addictions
 866 therapy, physiotherapy, OT, an interdisciplinary pain self-management program, and alternative therapies (e.g., art therapy, Qi gong).
 867 The secondary sites provide medication management, counselling, and in-office injections (e.g., Botox therapy, trigger point
 868 injections). All of the care received at the tertiary and secondary centres in this model is publicly funded.

869 Patients can be referred to the secondary or tertiary pain centres by a physician or nurse practitioner using a standardized referral
 870 form. Patients can also self-refer to the pain self-management program offered at the tertiary center. At the tertiary center, there is a
 871 waitlist coordinator who triages all patients. Referrals are triaged into 4 categories: regular waitlist (currently 2 years); complex care
 872 (no timeline specified); fast-track (usually seen in 3 to 6 months); and urgent consult (e.g., palliative or oncology patients; no timeline
 873 specified). Prior to their first clinic visit at the tertiary center, patients attend a group visit with the team, which provides an overview of
 874 the programs offered at the clinic and provides patients with some resources they can access prior to clinic appointments. This visit
 875 used to be in-person, but has shifted to a virtual appointment to reduce travel for patients. Patients receive their first clinic
 876 appointment within a few weeks of this initial group visit. The initial assessments at the tertiary and secondary centres are conducted
 877 jointly by a physician and nurse, who work together to conduct an in-depth patient assessment, and to develop individual treatment
 878 plans. The majority of the care at these centres is provided by physicians and nurses, with the option to refer patients to
 879 multidisciplinary providers if needed (e.g., physiotherapy, OT). Additional visits and follow-ups are scheduled as needed.

880 *Regional Strategies within Quebec (adult)*

881 There are 4 health regions in Quebec which are responsible for developing their own models of care for chronic pain based on the
 882 provincial strategy. This Environmental Scan includes information on the regional pain models from 2 of the 4 health regions,
 883 Montreal and McGill.

884 In the Montreal health region, an informant reported a pyramid model of care is used. They believe that out of the 4 health regions in
 885 the province that their model is the closest to what was outlined in the Quebec provincial pain strategy. The pyramid model involves 3
 886 levels of care: primary care, regional pain centres, and a tertiary pain centre (the centre for expertise). As part of their regional
 887 strategy, the Montreal region focused first on developing regional pain centres, and they are now focusing on developing capacity for
 888 chronic pain services in primary care (e.g., increased access to physical therapy or psychology in primary care). The Montreal region
 889 is further divided into 9 areas based on the regional hospitals. Their regional plan for chronic pain aims to have a pain centre at each
 890 regional hospital. Currently there are 7 regional pain centres, with 2 more in development. The tertiary pain centre in Montreal is
 891 located within a tertiary care hospital that is joined with a rehabilitation center. The tertiary pain centre accepts patients with complex
 892 pain, and works to develop capacity at the primary care and regional levels. The tertiary hospital also offers a transitional pain
 893 service, which aims to identify patients at risk of abusing opioids after surgery and helps them decrease the amount of medication
 894 taken post-surgery.

895 Primary care physicians can refer their patients to the regional pain centres in the Montreal region using a standardized referral form.
 896 To access specialist services at the tertiary centre requires referral from a physician at a regional pain center, from other specialists,
 897 or from within the hospital (but the tertiary centre does not accept referrals from primary care). The current model requires that
 898 patients move through each level of the system before progressing to the next level; however, the informant reported that there are
 899 plans to change this system such that patients would be triaged based on complexity to help ensure that patients are directed
 900 towards the correct level of care that is needed, rather than progressing sequentially through all levels. For instance, with the new
 901 system if it is known in advance that a patient will need tertiary care interventions then patients would be triaged directly to the
 902 tertiary centre and skip the regional pain center. At their first visit to the tertiary pain center, patients meet with a general practitioner
 903 who conducts an assessment and refers patients to specialists as needed. The multidisciplinary team members at the tertiary centre
 904 include general practitioners, anesthesiologists, neurologists, a neurosurgeon, a psychiatrist, nurses, physiotherapists, psychologists,
 905 a social worker, and a pharmacist. The tertiary centre offers various group sessions (e.g., mindfulness, pain education, support
 906 groups), as well as many other services, such as acupuncture, self-management programs, yoga, and chair gymnastics. The
 907 Montreal health region also uses project ECHO to increase capacity for care for patients with chronic pain in the region, particularly in
 908 remote areas.

909 In the McGill health region in Quebec, an informant reported that their regional model was designed differently than in the Montreal
 910 region. In the McGill region, they do not have regional pain centres (i.e., the second level of care in the pyramid model from the
 911 Quebec provincial strategy); rather, they have a 2-stage model with a tertiary pain center and enhanced capacity for care for patients
 912 with chronic pain at the level of primary care. At the primary care level, there are family physicians who treat patients within their
 913 capacity, as well as some special chronic pain focused clinics (e.g., low back pain clinic) within primary care. The clinics were
 914 developed with assistance from the tertiary pain centre (e.g., advice on caring for patients with chronic pain) and were established to
 915 relieve some of the pressure from primary care physicians. Similar to in the Montreal region, the tertiary pain centre in the McGill
 916 region is located within a tertiary care hospital that is joined with a rehabilitation center. As there are no regional pain centres in the
 917 McGill region, the tertiary centre accepts referrals directly from primary care providers and offers treatments that would normally be
 918 offered at a secondary care facility (e.g., injections).

919 Primary care providers can refer their patients to the tertiary centre in the McGill region using a standard referral form and centralized
 920 triage system; this process includes patient questionnaires and an orientation session (when feasible for the patient to attend). The
 921 orientation at the tertiary centre includes information about the pain clinic (e.g., available therapies, some pain education), and
 922 patients with severe pain can stay after the session to speak briefly with pain physicians. After the orientation session, patients are
 923 triaged by a team (physician, nurse, psychologist). Triage considers numerous factors including age, likelihood of returning to work,
 924 and risk of opioid addiction. The average wait time to be seen at the tertiary centre was reported to be 6 months; high priority patients
 925 were reported to be seen within 2 to 4 weeks, and low priority patients were reported to, at times, wait up to 1 year. There is also a
 926 fast-track system for patients who have been treated at the primary care specialty clinics but have not improved (based on

927 predefined criteria). A fast-track system also exists for patients from other services, such as palliative care, or the Institute of
928 Geriatrics.

929 After being triaged, patients and their primary care providers are sent a letter inviting them to attend their first visit at the McGill
930 tertiary pain center; this letter provides the wait time and the name of the specialist. This letter aims to help relieve patient anxieties,
931 and the referring physicians are given the opportunity to respond if they disagree with the priority level or wait time assigned to the
932 patient. According to the informant, all patients referred to the tertiary pain centre in the McGill health region will be seen at least
933 once, based on their 'one visit only' system. The 'one visit only' system entails a patient assessment, providing advice to the referring
934 physician, and discharging the patient back to primary care provider for follow up. The first visit is typically conducted by one
935 provider, but combined first visits with more than one provider (e.g., physician and psychologist) are possible. When needed, patients
936 are referred to the appropriate multidisciplinary specialty (e.g., facial pain specialist, physiatrists, anesthesiologists, psychologists)
937 within the tertiary centre for additional care.

938 **Local Approaches**

939 This Environmental Scan identified 7 provinces and territories with local approaches for the provision of care for patients with chronic
940 pain (Alberta, British Columbia, New Brunswick, Newfoundland, North West Territories, Ontario, and Saskatchewan). This
941 information is based on findings from the consultations and the literature. For the purpose of this scan, 'local approaches' were
942 considered ones where a specific model or program was developed and operated independently, without oversight from a regional or
943 provincial health authority.

944 *Local Approaches within Alberta (pediatric)*

945 One informant reported on the pediatric pain services offered at the Alberta Children's Hospital in the Calgary zone, which includes a
946 tertiary pediatric pain program and an intensive pain rehabilitation program; both programs serve the Calgary zone, parts of the
947 Southern and Central zones, and parts of British Columbia. Care received at the hospital is publicly funded, however, some referrals
948 to specialists in the community (e.g., psychology, physical therapy) may be offered on a fee for service basis.

949 The tertiary pain program at the Alberta Children's Hospital is an outpatient clinic that shares clinic space with other medical
950 programs. The tertiary pain program uses an interdisciplinary model, with an informal stepped care approach to the provision of care
951 (i.e., less resource and time intensive interventions are offered first, and therapies are escalated as needed). Referrals to the tertiary
952 pain program can come from the community or within the hospital, and nursing staff triage the referrals. The intake into the program
953 consists of an interdisciplinary team assessment conducted by a physician, nurse, psychologist, and a physical therapist. There is
954 also an interdisciplinary team approach to patient care and follow-up. The program offers individual and group interventions as well
955 as follow-up across different disciplines. Care usually follows the '3 P model' (i.e., physical, pharmacological, and psychological
956 therapies) that is tailored to meet patients' needs. The program also offers a chronic pain self-management group program for youth
957 and their parents, which entails an introduction to psychologically based self-management principles of chronic pain.

958 The intensive rehabilitation pain program at the Alberta Children's Hospital is designed for patients with complex chronic pain and
959 significantly impaired functioning. It is an intensive 3-week day-treatment program that follows a rehabilitation approach. The
960 interdisciplinary team includes psychology, physical therapy, nursing, medicine, OT, family therapy, art therapy, recreation therapy,
961 and a school-based component.

962 *Local Approaches within British Columbia (adult)*

963 An informant from British Columbia reported that the province does not have an overarching government-mandated model for the
964 organization or provision of care for chronic pain. The informant reported that there have been discussions since 2016 regarding
965 developing a provincial pain strategy, but it has not come to fruition. Instead, various independent programs and services for adults
966 with chronic pain have been developed and implemented throughout the province. These services include: Pain BC, a not-for-profit
967 health charity; community-based family doctor networks; private pain clinics (not discussed in this report); and tertiary chronic pain
968 clinics. Together these 4 different approaches resemble stepped care, but there is no system or administration that connects all the
969 programs together into a stepped care model.

970 Pain BC²⁵ is an independent, not-for-profit health charity that developed an array of services for people living with chronic pain. The
971 many services offered through Pain BC could be considered the lower "steps" of a traditional stepped care model. People living in the

972 province can freely access these services through the Pain BC website,²⁵ and the majority of the services do not require referral from
 973 a health care professional. There is one coaching program that requires referral from a health professional; however, Pain BC has a
 974 support line that gives access to a social worker who can refer patients to the coaching program if needed. Pain BC does a lot of
 975 promotion and outreach to clinicians to ensure they are aware of the services available for their patients. The Pain BC model is
 976 focused on 6 strategies: early intervention and prevention; support and empowerment; education for professionals; system redesign
 977 and health policy advocacy; combatting stigma and raising awareness; and research. This program offers 3 types of care. First, there
 978 are self-serve options, including a pain self-management website.⁵⁷ Second, there are peer-enabled supports, such as peer-support
 979 groups that are facilitated by trained peers in tandem with a technical team and clinical staff, or a lay coaching program where the
 980 coaches are people living with pain. Third, Pain BC includes clinician-provided services, including a pain support line staffed by social
 981 workers which provides resource connection and psychosocial assessments, as well as a clinician-supported 8-week pain self-
 982 management course.

983
 984 The community-based family doctor networks in British Columbia are divisions of family practice with an interest in chronic pain that
 985 work with their municipality and local health authorities to provide pain services. Community physicians are trying to build local
 986 referral networks with family physicians and allied health professionals. For instance, a division of family practice may decide to pair
 987 a professional with training in Pain BC's gentle movement and relaxation course with their community practice to improve access to
 988 this type of therapy. These networks are considering using the 'group medical visit' model (i.e., where providers see a group of
 989 patients at once) to improve access to pain services.

990 The informant reported that there are multiple tertiary chronic pain clinics in British Columbia, and that they were all developed
 991 independently by different specialties and sit within different health disciplines (e.g., orthopedics, surgical, mental health) in local
 992 hospitals. These publicly funded clinics are not standardized in how they were designed or the pain services that they offer, and
 993 there is no formal coordination for the clinics. To access these tertiary pain clinics, patients require referral from a physician, but there
 994 is no centralized intake or referral model. The programs and services offered at these clinics varies by center, but in general they
 995 include a multidisciplinary team (e.g., OT, physiotherapy, psychology, pain medicine, physiatry), a pain self-management program,
 996 and the full range of pain services from low intensity interventions (e.g., physiotherapy, group exercise) to high intensity interventions
 997 (e.g., medication management, infusions, and nerve blocks).

998 *Local Approaches within New Brunswick (adult)*

999 There are 7 health zones in New Brunswick, and as part of this environmental scan we spoke to informants from 2 of the 7 health
 1000 zones, who provided information on a local program within their zone. One informant also mentioned that New Brunswick does have
 1001 some publicly funded multidisciplinary pain clinics with long wait lists (e.g., up to 5 years), and that in general patients with chronic
 1002 pain are mainly treated by their primary care provider with referrals for specialist consults where necessary.

1003 The informant from zone 1 provided information on New Brunswick's Interprofessional Spine Assessment and Education Clinic
 1004 (ISAEC) program. The New Brunswick ISAEC program originated from within the physiotherapy department at the Moncton Hospital,
 1005 and it is modelled after the ISAEC program in Ontario. It is a collaborative approach between publicly funded physiotherapists and
 1006 primary care providers. The objectives of the program are to reduce unmanageable chronic low back pain, reduce unnecessary
 1007 referrals for imaging, reduce unnecessary consultations with specialists, and to help direct patients to the most appropriate care. The
 1008 informant reported that the ISEAC program serves as an unofficial triage system for accessing chronic pain services within the health
 1009 zone, but that it is not a treatment program for patients whose pain has persisted for more than 1 year. The ISAEC program is for
 1010 people with low back pain lasting less than 1 year, and the intent is that family doctors refer their patients to the ISAEC program for
 1011 assessment before referring them for imaging or to a specialist. The program is designed to provide rapid access (i.e., within 2 weeks
 1012 of receipt of referral) to conservative treatment while patients wait to see a specialist (if needed). The initial visit includes an in-depth
 1013 patient assessment (i.e., 1.5 to 2 hours), during which patients are screened using the STarT BACK questionnaire⁵⁸ which stratifies
 1014 patients by low, medium, or high risk of a poor clinical outcome due to the chronicity of their pain. This assessment serves as an
 1015 approach to get timely access to care for high-risk patients. Following the initial assessment, the physiotherapists make
 1016 recommendations for additional imaging, treatment, or follow-up (e.g., additional physiotherapy, chiropractor, psychology,
 1017 rheumatology) and work with the primary care providers who provide the referrals for these services. In addition to the in-depth
 1018 patient assessment, the program involves pain education and home exercises provided by physiotherapists. Patients are followed-up
 1019 every 6 weeks, and each patient receives between 0 and 4 follow-up visits with the ISEAC program, depending on their risk of a poor
 1020 clinical outcome. Low-risk patients have 0 or 1 follow-up visits and high-risk patients have 2 to 4 follow-up visits.

1021 The informant from zone 3 in New Brunswick spoke about the pain management program that has been implemented as part of their
 1022 neurorehabilitation center. This publicly funded centre only admits patients with neurological disorders who require rehabilitation
 1023 services; thus, patients with other types of chronic pain would be referred to a pain clinic elsewhere in the province. This program
 1024 was initiated locally within the centre to improve pain management in their facility. The approach initially focused on a coordinated
 1025 effort for measuring and tracking patients' pain, and it now includes interventions to manage pain. All patients at the
 1026 neurorehabilitation centre have access to the pain program. The program offers both inpatient and outpatient pain services through a
 1027 multidisciplinary team (i.e., physiatry, psychology, physiotherapy, OT, nursing). Inpatients are seen by providers from multiple
 1028 different disciplines individually, and then the team meets to discuss the assessments and findings, and to set pain management
 1029 goals for the patient. For outpatients, the approach is less co-ordinated among the disciplines, and often involves individualized
 1030 assessments and treatment goals. The program also offers inpatient and outpatient pain management groups (consisting of 4 hours
 1031 of material), that were developed locally between physiotherapy, OT, and psychology. The inpatient group runs regularly, depending
 1032 on case load, and the outpatient group is offered twice a year.

1033 *Local Approaches within Newfoundland (adult)*

1034 According to the informant representing Newfoundland, there are no provincial or regional strategies for chronic pain in this province.
 1035 A health consultant from Newfoundland reported that all 4 health regions each have their own approach for the provision of care for
 1036 chronic pain. This informant was able to provide information on all 4 health regions in the province. There are 3 regions that do not
 1037 have a formalized program (see section titled No Formalized Approach

1038 This Environmental Scan identified 2 provinces that reported areas within the province that have no formalized approach for the
 1039 provision of care for patients with chronic pain (Newfoundland and Prince Edward Island). This information is based on findings from
 1040 the consultations. For the purpose of this scan, a jurisdiction was considered to have 'no formalized approach' if the area does not
 1041 have any definitive programs or services for chronic pain established within a hospital or clinic. This does not mean that there are no
 1042 services for patients with chronic pain in the area, rather that care may be provided by independent physicians but there is no
 1043 governing body that informs or organizes the provision of this care.

1044 , and 1 region, Labrador-Grenfell Health, which offers a weekly pain clinic at the regional hospital within the rehabilitation and
 1045 community support department. Referrals to the clinic are made by primary care providers or other specialists, but there is no
 1046 standardized approach to referrals and no formal triage process. The clinic uses a team approach to care, with services (e.g.,
 1047 injections, medication management) provided primarily by 1 anesthesiologist and 1 nurse, with monthly multidisciplinary meetings
 1048 that include a physiotherapist, psychologist, and chronic disease management coordinator. The clinic also offers addiction services
 1049 and holistic therapies (e.g., massage, acupuncture).

1050 *Local Approaches within North West Territories (adult)*

1051 A physiotherapist from the North West Territories informed us that there are no pain centres, is no centralized approach to care for
 1052 patients with chronic pain, and are very few services available for chronic pain care in the territory. Some basic care for pain (e.g.,
 1053 medication management) is provided through family doctors and some physical treatments (e.g., physiotherapy) are available in
 1054 Yellowknife. Patients with complex pain that require interventions outside of what is provided by primary care providers (e.g., nerve
 1055 blocks) are referred to Edmonton, Alberta for care. To help meet the needs of patients with chronic pain, a local educational pain
 1056 program for adults with chronic pain was developed independently by rehabilitation professionals in Yellowknife. This pain education
 1057 program is offered as part of the mandate of a publicly funded physiotherapy clinic, but the clinic did not receive any additional
 1058 funding to develop or run this program. Referral to the pain program or to the physiotherapy clinic can be by health care providers or
 1059 self-referral, although the pain program has a wait list. The pain education program is offered 3 to 4 times a year and consists of 5
 1060 weekly 1 hour small group sessions. The program is taught by physiotherapists and occupational therapists, and provides pain
 1061 education, practical ideas, and homework on a variety of topics (e.g., goal setting, stress management, relaxation, and body
 1062 mechanics). Patients requiring additional help can self-refer to the rehabilitation centre for individual therapy.

1063 *Local Approaches within Ontario (adult)*

1064 As part of this scan, we spoke to 3 individuals from the Champlain health network who participated in a joint consultation. The
 1065 informants reported that the local approach used in their jurisdiction includes the stepped care model at The Ottawa Hospital Pain
 1066 Clinic (see section titled Stepped Care Model for Chronic Pain

1067), an intensive pain rehabilitation program at The Ottawa Hospital, and access to an e-consult service. The intensive pain program at
 1068 the rehabilitation centre is a 4-week outpatient program, called the Chronic Pain Management Program. It is a group-based
 1069 interdisciplinary self-management program where patients learn skills and techniques to better cope with chronic pain.⁵⁹ The e-
 1070 consult service is a province-wide service that allows primary care providers to seek advice for their patients from pain specialists. It
 1071 is asynchronous written communication between specialists from a variety of disciplines and primary care providers. The informants
 1072 believe that e-consult is one of the fastest ways for primary care providers to access specialist-level care for their patients. A
 1073 perceived downside of e-consult is that it is not seen to be an efficient way to provide multidisciplinary care for patients; for example,
 1074 for complex patients the primary care provider may be required to seek an e-consult from multiple specialists to build a
 1075 comprehensive care plan for their patient.

1076 One additional local approach for care for patients with chronic pain in Ontario was identified in the literature search.⁵⁴ The Pain and
 1077 Wellness centre is a publicly-funded community-based chronic pain clinic located in the Central health network. This clinic provides
 1078 consultations and chronic pain management. The team includes physicians, a psychologist, a psychotherapist, a mindfulness
 1079 facilitator, naturopathic doctors, a dietician, massage therapists, chiropractors, and a community resource facilitator. Following the
 1080 initial consultation with a physician, patients will receive either: treatment recommendations from the referring physician; referrals for
 1081 additional diagnostic tests; referral for external specialist services (e.g., TAPMI); or entry into their Interdisciplinary Pain Program. For
 1082 the Interdisciplinary Pain Program patients must commit to attending the clinic twice a week for a minimum of 2 hours per visit, and
 1083 they receive between 3 and 6 services (i.e., manual therapy, exercise therapy, CBT, mindfulness, naturopathic doctor, nutrition
 1084 counseling, and/or massage therapy).⁵⁴

1085 *Local Approaches within Ontario (pediatric)*

1086
 1087 An informant from a tertiary pediatric pain program in the Toronto Central health network explained that their clinic sees patients with
 1088 severe pain, and that this would be considered the top level of care in a stepped care model, if such a formalized model existed in
 1089 the region. The informant reported that the tertiary pain clinic follows a true interprofessional model. The core interprofessional team
 1090 includes a senior level nurse, a pain anesthesiologist, a psychologist, and a physiotherapist. The clinic also includes other specialties
 1091 outside of the core team to whom patients can be referred. Patients can be referred to the clinic from the community and from within
 1092 the hospital, and all referrals are checked against eligibility criteria. Once accepted into the program, patients are triaged based on
 1093 their level of disability caused by their pain. Patients with mild disability are often referred out to the community for treatment (if cost
 1094 of treatment is not a barrier for the family). Patients with moderate disability are treated at the pain clinic. Patients with severe
 1095 disability are referred to an intensive pain rehabilitation program at another hospital in the area. Prior to first appointment, patients
 1096 are sent information about the interprofessional program. At the first intake appointment, the patient is seen by the whole
 1097 interprofessional team. After the intake assessment, the team debriefs, and then presents the family with a diagnosis, pain education,
 1098 and treatment recommendations.

1099 At the tertiary pediatric pain program, all care plans are tailored to the patient, and all patients are referred for pain neuroscience
 1100 education. The care at this tertiary pediatric pain program follows a functional rehabilitation model and treatment recommendations
 1101 based on '3 P model' (i.e., physical, psychological, and pharmacological recommendations). The physical treatments are centered
 1102 around developing strength, endurance, and flexibility. The clinic also offers OT which addresses problems with sleep, scheduling,
 1103 liaising with school, and some physical treatments. The psychological treatments include mindfulness, CBT, acceptance, and
 1104 commitment therapy. The pharmacological component of care is focused on medication management. One of the main objectives of
 1105 the pharmacotherapy and mental health therapies is to support the functional rehabilitation approach. Following every clinic
 1106 appointment, a nurse provides a summary of the appointment to the patient via email. There are 2 nurses that serve as the main
 1107 points of contact for the patients, and all patient logistics (e.g., appointments) are coordinated by a patient information coordinator or
 1108 clinic clerk. Eventually, patients are discharged from the clinic based on discharge criteria. All care provided at the tertiary pain clinic
 1109 is publicly funded, but referrals to outside specialist services may not be covered.

1110 *Local Approaches within Saskatchewan (adult and pediatric)*

1111 One informant provided an overview of the 3 pain programs offered in Saskatchewan including 1 pediatric program and 2 programs
 1112 for adults. The informant also mentioned some of the standalone services for chronic pain offered in Saskatchewan, including
 1113 physiatrists, anesthesiologists who provide interventional treatments, an online pain self-management CBT program, pain services at
 1114 a rehabilitation center, an online pharmacy-led consultation for medication questions, and a peer-led pain self-management program
 1115 based on a chronic disease management model.

1116 The pediatric program is an interdisciplinary complex pain clinic that has operated since 2009 and treats children with chronic pain
 1117 between the ages of 6 and 17 years old. This is not a stand-alone program, and its operational funding comes from a variety of
 1118 sources including borrowed time from other departments and faculty appointments. This clinic provides team-based publicly funded
 1119 services 1 day per week. The interprofessional team includes a pediatrician, a nurse, a physical therapist, and a pediatric
 1120 psychologist. The team works together to conduct a comprehensive initial assessment with the patient and family (when possible),
 1121 and then they consult together to develop a care plan which they share with the patient and their family. The patient's care plan is
 1122 tailored to meet their needs, although the informant reported that most patients require all of the services offered at the clinic (i.e.,
 1123 mental health, physiotherapy, pediatric medicine, nursing); this care plan determines the patient's follow-up with the physician or
 1124 other disciplines. Referral from a physician is required to access the program using the online referral form. A nurse triages the
 1125 referrals, and priority access to the clinic is based on the urgency of the clinical condition.

1126 For adults with chronic pain, there is the Regina Pain Clinic, which offers publicly funded multidisciplinary care. The multidisciplinary
 1127 team includes a physician, a nurse practitioner, a psychiatric nurse, and a pharmacist. The providers see and assess the patients
 1128 separately, and then consult as a team to share findings and develop a care plan that is tailored to the patients' needs. The clinic
 1129 offers a wide range of services including a traditional Indigenous healing support program that is available to all patients. Access to
 1130 this clinic requires referral from a physician, and patients are triaged based on urgency. According to the informant, the clinic is
 1131 aiming to build up their model so that it is similar to the pediatric clinic (i.e., moving towards a true interdisciplinary model of
 1132 assessment).

1133 Adults with chronic pain in Saskatchewan also have access to chronic pain and opioid pharmacotherapy management services
 1134 through a program called 'Medication Assessment Centre Interprofessional Opioid Pain Service' or MAC iOPS. This is a pharmacist-
 1135 led program that is operated by the University of Saskatchewan, and has 4 full-time pharmacists, and a physician who provides
 1136 virtual consultations for the pharmacists. The program recently received funding to hire a multidisciplinary team including a
 1137 physiotherapist, social workers or counsellors, and mental health care providers. All care provided at the clinic is publicly funded.
 1138 People can self-refer to the MAC iOPS program, but as participation requires linkage with a family physician, the program will help
 1139 patients find a family physician if needed. A clinic manager receives the referrals and schedules the visits. The initial 1 hour visit to
 1140 the program entails a meeting with a pharmacist to discuss complex medication needs and a medication review. The pharmacist then
 1141 consults with the physician who may recommend additional services for the patient; all treatments are tailored to patient need.
 1142 According to the informant, the goal is to develop this program into a hub-and-spoke model with the clinic serving as the hub and
 1143 primary care providers acting as spokes that can connect back to hub for assistance.

1144 **No Formalized Approach**

1145 This Environmental Scan identified 2 provinces that reported areas within the province that have no formalized approach for the
 1146 provision of care for patients with chronic pain (Newfoundland and Prince Edward Island). This information is based on findings from
 1147 the consultations. For the purpose of this scan, a jurisdiction was considered to have 'no formalized approach' if the area does not
 1148 have any definitive programs or services for chronic pain established within a hospital or clinic. This does not mean that there are no
 1149 services for patients with chronic pain in the area, rather that care may be provided by independent physicians but there is no
 1150 governing body that informs or organizes the provision of this care.

1151 *Newfoundland (adult)*

1152 The informant from Newfoundland reported that there is no provincial strategy for chronic pain in Newfoundland, and that each of the
 1153 4 health regions has their own approach. The Labrador-Grenfell Health region has a pain clinic (see section titled Local Approaches

1154), and the other 3 regions (Eastern, Central, and Western) do not have any formal programs for managing chronic pain. In the
 1155 Eastern region, chronic pain services are distributed across various other clinical programs at the regional hospital, and the services
 1156 provided vary by pain specialist within the different disciplines (e.g., interventional treatments, education, medication management, or
 1157 CBT). For example, one of the treatment options in the Eastern regions is a pain program run through the rehabilitation program,
 1158 which offers multidisciplinary care (e.g., social work, physiotherapy, OT). In the Central region, there is one anesthesiologist with an
 1159 interest in pain that runs a part-time practice at the regional hospital, and offers medication management, nerve blocks, and
 1160 injections. In the Western region, care for patients with chronic pain is limited to an outpatient service provided by an anesthesiologist
 1161 who provides some pain interventions and injections. In all 3 regions, referrals to pain specialists are made by primary care
 1162 providers, and there is no standardized referral process, and occasionally patients are referred to (and seen by) multiple pain
 1163 specialists. In the Central and Eastern regions, there is no formalized triage process, and the anesthesiologist in the Western zone
 1164 triages patients based on their pain referral form and initial in-person assessment.

1165 *Prince Edward Island (adult)*

1166 A physician from Prince Edward Island reported that that the province does not have an organized model for care for patients with
 1167 chronic pain, and care for patients with chronic pain is organized by individual providers with an interest in chronic pain. There is no
 1168 local or regional administration for the care, and providers are required to find their own office space and provide their own
 1169 administrative support. Patients with chronic pain are first be assessed by their primary care provider who may prescribe pain
 1170 medications, but patients requiring additional help for their pain are referred to 1 of 3 pain practices in the province. There are 2
 1171 emergency room doctors that run a small pain clinic that offers a self-management program and medical management for pain (e.g.,
 1172 medication, small injections); this program has a 2-year wait list. There is an anesthesiologist who does specialist consults and spinal
 1173 interventions (e.g., for spinal pain or nerve injuries). This anesthesiologist also travels to remote areas to offer pain services in
 1174 community clinics, and leverages available resources by providing written referrals for the only pain self-management program from
 1175 TAPMI.¹⁴ There is also a visiting anesthesiologist with a fellowship in chronic pain that comes from Halifax once a month to see
 1176 patients with chronic pain. There is no official triage or guidance as to which patients should be referred to which provider, and it is up
 1177 to the referring physician to decide where to refer their patients. Patients can also be referred to pain clinics in other provinces, but
 1178 some of these clinics have 5-year wait lists. Complex cases requiring specialist services that are not available in the province (e.g.,
 1179 spinal surgery) are referred to other provinces.

1180 **Other Models of Care used Internationally**

1181 Resources identified in the literature search provided information on the use of the other models of care delivery for chronic pain in
 1182 other countries, and the programs and services offered.

1183 *Europe*

1184 Three additional models of care for chronic pain from European countries were identified in the literature search. In Scotland, the
 1185 Scottish Service Model for Chronic Pain Management,⁴⁹ was revised and simplified in 2014 to include four levels of care. These
 1186 levels are as follows: pain education that is accessible to everyone; care provided in the community setting; specialty pain
 1187 management from multidisciplinary teams; and referrals for highly specialized care.⁴⁹ This Environmental Scan did not identify any
 1188 other information about the Scottish Service Model for Chronic Pain. In the Netherlands, an Integrated Care model for chronic low
 1189 back pain was identified as being investigated as part of a randomized controlled trial in 2010.⁴⁴ In this trial, patients from 17 primary
 1190 or secondary care centres were randomly assigned to receive either usual care or care following this Integrated Care model.⁴⁴ This
 1191 model provided care through a multidisciplinary team (i.e., clinical occupational physician, medical specialist, occupational therapist,
 1192 and physiotherapist), and included a workplace intervention (e.g., ergonomics) and a graded physical activity component based on
 1193 the principles of CBT.⁴⁴ From the UK, a National Health Service model for Integrated Care for Chronic Pain Management was
 1194 identified;⁴⁵ this model was being evaluated in a survey of pain specialists in the UK. The results of this survey found that two-thirds
 1195 of respondents were unsatisfied with the current level of integration in this model. The survey respondents valued engaging
 1196 physicians in planning, education and training, easily accessible medical records, good medical leadership, evidence-based
 1197 guidelines, and a triage system as vital components of an integrated care model.⁴⁵

1198 *United States*

Two additional models of care for chronic pain were identified from the United States. In Tennessee, at an integrative health care clinic for patients with complex chronic pain, a Whole Person Care Model was founded in 2007.⁵⁵ This whole person model has three core principles: whole person therapies; care co-ordination among providers; and the provision of interdisciplinary care by an interdisciplinary team (including outpatient services). Following an integrative health consultation, individual patient treatment plans are developed by a nurse practitioner or a physician. This integrated treatment plan is focused on lifestyle and behavior change and includes health psychology (e.g., mindfulness-based interventions), group psychotherapy, therapeutic movement (e.g., yoga), physical therapy (e.g., acupuncture, massage), and mind and body therapies (e.g., nutrition counseling, biofeedback).⁵⁵ This clinic relies on revenue generated through fee-for-services, billing providers, and insurance companies. In Massachusetts, an Integrated Medical Group Visit was tested as part of a randomized controlled trial in a medical centre and outpatient community health centres.⁴⁶ The approach is intended to empower and motivate individuals; it combines elements from integrative medicine, medical group visits, mindfulness-based stress reduction, and self-management techniques. Patients attend 10 weekly group visits which are facilitated by clinicians with training in integrative medicine and instructors with training in yoga or mindfulness-based stress reduction. These group sessions each focus on a different integrative health activity (e.g., pain self-efficacy or stress management), and are supplemented by an online component that includes an automated coach and an online toolkit.

Australian

The literature search identified one additional model of care for chronic pain New South Wales, Australia - a Whole-Person Integrated Model of Care that was implemented in 2004.⁴⁷ This whole person integrated model has a holistic approach that recognizes the importance of the biopsychosocial influences in the causes and management of pain. The therapeutic approach involves treating the whole person (rather than fragmented parts) with informed choice by the patients. Treatment includes individual approaches (i.e., medical and multidisciplinary assessments, personalized care plans, pain management through medicine, physiotherapy, and psychology), group approaches (i.e., small- and large-group education classes on understanding pain, lifestyle, and living and moving with pain), and a partnership with primary care to implement the care plan (i.e., contact with general practitioner, nurse practitioner, allied health). This model has evolved over time to include additional components such as an educational website, development of new triage criteria, standardized referral questionnaire, and a pre-clinic education seminar.⁴⁷

Limitations

The aim of this Environmental Scan was to provide an overview of on models of care for chronic pain and non-pain indications used in Canada and internationally. The findings are based on a limited number of consultations with key informants and a targeted, non-systematic review of the literature. It is not intended to be an exhaustive review on the topic of models of care. There may be models of care for chronic pain or non-pain indications that are used in Canada or internationally that were not captured in this report. Potential stakeholders for the consultations were identified by CADTH as well as input from the key stakeholders, and it is likely that not all relevant stakeholders were identified or contacted. While attempts were made to identify and contact stakeholders from all Canadian provinces and territories, CADTH did not obtain responses from all jurisdictions. In addition, given the large variation in provincial, regional, and local approaches to the provision of health care, and specifically in the organization of care for patients with chronic pain across Canada, it was not possible to consult with stakeholders from every jurisdiction. The responses provided by the informants are based on their unique experiences and perspectives from their own jurisdictions, and may not represent the experiences of others in the same jurisdiction or in all jurisdictions.

For the selected models (i.e., hub-and-spoke, OCM, and stepped care), no information was identified on the OCM for caring for patients with chronic pain, and only 1 hub-and-spoke model of care for chronic pain was identified (with 2 additional jurisdictions that described their models as “modified” hub-and-spoke models). Therefore, there was no information on patient-related outcomes that were associated with the OCM, and limited information on patient-related outcomes that were associated with the hub-and-spoke model of care. In addition, limited information was identified regarding the programs and services offered within the hub-and-spoke models for non-pain conditions. The majority of the information relating to the issues, challenges, and lessons learned from implementing various models of care was obtained from the consultations. Informants from 13 of the 15 consultations reported on

1245 their experience with models or approaches to care other than the 3 selected models; therefore, the specific perspective relating to
 1246 barriers and facilitators associated with these selected models may be lacking from this report.

1247
 1248

1249 Conclusions and Implications for Decision or Policy Making

1250

1251 This Environmental Scan gathered information on models of care for chronic pain and non-pain indications used in Canada and
 1252 internationally. Specifically, the aims of this Environmental Scan were to: describe how selected models of care (i.e., hub-and-spoke,
 1253 OCM, and stepped care) are implemented for chronic pain and non-pain indications; summarize patient-related outcomes associated
 1254 with models of care for chronic pain; summarize the challenges and lessons learned in implementing models of care for chronic pain;
 1255 and identify and describe other models of care delivery for chronic pain. This Environmental Scan was informed by a literature search
 1256 and 15 in-depth consultations with clinicians (e.g., physicians, psychologists, physiotherapists) or managers involved in the provision
 1257 of care for patients with chronic pain and government health consultants or executive directors with expertise on the topic. This scan
 1258 provides a snapshot of the information available at the time of the literature search and from expert consultations, and it is not
 1259 intended to be a comprehensive overview of all models of care for pain and non-pain indications.

1260
 1261 Three models of care were selected as priority models of interest for this Environmental Scan; these models were hub-and-spoke,
 1262 OCM, and stepped care models (Objective #1). For the selected models of care, information regarding 1 hub-and-spoke model and 4
 1263 stepped care models for the delivery of care for chronic pain was identified and described in this Environmental Scan. The hub-and-
 1264 spoke model is a regional model in Toronto, Ontario, Canada, with 1 virtual hub that triages all patients, and 5 spokes that offer a
 1265 variety of programs and services (e.g., interventional therapies for pain, self-management options, addiction services, transitional
 1266 pain service; Table 2). Three international stepped care models for which the 'steps' of the model are based on the level of care of
 1267 the facility and patients progress sequentially through the steps were described (Table 3). This includes 1 model from the US with 4
 1268 steps, and 2 models from Australia, with 3 and 4 steps; the steps range from population level care to tertiary care centres. One
 1269 Canadian stepped care model was summarized for which the 'steps' are based on the type of care provided and are not considered
 1270 sequential. This model includes 9 steps, and the interventions include online education modules, self-management programs, group
 1271 therapy, and one-on-one therapy (Table 3). No information was identified on the use of OCM for the delivery of care for chronic pain.

1272
 1273 For the selected models for non-pain indications, this scan summarized 5 hub-and-spoke models, 9 stepped care models, and the
 1274 OCM for the delivery of care in Canada and internationally. The 5 hub-and-spoke models were for pediatric patients with complex
 1275 conditions, spinal disorders in rural settings, cancer, and opioid use disorder (2 different models). The programs and services offered
 1276 at 3 of these models were summarized, but were not reported in the literature sources that provided information on the other 2
 1277 models (Appendix 3, Table 6). The programs and services offered at the hubs and spokes varied substantially by clinical condition;
 1278 for instance the hub for cancer included diagnostic assessments and surgical consults, whereas a hub for opioid use disorder
 1279 provided comprehensive assessments and methadone treatment where needed. Of the 9 stepped care models, 8 were for the care
 1280 of patients with mental health conditions and 1 was for patients with insomnia. For all 9 stepped care models the 'steps' were based
 1281 on the type of care provided (i.e., intensity of the interventions increases with each step), not the level of care of the facility where
 1282 treatment was provided. The programs and services offered within these stepped care models included online education, self-
 1283 management resources, group sessions, and one-on-one treatments (Appendix 3, Table 7). The OCM is an alternative payment
 1284 model, where practices commit to providing high-quality, well-coordinated oncology care and they are reimbursed a monthly rate
 1285 which covers all care (oncology and non-oncology related).

1286
 1287 The main patient-related outcomes identified in the literature and via the consultations that were associated with the selected and
 1288 other models of care for chronic pain were measures of pain (e.g., intensity, catastrophizing, interference), psychosocial outcomes
 1289 (e.g., depression, anxiety, distress, sleep), functional outcomes (e.g., disability, functional status, health related quality of life, work
 1290 status), and health care utilization (e.g., opioid use, medication use, frequency of health care visits) (Objective #2; Table 4). In
 1291 addition, 5 informants mentioned the use or development of standardized core outcome sets for adult and pediatric patients with
 1292 chronic pain, that could be used provincially or nationally to ensure all pain programs collect the same outcome data. The
 1293 measurement tools were specified by the researchers for one of the core outcome sets, were unpublished for 1 outcome set, and it

1294 was unclear whether these will be specified for the outcome sets that are in development. Similar patient-related outcomes were
 1295 reported for the standardized outcome sets and the models of care (i.e., measures of pain, physical functioning, mental health),
 1296 although measures of health care utilization were not included as part of the standard outcome sets.
 1297

1298 Various barriers and facilitators to providing care for patients with chronic pain were identified in the literature and via consultations
 1299 with key informants (Objective #3). Big picture barriers identified via the consultations, such as a lack of clarity regarding which health
 1300 discipline is responsible for the provision of care for chronic pain and a lack of a direction from the provincial or federal government,
 1301 have resulted in disjointed approaches to care for chronic pain within provinces and across Canada. Other barriers that were
 1302 identified included: insufficient funding for infrastructure and providers, a lack of local support and collaboration, an absence of a
 1303 formalized referral and triage system, and insufficient management of expectations for care. In addition, the transitions from pediatric
 1304 to adult pain services, and from care for acute to chronic pain, were identified as a gaps in the health care system. Conversely
 1305 facilitators for successful models and programs for chronic pain included strong government support and local collaborations,
 1306 leveraging existing resources and models, an efficient intake and triage system, and using a flexible, iterative approach for caring
 1307 with patients with chronic pain.
 1308

1309 In addition to the three selected models of care, this scan identified multiple different approaches for providing care for patients with
 1310 chronic pain across Canada (Objective #4). There were provincial strategies, regional strategies developed by provincial health
 1311 zones, local programs and services, and areas with no formalized models or programs (Appendix 3, Table 8). Specifically, Quebec
 1312 was identified as the only province with a provincial strategy for chronic pain; no other provincial or territorial models for chronic pain
 1313 were identified in Canada. In Quebec, the provincial strategy for chronic pain recommends using the pyramid model, and this
 1314 strategy provides guidance to the 4 health regions to develop their own models of care for chronic pain.
 1315

1316 Regional strategies for chronic pain were identified in 4 provinces (Alberta, Ontario, Nova Scotia, Quebec), where the model of care
 1317 is applied to the whole health region or health zone. There are 5 health zones in Alberta, and each has their own regional strategy for
 1318 caring for adults with chronic pain; this scan included details regarding the 'hub-and-spoke-and-spoke' model for adults (Calgary
 1319 Zone; Table 5). In Ontario, the provision of care for patients with chronic pain differs across the 14 health networks, and this scan
 1320 identified 1 regional hub-and-spoke model for adults in the Toronto Central region. In Quebec, this scan included information on the
 1321 regional models for the Montreal (pyramid model) and McGill (2-stage model) health regions. There are 4 health zones in Nova
 1322 Scotia, each with a different approach for caring for patients with chronic pain; this scan included information on the regional modified
 1323 hub-and-spoke model used in the Central zone.
 1324

1325 Local approaches, whereby the model or program for care for patients with chronic pain was developed without regional or provincial
 1326 oversight, were identified in 7 provinces and territories (Alberta, British Columbia, New Brunswick, Newfoundland, North West
 1327 Territories, Ontario, and Saskatchewan). In Alberta, an interdisciplinary tertiary pediatric pain program was identified. Three
 1328 independent strategies for adults in British Columbia were identified (i.e., Pain BC, family doctor networks, and tertiary pain clinics).
 1329 Two local programs were identified in New Brunswick (i.e., a low back pain clinic and a pain program at a neurorehabilitation center),
 1330 as well as 1 weekly pain clinic in Newfoundland and a local education program in the North West Territories. Three local approaches
 1331 were identified in Ontario: an interprofessional tertiary pediatric pain program, a stepped care model within an adult pain clinic, and
 1332 an interdisciplinary clinic. Similarly, 3 local programs for chronic pain were identified in Saskatchewan (an interdisciplinary pediatric
 1333 pain clinic, a multidisciplinary pain clinic for adults, and an opioid pain service).
 1334

1335 Two provinces were identified (Newfoundland and Prince Edward Island) that reported areas within the province that have no
 1336 formally organized programs or services for the provision of care for patients with chronic pain, and the current approaches used in
 1337 these areas were summarized in this report. Furthermore, this scan identified 6 additional models of care for chronic pain that are
 1338 implemented in European countries (3 models), the United States (2 models), and Australia (1 model).
 1339

1340 This Environmental Scan provides information pertaining to the implementation of different models of care for chronic pain and non-
 1341 pain conditions in Canada and internationally, which addresses the need to better understand models of care for chronic pain that
 1342 was identified in the October 2020 report by the Canadian Pain Task Force.⁸ Notably, this report included examples of multi- and
 1343 inter-disciplinary models of care and variations of the stepped care and hub-and-spoke models for the care of patients with chronic
 1344 pain. This report also included multiple examples of referral pathways, centralized intake and triage, standardized care pathways,
 1345 patient navigators, and individualized treatment approaches that are used within the various models. The information identified in this
 1346 scan demonstrates that there is substantial diversity in the models of care for pain and non-pain indications, and that the organization

1347 of care for patients with chronic pain is not standardized. Within the selected models of care, there were many different approaches
1348 to the design of the model (e.g., the number of steps in stepped care model, or what constitutes the 'hub' in a hub-and-spoke model)
1349 and which programs and services were offered (varies within and across clinical conditions). Additionally, information gathered via
1350 consultations suggested that these models may be further adapted to better suit the health care landscape of a particular region. For
1351 instance, the 'hub-and-spoke-and-spoke' model identified in Alberta is an adaptation of the hub-and-spoke model that also integrates
1352 some components of stepped care. The extent of variability in models of care suggests that there may not be a "best" model for the
1353 provision of care for chronic pain; however, this Environmental Scan did not include an assessment of the clinical or cost-
1354 effectiveness of the identified models of care. This Environmental Scan also identified strengths of various models and potential
1355 challenges that may be encountered when implementing a model of care. Together with information regarding the design features of
1356 models, knowledge of these barriers and facilitators may assist decision-makers in designing, adopting, or adapting a model of care
1357 for chronic pain.

1358 Notable gaps identified in this report included a lack of information on the use of the OCM for chronic pain and associated patient-
1359 related outcomes, the programs and services offered within the hub-and-spoke models for non-pain conditions, and the barriers and
1360 facilitators associated specifically with the selected models of care (i.e., hub-and-spoke, OCM, stepped care). This report was not a
1361 systematic review, and it is possible that information on these topics exists but was not captured in the limited literature review or the
1362 consultations conducted for this report.

1363 Overall, this Environmental Scan identified a multitude of models of care for chronic pain and non-pain indications, with substantial
1364 variation within and across models. There was no single model that was used in an identical fashion in more than one situation;
1365 rather, models of care were adapted to meet the needs of specific populations (e.g., based on the clinical condition or age group) or
1366 the unique attributes of a geographical area (e.g., population density or availability of specialists). Decision makers should consider
1367 the needs of their patients and the specific needs of their jurisdictions when designing, adopting, or adapting a model of care for
1368 chronic pain.
1369

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Appendix 1: Consultation Questions

Model of Care in their Jurisdiction

1. Please describe your occupation and scope of work as it relates to the management of chronic pain.
 2. Does your jurisdiction have an organized program or model of care for the provision of care for chronic pain?
 - a. If yes, can you please provide an overview of this model?
 - i. Is there a specific name for the model?
 - b. If no, please describe how care for chronic pain is provided.
 - i. Are you aware of any models of care for chronic pain that are currently being considered for use?
 3. Can you describe the organizational structure of this (model of) care?
 - a. Physical organization (e.g., single- or multi-center?)
 4. What are the different programs or services offered under the different components of this approach to care?
 - a. Do all patients have access to all these services? Are there different levels of service?
 5. Who are the team members involved in providing this care? How is the team structured?
 6. I'd like to know more about how patients access this model/care.
 - a. Can you describe how patients are referred to this program?
 - b. Is there a process for triaging patients? [If yes, please describe]
 7. Once referred, can you describe how patients move through the program or access the different treatments?
 - a. Do all patients follow the same pathway?
 - b. Who manages patient flow through the program?
 8. As part of the Environmental Scan, we are interested in learning about three models of care for chronic pain: the stepped (or tiered) care model, the hub-and-spoke model, or the Oncology Care Model.
 - a. Thinking about the provision of care for chronic pain in your jurisdiction, are there any aspects of this care that are organized in either a stepped care model, a hub-and-spoke model, or similar to the oncology care model?
 - i. If yes, can you describe how these models are implemented in your jurisdiction?
 - ii. If no, do you have any insights on these models?
- Thinking about the Administration of care for chronic pain in your jurisdiction:
9. Who is responsible for managing or administering this (model of) care?
 10. Can you tell me about the funding structure for this (model of) care?
 11. Are you aware of any proposed changes to the way care is provided to patients with chronic pain in your jurisdiction?

- 1533 12. Have you had the opportunity to evaluate this approach to the provision of care for chronic pain?
- 1534 a. If yes, which patient-related outcomes have you used to evaluate the effectiveness of the care?
- 1535 b. If no, which patient-related outcomes do you think would be important to measure in evaluating the
- 1536 effectiveness of the care?

Barriers and Facilitators to Implementing Models of Care for Chronic Pain

- 1538
- 1539 13. Based on your experience, what are some key success factors or strategies that have worked well when implementing
- 1540 this approach to care for chronic pain?
- 1541 14. Based on your experience, what are the main barriers or challenges experienced when implementing this approach to
- 1542 care for chronic pain?
- 1543 15. Can you share any specific lessons learned when implementing your jurisdiction's approach to care for chronic pain?
- 1544

Opportunity for discussion and questions

- 1547 16. Are you aware of any other models of care delivery for chronic pain specifically?
- 1548
- 1549 17. Is there anything else that you would like to note regarding care for chronic pain in your jurisdiction?
- 1550
- 1551 18. Do you have any questions for CADTH?
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Appendix 2: Chronic Pain and the Impact of the COVID-19 Pandemic

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1556 During the consultations several informants mentioned the impact of the COVID-19 pandemic on their approach to caring for patients
1557 with chronic pain. Informants were not directly asked about the impact of the pandemic on their model of care, and these responses
1558 were volunteered by the informants without prompting. Therefore these findings are not expected to be comprehensive or systematic,
1559 and there may be other relevant changes that exist that are not reported here. The following is a summary of the main areas that
1560 were reported to have been impacted by changes in the delivery of care due to the COVID-19 pandemic.

- 1561 1. Delayed planning meetings and system changes.
- 1562 a. One informant reported that their province was scheduled to have their first planning meeting in April 2020 to
1563 organize a provincial pain management strategy; however, the COVID-19 pandemic meant that this meeting did
1564 not take place, and at the time of the consultation, no further arrangements had been made.
- 1565 b. Informants from 2 other provinces reported that discussions regarding provincial pain strategies have been put on
1566 hold due to COVID-19
- 1567 c. In another province, an informant was concerned that the plans to develop a provincial strategy for chronic pain
1568 will never come to fruition due to the high health care costs of the COVID-19 pandemic.
- 1569 d. In another province, the development of 2 pain centres was halted due to COVID-19.
- 1570 2. Moving towards digital tools
- 1571 a. Virtual visits: informants from 5 jurisdictions reported that patient assessments and visits (including physical
1572 therapy and psychology) shifted to virtual visits during the pandemic. One informant highlighted that these are not
1573 as effective as doing the consults in-person, while another informant reported that their program was already
1574 planning to switch from in-person to virtual visits to improve access to care (e.g., reduce travel times for patients),
1575 and the pandemic helped accelerate this change.
- 1576 b. Virtual programming: informants from 4 jurisdictions reported that their programs started offering some of their
1577 services virtually due to the pandemic, including pain education programs and self-management programs.
1578 Informants felt that this virtual programming was an advantage, as it improves access to care for people in rural
1579 and remote communities, however, with virtual programming patients lose the benefits of peer interactions.
- 1580 c. Digital questionnaires: 1 informant reported that their program has shifted away from paper to electronic
1581 questionnaires.
- 1582 3. Affecting the waitlist
- 1583 a. Informants from 4 jurisdictions reported that the COVID-19 pandemic has increased the wait time for care for
1584 patients with chronic pain in their jurisdictions.
- 1585 4. Clinics or programs not running
- 1586 a. Informants from 3 jurisdictions reported that certain components of their programs were not running due to the
1587 pandemic, including self-management programs, and in-depth patient questionnaires.
- 1588 5. Access to services
- 1589 a. One informant reported that in response to the increased distress caused by the pandemic, 1 of the programs in
1590 their jurisdiction provided access to a social worker via a support line who can refer patients to specific services in
1591 order to improve access.
- 1592 b. Another informant reported that jurisdictional restrictions for virtual care have reduced their ability to see patients
1593 from other provinces (who they used to see in person).
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Appendix 3: Additional Tables

Table 6: Hub-and-Spoke Models for Chronic Non-Pain Conditions

Model, country, condition	Programs and Services Offered
Canadian	
Hub-and-Spoke Model for Kids with Complex Care ²⁷ Ontario, Canada Pediatric patients with complex conditions	Not reported
Ottawa Community of Practice Hub-and-Spoke Model ³⁰ Ontario, Canada Cancer	Hub provides: diagnostic assessments, surgical consultations for regional patients, and for non-regional patients with complex cases Spoke hospitals offer: unique satellite cancer surgery programs (based on capacity and needs of community) Providers include: surgical, medical, radiation oncologists, nurses, social workers, administrators, family doctors, radiologists, public health leaders
International	
Hub-and-Spoke Spinal Service ²⁸ UK Spinal disorders in a rural setting	Not reported
Vermont Hub-and-Spoke Opioid Treatment System ^{29,60} Vermont, USA Opioid use disorder	Hubs provide: methadone treatment and supports, initiate buprenorphine treatment, provide comprehensive assessments and treatment protocols, and coordinate with primary care Spokes (the physicians): prescribe buprenorphine, coordinate access to recovery support and provide case management. Spokes have direct access to the hubs for consultation on referrals, screenings, and induction logistics. Supported by a Medication-Assisted Treatment team composed of a registered nurse and a licensed behavioral health provider Spoke providers include: family practitioners, internists, psychiatrists, obstetricians, and pediatricians.
California Hub and Spoke Medications for Addiction Treatment Program ³¹ California, USA Opioid use disorder	Hubs (i.e., licensed opioid treatment programs) serve as regional consultants and subject matter experts to the spokes. Spokes include: clinics with drug addiction treatment providers, prescribe and/or administer buprenorphine; provide ongoing care for patients with more stable disorders; manage induction and maintenance Spokes can also refer complex patients to a medications for addiction treatment team, which include nurses, behavioral health specialists, peer support workers, and other care coordinators

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Table 7: Stepped Care Models for Chronic Non-Pain Conditions

Model, country, condition	Care provided at Each Step
Canadian	
<p>Newfoundland and Labrador Stepped Care 2.0¹²</p> <p>Newfoundland, Canada</p> <p>Mental Health</p>	<p>Step 1 = watchful waiting, online self-directed online information</p> <p>Step 2 = online self-directed interactions</p> <p>Step 3 = real time peer support</p> <p>Step 4 = real time psycho-educational workshops, seminars</p> <p>Step 5 = expert assisted e-support or in-person programs</p> <p>Step 6 = intensive group programming</p> <p>Step 7 = intensive flexible one-on-one programming</p> <p>Step 8 = specialist consultation (e.g., psychiatric consult) and chronic care</p> <p>Step 9 = acute care and case management, system navigation and advocacy</p>
<p>Vincent Stepped Care Model for Insomnia⁴²</p> <p>Manitoba, Canada</p> <p>Insomnia</p>	<p>Step 1 = 6-week computerized treatment completed independently (psychoeducational, relaxation, stimulus control, cognitive therapy, sleep hygiene, mindfulness meditation)</p> <p>Step 2 = in person, single counseling session with psychologist</p> <p>Step 3 = 6-week in-person CBT group program</p> <p>Step 4 = individualized psychotherapy</p>
<p>UOttawa Stepped Care Counselling Service⁴¹</p> <p>Ontario, Canada</p> <p>Mental Health</p>	<p>Step 1 = Online resources (e.g., books, apps, podcasts, worksheets)</p> <p>Step 2 = walk-in face-to-face single counseling session (rapid access, short term) to develop action plan</p> <p>Step 3 = self-directed online mental health resources</p> <p>Step 4 = peer-to-peer services and workshops (emotional, health, academic needs)</p> <p>Step 5 = group counselling by professionals (depression, anxiety, stress, relationships)</p> <p>Step 6 = individual short-term counselling (6 to 8 sessions)</p> <p>Step 7 = pathways to specialized mental health care</p>
International	
<p>Stepped Care for Prevention and Treatment (described in a systematic review)³⁵</p> <p>Netherlands and Hong Kong</p> <p>Depression or anxiety disorders</p>	<p><u>Stepped care for prevention:</u></p> <p>Step 1 = watchful waiting</p> <p>Step 2 = self-help, psychotherapy</p> <p>Step 3 = face-to-face psychotherapy (e.g., CBT)</p> <p>Step 4 = referral to specialists</p> <p><u>Stepped care for treatment:</u></p> <ul style="list-style-type: none"> - programs varied, with 2 to 4 steps - steps differed across models - services offered included: psychotherapy (self-help, and in person), exposure therapy, CBT
<p>Heart2Heart Stepped Care Model³⁸</p> <p>UK</p> <p>Mental health care for cardiac patients</p>	<p>Step 1 = screening for anxiety and depression, CBT education</p> <p>Step 2 = guided self-help, face to face, group or telephone sessions, computerized CBT</p> <p>Step 3 = high intensity, one-on-one CBT therapy, mindfulness classes</p> <p>Step 4 = intervention for severe and complex cases, CBT and other treatments</p>
<p>Improving Access to Psychological Therapy Stepped care³⁶</p> <p>Ireland</p> <p>Adult mental health</p>	<p>Step 1 = population level approach (e.g., pamphlets, websites, mental health promotion)</p> <p>Step 2 = self-help (e.g., computerized CBT)</p> <p>Step 3 = group treatment (e.g., psychoeducational)</p> <p>Step 4 = one-to-one treatment (e.g., brief CBT)</p> <p>Step 5 = referral to secondary care</p>

<p>Stepped care³⁷</p> <p>UK</p> <p>Depression and anxiety</p>	<p><u>Site A (specialist-led):</u> Step 1 = guided self-help, group classes Step 2 = short-term evidence-based psychological interventions Step 3 = complex evidence-based psychological interventions Step 4 = crisis teams, in-patient services by specialists, self-harm reduction</p> <p><u>Site B (primary care-led):</u> Step 1 = guided self-help, group classes Step 2 = short-term psychological interventions (e.g., CBT) Step 3 = specialized psychological treatment Step 4 = crisis teams, in-patient services by specialists, self-harm reduction</p> <p><u>Site C(specialist-led):</u> Step 1 = self-directed computerized CBT, guided self-help, group classes Step 2 = short-term psychological interventions (including CBT) Step 3 = not specified Step 4 = not specified</p> <p><u>Site D (primary care-led with specialist partner)</u> Step 1 = guided self-help, group classes Step 2 = psychology and counselling Step 3 = psychology, psychotherapy, and community mental health Step 4 = not specified</p>
<p>Gateway stepped care model³⁹</p> <p>Scotland</p> <p>Mental health services</p>	<p>Step 1 = community focused (e.g., mental health promotion in community groups, self-help material, local events) Step 2 = mental health awareness training and session for primary care staff, employers Step 3 = advice clinics, assessment clinics, mental health sessions for return to work Step 4 = group work: mental health life skills, recovery focused groups, personal development, overcoming anxiety Step 5 = Individual work: one-on-one CBT, interpersonal therapy, psychosocial interventions, self-help sessions</p>
<p>Luther College Counseling Service Stepped Care Model⁴⁰</p> <p>Iowa, USA</p> <p>Mental health</p>	<p>Step 1 = Initial screening: assessment to determine which resources are appropriate, develop action plan Step 2 = Referral to resources on campus (e.g., nutrition, wellness, career center, tutoring, fitness, housing) Step 3 = Peer support groups Step 4 = self-help resources: online tools (videos, websites) Step 5 = in person groups or workshops (e.g., sleep, anxiety, procrastination) Step 6 = therapeutic consultation or one-time counselling session Step 7 = group counseling Step 8 = online brief, individual therapy sessions Step 9 = individual therapy Step 10 = off-campus referral</p>

1605 CBT = cognitive behavioral therapy.
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Table 8: Overview of the Various Approaches to Care for Patients with Chronic Pain in Canada identified in this report

Province	Level (Provincial, Regional, Local)	No Model	Hub-and-Spoke	Stepped Care	Other Model or Program ^a
Alberta	Provincial	X	–	–	–
	Regional Calgary Zone (adult)	–	Modified (hub-and-spoke-and-spoke)	–	–
	Regional Calgary Zone (pediatric)	–	–	–	Interdisciplinary model at tertiary pain clinic
	Local Approaches	–	NI	NI	NI
British Columbia	Provincial	X	–	–	–
	Regional	X	–	–	–
	Local (adult)	–	NI	NI	Pain BC Community-based family doctor networks Independent tertiary pain clinics
	Local Approaches	–	NI	NI	NI
New Brunswick	Provincial	X	–	–	–
	Regional	–	NI	NI	NI
	Local Zone 1 (adult)	–	NI	NI	ISEAC program
	Local Zone 3 (adults)	–	NI	NI	Neurorehabilitation pain program
Newfoundland	Provincial	X	–	–	–
	Regional	X	–	–	–
	Local (Labrador-Grenfell Health) (adult)	–	–	–	Weekly pain clinic
	Local Central (adult)	–	–	–	1 specialist
	Local Eastern (adult)	–	–	–	Care distributed across programs
	Local Western (adults)	–	–	–	1 specialist
North West Territories	Provincial	X	–	–	–
	Regional	X	–	–	–
	Local Yellowknife (adults)	–	NI	NI	Physiotherapy-based pain education program
Nova Scotia	Provincial	X	–	–	–
	Regional Central Zone (adult)	–	Modified hub-and-spoke	–	NI
	Local	–	NI	NI	NI
Ontario	Provincial	X	–	–	–
	Regional Toronto Central (adults)	–	X	–	–

	Local Toronto Central (pediatric)	–	NI	NI	Interprofessional model at a tertiary pain clinic
	Local Champlain (adult)	–	–	X	NI
	Local Central (adult)	–	NI	NI	Community-based chronic pain clinic
Prince Edward Island	Provincial	X	–	–	–
	Regional	X	–	–	–
	Local (adult)	–	–	–	2 ER physicians, 1 specialist, and 1 visiting specialist
Quebec	Provincial	–	–	–	Pyramid Model
	Regional Montreal (adult)	–	–	–	Pyramid Model
	Regional McGill (adult)	–	–	–	2-Stage Model
	Local	–	NI	NI	NI
Saskatchewan	Provincial	X	–	–	–
	Regional	X	–	–	–
	Local (pediatrics)	–	NI	NI	Interdisciplinary complex pain clinic
	Local Regina (adult)	–	NI	NI	Multidisciplinary Pain Clinic
	Local Saskatoon (adult)	–	NI	NI	MAC iOPS

1609 ISEAC = Interprofessional Spine Assessment and Education Clinic; MAC iOPS = Medication Assessment Centre Interprofessional Opioid Pain Service;
 1610 NI = none identified.

1611 Note: The Oncology Care Model is not included in this table as this report did not identify any uses of this model in Canada. This table only includes the
 1612 models and programs of care for patients with chronic pain in Canada that were identified as part of this Environmental Scan; it is not an exhaustive
 1613 list, and there may be models of care or programs for chronic pain that are used in Canada that were not captured in this report.

1614 X indicates that this approach was used in this jurisdiction. “–” indicates that ‘no model’ was already identified for that level or jurisdiction, or that a
 1615 different model was identified. ‘None identified’ (NI) indicates that no models or approaches were identified for this category in this report, but it does
 1616 not exclude the possibility that they may exist in the province or territory.

1617 ^a Models and programs reported in the “other” column may have the same description or name (e.g., “pyramid model”), but all are unique models or
 1618 programs