CADTH

ENVIRONMENTAL SCAN

Care for Acquired Brain Injury and Concurrent Mental Health and/or Substance Use Disorders – An Environmental Scan

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Cite As: Draft: Care for Acquired Brain Injury and Concurrent Mental Health and/or Substance Use Disorders — An Environmental Scan. CADTH; 2020. (Environmental Scan; no. X).

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Funding: CADTH receives funding from Canada's federal, provincial, and territorial governments, with the exception of Quebec.

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Abbreviations

ABI	acquired brain injury
CAMH	Centre for Addiction and Mental Health
CCAC	Community Care Access Centres
CHIRS	Community Head Injury Resource Services
ISKM	Implementation Support and Knowledge Mobilization
LHIN	Local Health Integration Networks
MOHLTC	Ministry of Health and Long-Term Care
nTBI	non-traumatic brain injury
OACBABIS	Ontario Association of Community Based Boards for Acquired Brain Injury Services
PABICOP	Pediatric Acquired Brain Injury Community Outreach Program
SUBI	Substance Use and Brain Injury bridging project
TBI	traumatic brain injury

Summary

- The overall objectives of this Environmental Scan were to identify Canadian integrated care systems and programs for the care of individuals with acquired brain injury and concurrent mental health and/or substance use disorders. A literature search and a survey informed this Environmental Scan. Survey respondents comprised of stakeholders involved in planning, decision making, management, and service provision related to acquired brain injury care.

- Determining the care needed for acquired brain injury, from that needed for mental health and/or substance use disorders can be complex in populations where these comorbidities exist.

- There are numerous types of systems, services, and programs in Canada for individuals with acquired brain injury; however, in the presence of concurrent mental health and/or substance use disorders, the care for these concurrent conditions is usually siloed. Both survey results and literature findings signaled a need for greater integration as key to improving care and patient outcomes.

- Most programs are either publicly or provincially funded, or locally funded. Nevertheless, a small proportion rely on foundational grants and fundraising efforts.

- Areas for improvement were numerous and revolved mostly around limited funding and resources, timeliness to treatment, and patient access to treatment. Generally, these underscored the need to breakdown siloed care between agencies, systems, ministries, and funding sources.

Context

Acquired brain injury (ABI), in the context of this Environmental Scan, is defined as damage to the brain that occurs after birth and is not related to congenital disorders, developmental disabilities, or a degenerative disease.[1,2] Brain Injury Canada reports there are an estimated 160,000 new cases of ABI annually, with an estimated national prevalence of 1,5 million cases.[1] ABI is a leading cause of death and disability for Canadians under the age of 40.[3]

ABI refers both to a traumatic (TBI) or non-traumatic brain injury (nTBI). Common causes of TBI include car accidents, falls, assaults, and sport injuries, while seizures, tumours, aneurysm, stroke, oxygen deprivation, infections, and adverse effects of substance abuse are some conditions that can result in nTBI.[1,2] In 2017, it was estimated there were 447 new cases of TBI per 100,000 Canadians,[4] with an estimated national prevalence of 442,623 cases.[5] In the United States, it is estimated that between 3.2 million and 5.3 million people are living with a disability as a result of TBI.[6] From a provincial perspective, data collected in Ontario indicate an incidence of 800,000 TBI between 2002 and 2006.[7] British Columbia has an annual incidence of 22,000 new cases, added to the 180,000 prevalent cases.[3,8] For stroke, a form of nTBI, 2017 saw an estimated 181 new cases per 100,000 Canadians,[9] with an estimated national prevalence of 709,411 cases.[10]

Individuals with a TBI can experience a complex combination of impairments that impact both their physical and mental wellbeing and that may persist for years. These adverse effects may include memory, attention and learning deficits, mood disorder, problems with balance and coordination, headaches, fatigue, and reduced quality of life, among others.[2,6] Moreover, people with ABI can be affected by mental health and substance use disorders that existed prior to, or develop after, the injury. For example, one literature review suggests that as many as 50% to 60% of individuals who are living with TBI also have concurrent problems related to substance use.[11] Similarly, in a systematic review conducted in the United States, depression was found to be common among those with TBI, with an estimated prevalence of 33% observed after more than 12 months, post-injury.[12] ABI from traumatic and non-traumatic causes is also associated with a substantial economic burden. One study conducted in Ontario found that the provision of health care services to people with ABI in the first year after injury carried a mean cost of $32,132 per TBI and $38,018 per nTBI.[13] Authors of a 2012 cohort study estimated the total annual costs for this care, in the first year post-injury, to be approximately $120.7 million for TBI and $368.7 million for nTBI.[13]

Individuals living with ABI and associated health problems typically require a diverse range of health care services to treat and manage their condition and to address their needs.[13,14] Depending on the severity and degree of persistence of ABI-related symptoms, the care and assistance needed may extend over a period of several years or can be lifelong.[7,13,14]

The availability and organization of resources and programs to address the needs of people with ABI vary among jurisdictions and care settings across Canada. To help inform decision-making, CADTH conducted an Environmental Scan to summarize available systems and services, and integrated patient-centered care centers that are in place across Canada.

Objectives

The key objectives of this Environmental Scan are as follows:

- Identify and describe the systems that are in place to manage the care of individuals with acquired brain injury and concurrent mental health and/or substance use disorders in Canada
- Identify and describe integrated patient-centered care centers that have been implemented in Canada for patients with acquired brain injury and concurrent mental health and/or substance use disorders
- Describe how existing programs and services for acquired brain injury are funded.
- Describe unmet needs and known areas for improvement in the care of individuals with acquired brain injury and concurrent mental health and/or substance use disorders in Canada.

This Environmental Scan does not include an assessment of the clinical or cost-effectiveness of care programs for ABI and concurrent mental health and/or substance use disorders. Thus, conclusions or recommendations about the value of the services or their place in therapy are outside the scope of this report. CADTH has also published a Summary of Abstracts report on the clinical effectiveness, cost-effectiveness and guidelines of integrated care models for acquired brain injury.[15]

Methods

The findings of this Environmental Scan are based on a focused literature search and responses received from a survey (Appendix 1) distributed to identified relevant stakeholders across Canada. Table 1 outlines the criteria for information gathering and selection for the literature review.

Research Questions

The literature review and survey aimed to address the following questions:

- What systems and services are in place in Canadian jurisdictions for the care of individuals with ABI and concurrent mental health and/or substance use disorders?
- What are the integrated patient-centered care centers that exist in Canada for individuals with ABI and concurrent mental health and/or substance use disorders?
- What are current needs and gaps related to the care of individuals with ABI and concurrent mental health and/or substance use disorders?

Literature Search

A focused literature search was conducted by an information specialist on key resources including PubMed, PsycINFO via OVID, the Cochrane Library, the University of York Centre for Reviews and Dissemination (CRD) databases, the websites of Canadian and

major international health technology agencies, as well as a focused internet search. The search strategy was comprised of both controlled vocabulary, such as the National Library of Medicine's MeSH (Medical Subject Headings), and keywords. The main search concepts were acquired brain injury and rehabilitation. No search filters were applied to limit by study type. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1, 2015 and April 12, 2020.

Table 1: Components for Literature Screening and Information Gathering

Population	Patients of any age with acquired brain injury and concurrent mental health and/or substance use disorders
Intervention	Available interventions that are aimed at addressing the needs of individuals with acquired brain injury and concurrent mental health and/or substance use disorders
Settings	• Primary and secondary care • Acute care • Rehabilitation • Long-term care • Home care • Urban, rural, and remote
Types of Information	• Identification and understanding of the systems and services that are currently in place in different care settings to address the needs of individuals with acquired brain injury and concurrent mental health and/or substance use disorders • Identification of needs and potential improvements in acquired brain injury care and services

Screening and Study Selection

One author independently screened titles and abstracts for eligibility according to the inclusion criteria outlined in Table 1. Articles that were published in a language other than English or French were excluded. There were no limitations on publication type, except conference abstracts, which were ineligible and excluded due to the limited information available within.

Survey

A survey was conducted to address the objectives of the Environmental Scan, and complement the literature review. The survey was distributed electronically using SurveyMonkey (www.surveymonkey.com) to key jurisdictional informants and stakeholders involved in planning, decision making, management, and service provision related to ABI care.

Survey respondents were identified through CADTH Implementation Support and Knowledge Mobilization (ISKM) team networks, and other available networks via stakeholder and expert suggestions. Participants were invited to forward the survey to relevant colleagues. The following categories of respondents were eligible, with the intention of getting representation from each jurisdiction as well as rural, remote and urban settings:

- Clinicians (e.g., physicians, nurses, other specialists) involved in the provision of care to individuals with ABI in relevant health care facilities and settings
- ABI organizations (e.g., Brain Injury Canada, Toronto ABI Network)
- Patient stakeholder groups
- Researchers, academics, and other experts involved with the ABI topic

The survey consisted of 33 questions, including questions regarding demographics, characteristics of existing programs, types of patients accepted, integration of mental health and/or substance use care in the program, integration of indigenous practices, wait times, and unmet needs. A full list of questions is provided in Appendix 1.

The survey questions were piloted within the survey platform interface by independent CADTH researchers who were not involved with the project.

Synthesis Approach

Feedback from respondents who gave consent to use their survey information were included in the report. Survey responses were excluded if all answers to core questions (other than demographics) were blank, the respondent refused participation, or if consent to use information was not provided.

Responses were analyzed by the objectives of this Environmental Scan, then by jurisdiction where appropriate. In the case of multiple responses from one organization, all responses were included. Quantitative and multiple-choice answers were summarized through tables by jurisdiction and presented narratively. Qualitative (open-ended) answers were categorized using thematic analysis and were also presented through tables and narratively.

Findings from the literature search were presented separately from survey results and were summarized narratively.

Findings

The findings presented are based on literature results and survey responses received and collected by March 25, 2020. The survey was distributed to 32 stakeholders representing six Canadian provinces (i.e., Alberta, British Columbia, Nova Scotia, Ontario, Prince Edward Island, and Saskatchewan) and one Federal Health Care Plan. The survey was not distributed to the remaining provinces, territories, and Federal Health Care Plans, owing to a lack of identified stakeholders in these jurisdictions, which is acknowledged as a limitation to this report. Stakeholders were invited to forward the survey to colleagues knowledgeable in this field. Forty respondents attempted the survey, with 22 fulfilling the inclusion criteria (e.g., providing consent, completeness of answers). These 22 respondents represented four jurisdictions, including Alberta, British Columbia, Ontario, and Saskatchewan. The sectors of employment represented were: provincial government, academic or research institute, not-for-profit or foundation, and private. The geographical work settings of respondents were urban, rural, and remote. Appendix 2, Table 2, describes additional demographics of survey respondents.

The organizations or facilities represented by the survey respondents engaged with a variety of populations (e.g., adult, adolescent, Indigenous, homeless), as well as all severity levels and types of ABI (i.e., TBI and nTBI). Table 3 describes additional characteristics of the organization and facilities, while Table 4 lists organizations represented by survey respondents.

The literature searches yielded 2,732 citations. Of these, 63 were selected for full-text screening and seven were determined to be eligible to address the research questions. All articles were from authors in Canadian organizations and were published between 1999 and 2020. Reference lists of retained articles were scanned for further potentially eligible citations, and grey literature (e.g., government websites, program websites) were searched

Objective 1: Identify and describe the systems that are in place to manage the care of individuals with acquired brain injury and concurrent mental health and/or substance use disorders in Canada

Information on specific programs can be found in Appendix 3, Table 5, Table 6, Table 7, and Table 8.

Survey Results

Twenty-two survey respondents from four Canadian provinces (Alberta n=5, British Columbia n=1, Ontario n=10, and Saskatchewan n=6) provided information on systems and services for individuals with ABI and concurrent mental health and/or substance use disorders. A summary of the existing programs as identified in the survey responses are presented in Appendix 3, Table 5.

Survey respondents indicate that systems and services for mental health and/or substance use disorder with ABI care are currently available in Alberta, British Columbia, Ontario, and Saskatchewan, identifying five, two, 16, and nine programs respectively. The characteristics of the individual programs vary, and, in many cases, the mental health and/or substance use care is a stand-alone program that is offered concurrently to the ABI rehabilitation programs. Nevertheless, examples of services offered include: case management (e.g., service coordination, referral), community services, rehabilitation (e.g., occupational therapy, speech and language therapy, physiotherapy, neurobehavioural rehabilitation), support groups (e.g., peers, family and caregiver), recreational services, reintegration programs (e.g., workplace, school, community).

While not a direct patient care provider, the Ontario Brain Injury Association provides training (in conjunction with Brock University, Saint Catharines, Ontario) as well as resources to service providers caring for individuals with ABI and concurrent mental health and/or substance use disorders, as well as problem gambling.[16] Similarly, while the Toronto ABI Network provides system navigation support and referrals to hospital and community programs, they offer a resolution service that brings the ABI, addiction, mental health, and criminal justice sectors to a common table to create personalized solutions for individuals who become involved in the justice system.[17]

When asked to described types of inpatient services or consultations for individuals with ABI offered in their facility or jurisdiction, 14 respondents provided no response (63.6%), while eight (36.4%) indicated an assortment of services (see Appendix 3, Table 6 for details). Based on the responses of the survey, clinical pharmacy, occupational therapy, physiotherapy, and speech-language pathology are offered as inpatient services in both Ontario and Saskatchewan, while clinical nutrition and nursing are offered in British Columbia, Ontario and Saskatchewan. Holistic services and social services are offered in both British Columbia and Ontario, and recreation therapy is offered in all four jurisdictions. Case management and individualized programming for patients are offered in Alberta, British Columbia, and Ontario. One respondent from British Columbia indicated that online services or modules, as well as spiritual services are offered in their jurisdiction, two respondents from Saskatchewan indicated they offer physiatry, and one respondent from Ontario added that their institution offers behavioural supports and personal care. One respondent from Saskatchewan indicated that they were not aware of all the specifics of their inpatient offering, while a respondent from Ontario indicated that their program did not offer inpatient services.

Similarly, for types of outpatient services for individuals with ABI offered in their facility or jurisdiction, 8 respondents provided no response (36.4%), while 14 (63.6%) indicated an assortment of services (see Appendix 3, Table 7 for details. Based on the responses of the survey, clinical nutrition, nursing, individualized programming for patients, and social services are offered as outpatients services in both Ontario and Saskatchewan, while occupational therapy, physiotherapy, and speech-language pathology are offered in British Columbia, Ontario, and Saskatchewan. Physiatry is offered both in British Columbia and Saskatchewan, while case management and recreation therapy are offered in Alberta, Ontario, and Saskatchewan. One respondent from Saskatchewan added that they offer clinical pharmacy. One respondent from Ontario indicated they offer holistic services, another indicated they offer online services or modules, and a third respondent from Ontario added that they offer behaviour consultant and neuropsychiatry. One respondent from Saskatchewan indicated that they were not aware of all the specifics of their outpatient offering.

When describing criteria that patients with suspected or diagnosed ABI must meet to receive ABI services, eight respondents provided no answer (36.4%), while 14 (63.6%) indicated an assortment of responses (See Appendix 3, Table 8 for details). Based on these, an assessment (e.g., evaluation, checklist), and the time of the ABI diagnosis are factors present in all four jurisdictions. A referral from a physician or other health care provider is required in Alberta and British Columbia, and the severity of the ABI diagnosis is considered in Alberta, British Columbia, and Saskatchewan. One respondent from Alberta and two from Ontario added that there needed to be a diagnosis of ABI present in order to access services. Another respondent from Ontario indicated that demographics (e.g., age, geographic location, willingness to participate in treatment) were also part of their criteria. One respondent from Saskatchewan also indicated that attempting sobriety (e.g., drug, alcohol) was a criterion.

Literature Results

The survey findings are generally in line with the findings from a 2014 mixed methods study of community health care services for ABI in Ontario,[18] which reported few organizations were equipped with in-house mental health care staff. However, authors identified various models and programs that could effectively be utilized across the province, such as: the Pediatric Acquired Brain Injury Community Outreach Program (PABICOP),[19] Substance Use and Brain Injury (SUBI) bridging project,[20] and Community Care Access Centres (CCACs).[18]

Objective 2 Identify and describe integrated patient-centered care centers that have been implemented in Canada for patients with acquired brain injury and concurrent mental health and/or substance use disorders

Information on specific programs that integrate care for concurrent mental health and/or substance use disorder can be found in Appendix 3, Table 5.

Survey Results

Twenty-two survey respondents from four Canadian provinces (Alberta n=5, British Columbia n=1, Ontario n=10, and Saskatchewan n=6) provided information on integrated care centers for individuals with ABI and concurrent mental health and/or substance use disorders. A summary of the existing programs as identified in the survey responses are presented in Appendix 3, Table 5.

Survey respondents indicate that programs integrating mental health and/or substance use disorder with ABI care are currently available in Alberta, British Columbia, Ontario, and Saskatchewan. Few programs were reported as having interdisciplinary management of this client population. Of the five programs identified in Alberta, three were identified as having integrated mental health and/or substance use care, while two were not. Both programs identified in British Columbia were acknowledged as having integrated care. Of the 16 programs identified in Ontario, seven were recognised as having integrated mental health and/or substance use care, an additional one was dependent on the type of program, four programs were not, and the information was not provided for four other programs. Of the nine programs identified in Saskatchewan, one program was identified as having integrated care, five programs were not, and the information was not provided for three other programs.

One example of an integrated care center is the Community Head Injury Resource Services (CHIRS)[21] program in Toronto, Ontario, which developed the SUBI bridging project, facilitating the care of clients living with ABI and problematic substance use.[20] This project introduced treatment alternatives for clients of CHIRS whose cognitive impairments precluded their treatment in mainstream substance use programs. According to the CHIRS website, this was accomplished with close collaboration and cross-training with the Centre for Addiction and Mental Health (CAMH).[20] Additionally, the ABI inpatient program at Hamilton Health Sciences is a provincial centre specialized in neurobehavioural rehabilitation services for individuals with ABI and complex behavior or mental health disorders.[22]

Sixteen respondents provided a response for questions relating to Indigenous health practices for individuals with ABI and concurrent mental health and/or substance use disorders. Thirteen (Alberta n=1, Ontario n=6, Saskatchewan n=6) of the 16 respondents (81.3%) indicated their facility were involved in the care of Indigenous populations with ABI (Table 3). When asked if there were facilities in their jurisdiction that incorporated Indigenous health practices into their services for individuals with ABI and concurrent mental health and/or substance use disorders, six of the 16 respondents indicated “no” (37.5%), four were “not sure” (25.0%), and six of the 16 indicated “yes” (37.5%). Among the latter, one respondent from Ontario noted that their program partners with local Indigenous health centres to deliver care, and a respondent from Saskatchewan indicated that they incorporate Indigenous health practices upon request; however, the extent of the integration was not clear in either case. Two additional respondents indicated that they are sensitive to all needs (e.g., religious, cultural) across their service offering.

Literature Results

No literature was identified regarding any specific integrated patient-centered care centers in Canada for individuals with ABI and concurrent mental health and/or substance use disorders.

Objective 3 Describe how existing programs and services for acquired brain injury care are funded

Information on the source of funding for existing programs and services for ABI can be found in Appendix 3, Table 5.

Survey Results

Twenty-two survey respondents from four Canadian provinces (Alberta, British Columbia, Ontario, and Saskatchewan) provided information on the funding of systems and services for individuals with ABI and concurrent mental health and/or substance use disorders.

Of the five programs identified in Alberta, three were locally funded (e.g., local health authorities, hospitals), two were publicly or provincially funded (one of which also identified fundraising as a funding source). Both British Columbian programs were identified as being privately funded (one of which was also locally funded). Of the 16 programs identified in Ontario, most indicated receiving multiple sources of funding, including: private (n=2), public or provincial (n=10), both public and private (n=3), locally funded (n=9), fee-for-service (n=2), patient out-of-pocket or third party (n=1), foundational grant (n=2), and the information was not provided for two other programs. In Saskatchewan, three programs were identified as being both public and privately funded (one of which was also fee-for-service), two programs were publicly or provincially funded, one was locally funded, and the information was not provided for three other programs.

Literature Results

The survey findings are generally in line with the findings from a 2014 mixed methods study of community health care services for ABI in Ontario.[18] Their survey results found that five of eight community based organizations that belonged to the Ontario Association of Community Based Boards for Acquired Brain Injury Services (OACBABIS) surveyed were funded through the Ontario Ministry of Health and Long Term Care (MOHLTC) by direct payment to the client, while three were funded through the MOHLTC by direct payment to the programs, seven through local health integration networks (LHINs), four through private insurance, seven through automobile insurance, and six via other sources not specified.[18]

For the nine community-based organizations that did not belong to the OACBABIS, three were funded through the Ontario MOHLTC by direct payment to the client, all through LHINs, four through private insurance, four through automobile insurance, and three via other sources not specified.[18] Additionally, they surveyed six CCACs, of which all were funded through LHINs, one received funding through private insurance, and one through automobile insurance. Ten community associations were surveyed, of which two were funded through the Ontario MOHLTC by direct payment to the client, five through LHINs, and nine via other sources not specified.[18] Authors also surveyed nine rehabilitation hospitals (some of which included dedicated rehabilitation hospitals for children) and reported that one was funded through the Ontario MOHLTC by direct payment to the client, two through the Ontario MOHLTC by direct payment to the programs, eight through LHINs, six through private insurance, all through automobile insurance, and three via other sources not specified.[18]

Objective 4 Describe unmet needs and known areas for improvement in the care of individuals with acquired brain injury and concurrent mental health and/or substance use disorders in Canada.

Information on specific unmet needs and known areas for improvement in the care of individuals with ABI and concurrent mental health and/or substance use disorder can be found in Appendix 4, Table 9, and Table 10.

Survey Results

Themes that emerged from the survey included limited funding, limited resources, timeliness to treatment, and patient access to treatment.

Sixteen respondents provided a response to the question relating to treatment delays caused by wait times (Table 3), which are cited as a moderate issue by six respondents (37.5%) or a major issue by three respondents (18.8%). Three respondents indicated it was not an issue (18.8%), while four indicated it was a minor issue (25%).

Fifteen respondents provided a response to questions relating to unmet needs or areas for improvement that currently exist in their jurisdiction in caring for patients with ABI. Unmet needs in relation to limited funding/budget, resource implications (e.g., limited staff or alternative health professionals, education), and patient access to treatment or services were identified by all responding jurisdictions. Additionally, timeliness to treatment or services was identified by respondents in Alberta, Ontario, and Saskatchewan. One respondent from Alberta highlighted the need for a model to deal with the behavioural side of treatment for those with ABI who can be termed complex or complicated or may not be engaged in treatment. Another respondent from Alberta, as well as one from Saskatchewan, noted the lack of infrastructure for supporting travel from remote locations as an area for improvement. One other respondents from Saskatchewan identified a lack of suitable options for individuals with ABI who tend to get aggregated with other patient populations, while another respondent from Saskatchewan identified a need to improve medical insurance, as well as wait times. Both a respondent from Saskatchewan and one from Ontario noted a lack of affordable housing. One respondent from Ontario indicated that the range of services available could be improved (e.g., they indicated all rehab occurs outside their jurisdiction), while another respondent from Ontario suggested that transitions between acute care centres (e.g., rehabilitation is at one hospital corporation, while mental health is at another) as well as transition to community could be improved.

Furthermore, of the fifteen respondents who answered the question relating to current strategies or solutions being considered or implemented for improving the availability of ABI services or programs, four (26.7%) indicated “no”, eight (53.3%) indicated “unsure”, and three (20.0%) indicated “yes”. Of these latter three, one respondent from Ontario specified that collaboration with community agencies (e.g., mental health, addictions) were being considered or implemented, while another respondent from Ontario indicated they had implemented reduced wait time for their outreach services and they were improving access to residential beds. One respondent from Saskatchewan indicated that telehealth was being considered or implemented.

Literature Results

While not specific to individuals with concurrent mental health and/or substance use disorders, a 2014 mixed methods study of community and health services for individuals with ABI in Ontario,[18] revealed unmet needs from an organizational or provider perspective. Authors found there was a lack of services for children and adolescents, a lack of services for individuals with concurrent mental health conditions, lack of employment services, a gap in care for individuals who are medically unstable or have severe behavioural disorders (i.e., since these are usually exclusion criteria for services)[18,23], and a need for organization to improve tracking of patient outcomes.[18] Authors also underscored the need to breakdown siloed care between agencies, systems, ministries, and funding sources.[18] This call for integrated care is largely echoed in other publications.[24,25]

A 2019 Canadian study,[26] on intimate social relationships in adolescent girls and women with traumatic brain injury identified that women of all ages with TBI report more symptoms of poor mental health, especially depression and anxiety. As such, authors highlight the need to provide gender specific support to individuals with TBI as they develop intimate relationships.[26] This is supported by two retrospective cohort studies in Ontario, one in 2017,[27] and another in 2016,[28] which identified gender inequalities and vulnerabilities in the clinical profile of individuals with TBI, that ought to be reflected in care programs.

A 2013 qualitative study, based in Toronto, Ontario, on the link between traumatic brain injury and homelessness identified several areas for improvement in the care of individuals with TBI and concurrent mental health issues.[23] These included a lack of research upon which to base and develop interventional programs, the difficulty for individuals experiencing homelessness to adhere to specialized programming in shelters while being transient, and poor medical record documentation of brain injuries precluding access to programs that require a diagnosis.[23]

Another area for improvement is the need for effective brain injury prevention programs, underscored by a 2015 study on substance use among adolescents with TBI,[29] as well as the need to inquire about a history of TBI when individuals first present with a substance misuse problem. Shortcomings in preventive efforts are also highlighted by a 2018 study from Québec evaluating drug use during the first year after TBI.[30] Authors remark that a greater proportion of persons with mild brain injuries do not receive rehabilitation service or even regular medical follow up, and are thus possibly not given firm recommendations on substance use,[30] highlighting a need for public education campaigns and screening protocols for all severity levels of acquired brain injury.

With regards to Indigenous populations, one 2017 Canadian literature review,[31] outlined six social determinants of health associated specifically with traumatic brain injury in North American Indigenous populations: physical environment (e.g., rural location), gender (e.g., male gender, female gender in the setting of interpersonal violence), personal health practices and coping skills (e.g., substance use, failure to use personal protective equipment), social environment (e.g. interpersonal violence), health services (e.g., availability of rehabilitation services), and social support network (e.g., lack of family and friend presence during meetings with health care professionals).[31] Identified unmet needs in this population included outpatient physiotherapy, occupational therapy, and long-term care.[31,32] Furthermore, a 1999 Canadian retrospective cohort study of TBI in Indigenous populations,[33] identified that initial treatment received, discharge planning, and post-discharge resources offered (e.g., family conferences)[31] were areas for improvement.[33] Furthermore, a 2008 participatory action research study,[34] with Aboriginal Elders in Treaty 3 (Northwestern Ontario and Southeastern Manitoba)[35], identified that additional information was needed about mechanisms of injury and the pathophysiology of brain injury and how it is treated from a Western perspective, ways to motivate survivors of brain injury, and financial support for traditional healing.[34] The lack of awareness, education, and resources available in this population, are themes echoed by a 2011 Canadian qualitative study.[36] While another Canadian qualitative study identified the need for rehabilitation protocols and discharge planning adapted to Indigenous populations in remote communities, as well as social and travel support.[37]

Limitations

The findings of this Environmental Scan present a broad overview of care programs for people with ABI and concurrent mental health and/or substance use disorders and are based on a survey and focused literature review. It is not a fully comprehensive review of the topic. There may be ABI programs across Canada that are not well-documented either in the literature or online, and therefore were not captured in this report.

Methods

The quality of included studies is uncertain as a critical appraisal of the literature was not conducted and the broad inclusion of publication types. Surveys were sent to stakeholders identified by CADTH and it is likely that not all relevant stakeholders were identified and contacted. This could potentially create a gap in valuable information regarding ABI care programs.

Survey Results

The survey respondents identified through the CADTH Implementation Support and Knowledge Mobilization (ISKM) team networks, and other available networks via stakeholder and expert suggestions did not identify stakeholders in all Canadian jurisdictions. While the survey was sent out to 32 representatives in six Canadian provinces and one Federal Health Care Plan, 22 respondents representing four jurisdictions were captured in the survey results. In addition, not all respondents provided a response to all questions. Hence, the information was obtained for a small sample and is not representative of all provinces and territories, a primary limitation of this report. As well, respondents were able to speak on behalf of their own program and may not have been able to fulsomely comment on other programs. The responses to the survey also reflect personal experiences with ABI systems in their jurisdiction and may not reflect all systems.

Literature

Specific literature and information regarding integration of program and services, as well as admission criteria and prioritization of recipients of ABI treatment were lacking. Literature was largely found for Ontario, while literature representing other Canadian jurisdictions was not identified. The literature spanned twenty years. Additionally, there was a lack of information available regarding

integrated patient-care centers that are based on Indigenous practices to manage the care of individuals with acquired brain injury and concurrent mental health and/or substance use disorders.

Conclusions and Implications for Decision or Policy Making

This Environmental Scan was informed by literature searches and a survey responses.

While there are systems and services in place to manage the care of individuals with acquired brain injury and concurrent mental health and/or substance use disorders in Canada, there is limited integration between those services. In many cases, the mental health and/or substance use care is a stand-alone program that is offered in addition to the ABI programming. Literature results generally align with the survey results; although, it should be noted that systems and services from a limited number of jurisdictions were captured by the survey and may not accurately reflect services offered elsewhere in Canada.

The survey results highlighted that while mental health and substance use services do exist, there is a need for effective integration between agencies, systems, ministries, and funding sources, given the needs of individuals with ABI and concurrent mental health and/or substance use disorders. Some community associations have recognised the needs of this unique population and have begun collaborations and cross training their health care staff between these care sectors. In cases where there is incorporation of Indigenous health practices, it was noted that some programs partner with local Indigenous health centres to deliver care; however, the extent of the integration was not clear.

Most programs are either publicly or provincially funded, or locally funded. Nevertheless, a small proportion rely on foundational grants and fundraising efforts.

Unmet needs and known areas for improvement that emerged from the survey generally included limited funding, limited resources, timeliness to treatment, and patient access to treatment. This aligned with the literature findings, which also highlighted a greater need to break down siloed care in the management of individuals with ABI and concurrent mental health and/or substance use disorders. Another area for improvement was brain injury awareness and prevention programs amongst the general population as well as health care practitioners. In the latter, enhanced screening programs would help disentangle ABI from many other factors, particularly in cases where the patient first presents with a mental health and/or substance use issue.

The limitations of this report, particularly the lack of representation from all Canadian provinces and territories, should be considered when interpreting the results. Further work that evaluates the implementation of integrated care for patients with ABI and concurrent mental health and/or substance use disorders may provide additional insight into the complexities of the interventions. Alternative approaches to information gathering as well as opportunities for broader engagement and enhanced communication and collaboration among relevant stakeholders involved in the delivery of care for individuals with ABI and concurrent mental health and/or substance use disorders may provide guidance for future research and understanding of this area.

References

1. Acquired Brain Injury (ABI) — The Basics. Ottawa (ON): Brain Injury Canada; 2019: https://www.braininjurycanada.ca/acquired-brain-injury/. Accessed 2020 Aug 7.
2. Faltynek P, Teasell R. Introduction to moderate to severe acquired brain injury. https://erabi.ca/wp-content/uploads/2019/05/Clinical-Guidebook_Ch1_Intro.pdf. Accessed 2020 Jul 29.
3. Brain injury statistics. Prince George (BC): Northern Brain Injury Association; 2020: https://www.nbia.ca/brain-injury-statistics/. Accessed 2020 Aug 7.
4. Institute for Health Metrics and Evaluation. The Global Burden of Disease study data visualization hub, injuries by nature : estimated incidence rate of head injuries, for both sexes and all ages in Canada. Seattle (WA): University of Washington; 2020: https://vizhub.healthdata.org/gbd-compare/. Accessed 2020 Aug 7.
5. Institute for Health Metrics and Evaluation. The Global Burden of Disease study data visualization hub, injuries by nature : estimated prevalence count of head injuries, for both sexes and all ages in Canada. Seattle (WA): University of Washington; 2020: https://vizhub.healthdata.org/gbd-compare/. Accessed 2020 Aug 7.
6. National Center for Injury Prevention and Control, Division of Unintentional Injury Prevention. Report to Congress: Traumatic Brain Injury in the United States: Epidemiology and Rehabilitation. Atlanta (GA): Centers for Disease Control and Prevention; 2015: https://www.cdc.gov/traumaticbraininjury/pdf/TBI_Report_to_Congress_Epi_and_Rehab-a.pdf. Accessed 2020 Jul 29.
7. Teasell R., Metha S, Faltynek P, Duffy T, Bayley M, MacKenzie H. Epidemiology and Long-term Outcomes Following Acquired Brain Injury. *(Evidence-based review of moderate to severe acquired brain injury)*. London (ON): Parkwood Institute 2018: https://erabi.ca/wp-content/uploads/2018/12/Module-2_V12_epiandlongterm.pdf.
8. Brain Trust Canada. Brain Injury Information. Kelowna BC Canada: Brain Trust Canada; 2020: https://braintrustcanada.com/resources/brain-injury-information/. Accessed 07-Aug-2020.
9. Institute for Health Metrics and Evaluation. The Global Burden of Disease study data visualization hub, causes : estimated measure of incidence of stroke, for both sexes and all ages in Canada, expressed as rate per 100,000. Seattle (WA): University of Washington; 2020: https://vizhub.healthdata.org/gbd-compare/. Accessed 2020 Aug 7.
10. Institute for Health Metrics and Evaluation. The Global Burden of Disease study data visualization hub, causes : estimated measure of prevalence of stroke, for both sexes and all ages in Canada, expressed as a count. Seattle (WA): University of Washington; 2020: https://vizhub.healthdata.org/gbd-compare/. Accessed 2020 Aug 7.
11. West SL. Substance use among persons with traumatic brain injury: a review. *NeuroRehabilitation.* 2011;29(1):1-8.
12. Guillamondegui OD, Montgomery SA, Phibbs FT, McPheeters ML, Alexander PT, Jerome RN, et al. Traumatic Brain Injury and Depression. *AHRQ Comparative Effectiveness Reviews No. 25.* Rockville (MD): Agency for Healthcare Research and Quality 2011: https://effectivehealthcare.ahrq.gov/products/depression-brain-injury/research. Accessed 2020 Jul 29.
13. Chen A, Bushmeneva K, Zagorski B, Colantonio A, Parsons D, Wodchis WP. Direct cost associated with acquired brain injury in Ontario. *BMC Neurol.* 2012;12:76.
14. Laver K, Lannin NA, Bragge P, Hunter P, Holland AE, Tavender E, et al. Organising health care services for people with an acquired brain injury: an overview of systematic reviews and randomised controlled trials. *BMC Health Serv Res.* 2014;14:397.
15. Integrated Care Models for Acquired Brain Injury: Clinical Effectiveness, Cost Effectiveness and Guidelines. *(Rapid response report: summary of abstracts)*. Ottawa (ON): CADTH; 2019: https://www.cadth.ca/integrated-care-models-acquired-brain-injury-clinical-effectiveness-cost-effectiveness-and-0. Accessed 2020 Jul 29.
16. Ontario Brain Injury Association. Ontario Brain Injury Association. Thorold ON Canada: Ontario Brain Injury Association; 2020: http://obia.ca/. Accessed 30-Jul-2020.
17. For Professionals: ABI Programs/Services. Toronto (ON): Toronto ABI Network; 2020: https://abinetwork.ca/for-professionals/abi-programs-services/. Accessed 2020 Jul 29.
18. Munce SE, Laan RV, Levy C, Parsons D, Jaglal SB. Systems analysis of community and health services for acquired brain injury in Ontario, Canada. *Brain Inj.* 2014;28(8):1042-1051.
19. Kendall M. The PABICOP Model of School Reintegration: A Unique and Individualized Approach. Thorold (ON): Ontario Brain Injury Association: http://obia.ca/the-pabicop-model-of-school-reintegration/. Accessed 2020 Jul 30.
20. Community Head Injury Resource Services (CHIRS). About SUBI. Toronto ON Canada: Community Head Injury Resource Services; 2020: https://www.subi.ca/Home/About. Accessed 30-Jul-2020.
21. About SUBI. Toronto (ON): Community Head Injury Resource Services; 2020: http://www.chirs.com/home. Accessed 2020 Jul 30.
22. Acquired Brain Injury (Inpatient). Hamilton (ON): Hamilton Health Sciences; 2019: https://www.hamiltonhealthsciences.ca/areas-of-care/rehabilitation/inpatient/acquired-brain-injury-program/. Accessed 2020 Jul 30.
23. Topolovec-Vranic J, Ennis N, Ouchterlony D, Cusimano MD, Colantonio A, Hwang SW, et al. Clarifying the link between traumatic brain injury and homelessness: workshop proceedings. *Brain Inj.* 2013;27(13-14):1600-1605.
24. Kim H, Bayley M, Dawson D, Mollayeva T, Colantonio A. Characteristics and functional outcomes of brain injury caused by physical assault in Canada: a population-based study from an inpatient rehabilitation setting. *Disabil Rehabil.* 2013;35(26):2213-2220.
25. Bayley MT, Lamontagne ME, Kua A, Marshall S, Marier-Deschenes P, Allaire AS, et al. Unique Features of the INESSS-ONF Rehabilitation Guidelines for Moderate to Severe Traumatic Brain Injury: Responding to Users' Needs. *J Head Trauma Rehabil.* 2018;33(5):296-305.
26. Wiseman-Hakes C, Saleem M, Poulin V, Nalder E, Balachandran P, Gan C, et al. The development of intimate relationships in adolescent girls and women with traumatic brain injury: a framework to guide gender specific rehabilitation and enhance positive social outcomes. *Disabil Rehabil.* 2019:1-7.
27. Chan V, Mollayeva T, Ottenbacher KJ, Colantonio A. Clinical profile and comorbidity of traumatic brain injury among younger and older men and women: a brief research notes. *BMC Res Notes.* 2017;10(1):371.
28. Toor GK, Harris JE, Escobar M, Yoshida K, Velikonja D, Rizoli S, et al. Long-Term Health Service Outcomes Among Women With Traumatic Brain Injury. *Arch Phys Med Rehabil.* 2016;97(2 Suppl):S54-63.
29. Ilie G, Mann RE, Hamilton H, Adlaf EM, Boak A, Asbridge M, et al. Substance Use and Related Harms Among Adolescents With and Without Traumatic Brain Injury. *J Head Trauma Rehabil.* 2015;30(5):293-301.
30. Beaulieu-Bonneau S, St-Onge F, Blackburn MC, Banville A, Paradis-Giroux AA, Ouellet MC. Alcohol and Drug Use Before and During the First Year After Traumatic Brain Injury. *J Head Trauma Rehabil.* 2018;33(3):E51-e60.
31. Zeiler KJ, Zeiler FA. Social Determinants of Traumatic Brain Injury in the North American Indigenous Population: A Review. *Can J Neurol Sci.* 2017;44(5):525-531.
32. Lasry OJ. The epidemiology of traumatic brain injury in the Cree Communities of Eeyou Istchee. Chisasibi (QC): Cree Board of Health and Social Services of James Bay; 2015: https://www.creehealth.org/library/online/epidemiology-traumatic-brain-injury-cree-communities-eeyou-istchee. Accessed 2020 Jul 30.
33. Blackmer SCMJ. A comparison of traumatic brain injury in the Saskatchewan native North American and non-native North American populations. *Brain Inj.* 1999;13(8):627-635.

34. Traditional teachings and acquired brain injury. Ohsweken (ON): Indigenous Health Research Development Program; 2008: http://www.ihrdp.ca/media/docs/lega4e54fe0e9709f-brain%20injury%20and%20traditional%20teachings.pdf. Accessed 2020 Jul 30.
35. Land. Kenora (ON): Grand Council Treaty #3; 2020: https://gct3.ca/land/. Accessed 2020 Jul 30.
36. Keightley M, Kendall V, Jang S-H, Parker C, Agnihotri S, Colantonio A, et al. From health care to home community: An Aboriginal community-based ABI transition strategy. *Brain Inj.* 2011;25(2):142-152.
37. Keightley ML, Ratnayake R, Minore B, Katt M, Cameron A, White R, et al. Rehabilitation challenges for Aboriginal clients recovering from brain injury: A qualitative study engaging health care practitioners. *Brain Inj.* 2009;23(3):250-261.
38. Brain injury supports. Edmonton (AB): Government of Alberta; 2020: https://www.alberta.ca/brain-injury-supports.aspx. Accessed 2020 Jul 30.
39. Calgary Brain Injury Program. Edmonton (AB): Alberta Health Services: https://www.albertahealthservices.ca/services/cbip.aspx. Accessed 2020 Jul 30.
40. Halvar Jonson Centre for Brain Injury - Calgary Zone. Edmonton (AB): Alberta Health Services: https://www.albertahealthservices.ca/services/page13162.aspx. Accessed 2020 Jul 30.
41. Pediatric Brain Injury Rehabilitation Program (PBIRP). Edmonton (AB): Alberta Health Services: https://www.albertahealthservices.ca/findhealth/Service.aspx?id=1010102&serviceAtFacilityID=1023253. Accessed 2020 Jul 30.
42. Blue Heron Support Services Association. Barrhead (AB): Blue Heron Support Services Association; 2020: https://www.bhssa.ca/. Accessed 2020 Jul 30.
43. Bill's Place Support Services Inc. Nanaimo (BC): Bill's Place Support Services Inc.: http://www.billsplace.ca/. Accessed 2020 Jul 30.
44. CONNECT Hamilton. Langley BC Canada: CONNECT Communities; 2020: https://connectcommunities.ca/contact/on/. Accessed 2020 Jul 30.
45. Acquired Brain Injury Behaviour Service. Toronto (ON): West Park Healthcare Centre: https://www.westpark.org/en/Services/ABIBS. Accessed 2020 Jul 30.
46. Brain Injury Association Peterborough Region. Peterborough ON Canada: Brain Injury Association Peterborough Region; 2020: https://www.biapr.ca/. Accessed 2020 Jul 30.
47. Brain Injury Services Muskoka Simcoe. Brain Injury Services Muskoka Simcoe. Barrie ON Canada: Brain Injury Services; 2020: http://braininjuryservices.ca/. Accessed 30-Jul-2020.
48. Hamilton Brain Injury Association. Hamilton (ON): Hamilton Brain Injury Association; 2020: https://hbia.space/. Accessed 2020 Jul 30.
49. Head Injury Rehabilitation Ontario. Hamilton (ON): Head Injury Rehabilitation Ontario: https://hiro.ca/. Accessed 2020 Jul 30.
50. Brain Injury Services. Toronto (ON): March of Dimes Canada; 2020: https://www.marchofdimes.ca/en-ca/programs/abi. Accessed 2020 Jul 30.
51. North Simcoe Muskoka Acquired Brain Injury (ABI) Collaborative. Barrie (ON): North Simcoe Muskoka Acquired Brain Injury (ABI) Collaborative; 2020: http://abicollaborative.ca/. Accessed 2020 Jul 30.
52. Central Healthline. Outpatient Neurological Rehabilitation: Southlake Regional Health Centre. Newmarket (ON): Central Local Health Integration Network; 2020: https://www.centralhealthline.ca/displayService.aspx?id=189700. Accessed 2020 Jul 30.
53. Regional Rehabilitation Centre (RRC). Hamilton (ON): Hamilton Health Sciences; 2019: https://www.hamiltonhealthsciences.ca/about-us/our-organization/our-locations/regional-rehabilitation-centre/. Accessed 2020 Jul 30.
54. Toronto Rehabilitation Institute UHN completed. Toronto (ON): Ontario Neurotrauma Foundation; 2020: https://onf.org/implementation/acquired-brain-injury-2/toronto-rehab-institute-1/. Accessed 2020 Jul 30.
55. Centre for Behaviour Health Sciences for Adults. Richmond Hill (ON): Mackenzie Health; 2017: https://www.mackenziehealth.ca/en/programs-services/centre-for-behaviour-health-sciences.aspx. Accessed 2020 Jul 30.
56. Acquired Brain Injury Partnership Project. Regina (SK): The ABI Partnership Project; 2020: https://www.abipartnership.sk.ca/index.php. Accessed 2020 Jul 30.
57. SaskAbilities. Acquired Brain Injury Programs. Saskatoon (SK): Saskatchewan Abilities Council; 2017: https://www.saskabilities.ca/programs-services/quality-of-life/acquired-brain-injury-programs. Accessed 2020 Jul 30.
58. Life Without Barriers. Yorkton (SK): Society for the Involvement of Good Neighbours; 2019: https://signyorkton.ca/life-without-barriers. Accessed 2020 Jul 30.
59. The Lloydminster and Area Brain Injury Society. Lloydminster (SK): The Lloydminster and Area Brain Injury Society; 2019: http://labis.xyz/. Accessed 2020 Jul 30.
60. Therapy Services. Regina (SK): Government of Saskatchewan; 2019: https://www.saskatchewan.ca/residents/health/accessing-health-care-services/therapies. Accessed 2020 Jul 30.
61. Acquired Brain Injury (ABI). Regina (SK): Phoenix Residential Society; 2020: https://phoenixregina.com/program-descriptions/acquired-brain-injury-abi/. Accessed 2020 Jul 30.
62. Rehab Day Services. Saskatoon (SK): Saskatchewan Health Authority; 2018: https://www.saskatoonhealthregion.ca/locations_services/Services/Rehabilitation/Pages/RDS.aspx. Accessed 2020 Jul 30.
63. The Saskatchewan Association for the Rehabilitation of the Brain Injured. Saskatoon (SK): The Saskatchewan Association for the Rehabilitation of the Brain Injured; 2020: https://sarbi.ca/. Accessed 2020 Jul 30.
64. Stroke Rehabilitation Clinic. Regina (SK): Saskatchewan Health Authority; 2020: https://www.pnrha.ca/programs_services/Pages/Stroke-Rehabilitation-Clinic.aspx. Accessed 2020 Jul 30.

Appendix 1: Environmental Scan Survey – Programs for the Care of Acquired Brain Injury and Concurrent Mental Health and/or Substance Use Issues

CONSENT FORM

Thank you for your interest in contributing to a CADTH report. Your input is needed and highly valuable, as it will inform decision-making on the management of health technologies in Canada. The purpose of this survey is to gather information that will be used to prepare a CADTH Environmental Scan report, which will be published on the CADTH website.

Your participation in this survey is voluntary. You may choose not to participate, or you may exit the survey at any time without penalty. It should take approximatively 20 minutes to complete.
Your identifiable private information will be kept confidential. This consent form does not give CADTH permission to disclose your name. If any direct quotes from the survey results are required, respondents will be contacted separately for a signed personal communication form before publishing.

CADTH will summarize your responses in the published report and your organization may be identified as a source. However, you and (if applicable) the organization you represent are not responsible for the analyses, conclusions, opinions, and statements expressed by CADTH.
For detailed information on the purpose of this Environmental Scan entitled **Care for Acquired Brain Injury and Concurrent Mental Health and Substance Use Issues: An Environmental Scan**, please see the invitation email from Bert Dolcine (bertd@cadth.ca).

ELECTRONIC CONSENT: Please select your choice below.

Clicking on the "Agree" button below indicates that:

- you have read the aforementioned information
- you voluntarily agree to participate
- you authorize CADTH to use the information provided by you for the purpose as stated in this form.

If you do not wish to participate in the survey, please decline participation by clicking on the "Disagree" button.

☐ Agree
☐ Disagree

Name:
Title:
Organization:
Province:

SURVEY QUESTIONNAIRE

A. Care Types and Settings for Acquired Brain Injury

1. Are you involved in any capacity with the topic of acquired brain injury (ABI) (e.g., research, service provision, policy-making, advocacy)?

   ☐ Yes
   ☐ No
   If no, please exit the survey.

2. Are you currently involved in any capacity with **care** for ABI?

☐ Yes
☐ No
If no, please exit the survey.

3. What is your profession, occupation, or title?

☐ Policy-maker
☐ Researcher
☐ Health care provider (e.g., physician, nurse etc.)
☐ Member of patient support group, community association, community-based organization
☐ Other (please specify): _____

4. Describe your role and how it serves those patients with ABI.

5. Do you work in one or more of these **health care** settings? (Select all that apply.)

☐ Primary care
☐ Secondary or tertiary care
☐ Rehabilitation care
☐ Long-term care
☐ Home care
☐ None of these settings
☐ Other (please specify): _____

6. Do you work in one or more of these types of facilities? (Select all that apply.)

☐ Stand-alone private facility (e.g., rehabilitation services, only)
☐ Stand-alone public facility
☐ Multidisciplinary ABI services treatment facility (stand-alone)
☐ Multidisciplinary ABI services treatment facility (affiliated)
☐ Public academic hospital
☐ Public community hospital
☐ Health care research institute
☐ Community health care facility (e.g., public health clinic, family health team)
☐ None of these facilities
☐ Other (please specify): _____

7. To your knowledge, what are the current programs or services for the care of individuals with ABI offered in your jurisdiction or facility?

Program or Service A _____ Website link A_____
Program or Service B _____ Website link B_____
Program or Service C _____ Website link C_____

8. Please fill out the table that follows to provide more information on each program or service identified in Question #6.

	How is the program or service funded? (Select all that apply.)	**Does the program or service incorporate mental health care and care regarding**

							substance issues for people with ABI?	
Name of program or service	Publicly or provincially funded (e.g., Ministry of Health and Long-Term Care	Locally-funded (e.g., local health authorities, hospitals)	Private	Both public and private	Patient out-of-pocket/ third party	Foundational, grant	Yes	No
Program or Service A								
Program or Service B								
Program or Service C								

If any other source of funding for a program or service is received, provide details here.

B. Programs and Services for Acquired Brain Injury

The following section and questions aim to collect more details (e.g., patient population served, type of ABI services offered, etc.) about *existing* programs and services for ABI. The section is geared toward those respondents who are directly involved in providing *current* programs and services for individuals with ABI or toward those helping individuals with ABI receive services. If the section and questions do not apply to your profession or occupation, please proceed to next section. However, if you have any knowledge or experience regarding *current* programs and services for ABI and would like to fill out the following section, we welcome your input.

9. Do you wish to respond to the questions in this section about current programs and services for ABI?

☐ Yes
☐ No (Continue to next section.)

10. What population(s) with ABI does your facility or work involve? (Select all that apply.)

☐ Adolescent population
☐ Adult population
☐ Indigenous population
☐ Homeless population
☐ Veterans
☐ Accident survivors
☐ Survivors of family/domestic violence
☐ Athletes
☐ Incarcerated population
☐ Other (please specify): _____

11. What types of patients do you provide brain injury services to? (Select all that apply.)

☐ Mild traumatic brain injury
☐ Moderate traumatic brain injury
☐ Severe traumatic brain injury
☐ Mild *non-traumatic* brain injury
☐ Moderate *non-traumatic* brain injury
☐ Severe *non-traumatic* brain injury
☐ Other (please specify): _____

12. In caring for individuals with ABI, does your facility or jurisdiction offer services or programs for those with mental health conditions? (Select one option.)

☐ Yes
☐ No
☐ Unsure

If no, is your facility or jurisdiction *planning* to offer services or programs for individuals with ABI and a concurrent mental health condition?

☐ Yes (please specify): _____
☐ No (please specify): _____
☐ Unsure

13. In caring for individuals with ABI, does your facility or jurisdiction offer services or programs for those with substance use issues? (Select one option.)

☐ Yes
☐ No
☐ Unsure

If no, is your facility or jurisdiction *planning* to offer services or programs for individuals with ABI and concurrent substance use issues?

☐ Yes (please specify): _____
☐ No (please specify): _____
☐ Unsure

14. What type of *in-patient* services or consultations are offered in your facility or jurisdiction for individuals with ABI? (Select all that apply.)

☐ Clinical nutrition
☐ Holistic services
☐ Clinical pharmacy
☐ Nursing
☐ Occupational therapy
☐ Physiotherapy
☐ Physiatry
☐ Psychology
☐ Speech-language pathology
☐ Case management (e.g., coordination of care)
☐ Online services or modules (e.g., Internet cognitive behavioural therapy)

☐ Recreation therapy
☐ Individualized programming for patients
☐ Social services
☐ Spiritual services
☐ Other (please specify): _____

15. What type of *outpatient* services are offered in your facility or jurisdiction for individuals with ABI? (Select all that apply.)

☐ Clinical nutrition
☐ Holistic services
☐ Clinical pharmacy
☐ Nursing
☐ Occupational therapy
☐ Physiotherapy
☐ Physiatry
☐ Psychology
☐ Speech-language pathology
☐ Case management (e.g., coordination of care)
☐ Online services or modules (e.g., Internet cognitive behavioural therapy)
☐ Recreation therapy
☐ Individualized programming for patients
☐ Social services
☐ Spiritual services
☐ Other (please specify): _____

16. Are there facilities in your jurisdiction that incorporate Indigenous health practices into their services for individuals with ABI and concurrent mental health and/or substance use issues?

☐ Yes (please specify): _____
☐ No
☐ Unsure

17. In your jurisdiction or facility, are wait times an issue for access to ABI services or programs? Please choose only **one** of the following:

☐ Not an issue
☐ Minor issue
☐ Moderate issue
☐ Major issue

18. For *in-patient* services, approximately how many ABI patients can your facility care for (at one time)?

☐ 0 to 50
☐ 51 to 100
☐ 101 to 150
☐ More than 150

19. For *outpatient* services, approximately how many ABI patients can your facility care for (at one time)?

☐ 0 to 50
☐ 51 to 100
☐ 101 to 150
☐ More than 150

20. In your facility or jurisdiction, is there any specific criteria that a patient with suspected or diagnosed ABI must meet to receive ABI services or programs?

☐ Referral from physician or other health care provider
☐ Assessment or criteria
☐ Severity of ABI diagnosis
☐ Time of ABI diagnosis
☐ Other (please specify): _____

C. Policies, Frameworks, and Challenges

21. Are there any frameworks, policies, or guidelines in your facility or jurisdiction to guide the care of individuals with ABI? (Please describe.)

Write your answer here.
Upload any available document related to your response.

22. What are the unmet needs and/or areas for improvement that currently exist in your jurisdiction for the care of patients with ABI? (Select all that apply.)

☐ Limited funding/budget
☐ Resource implications (e.g., limited staff or alternative health professionals, education)
☐ Timeliness to treatment or services
☐ Patient access to treatment or services
☐ Other (Please specify.)

23. In your jurisdiction, are there any current strategies or solutions being considered or implemented for improving the availability of ABI services or programs?

☐ Yes
Explain your answer here.
☐ No
☐ Unsure

D. Organization Demographics

24. Which jurisdiction do you work in? (Select one option.)

☐ Alberta
☐ British Columbia
☐ Manitoba
☐ New Brunswick
☐ Newfoundland and Labrador
☐ Northwest Territories

☐ Nova Scotia
☐ Nunavut
☐ Ontario
☐ Prince Edward Island
☐ Quebec
☐ Saskatchewan
☐ Yukon
☐ Federal

25. Do you work in one or more of these sectors or areas? (Select all that apply.)

☐ Provincial government
☐ Municipal government
☐ Academic or research institute
☐ Not-for-profit, foundation
☐ None of these sectors or areas
☐ Other (please specify): _____

26. Do you work in one or more of these geographical settings? (Select all that apply.)

☐ Urban (i.e., area with no fewer than 400 persons per square kilometre and an overall population of at least 1,000 inhabitants)
☐ Rural (i.e., not fitting the definition of "urban" or "remote")
☐ Remote (see below)
(Please self-identify based on your understanding of the criteria for remote. As an example, Health Canada defines various levels of remote, ranging from remote isolated = no scheduled flights or road access and minimal telephone or radio service, through to non-isolated remote = road access and less than 90 km away from physician services.)

Appendix 2: Information on Survey Respondents

Table 2: Demographics of Survey Respondents

Demographic items	Responses
Attempted the survey	n=40
Analytical sample; number	• Included; n=22 • Excluded (e.g., no consent provided, answers to core questions were blank, refused participation); n=18
Jurisdictions	• AB; n=5 • BC; n=1 • ON; n=10 • SK; n=6
Sector of employment[a]	• Provincial government; n=9 • Academic or research institute; n=1 • Not-for-profit, foundation; n=6 • Other: Private (n=1) • No response; n=5
Profession, occupation, or title[a]	• Policy-maker; n=3 • Researcher; n=2 • Health care provider; n=9 • Member of patient support group, community association, community-based organization; n=6 • Other: Provincial health department (n=1); Service access and transitions leader (n=1); Health educator (n=2); Executive director (n=3); Program coordinator (n=1); Manager (n=1).
Health care setting[a]	• Primary care; n=4 • Secondary or tertiary care; n=3 • Rehabilitation care; n=6 • Long-term care; n=2 • Home care; n=5 • None of these; n=4 • Other: Provincial health department (n=2); Community service (n=9)
Type of facility where the respondent works[a]	• Stand-alone private facility; n=4 • Stand-alone public facility; n=4 • Multidisciplinary ABI services treatment facility (stand-alone); n=2 • Multidisciplinary ABI services treatment facility (affiliated); n=2 • Public academic hospital; n=2 • Public community hospital; n=4 • Health care research institute; n=1 • Community health care facility; n=7 • None of these; n=4 • Other: Provincial health department (n=2); local health integration network (n=1);
Type of facility where the respondent currently works[a]	• Stand-alone private facility; n=4 • Stand-alone public facility; n=2 • Multidisciplinary ABI services treatment facility (stand-alone); n=2

	• Multidisciplinary ABI services treatment facility (affiliated); n=2 • Public academic hospital; n=2 • Public community hospital; n=5 • Health care research institute; n=1 • Community health care facility; n=3 • None of these; n=5 • Other: Provincial health department (n=2); private not-for-profit organisation (n=2); local health integration network (n=1); home care (n=1);
Geographical setting[a]	• Urban; n=15 • Rural; n=9 • Remote; n=2

[a] multiple choice was possible for this answer.

Table 3: Characteristics of Survey Respondent's Organizations or Facilities

Demographic items	Responses
Type(s) of population(s) that the facility works with[a]	• Adolescent population; n=7 • Adult population; n=16 • Indigenous population; n=13 • Homeless population; n=13 • Veterans; n=12 • Accident survivors; n=15 • Survivors of family/domestic violence; n=15 • Athletes; n=14 • Incarcerated population; n=7 • Other: individuals diagnosed with moderate to severe brain injury (n=1); falls (n=1); individuals over the age of 16 (n=1)
Type(s) of patient(s) that services are provided to[a]	• Mild traumatic brain injury; n=14 • Moderate traumatic brain injury; n=17 • Severe traumatic brain injury; n=14 • Mild non-traumatic brain injury; n=13 • Moderate non-traumatic brain injury; n=16 • Severe non-traumatic brain injury; n=14 • Other: stroke (n=1)
Facility or jurisdiction offering services or programs for individuals with ABI with concurrent mental health conditions.	• No response; n=5 • Unsure; n=2 • Yes; n=13 • No; n=2 ○ If no, is the facility or jurisdiction planning to offer such services: Unsure: n=2
Facility or jurisdiction offering services or programs for individuals with ABI with concurrent substance use issues.	• No response; n=5 • Unsure; n=1 • Yes; n=9 • No; n=7 ○ If no, is the facility or jurisdiction planning to offer such services: Unsure: n=4; No: n=2
Are wait times an issue for access to ABI services or programs	• Not an issue; n=3

	• Minor issue; n=4 • Moderate issue; n=6 • Major issue; n=3 • No response; n=6
Number of patients that the facility can care for at one time, for inpatient services	• 0 to 50; n=7 • 51 to 100; n=1 • 101 to 150; n=1 • More than 150; n=0 • No response; n=13
Number of patients that the facility can care for at one time, for outpatient services	• 0 to 50; n=7 • 51 to 100; n=2 • 101 to 150; n=2 • More than 150; n=2 • No response; n=9
Presence of frameworks, policies, or guidelines in the facility or jurisdiction, to guide the care of individuals with ABI	• Yes; n=10 • No; n=6 • No response; n=6

[a] multiple choice was possible for this answer.

Table 4: Organizations Represented by Survey Respondents

Province / Territory	Organization Represented by Survey Respondents
Saskatchewan[a]	• Saskatchewan Ministry of Health
Alberta[b]	• Government of Alberta • Blue Heron Support Services Association
Ontario[c]	• Ontario Brain Injury Association • Mackenzie Health • Connect-Communities • Local Health Integration Networks • March of Dimes • Brain Injury Services
British Columbia	• Bill's Place Support Services

[a] one respondent from Saskatchen did not indicate the organization they represented
[b] three respondents from Alberta did not indicate the organization they represented
[c] three respondents from Ontario did not indicate the organization they represented

Appendix 3: Identified Programs Available in Canada

Table 5: Programs Identified by Survey Respondents, Available in Canada for Care of Acquired Brain Injury in People Experiencing Concurrent Mental Health and/or Substance Use Disorders

Jurisdictional availability	Organisation or program name	Services Offered	Source of funding	Program is specific to acquired brain injury	Integrates mental health and/or substance use care
AB	Alberta Brain Injury Supports[38]	• Service coordination	• Publicly or provincially funded	Yes	No
AB	Calgary Brain Injury Program[39]	• Service coordination	• Locally funded	Yes	Yes
AB	Halvar Jonson Centre for Brain Injury;[40] Centennial Centre for Mental Health and Brain Injury	• Inpatient long-term rehabilitation	• Locally funded	Yes	No
AB	Pediatric Brain Injury Rehabilitation Program;[41] Glenrose Rehabilitation Hospital	• Follow-up assessment and monitoring of rehabilitation	• Locally funded	Yes	Yes
AB	Supported Community Living;[42] Blue Heron Support Services Association	• Overnight, in-home support • Living Independently For Everyone (LIFE) program (e.g., community access, employment support, recreation, children's service) • Caregiver respite • Service coordination • Support groups	• Publicly or provincially funded • fundraising	No	Yes
BC	Bill's Place Support Services[43]	• Residential support • Transitional support • Supported independent living • Mentorship program	• Locally funded • Private	Yes	Yes
BC, ON	CONNECT Communities[44]	• Residential condo program • Therapy (e.g., nursing, occupational therapy, physiotherapy, speech language pathology, medicine) • Outreach program (CONNECT at home)	• Private	Yes	Yes

ON	Acquired Brain Injury Behaviour Service,[45] West Park Healthcare Centre	• Inpatient rehabilitation (e.g., rehabilitation therapy, social work, psychological, physiotherapy, occupational therapy) • Community outreach behavioural rehabilitation	• Publicly or provincially funded	Yes	NR
ON	Brain Injury Association Peterborough Region[46]	• Case management • Community support services (e.g., planning for living arrangements, support of independent living, referring to community services) • Day services (e.g., recreation, learning) • Peer support • Transitional support • System navigation	• Publicly or provincially funded • Both public and private	Yes	No
ON	Brian Injury Services Muskoka Simcoe[47]	• Adult day services (e.g., socialization, brain education and exercise, health wellness, caregiver respite) • Community programs (e.g., return to school/work/leisure, increasing independence, transitional support)	• Publicly or provincially funded	Yes	No
ON	Community Head Injury Resource Services[21]	• Adult day services (e.g., social, recreation, and skill building programs) • Clinical groups (e.g., dialectical behavior therapy, cognitive compensation technologies for ABI, living well with a brain injury, positive psychology, substance abuse and brain injury) • Community Support Services (e.g., medical management, household management, employment support, neurobehavioural intervention) • Residential services • Neuropsychological and neuropsychiatric services	• Locally funded • Fee-for-service	Yes	Yes
ON	Hamilton Brain Injury Association[48]	• Support groups • Community programs (e.g., prevention education, recreational, peer support mentoring, caregiver and family support)	• Publicly or provincially funded	Yes	No
ON	Head Injury Rehabilitation Ontario[49]	• Residential services • Community services (e.g., skill training, crisis management, referral to community resources, recreation, clinical services)	• Publicly or provincially funded • Locally funded • Private • Both public and private	Yes	No

			• Patient out-of-pocket or third party		
ON	Inpatient ABI program,[22] Hamilton Health Sciences	• Neurobehavioural rehabilitation service for individuals with ABI and complex behavior and/or mental health issues • Community reintegration program • Slow to recover program	• NR	Yes	Yes
ON	March of Dimes Canada[50]	• Case management • Rehabilitation • Attendant care • Programs (e.g., daily living skills, communication, community orientation and integration, emotional and behavioural support, life skills training, vocational support, recreation opportunities)	• Publicly or provincially funded • Fee-for-service	Yes	Yes
ON	North Simcoe Muskoka Acquired Brain Injury Collaborative[51]	• In-home rehabilitation support and/or nursing • Specialized clinical services to support community integration • Support for independence and community integration • Peer support and socialization opportunities	• Publicly or provincially funded • Locally funded	Yes	Yes
ON	Ontario Brain Injury Association[16]	• Helpline (e.g., patient support, caregiver support, referral to community services) • Online concussion support group • Online caregiver support group • Peer support program	• Foundational grant • Both public and private • Locally funded	Yes	Yes (program dependent)
ON	Outpatient neurological rehabilitation;[52] Southlake Regional Health Centre	• Hospital-based outpatient rehabilitation program	• Publicly or provincially funded	No	NR

ON	Regional Rehabilitation Centre;[53] Hamilton Health Sciences	• Inpatient
		  ○ Neurobehavioural rehabilitation service
		  ○ Community reintegration program
		  ○ Slow to recover program
		• Outpatient
		  ○ Neurology, physiatry, neuropsychology
		  ○ Outreach service (e.g. rehabilitation therapist)
		  ○ Crisis management
		• Community services (e.g., rehabilitation therapy, neuropsychological assessment, neuropsychological counseling)
			• Publicly or provincially funded	Yes	NR

ON	Toronto ABI network[17]	• Referral to inpatient programs	• NR	Yes	Yes

		• Referral to outpatient ambulatory care programs • Referral to community-based services (e.g., mental health, recreational, vocational and supportive housing programs)			
ON	Toronto Rehabilitation Institute;[54] University Health Network	• Telephone follow-up supporting community transition post ABI rehab	• Foundational grant	Yes	NR
ON	York-Simcoe Brain Injury Services,[55] (a partnership between Mackenzie Health's Centre for Behaviour Health Sciences and March of Dimes Canada)	• Case management • Rehabilitation support • Adult day program (not ABI specific)	• Publicly or provincially funded • Locally funded	Yes (program dependent)	Yes
SK	ABI Partnership Project[56]	• 36 programs (e.g., support services, community residential program, injury prevention, case management, rehabilitation, therapy, vocational training, education, crisis management service, employment support, life enrichment) • Service coordination	• Both public and private • Fee-for-service	Yes (program dependent)	No
SK	Acquired brain Injury programs;[57] SaskAbilities	• Community support (e.g., independent living assistant, community referrals, recreation) • Aboriginal community support	• NR	Yes	NR
SK	Life Without Barriers;[58] Society for the Involvement of Good Neighbours	• In-home support (e.g., home management, financial assistance, accommodation assistance, personal care, medication management, nutritional assistance, cognitive growth, system navigation) • Community support • Group support	• NR	Yes	NR
SK	Lloydminster & Area Brain Injury Society[59]	• Life enrichment program (e.g., recreational and social activities) • Outreach service • Support groups • Referrals to community services (e.g., medical, transportation, employment, counselling) • Public awareness (e.g., prevention education)	• Both public and private	Yes	No
SK	Outpatient Therapy;[60] Saskatchewan Health Authority	• Outpatient therapy (e.g., occupational therapy, physical therapy, speech and language pathology services)	• Publicly or provincially funded	Yes	No
SK	Pearl program;[61] Phoenix Residential Society	• On site supported living (e.g., supervision, interpersonal skills, wellness skills, physical health management, medication management)	• NR	Yes	NR

		• In-home support			
SK	Rehabilitation Day Service;[62] Saskatoon City Hospital	• Outpatient therapy: occupational therapy, physical therapy, recreation therapy, speech and language pathology services	• Publicly or provincially funded	No	No
SK	Saskatchewan Association for the Rehabilitation of the Brain Injured[63]	• Psychosocial rehabilitation • Recreation services	• Both public and private	Yes	Yes
SK	Stroke Rehabilitation Clinic;[64] Battlefords Union, Prairie North, and Meadow Lake Hospitals	• Rehabilitation (e.g., physiotherapy, occupational therapy, speech and language therapy, chronic disease nurse) • Case coordination • Dietetics • Social work	• Locally funded	Yes	No

AB = Alberta; ABI = acquired brain injury; BC = British Columbia; NR = not reported; ON = Ontario; SK = Saskatchewan.

This list of programmes is based on information provided by Canadian stakeholders who participated in the survey. This list is not comprehensive, and this information is subject to change as the field develops.

Table 6: Jurisdictions offering types of inpatient services for individuals with ABI

Type of inpatient services	Jurisdictional availability			
	AB[a]	BC[a]	ON[b]	SK[c]
Clinical nutrition		X	X	X
Holistic services		X	X	
Clinical pharmacy			X	X
Nursing		X	X	X
Occupational therapy			X	X
Physiotherapy			X	X
Physiatry				X
Speech-language pathology			X	X
Case management	X	X	X	
Online services or modules		X		
Recreation therapy	X	X	X	X
Individualized programming for patients	X	X	X	
Social services		X	X	
Spiritual services		X		
Other: 1. Behavioural supports, personal care			X	

AB = Alberta; ABI = acquired brain injury; BC = British Columbia; ON = Ontario; SK = Saskatchewan.

Notes:
[a] one respondent respresented from that jurisdiction
[b] compilation of seven responses from that jurisdiction
[c] compilation of five responses from that jurisdiction

Table 7: Jurisdictions offering types of outpatient services for individuals with ABI

Type of inpatient services	Jurisdiction availability			
	AB[a]	BC[a]	ON[b]	SK[c]
Clinical nutrition			X	X
Holistic services			X	
Clinical pharmacy				X
Nursing			X	X
Occupational therapy		X	X	X
Physiotherapy		X	X	X
Physiatry		X		X
Speech-language pathology		X	X	X
Case management	X		X	X
Online services or modules			X	
Recreation therapy	X		X	X
Individualized programming for patients			X	X
Social services			X	X
Spiritual services				
Other: 1. Behaviour consultant and neuropsychiatry			X	

AB = Alberta; ABI = acquired brain injury; BC = British Columbia; ON = Ontario; SK = Saskatchewan.

Notes:
[a] one respondent respresented from that jurisdiction
[b] compilation of seven responses from that jurisdiction
[c] compilation of five responses from that jurisdiction

Table 8: Criteria that patients must meet to access ABI services or programs by jurisdictions

Criteria	Jurisdictions			
	AB[a]	BC[a]	ON[b]	SK[c]
Referral from physician or other health care provider	X	X		
Assessment or criteria (e.g., evaluation, checklist)	X	X	X	X
Severity of ABI diagnosis	X	X		X
Time of ABI diagnosis	X	X	X	X
Other; Presence of an ABI diagnosis	X		X	

Other; Demographics (e.g., age, location)			X	
Other; Attempting substance use sobriety				X

AB = Alberta; ABI = acquired brain injury; BC = British Columbia; ON = Ontario; SK = Saskatchewan.

Notes:

[a] one respondent respresented from that jurisdiction

[b] compilation of seven responses from that jurisdiction

[c] compilation of five responses from that jurisdiction