

## ENVIRONMENTAL SCAN

# Funding and Access to Assistive Technologies – Electronic Aids to Daily Living: An Environmental Scan



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## 24 Abbreviations

25	<b>ALS</b>	amyotrophic lateral sclerosis
26	<b>AT</b>	assistive technology
27	<b>ATC</b>	assistive technology centre
28	<b>ATDC</b>	Assistive Technology Device Classification
29	<b>CAYA</b>	Communication Assistance for Youth and Adults
30	<b>CHD</b>	central hospital districts
31	<b>DAT</b>	<i>Domotica, Ausili, Terapia occupazionale</i> (i.e, "Smart Home, Assistive Technology, and Occupational Therapy")
32	<b>EADL</b>	electronic aid to daily living
33	<b>ES</b>	Environmental Scan
34	<b>FTE</b>	full-time equivalent
35	<b>GATE</b>	Global Cooperation on Assistive Technology
36	<b>HAAT</b>	Human, Activity, Assistive Technology Model
37	<b>ICF</b>	International Classification of Functioning, Disability and Health
38	<b>MND</b>	motor neurone disease
39	<b>MPT</b>	Matching Person and Technology
40	<b>NDIS</b>	National Disability Insurance Scheme
41	<b>OT</b>	occupational therapist
42	<b>SLP</b>	speech language pathologist
43	<b>TIL</b>	Technology for Independent Living
44	<b>WHO</b>	World Health Organization

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## Summary

- The overall objectives of this Environmental Scan were to identify and describe the essential components of an electronic aid to daily living (EADL) assistive technology (AT) program, circumscribe barriers and facilitators to equitable access, and identify and describe funding mechanisms. A literature search and stakeholder consultations informed this Environmental Scan.
- There is no clear definition of EADL that emerged from the literature or consultations.
- The majority of included publications generally discussed AT devices and service provision, with a lack of availability of information specific to EADL devices.
- User-centred approaches that are anticipatory of user needs in AT service delivery provision was noted in the literature as key to facilitating effective AT service delivery.
- Barriers to providing equitable access to EADLs include lack of awareness by both health professionals and users of AT devices and services, shortage of trained professional staff to provide individual supports, affordability and access to ATs, and limited user participation in decision-making with professionals in selecting ATs.
- Funding mechanisms and eligibility criteria vary between jurisdictions with limited integration of funding available for EADLs and modified consumer product technologies.

## Context

Electronic Aids to Daily Living (EADLs) are a category of assistive technologies (ATs) that include a range of devices that are used within the home to allow individuals with physical impairments to control their home environment, have improved independence and safety, and have more access to the community. Other names that are sometimes used to refer to EADLs include environmental control units, environmental control systems, and, more recently, electronic assistive technologies.<sup>1,2</sup> The implementation of EADLs can be a collection of assistive devices that are integrated and controlled through a main computer-based system or a single device that functions and is controlled on its own. In general, EADLs can be adapted to the user's need and based on their physical limitations to facilitate device operation, ensure proper functionality, and enable effective control of the environment.<sup>1</sup> Specifically, EADLs perform a variety of functions which are often grouped into these broad categories:

- Emergency call system (e.g., local buzzer system, smart phone)
- Home control (e.g., lights, thermostat, blinds, audiovisual equipment) (speech generating devices may fall under this category if their function/purpose is home control)
- Access and egress from home (e.g., through customized buttons/switches, smart phone)

A fourth category that is sometimes included under EADLs are technologies that enable access to the external world from your home (e.g., email, social media, online banking through a computer or tablet).

In the 2017 Canadian Survey on Disability, 1 in 5 Canadians (or 6.2 million people) aged 15 years and over reported living with 1 or more disabilities that limited their daily activities.<sup>3</sup> Of those, 43% had a disability classified as severe or very severe that restricted, to varying degrees, their ability to perform their daily routines.<sup>3</sup> In 2012, more than 80% of Canadians living with a disability reported using at least 1 aid or assistive device to undertake daily activities and enable social participation.<sup>4</sup> While a proportion of those assistive devices are likely EADLs, there is a lack of data regarding usage of, and need for, EADLs among people in Canada living with disabilities.

Assistive technologies are paid for in a variety of ways in Canada and internationally, including through public funding, third-party insurance, charity, out-of-pocket payment, or a combination of these methods.<sup>5,6</sup> Publicly-funded AT programs tend to vary widely in terms of their structure, eligibility criteria, and the assistive devices funded.<sup>5,6</sup> In this context, there is a need to understand how different jurisdictions deal specifically with the EADL category.

This Environmental Scan is being conducted to gather information on Canadian and international programs that provide access to EADLs to individuals with physical disabilities. The main purpose of this report is to identify and describe how assistive technology programs in various jurisdictions are organized (e.g., essential personnel, service structure, device maintenance, reassessment programs), funded, and approach funding decisions for clients and EADL devices alike.

## Objectives

The key objectives of this Environmental Scan are as follows:

1. Identify and describe the essential components of an EADL assistive technology program – including essential team members, service structure, device maintenance and reassessment programs, etc.
2. Identify barriers and facilitators to providing equitable access to assistive technologies.
3. Describe how other jurisdictions fund assistive technology programs – including funding mechanisms, eligibility criteria, type of devices covered, extent of coverage (i.e., full or partial), etc., for EADL devices.
4. Describe how other jurisdictions make funding decisions regarding coverage of basic and essential assistive technology devices, including identifying and analyzing the key factors and considerations that determine an essential EADL.

This Environmental Scan does not include an assessment of the clinical or cost-effectiveness of the technology area. As such, conclusions or recommendations about the value of EADLs are outside the scope of this report.

## Research Questions

1. What are the essential components of an EADL assistive technology program – including essential team members, service structure, device maintenance and reassessment programs, etc.?
2. What are the barriers and facilitators to providing equitable access to assistive technologies?
3. What programs and funding practices – including funding mechanisms, eligibility criteria, type of devices covered, extent of coverage (i.e., full or partial), etc., -- are in place in different Canadian and international jurisdictions for providing access to EADLs?
4. What criteria, factors, and considerations do Canadian and international jurisdictions use to make funding decisions regarding coverage of basic and essential EADL devices?

## Methods

The findings presented in this Environmental Scan are informed by a limited literature search and consultations with key informants from selected Canadian rehabilitation and social programs. Table 1 outlines the criteria for information gathering and selection.

### Literature Search

A limited literature search was conducted by an information specialist on key resources including MEDLINE All (1946– ) 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 electronic aids for daily living and physical disabilities. No filters were applied to limit the retrieval by study type. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 01, 2015 and February 12, 2020. An update of the literature search was run on December 07, 2020, to capture new research published after the initial search.

Additionally, a supplemental search was conducted in MEDLINE to locate publications from select countries. The main search concepts were electronic aids for daily living and Australia, New Zealand, Denmark, Sweden, Norway, Finland, Iceland, and Greenland. The search was also limited to English language documents published between January 01, 2015 and January 14, 2021. No filters were applied to limit the retrieval by study type.

**Table 1: Components for Literature Screening and Information Gathering**

<b>Population</b>	Adults with physical disabilities that limit mobility and functioning (e.g., spinal cord injury, neuromuscular disorder)
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<b>Intervention</b>	Electronic assistive technologies, including specialized EADL devices and mainstream consumer products that are used in the home environment and aimed at providing individuals with physical impairments with enhanced control, functionality, independence, safety, and access to the community. Examples of relevant technologies include: <ul style="list-style-type: none"> <li>• emergency call systems,</li> <li>• customized systems to control audiovisual equipment, lights, door locks, blinds, fans, appliances, home climate, etc.,</li> <li>• systems and devices to facilitate entry and exit from the home,</li> <li>• technologies that enable access to the external world from your home (i.e., email, social media, online banking through a computer or tablet),</li> <li>• mainstream smart home products such as smart speakers.</li> </ul>
<b>Settings</b>	Personal home environments
<b>Types of Information</b>	Literature search

EADL = Electronic Aid to Daily Living

## Screening and Study Selection

Literature identified through database searching was screened for relevance (see Table 1) by one author. In the first level of screening, titles and abstracts were reviewed and the full texts of potentially relevant articles were retrieved. The final selection of full-text articles was based on their relevance in answering the four research questions.

## Consultations

Targeted consultations with key Canadian stakeholders were conducted between November 23, 2020 and December 17, 2020. The purpose of these consultations was to fill knowledge gaps identified following a review of the literature. Consultation contacts were identified by CADTH Liaison Officers, through stakeholder suggestions, and other available networks. Pre-planned consultation questions were developed (Appendix 1), and the consultations were conducted in the form of semi-structured one-on-one interviews using an online video conferencing platform. Consultation recordings were subsequently transcribed for analysis. Informants were not limited to any particular profession; however, they comprised mostly of clinicians (e.g., occupational therapists [OTs]) and academic researchers involved in the provision of care to individuals requiring EADLs in relevant health care facilities and settings.

Consultation discussions were guided by four core questions on the funding and components of EADL programs and the barriers and facilitators impacting equitable access to ATs.

## Synthesis Approach

Informants were asked for consent to include their responses, in aggregate or direct quotation form, in the report. Responses were analyzed according to the objectives of this Environmental Scan. In the case of multiple informants from one organization, all responses were included. Conversations were summarized and categorized using thematic analysis.

Findings from the literature search are incorporated to consultation results, where possible, and summarized within relevant sections of the report.

## Stakeholder Feedback

The results of the consultations and literature search were presented in the form of a draft report that was posted on the CADTH website to elicit stakeholder feedback. Relevant stakeholder feedback *will be* incorporated into the final version of the Environmental Scan based on input received.

# Findings

## Summary of Information Sources

157 The findings presented are based on a limited literature search, an update to the main literature search, a country specific  
158 supplemental search, and consultations.

## 159 Main Search

160 The literature searches yielded 546 citations. After screening titles and abstracts, 434 citations were excluded and 112 potentially  
161 relevant reports from the electronic search were retrieved for full-text review. Additionally, 15 potentially relevant publications were  
162 retrieved from the grey literature search. Of these 139 potentially relevant articles, 27 articles were deemed eligible to address the  
163 research questions. Literature was excluded after full-text review, because the individual articles either did not answer the research  
164 questions or did not meet the inclusion criteria for population, intervention, or setting. The majority of included publications generally  
165 discussed AT devices and service provision, with a lack of availability of information specific to EADLs devices.

## 166 Update Search

167 The update to the main literature search yielded 98 citations. After screening titles and abstracts, 87 citations were excluded and 11  
168 potentially relevant reports from the electronic search were retrieved for full-text review. Additionally, 1 potentially relevant publication  
169 was retrieved from the grey literature search. Of these 12 potentially relevant articles, 4 articles were deemed eligible to address the  
170 research questions. Literature was excluded after full-text review, because the individual articles either did not answer the research  
171 questions or did not meet the inclusion criteria for population, intervention, or setting.

## 172 Country Specific Search

173 The country specific literature searches yielded 38 citations. After screening titles and abstracts, 35 citations were excluded and 3  
174 potentially relevant reports from the electronic search were retrieved for full-text review. Of these 3 potentially relevant articles, none  
175 were deemed eligible to address the research questions. Literature was excluded after full-text review, because the individual articles  
176 either did not answer the research questions or did not meet the inclusion criteria for population, intervention, or setting.

## 177 Consultations

178 Findings are also based on consultations with key informants held in November and December 2020, representing 4 Canadian  
179 provinces (i.e., Alberta, Manitoba, New Brunswick, and Nova Scotia), 1 Federal health care plan, and 2 academic researchers.  
180 Consultations were not held with informants from the remaining provinces, territories, and federal health care plans, owing to a lack  
181 of identified stakeholders in these jurisdictions, which is acknowledged as a limitation to this report.

182

## 183 Objective 1 - Essential Components of an EADL Assistive Technology Program

184 This objective was addressed by research question 1 based on findings from the literature and consultations.

## 185 Essential Team Members and Skills

186 In high resource settings, AT personnel include physiotherapists, OTs, physical and rehabilitation medicine specialists, and speech  
187 language pathologists (SLPs), with AT provision comprising a part of the focus of their profession.<sup>7</sup> Professionals including  
188 rehabilitation engineers, orthotists/prosthetists, and other AT professionals may focus on AT service provision.<sup>7</sup> The literature  
189 suggests that OTs and SLPs are central in AT service provision, assessment, and delivery, particularly for assessing technology  
190 access, seating, cognitive and visual issues, and the capacity to operate the device.<sup>8,9</sup> Consultations revealed that this was reflected  
191 in Canadian practice. One informant from an AT program at a tertiary rehabilitation hospital,<sup>10</sup> with an approximate 500 client per  
192 year case load, reported their team was formed of 16 individuals of the following professions: OT, SLP, SLP assistant, teacher  
193 (mainly for children), biomedical technician, and a biomedical engineer, all of whom contribute 10 full-time equivalents (FTE) total.

194 Another informant from an AT communication devices program at a rehabilitation and long term care centre,<sup>11</sup> reported their team  
195 included 1.0 FTE each of an SLP, OT, rehabilitation assistant, electronics technologist, administrative assistant, and a program  
196 coordinator.

197 One informant from the AT services of a provincial tertiary rehabilitation facility specialised in neurological conditions,<sup>12</sup> described the  
198 team as having 1.2 FTE of OTs, 1.0 FTE of rehabilitation engineer, 0.5 FTE of SLP, and a recreation therapist (FTE not reported). In



199 this particular team, the recreation therapist assists with adaptive video gaming while the rehabilitation engineer performs equipment  
200 modifications and 3-dimensional prints of custom parts such as joysticks and paddles.

201 Two informants from the AT services of a provincial tertiary rehabilitation centre,<sup>13</sup> with an approximate 500 client per year case load,  
202 reported their team having an OT (FTE not reported), 1.0 FTE of rehabilitation engineer, 0.6 FTE of OT assistant, and a SLP (FTE  
203 not reported).

204 From the perspective of a Federal health care plan, the people involved in case evaluation and reimbursement decisions include  
205 OTs, nurses, physicians, and case managers (FTE not reported).

206 In line with the literature, two academic researchers indicated that essential team members would generally comprise OTs, SLPs,  
207 SLP assistants, physical therapists, biomedical engineer, and other health professionals depending on the type of characteristics of  
208 the clientele.

209 A high level of professional skills and knowledge for AT service and delivery is needed to provide individually tailored AT solutions.<sup>8</sup>  
210 Therapists and health professionals need to know the AT devices available (both “specialized” and “consumer” products) and local  
211 funding systems, how devices can be adapted for individuals with various progressive and functional limitations, how the AT device  
212 interacts with a user’s concurrent interventions, and how to assess user needs and outcomes.<sup>8,9</sup>

213 It was noted in the consultations that many health professionals are not sufficiently skilled to manage the AT needs of individuals with  
214 chronic conditions, which is echoed in the literature with the particular example of motor neurone disease (MND).<sup>8,9</sup> Non-formal and  
215 formal education, mentoring, and training by experienced AT users can build the capacity of novice users, providers, and  
216 professionals for AT provision.<sup>7</sup> A user-centred approach and continuing education opportunities by and for professionals providing  
217 AT allow for specialization and addressing of various community needs.<sup>7</sup> Trained AT advisors increase AT awareness, access, and  
218 service delivery, as quality of training, consideration of user perspectives, AT device set-up, and follow-up are determinants of  
219 continued AT device usage by users.<sup>8,14</sup> In particular, professionals who can provide independent support and advice through  
220 independent expertise centres, instead of those directly linked to manufacturers of AT products or a commissioning body, are  
221 favorably positioned to increase AT awareness.<sup>8</sup> An example of a network of these centres can be found in Italy, which could serve  
222 as a model for other jurisdictions.<sup>8</sup> Aside from these professionals, others that may be involved include pharmacists, community  
223 nurses, community and social workers, and in-home service providers, and where not available, non-professionals who are  
224 supported by online information and tools.<sup>8,15</sup> Professionals’ training and competencies, and user involvement positively impact  
225 outcomes of service delivery provision.<sup>16</sup>

## 226 Service Structure

227 The service delivery process is a key element of AT provision – it is the process an individual goes through to obtain an AT device  
228 that meets their needs.<sup>8</sup> Current models of delivery for AT services are usually reactive with little attention placed on anticipatory  
229 needs.<sup>7</sup> Outlined in the literature were seven steps for service delivery provision to achieve the desired functional outcome for AT  
230 users: 1) initiative (first point of contact), 2) assessment (evaluating user needs), 3) typology (choosing an appropriate AT solution),  
231 4) selection (selecting specific devices), 5) authorization (obtaining funding), 6) delivery (getting the AT device to the user), and 7)  
232 follow-up and management (continuing support).<sup>7,8,16</sup> Many of these steps were echoed by consultation informants, including one  
233 informant from an AT program at a tertiary rehabilitation hospital,<sup>10</sup> who indicated that clients access the service through a health  
234 care provider referral or by referring themselves. The individual would initially be assessed by an OT, followed by a cognitive  
235 assessment (as it applies for use of the technology) performed conjointly by an OT and SLP, and finally the SLP would do a  
236 language and communication assessment before a device would be selected.

237 Another informant from an AT communication devices program at a rehabilitation and long term care centre,<sup>11</sup> reported that a SLP or  
238 other health care professional would need to refer the client to the program for assessment and service provision. If needed, staff will  
239 travel to remote communities to provide services. The transition of services at age 65 is relatively seamless for this program, which  
240 does not seem to be the norm elsewhere where funding ceases and new sources have to be identified. In contrast, literature findings  
241 did not discuss age-related changes to services.

242 Two informants from the AT services of a provincial tertiary rehabilitation facility,<sup>12</sup> described their program as being specifically for  
243 clients with a neurological condition or upper amputations. Clients are referred to the facility by their community physician, health  
244 care provider, or can self refer. Referring providers may include notes suggesting the client would benefit from seeing the AT team.  
245 An initial intake takes place with a physiatrist who may recognise a need for the client to be assessed by the AT team. Otherwise,

once a client is admitted to the facility, a clinician would need to recognise that the client has an unmet need and would then arrange a consultation for assessment and service provision by the AT team.

Similarly, two informants from the AT services of a provincial tertiary rehabilitation centre<sup>13</sup> indicated that clients are referred to their program from the facility's psychiatry clinic. An assessment would follow, then device selection, securing funding, device delivery, and ongoing monitoring.

From the perspective of a Federal health care plan, plan members would generally consult their local health care provider for an initial assessment. If a recommendation or prescription for an EADL occurs, the plan administrator would assess the request and initiate a comprehensive in-home assessment to understand the functional needs of the plan member and to determine the best intervention to address those needs.

Additionally, one academic researcher provided information on two British Columbia AT programs. Firstly, the Technology for Independent Living (TIL) program,<sup>17</sup> which provides EADL to individuals with severe physical disabilities upon referral from a community health care practitioner. The individual then has their needs and environment assessed prior to service provision. Secondly, the Communication Assistance for Youth and Adults (CAYA) program,<sup>18</sup> which provides augmentative or alternative communication systems, which may include EADL features, to individuals with severe communication disability. Individuals can self refer or be referred by a health care professional.

Overall, consultations and the literature findings revealed that effective and optimal AT service provision includes: awareness by professionals and end-users of AT devices and solutions; procedures and policies for funding mechanisms and eligibility decision-making; professional support, advice, and follow-up services; good quality products at affordable prices; training on using AT devices; and infrastructure for repairs and maintenance.<sup>8</sup>

Awareness of AT solutions includes provision of information through evidence-informed AT databases on the existence of specific AT products and their usability, effectiveness, availability, and quality.<sup>8</sup> Numerous countries have databases to provide updated and validated information on services and devices.<sup>19</sup> In Europe, the European Assistive Technology Information Network search engine was established to connect websites from multiple European countries to make information on AT products publicly available to professionals and end users.<sup>8</sup> In Australia, there is a similar database that exists called the National Equipment Database, and the USA has a database called AbleData.<sup>8</sup> However, maintenance of the sites is challenging.<sup>8</sup> No such database was identified within Canada; however, our searches and consultations were not exhaustive. The World Health Organization (WHO) Priority Assistive Products List can be a starting point for developing a national information system.<sup>8</sup> The incorporation of self-management and peer mentoring into the provision of AT services and devices is important to a user-centred approach.<sup>19</sup>

## Service Delivery Systems in Other Jurisdictions

Information on service delivery systems in other jurisdictions was identified in the literature for Australia, Finland, Italy, Norway, the Republic of Korea, and Sweden.

### *Australia*

Funding for assistive devices is part of the National Disability Insurance Scheme (NDIS),<sup>20</sup> which provides assistance to people with permanent and significant disability, by helping them achieve their goals, participate in daily life, and choose their own supports and services.<sup>21</sup> To be eligible, an individual must be aged less than 65 years, reside in Australia, and satisfy one of the disability requirements set out in the NDIS Act.<sup>21</sup> The individual consults with their local state health services for an initial assessment and diagnosis of disability and rehabilitative health services.<sup>21</sup> State-level health care services also provide specialist, rehabilitation, and other therapies jointly with the NDIS.<sup>21</sup> If the person would benefit from AT supports, they are referred to the National Disability Insurance Agency, which implements the NDIS, who conducts an eligibility assessment to develop a support plan.<sup>21</sup> The NDIS uses the WHO definition of AT,<sup>21</sup> which is: "[...] any device or system that allows individuals to perform tasks they would otherwise be unable to do or increases the ease and safety with which tasks can be performed"<sup>22</sup>

### *Finland*

In Finland, there are 20 central hospital districts (CHD) varying from 45,000 to 1.5 million residents, each with their own guidelines for lending AT devices, which were developed with the Ministry of Social Affairs and Health and the National Institute of Health and Welfare.<sup>23</sup> The guidelines set out ground rules for AT process, legislation interpretation, and service provision.<sup>23</sup> AT Service Centres in the hospital districts maintain the rules and guidelines, with some CHDs harmonizing their rules.<sup>23</sup> In 2017, the Ministry was in the

process of creating national rules for AT services collated from each CHD, which address a user's function and participation, what is classified as an AT device versus a device users can buy themselves, and the standards that AT devices need to meet.<sup>23</sup>

## Italy

In Milan, the *Domotica, Ausili, Terapia occupazionale* (DAT) (i.e., "Smart Home, Assistive Technology, and Occupational Therapy") service offers a comprehensive rehabilitation process, which includes individual AT counselling, OT training, and education to become independent AT users.<sup>24</sup> The service integrates experience from the Assistive Technology Information and Assessment Service.<sup>24</sup> The methodology for AT counselling involves a counselling request from the clients' physician or therapist, caregivers, or the client themselves.<sup>24</sup> The DAT service prepares information for the assessment, professionals with appropriate competencies are selected and discuss the strategy for intervention, AT devices are identified for trial, DAT professionals complete the assessment together with clients to identify priorities and the most appropriate solution based on the AT device trials.<sup>24</sup> After the assessment, conclusions are made by the team with documentation provided to clients.<sup>24</sup> A team technician also provides support for assembly and personalization of the AT solution if needed after the AT device is obtained by the client.<sup>24</sup> Medical professionals then verify the compliance of the system with prescriptions and other specifications and may prescribe training sessions led by a therapist if needed.<sup>24</sup> User satisfaction with the AT solution and services are completed using instruments such as Quebec User Evaluation of Satisfaction with Assistive Technology (see Table 3).<sup>24</sup>

## Norway

One literature article included a case study on Norway. Although EADLs are not discussed explicitly, they appear to be included in the author's definition of AT, which encompasses "any product (including devices, equipment, instruments, and software) either specially designed and produced or generally available [...]".<sup>25</sup> Norway has a unified national system for AT that addresses users functional/practical daily problems.<sup>25</sup> This includes legislation for no cost access to necessary and appropriate AT, providing users with the same services regardless of location, involving user participation in the system, and emphasizing a focus on the individual.<sup>25</sup> Additionally, the system established a common information and communications technology system for registration of purchases, distribution, repairs and regular servicing, and refurbishing of AT.<sup>25</sup> Structurally, there are 18 Assistive Technology Centres (ATC), one in each county coordinating their local AT activities, serving as referral centers and working with rehabilitation and health services to address functional/practical daily problems of users.<sup>25</sup> The ATC have personnel such as engineers/technicians, opticians, speech therapists, physiotherapists, and OTs with expert knowledge who give guidance to local authorities.<sup>25</sup> The municipalities have the responsibility of AT product provision, with trained professionals, often physiotherapists and OTs, responsible for assessing and identifying user needs, recommending and providing AT products, and conducting follow-up with users.<sup>25</sup> In the national AT system there are national competence centres that have distinct expertise areas, which ATCs can contact. Norway has national agreements with suppliers and retailers of AT products, from which ATCs purchase and distribute AT products to the municipalities.<sup>25</sup> The country also recycles a substantial portion of their AT products as a cost-saving approach.<sup>25</sup>

## Republic of Korea

In the Republic of Korea, the AT service delivery system is comprised of 1 National Assistive Technology Centre and 8 State-based Assistive Technology Centres, with a goal to have 16 state-based centres for a nationwide system.<sup>26</sup> Each state-based centre manages the local Regional Assistive Technology Centre. The majority of ATCs are established at existing institutes and rehabilitation hospitals and centres including the National Rehabilitation Research Institute.<sup>26</sup> ATCs run call centres, websites, and social media to provide information on AT funding sources and devices to clients.<sup>26</sup> Individualized AT services are available through the ATCs, with quality control of delivery occurring through service manuals.<sup>26</sup>

## Sweden

The Swedish state has been funding ATs since 1968.<sup>27</sup> Access is widespread with ATCs located in all counties throughout the country,<sup>28</sup> and most ATs are funded by the government.<sup>29</sup> Devices can be prescribed by OTs, SLPs, physiotherapists, or nurses, following a process of assessment, selection, adaptation and implementation, education and training, and follow up and evaluation.<sup>27</sup> Furthermore, AT use is recorded in an individual's medical health record.<sup>28</sup> In 2007 Sweden started a pilot project to increased client's freedom of choice in the selection of their device.<sup>27</sup> Following a prescription, and with sufficient knowledge and experience to make a free choice, the user is given a voucher valued at the maximum amount the ministry of health will allow for the particular type of approved AT. The client is then free to chose the device, responsible for its purchase, and responsible for additional costs if the chosen AT exceeds the voucher value.<sup>27</sup>

## Organizations, Frameworks, Tools, and Criteria for Assistive Technology Service Provision

Six consultation informants from 3 Canadian provinces (Alberta, n = 1; Manitoba, n = 1; New Brunswick, n = 2), 1 Federal health care plan, and 1 academic researcher provided information on organizations, frameworks, tools, and criteria for AT service provision.

One informant from an AT program at a tertiary rehabilitation hospital,<sup>10</sup> indicated that AT services are provided to individuals if they have a communication need that fits within the capability of the AT program. Due to the large geographic area served by the program and limited resources, support with the initial set up and ongoing troubleshooting of EADL technologies is not available to those in the program. In order to access EADLs, an individual must have someone in their environment for that initial set up and ongoing device assistance, of particular relevance for those in remote settings. Furthermore, the organization uses a “managed waitlist”, such that clients with deteriorating conditions are moved up the queue.

Another informant from an AT communication devices program at a rehabilitation and long term care centre,<sup>11</sup> reported that individuals are eligible for service if they have a severe communication disorder (i.e., where speech alone does not meet their daily communication needs). Additional eligibility criteria for service provision include being 18 years of age or older and residing in the province of Manitoba, which includes First Nations. Individuals must demonstrate that the equipment would be of benefit to them, and that they (or someone in their environment) can care for the equipment. Formal evaluation tools offer limited application with regard to communications devices; hence, the needs of users are assessed through informal interviews, observation, and questionnaires. Modified assessment tools are generally preferred by SLPs, who can tailor the tool to the case at hand.

Two informants from the AT services of a provincial tertiary rehabilitation facility,<sup>12</sup> described that individuals are eligible for services if they have a neurological condition or upper amputation. Team members utilise a holistic and functional based approach, to assess how they can improve the individual’s function and quality of life and the individual must demonstrate a willingness and motivation to engage with the proposed AT solution. Depending on the diagnosis some standardized assessment tools may be used (e.g., spinal cord injury independence measure, Measure of Control using Electronic Aids to Daily Living [MCEADL]), either fully or partially, and technology literacy is also assessed to determine the type of tasks that can or cannot be performed.

From the perspective of a Federal health care plan, the framework or tools used in a member’s assessment is left to the professional judgement of their local health care practitioner. If specific parameters are needed by the plan administrator (e.g., does the client have the cognitive capacity to learn how to use the device), these would be requested as part of the assessment.

Additionally, one academic researcher provided information on two British Columbia AT programs. Firstly, the TIL program,<sup>17</sup> where any individual having severe physical disabilities, who needs help accessing their home environment, are eligible for service. The program,<sup>17</sup> leaves the evaluative framework and tools up to the OT’s professional judgement. Secondly, individuals are eligible for service by the CAYA program,<sup>18</sup> if they are non-verbal. Here too, the choice of evaluation framework and tools are left up to the professional judgement of the SLP and SLP assistant.

Few consultation informants indicated using specific frameworks, tools and criteria for general AT service delivery, leaving the specific choices up to the professional judgement of individual practitioners. This is supported by the literature which indicates that AT devices are often recommended without the use of a theoretical/conceptual framework.<sup>30</sup> Furthermore, when used, informants generally indicated needing to adapt instruments to the uniqueness of each case at hand. Aside from the MCEADL, no other specific tool was identified. In contrast, organizations, frameworks, tools and criteria for general AT service delivery provision found within included publications are outlined in Table 2. None were specific to EADLs and none were reflected in the consultations.

Of note, the Global Cooperation on Assistive Technology established by the World Health Organization (WHO) has a collection of innovation snapshots on practices for AT products, personnel, service provision, and policy occurring globally, which are publicly available on their site: [http://www.who.int/phi/implementation/assistive\\_technology/great\\_summit/e-proceedings/en/](http://www.who.int/phi/implementation/assistive_technology/great_summit/e-proceedings/en/).<sup>31</sup>

## Table 2: Organizations and Tools for Assistive Technology Service Provision

### Organizations

<b>Association for Advancement of Assistive Technology in Europe (AAATE)<sup>8</sup></b>	Professional organisation that conducts AT research, practice, and policy, and outlines 6 general quality criteria for AT service delivery of: accessibility, competence, coordination, efficiency, flexibility, and user influence. <sup>8</sup>
<b>Australian Rehabilitation and Assistive Technology Association (ARATA)<sup>8</sup></b>	Professional organisation for advancing and promoting assistive technologies and professional training. <sup>8</sup>
<b>Community Equipment Code of Practice Scheme (CECOPS)<sup>7</sup></b>	Professional organisation which provides AT training using an outcome-based credentialing framework, and a quality framework based on sustainability indicators, which includes monitoring methods and tools, outcomes measurement, and service provision and procurement standards. <sup>7</sup>
<b>International Association of Accessibility Professionals (IAAP)<sup>7</sup></b>	Professional organisation which has competency-based frameworks for AT personnel, which are paired with training and education programs. <sup>7</sup>
<b>Rehabilitation Engineering and Assistive Technology Society of North America (RESNA) Practice Guidelines<sup>7,32</sup></b>	Professional organisation which has guidelines for provision of skills and knowledge for speciality technology, and competency-based frameworks which are paired with training and education programs for AT personnel. <sup>7,32</sup>
<b>Tools for Assistive Technology Service Provision</b>	
<b>AskSARA<sup>19</sup></b>	A self-assessment tool hosted by the United Kingdom Disabled Living Foundation, which combines AT databases with problem-based search functions where users choose an activity or topic, and answer questions. <sup>19</sup> The tool then generates individual reports given to users on common AT devices and contact information of local services. <sup>19</sup>
<b>Assistive Technology Device Classification (ATDC)<sup>32</sup></b>	An ISO 9999:2011 and ICF based tool for identifying and acquiring specific AT products. <sup>33,34</sup> ATDC uses information from AT assessments to identify AT products including those from the Priority Assistive Product Listing and other AT products identified from each nation. <sup>33</sup> Appropriate AT product selection occurs through consideration of environmental factors including physical environmental, psychosocial factors, and usability of the product in the user's context. <sup>32,33</sup> The ATDC also distinguishes between universally-designed and medical AT. <sup>32</sup>
<b>Assistive Technology Service Method (ATSM)<sup>16,328</sup></b>	An ICF based standard of process for use across various professions, disabilities and AT service provision, policy, and practice contexts using a person-centred approach. <sup>16,328</sup> It is a well-stated model in international contexts and is intended to work with existing professional practice standards. <sup>33</sup> With this method, AT provision starts with an assessment of the environment and person, establishment of an ability and disability baseline, and the development of a strategy for intervention. <sup>33</sup> AT products are then identified, selected and obtained. <sup>33</sup>
<b>Horizontal European Activities in Rehabilitation Technology (HEART) Study<sup>16</sup></b>	Classified criteria for initiative, typology, assessment, selection, delivery, and follow-up/management of AT. <sup>16</sup>



<b>Human, Activity, Assistive Technology (HAAT) Model<sup>33</sup></b>	A model with key domains to consider during AT product selection including if the AT is used with the individual that encounters performance limitations in their activities, and consideration of personal and contextual factors, user finances and type of social support. <sup>33,35</sup>
<b>IMPACT<sup>2</sup> Model<sup>34</sup></b>	A conceptual and process framework describing theoretical relationships of key AT intervention approaches used for optimizing function of people with disabilities. <sup>34</sup> It considers the contextual and personal factors, and concurrent interventions in which AT devices and services are in practice, while providing a framework for costing At services (including training, evaluation, maintenance, and follow-up services). <sup>34</sup>
<b>International Classification of Functioning (ICF)<sup>8</sup></b>	Framework used for measuring health and disability and decision-making for ATs. <sup>8</sup>
<b>Institute on Matching Person Technology (MPT)<sup>32</sup></b>	Compendium of instruments for matching the consumer to the AT device, and outcomes tools for various contexts of AT device provision. <sup>32</sup>
<b>Matching Person and Technology (MPT)<sup>33</sup></b>	Tool for matching individuals to an AT product or selection of AT product distribution program for a region, while considering the person, context, activity, and physical and social environment to avoid poor device matching and subsequent non-use. <sup>33</sup> It has been found to be reliable in Australia, Canada, Ireland, and the USA. <sup>35</sup>
<b>Quality Indicators of Assistive Technology<sup>32</sup></b>	Framework for quality of AT services. <sup>32</sup>
<b>WHO Disability Assessment Schedule 2.0 (WHODAS 2.0)<sup>8</sup></b>	General assessment instrument for disability and health used for decision-making for ATs. <sup>8</sup>

AT = Assistive Technology, ICF = International Classification of Functioning, ISO = International Organisation for Standardisation, WHO = World Health Organization

## Device Assessment, Evaluation, and Reassessment Tools for AT Service Provision

Six consultation informants from 4 Canadian provinces (Alberta, n = 1; Manitoba, n = 1; New Brunswick, n = 2, Nova Scotia, n=2), 1 Federal health care plan, and 1 academic researcher provided information on device assessment, evaluation, and reassessment tools for AT service provision.

One informant from an AT program at a tertiary rehabilitation hospital,<sup>10</sup> indicated device trials are usually required, and with at least two different types of equipment so that the best solution can be identified for the client's need. After a successful trial period, evaluation takes place every 3 to 6 months until the client achieves stability, then they are discharged. Notwithstanding, users are encouraged to call back if their needs change or if their EADL malfunctions.

Another informant from an AT communication devices program at a rehabilitation and long term care centre,<sup>11</sup> reported that clients are given up to 3, 4-week trials (i.e., to a maximum of 12 weeks total), to evaluate the device, see if additional modifications are needed, or conclude that the particular device is not a good fit. Rarely, clients need additional evaluation time, particularly those who have difficulties learning how to use the equipment or the software. Program team members evaluate clients on an annual basis to reassess user comfort with the device, frequency of use, and its continued functionality. Outside these evaluations, clients can contact the program if the device is not meeting their needs or if they need a reassessment because of a change in circumstances. Clients are never discharged from the program unless they no longer need the equipment due to an improvement in their condition, there is a change in their environment, or death.

Two informants from the AT services of a provincial tertiary rehabilitation facility,<sup>12</sup> described that as part of the program, individuals are informally reassessed every time they return to the facility for a therapeutic appointment (e.g., every 3, 6, 12 months). Follow up

evaluations are also completed via telehealth, phone, outreach onsite visit, consultation with the client's local care teams, consultation with schools and other care providers. Here too, clients are never discharged and are invited to contact the program at any time. As an additional service, this program also evaluates clients who wish to start or return to gaming with friends and family. Depending on the needs assessed, the team will adapt gaming console buttons and joysticks to capitalise on the client's available movements and build a custom-made system.

Two informants from the AT services of a provincial tertiary rehabilitation centre,<sup>13</sup> reported that while the program works with all manner of assistive devices, they do not refer to EADLs as such, but simply as ATs. The facility has a demonstration suite where clients can trial devices before selecting one that will fit their needs. Device trials can be arranged on a case-by-case basis; however, they have limited inventory. Post-discharge from the rehabilitation centre, clients may be followed as an outpatient or linked up with a community group (e.g. the Neil Squire Society,<sup>36</sup> Department of Labour and Advanced Education,<sup>37</sup> employment support groups).

From the perspective of a Federal health care plan, device trials would be entirely dependent on what is available in the member's locale. A visit can be arranged to vendors that have demonstration suites, if available locally to the member. Members are welcomed to follow up with the plan administrator as needed.

Additionally, one academic researcher provided information on two British Columbia AT programs. Firstly, the TIL program,<sup>17</sup> which does not offer a trial program; however, if a device does not work for their needs, the client is welcomed to return it. This program does not have a demonstration suite; however, they collaborate closely the G.F. Strong Rehabilitation Centre,<sup>38</sup> and clients or community therapist can access trial equipment there. What is more, while TIL provides the device and do some initial training and set up, it is be the responsibility of the referring therapist to follow up with the client thereafter. In contrast, there is extensive client evaluation with the CAYA program,<sup>18</sup> until the client achieves stability. This is followed by periodic monitoring of decreasing frequency, and eventually monitoring is ceased if everything goes well.

Few consultation informants discussed specific device assessment, evaluation, and reassessment tools for AT service provision. In contrast, the literature outlines several criteria to consider in choosing an assessment tool: the population, specific contextual relevance of the instrument, clinical context, and appropriateness of the evaluation to the objectives.<sup>30</sup> While no particular assessment instrument emerged from our consultations, here too informants indicated the general need to adapt instruments to the uniqueness of each case at hand.

The literature also outlined the types of outcomes for assessments to consider including: effectiveness (ease of activity and participation, performance and satisfaction, and physical functioning), social significance (AT device type acquired, cost, device usage (frequency), independence, and AT device abandonment), and subjective well-being (user satisfaction with AT devices and services, and quality of life).<sup>16</sup> By addressing incompatibility between a potential user and the technology proposed early on, it may reduce non-use, inappropriate use, and disappointment.<sup>30</sup> Internationally, the use of assessment tools is growing in many countries due to a need to have systematic and standardized procedures for AT services.<sup>30</sup> A number of general assessment instruments were described in the literature and are outlined in Table 3; however, none were specific to EADLs and none were explicitly reflected during consultations.

**Table 3: Assessment Instruments for Assistive Technology Device and Service Provision**

**Assessment Instruments**

<b>Assistive Technology Device Predisposition Assessment (ATD PA)<sup>30</sup></b>	<p><b>A 66-item consumer form</b> with items matched to the WHO ICF.<sup>30</sup> It is an instrument for rehabilitation professionals and people living with disabilities to assist with selecting new or additional AT devices while ensuring an appropriate consumer-technology match.<sup>30</sup></p> <ul style="list-style-type: none"> <li>• Person Form: 9-item inquiry on capabilities in functional areas, 12-item inquiry to prioritize where they desire to have the most positive change, and 33-item inventory of consumer psychosocial and personal characteristics<sup>30</sup></li> <li>• Device Form: 12-item inquiry on consumer expectations of a particular type of AT device, and comparisons and rating of up to three competing devices<sup>30</sup></li> <li>• Overall Recommendations Form<sup>30</sup></li> <li>• Follow-up versions of Person Form and Device Form: Used to assess consumer realization of benefits, not used by consumer and reasons for non-usage<sup>30</sup></li> <li>• Companion professional forms: to gain perspectives of professionals<sup>30</sup></li> </ul> <p><b>Theoretical Model:</b> MPT model<sup>30</sup></p> <p>ATD PA emerged from research on non-use and use of ATs by adult users living with various disabilities.<sup>30</sup> It is a systematic method for selecting AT devices for individuals living with disabilities to help decrease AT device abandonment.<sup>30</sup></p>
<b>Assistive Technology Evaluation and Selection (ATES) Model<sup>30</sup></b>	<p>A model to provide a standardized assessment method for AT device requests.<sup>30</sup></p>
<b>Psychosocial Impact of Assistive Devices Scale (PIADS)<sup>30</sup></b>	<p>A 26-item standardized outcomes tool to assess the impact of AT devices on well-being, quality of life, and functional independence of consumers with cross-cultural adaptability.<sup>30</sup></p>
<b>Quebec User Evaluation of Satisfaction with Assistive Technology (Quest 2.0)<sup>30</sup></b>	<p>A 12-item standardized outcomes tool with 8-items on assistive technology devices and 4-items on services documenting user satisfaction with AT service provision and products.<sup>30,32</sup> It is intended for use by private and public services managers, researchers, and rehabilitation professionals for analysis of cost-effectiveness, cost-utility, and cost-benefit, and to improve product and service quality.<sup>30</sup></p>
<b>Usability Scale for Assistive Technology-Computer Access (USAT-CA)<sup>39</sup></b>	<p>Observational evaluation tool consisting of 114 usability indicators to assess individuals living with physical disabilities ability to access computer AT devices.<sup>39</sup> The tool uses the HAAT model for interviews.<sup>39</sup> The USAT-CA can be used to evaluate selection of computer AT device, trial AT devices, training to match skills to the demands of the device, and follow-up evaluation.<sup>39</sup></p>

AT = Assistive Technology, HAAT = Human Activity Assistive Technology, ICF = International Classification of Functioning, Disability, and Health, MPT = Matching Person and Technology, WHO = World Health Organization

## Objective 2 - Barriers and Facilitators to Providing Equitable Access to Assistive Technology

This objective was addressed by research question 2 based on findings from the literature and consultations.



The literature cites the need for funded supports, eligibility, and services for AT to be linked to human rights frameworks, and to understand and evaluate equitable access to AT through a capabilities approach.<sup>15</sup> This approach involves supporting opportunities where individuals can choose from a variety of AT services and devices, which address the needs and outcomes they value rather than what is valued by providers.<sup>15</sup> A number of barriers and facilitators relating to AT in general were described in the literature and are outlined below; yet, none were specific to EADLs. Nevertheless, several of these were echoed by consultation informants, in the context of EADLs. Many of the barriers were common among consultation programs, such as: funding, restrictive criteria, understaffing, awareness of technology, and geography. Similarly, many of the facilitators were common among programs, such as: support from family and friends, having the ability to demonstrate available products, and the accessibility of consumer products.

## **Funding**

All consultation informants indicated that without funding, EADLs can be cost prohibitive, particularly for individuals without third-party insurance (e.g., social assistance, insurance). In addition, some funding schemes expire at the 65<sup>th</sup> birthday of an individual.

In contrast, the literature outlines that adequate funding facilitates access for long-lasting, good quality devices to meet AT needs in all areas of life.<sup>34,40</sup> This is echoed by one informant who highlights that well designed third-party funding schemes are facilitators to providing equitable access to ATs.

## ***Consumer Products versus Medical Devices***

Mainstream technologies such as tablets and smartphones offer features and applications that allow them to function as AT devices.<sup>8</sup> This opens up the market for development of products for specific populations of people living with physical disabilities at low prices, thereby increasing its reach.<sup>8</sup> However, consultation informants highlighted the challenge payors face with the current definitions of “consumer products” and “medical devices” and the ensuing lack of integration. Many consumer products are less expensive, easier to install and maintain than traditional medical-grade EADLs; yet the absence of a “medical device” classification usually means the device will not be fundable based on a program’s criteria.<sup>8,34,41</sup> In such cases, the out-of-pocket cost of the consumer product may still be a barrier for people living with disability.<sup>8,34,41</sup>

Conversely, consumer products such as smartphones have greater uptake compared to medical-grade ATs as they are found to be more accessible, require less extensive training for the users - particularly as the disease progresses,<sup>9</sup> and are socially acceptable to the users.<sup>42</sup> Adopting universally designed technologies to act in complement to AT devices, may be more efficient, and allows a diverse population to interact with their environments and devices without stigmatization and/or making adaptations.<sup>34</sup> Furthermore, as greater numbers of EADLs continue to stem from consumer products costs will lower. Some clients, independently or perhaps with the help of family and friends, are able to access consumer product EADLs without the intervention of a clinician and without having to navigate the health care system. Furthermore, the growing mainstream nature of EADLs contributes to a normalisation of ATs. The same consumer product that is used by an AT client is also used by people who are non-disabled, creating an attitude shift in terms of acceptability and reduction of stigma.

## ***Client Funding Criteria are too Restrictive***

In some cases, consultation informants noted that some funding agencies require that a specific diagnostic criterion be met for funding, rather than basing the funding decision on an unmet need. In other cases, age (e.g., younger than 18 years, older than 65 years) is the barrier to funding.

## **Availability of Trained Professionals**

Individuals with disabilities particularly in low-income households and low-resourced environments are underserved due to a lack of access or availability of trained professionals who can provide individually tailored support and training.<sup>7,14,41,43</sup> This barrier is echoed by consultation informants who indicated that many AT programs lack the requisite technological support personnel for the initial setup, troubleshooting, and maintenance of EADLs as the technology evolves. These technical tasks often fall upon clinicians, taking time away from patient-directed tasks such as follow-ups, and resulting in appointments that are less thorough and that focus on the most pressing item rather than more fulsome needs. The capacity of a program to follow up with its clients is its rate-limiting step. In other words, a program that sees its clients to clinician ratio grow disproportionately eventually saturates and refuses services (e.g., device installation, client training, troubleshooting and repair) or new clients.

Conversely, informants reported that, in a context of few trained professionals, members of the client's immediate environment can facilitate access, particularly if they are knowledgeable in electronic consumer products, they are likely to seek out EADLs more readily and assist with set-up, programming, and maintenance.

## **Awareness of AT Products and Services**

A barrier to individuals accessing appropriate AT is health care providers lack of knowledge and awareness of AT products and services.<sup>19,41</sup> Awareness is needed on the benefits and availability of high-quality AT devices and services to inform user decision-making, enable earlier and wider adoption, and have support for users in obtaining AT devices, and device trialing, training, and maintenance.<sup>9,19,29,40</sup>

This is echoed by informants who report seeing a knowledge gap in clinicians working outside the specific field of AT, resulting in a lack of awareness to refer clients to AT services, or a lack of awareness on the implementation of AT solutions. With EADLs gaining greater market share from the "consumer product" segment, and because of the rapid pace of change in this field, it is difficult for clinicians to stay current regarding the assortment of EADL options and how to integrate them. Consultation informants reported that the complexity of integration is a real problem, and many clinicians are not confident in their abilities, therefore preferring to avoid the technology altogether.

Additionally, informants reported a lack of EADL education in allied health profession curriculums, as a result, graduates have a limited knowledge of EADLs and ATs in general.

Informants also reported a gap in client's awareness of the assortment of EADL options available. Furthermore, few opportunities to trial equipment contributes to limited product knowledge.

Conversely, having the ability to show clients an assortment of EADLs (e.g., a demonstration suite) and permitting a trial before the commitment to a particular solution facilitates access and helps clients be confident in their choice of device(s). In addition, developing classes educating clients regarding the available technological options helps to decrease fears around the technology.

## **Infrastructure and Geography**

A lack of reliable access to internet for some users limits electronic AT uptake.<sup>42</sup> This is also highlighted by consultation informants who indicate this is a particularly important barrier in some rural and remote communities. Furthermore, AT programs are usually associated with tertiary care centre in major cities.

Conversely, the literature revealed that having multiple entry points into AT provision systems may increase equity in access for potential or current AT users.<sup>19</sup> This is echoed by informants, who also report that increasing the number of AT programs across jurisdictions would facilitate access to services, particularly if this is combined with increased service locations or support in rural or remote areas.

## **Quality and Cost-Effective Devices**

The literature points to a lack of affordable high-quality assistive technology products for individuals with disabilities, an important determinant for the purchase and repair of AT devices.<sup>8,32,43</sup> Additionally, many AT products are available only through private purchase rather than provision through a public system.<sup>8</sup> This is echoed by an informant, who reports that the ability to find a good quality EADL solution that is also affordable (e.g., access and egress of dwelling) can be a barrier to access.

## **Programming**

Consultation informants report that some AT programs can be siloed, lacking to acknowledge the breadth of client needs and unwittingly creating a barrier to access.

This is echoed by the literature which indicates that a comprehensive assessment of AT user needs, priorities, preferences, identity, environment, and context is needed in order for devices to work well, not interfere with existing treatments and supports, and suit the users lifestyle and participation.<sup>33,34,40</sup> Furthermore, AT devices are often recommended without the use of a theoretical/conceptual framework.<sup>30</sup> The use of a theoretical model can guide clinical practice and research for AT.<sup>30</sup> Additionally, consideration is needed for changing needs for AT including across the lifespan.<sup>34</sup>

## **Technological Literacy**

528 Consultation informants reported that a client's technological literacy can limit the ability for some to troubleshoot basic issues. This  
529 topic did not emerge in the literature.

## 530 **Team Compositions**

531 One informant highlighted that collaborative teams can often fine tune a solution for a client or come up with a better solution than  
532 individual clinicians could have found in their professional silos, thereby facilitating access. This topic did not emerge in the literature.

## 533 **International or National AT Provision Standards or Systems**

534 The literature indicated that an international AT provision standard currently does not exist, and many countries also lack a national  
535 and/or coordinated system for AT services and funding.<sup>8,16,41</sup> This topic did not emerge in the consultations and it is unclear whether  
536 standards would change access in Canada.

## 537 **Shared Decision-Making**

538 The literature revealed that AT devices are often recommended by professionals without user partnership, participation, and/or  
539 perspective.<sup>30</sup> When personal criteria including environmental needs, and psychosocial characteristics are not considered, a  
540 technology that may have seemed appropriate can lead to it not being used or being used inappropriately leading to resource  
541 wastage.<sup>30</sup>

542 Conversely, actively involving users in decision-making processes about the devices they receive, and engaging with their  
543 preferences, allows for greater device-client compatibility resulting clients having greater agency in their lives.<sup>8,19,27,34,40</sup>

## 544 **Limited User Purchasing Power**

545 With traditional medical devices, users having limited or no direct purchasing power.<sup>8</sup> AT product procurement is also often  
546 outsourced to third parties, and although bulk procurement by insurance companies, agencies, or governments may reduce costs,  
547 efforts, and time, it results in a greater distance between users' needs and outcomes, and purchase decisions.<sup>8</sup> This topic did not  
548 emerge in the consultations.

## 549 **Limited Research Evidence**

550 The literature, along with the GATE initiative established by the WHO, emphasize five research priorities: costs, economic impact,  
551 and effects of AT; AT service provision models, best practices, policies, and systems; AT sector human resources; and  
552 methodologies and standards for assessing; and unmet need and ATs.<sup>8,31,32</sup> There is also limited data on AT outcomes and societal  
553 impacts, which together negatively impacts funding accountability, service provision, and public policy assessment.<sup>8,16,32</sup>

554 This is partly due to AT being provided alongside other interventions, which makes extracting the added value of AT difficult.<sup>8</sup>  
555 Additionally, evaluating the impact of AT devices is complex, as the effects and outcomes are individualistic and depend on the users  
556 personal context, ambitions, and capabilities.<sup>8</sup> Other barriers to AT research include resource allocation, limited infrastructure and  
557 time, privacy issues, and consumer attitudes.<sup>32</sup>

558

## 559 **Objective 3 - Jurisdictional Funding Approaches of Assistive Technology Programs**

560 This objective was addressed by research question 3 and 4 based on findings from the literature and consultations.

### 561 **Funding Mechanisms, Eligibility Criteria, Type of Devices Covered, and Extent of Coverage for EADL** 562 **Devices**

563

#### 564 *Canadian Jurisdictions*

565 Nine consultation informants from 4 Canadian provinces (Alberta, n = 1; Manitoba, n = 1; New Brunswick, n = 2; Nova Scotia, n = 2),  
566 1 Federal health care plan, and 2 academic researcher provided information on funding mechanisms, eligibility criteria, type of  
567 devices covered, and extent of coverage for EADL devices.

#### 568 **Funding mechanism**

One informant from an AT program at a tertiary rehabilitation hospital,<sup>10</sup> described funding availability via Alberta Aids to Daily Living,<sup>44</sup> which will pay 75% of costs up to \$500 per family per benefit year (July 1 to June 30).<sup>44</sup> Low-income individuals may only have to pay for upgrades.<sup>44</sup> Other funding sources include charitable associations such as the Amyotrophic Lateral Sclerosis (ALS) Society of Canada,<sup>45</sup> the Cerebral Palsy Alberta Association,<sup>46</sup> or a local chapter of a community service club (e.g., Lions Clubs International).

Another informant from an AT communication devices program at a rehabilitation and long term care centre,<sup>11</sup> reported that their specific communication program is fully funded for assessment and device provision through the Manitoba Department of Families,<sup>47</sup> instead of the Manitoba Ministry of Health and Seniors Care. The program's approximate budget is \$600,000 per year, for approximately 150 to 175 client referrals per year, approximately 50% of which end up agreeing to, and benefit from, a communication device. Following a trial period, the device is rented long term at a flat rate of \$20 a month regardless of the device type. Recipients of governmental Employment and Income Assistance,<sup>48</sup> have their rental fee reimbursed by that program. Similarly, other programs (e.g., Manitoba Public Insurance,<sup>49</sup> Workers Compensation Board of Manitoba<sup>50</sup>) either pay the rental fee or purchase the device privately. For clients paying out-of-pocket, the monthly fee is usually seen as an advantage over a large upfront purchase cost. About 300 clients use the rental program currently. There is a dedicated portion of the budget for staff to participate in training and education and international conferences. The program also has an academic mandate whereby they provide education to the rehabilitation assistance school, OT college, any other programs that wish education on ATs.

Two informants from the AT services of a provincial tertiary rehabilitation facility<sup>12</sup> described the availability of funding through the Disability Support Program of the New Brunswick Ministry of Social Development which offers funding for "technical supports and assistive devices not covered under other programs".<sup>51</sup> Institutional donations, such as the Stan Cassidy Foundation,<sup>52</sup> can also contribute up to \$300 per person per year in a "care and comfort" fund for clients of their rehabilitation centre. Program team members will often network with other autonomous, community-based, and non-profit organizations to identify other funding sources. For instance Abilities New Brunswick,<sup>53</sup> Muscular Dystrophy Association of Canada,<sup>54</sup> and Easter Seals New Brunswick,<sup>55</sup> can help identify other coverage sources, including opportunities from private foundations. This stream of funding is particularly useful for individuals who do not receive government funding, but who don't have the ability for out-of-pocket expenses. Since home controls are now mainstream consumer products, gifts of used equipment from family and friends is another manner by which clients sometimes obtain the necessary components, which could then be customized by their local rehabilitation program. In addition, loan programs are another mechanism to provide devices to those in need. Trial, short term, and long term loans can be provided by loan programs operated by Easter Seals New Brunswick,<sup>55</sup> or the ALS Society of Canada.<sup>45</sup> The program also relies on the donations of gently used equipment which are then provided back to clients who need them.

Two informants from the AT services of a provincial tertiary rehabilitation centre<sup>13</sup> reported being funded for the staffing of their program only. Devices are donations from charities and foundations. While they do have a demonstration suite, this was purchased through the hospital foundation and community donors. Although this program offers device trials, once an ideal EADL solution is identified, it is up to the client to fund it, either personally, via community fundraising, via employer sponsorship, community services, or other means.<sup>56</sup> Alternatively, there are community organizations (e.g., Neil Squire Society)<sup>36</sup> which operate loan programs for access by clients in need.

From the perspective of a Federal health care plan payor, EADLs are funded under the Program of Choice 13 – Equipment.<sup>57</sup> There is no budgetary annual cap. Funding continues until death, clinical improvement, or changes to the setting such that the device is no longer needed. The program will also reimburse rentals if requested.

Additionally, one academic researcher provided information on the TIL program,<sup>17</sup> in British Columbia, which provides devices on a loan basis with no user fees. While they are run as a not-for-profit, they receive government funding to purchase assistive devices. They also undertake fundraising to finance their operation.

One 2017 Canadian report specific to AT,<sup>6</sup> highlights the lack of consensus on the term's definitions among payors. Some of the funding programs include EADLs, while others not. Authors document a comprehensive list of programs from the 10 provinces, 3 territories, and federal level. Some were government programs (e.g., Programs of Choice 13 – Equipment by Veteran Affairs Canada, Correctional Services Canada, Alberta Aids to Daily Living, Nova Scotia's Disability Support Program) and others charity programs (e.g., War Amps, Rotary International, Muscular Dystrophy Canada, March of Dimes Canada). Some programs offer full funding, while others share the cost with the client. Eligibility criteria range widely, including residency status, age, type of disability, and demonstrated financial need. Types of EADLs funded include hearing, vision, and communication devices, tablets and software

applications, environmental control units, yet other programs have no device type restrictions as long as the need is demonstrated. Readers are encouraged to consult the report for a comprehensive list of federal, provincial, and private funders.<sup>6</sup>

## Eligibility Criteria for Funding

Two informants from the AT services of a provincial tertiary rehabilitation facility<sup>12</sup> described the criterion for client funding eligibility to be a demonstrated financial need (e.g., receiving Income Assistance through the Social Assistance Program).

From the perspective of a Federal health care plan, eligibility for funding is specific to the member's individual level of benefit and service.<sup>57</sup> The need for the requested AT must be clearly demonstrated. For instance, a member may have a disability entitlement for a specific functional disability. Hence, ATs not directly related to the specific disability would not be considered by the plan to be required and therefore would not be funded. In addition, and whenever possible, the plan requires that a member demonstrates that a more basic intervention (e.g., a paper calendar for time management) has been trialed and was not sufficient before graduating to an EADL solution (e.g., an electronic calendar for time management).

Additionally, one academic researcher provided information on the TIL program,<sup>17</sup> in British Columbia where funding is provided on the basis of a recommendation from the client's community therapist.

## Types of Devices Funded

All informants agreed that EADLs perform a variety of functions which are often grouped into broad categories: emergency call system; home control; access and egress; and access to the external world, including communication aids. Further detail regarding funding of those devices was provided.

One informant from an AT program at a tertiary rehabilitation hospital,<sup>10</sup> indicated that one criteria for reimbursement is that the technology has been released for at least a year before it is added to the list of approved ATs for reimbursement. Communication devices, device mounts, and some software applications are the only publicly funded EADL under the AT program. Such devices may also allow for extra features (e.g., alerting, distance communication). If "communication" is not a direct output of the device (e.g., a head movement operated mouse for computer access), it is not considered fundable. Similarly, special interfaces and switches to make a cell phone accessible would not be fundable.

Another informant from an AT communication devices program at a rehabilitation and long term care centre,<sup>11</sup> reported that the program is focused on finding the most appropriate EADL for the client. It is the responsibility of the program to justify the rationale for the clinical recommendation regardless of the cost of the device. While they include all the device categories listed previously, the type of device funded is based on the client's need, not on a list of approved choices or limited by a fiscal budget cap.

One informant from the AT services of a provincial tertiary rehabilitation facility<sup>12</sup> described the addition of "consumer products" to the categories listed by all informants, particularly smart home products. In addition, their program reimburses specialized custom-made products, produced in house via a 3-dimensional printer. Here too, the type of device funded is based on the client's need, not on a list of approved choices. A letter of support is often the only criteria for eligibility, particularly with third-party payors or charity organizations.

From the perspective of a Federal health care plan, funding is limited to the most basic version or model of a device that would meet the member's need. If the member wishes an upgraded version or model of a device, they pay the cost difference. Devices such as lifelines (emergency communication systems), anti-wandering equipment, computers and robotics equipment and accessories, are funded to enable the performance of essential or instrumental activities of daily living, but generally not for leisure purposes. Computers and robotics equipment and accessories are limited to enhancing communication, enhancing sensory perception, or health security monitoring.

One academic researcher provided information on two British Columbia AT programs. Firstly, the TIL program,<sup>17</sup> funds an assortment of devices from older "switch access" type systems to modern consumer products, and access and egress systems. In contrast, the CAYA program,<sup>18</sup> focuses on communication devices which may or may not include EADL functions. If a communication device can also integrate EADL features, that is considered added value to the client, but it is not the focus of the program.

## Extent of Funding

There is a lot of variability regarding the extent of funding. Some programs fund device customization, repair, and replacement, whereas others consider a device a 'one time' spend where maintenance and repair are the responsibility of the device user.

One informant from an AT program at a tertiary rehabilitation hospital,<sup>10</sup> indicated that education and training of personnel with new devices and client training is included in the funding. Furthermore, device customization is considered part of EADLs and is funded. Also included are basic maintenance and repair done in-house and by the program where possible, failing which, the device is shipped to the manufacturer for repair. This is similar to the AT communication devices program at a rehabilitation and long term care centre,<sup>11</sup> where their rental program funds the cost of basic maintenance and repairs performed in-house by the electronic technologist, when possible. If the repair requires a part replacement (i.e., a part that is available to consumers, such as a tablet screen), the part is billed to the client, but the labour of the repair is funded by the program. If the damage is to a non-serviceable part of the device, then a replacement is provided. What is more, a loaner device is provided to the client while the repair is performed. Instances of device loss or theft are not funded, and device replacement is at the client's expense.

One informant from the AT services of a provincial tertiary rehabilitation facility<sup>12</sup> noted that funding requests are singular events with no mechanism to fund changes that may come from a reassessment. Therefore, once a device is procured, any changes resulting from a reassessment would require a new source of funding. Furthermore, their program does not fund device maintaining or repair. However, if the equipment is on loan, the loan program administrator would take care of maintenance and repair. In addition, the program does not have a budget for training staff or for user setup, therefore they often rely on the installation service of consumer product vendors, such as the in-house experts provided at a point of sale.

From the perspective of a Federal health care plan, EADLs are classified as "computers and robotics" and considered as an "open benefit" with no per year frequency or cost limits. Other categories of assistive devices may have frequency limits (e.g., one every three years, one every five years). Most EADLs will have funding limited to the basic version or model of the device with no upgrades; however, the member can choose to pay the difference out-of-pocket if they wish to upgrade the device. The plan administrator will fund time spent training the client, family or caregivers with a new device. If the device was procured by the plan administrator, repairs and maintenance (after any manufacturer warranties are exhausted) are funded. If the device was acquired prior to the member's adherence to the plan, and an assessment by the plan administrator reveals it is still the best solution for the client, then the plan administrator may accept to fund ongoing maintenance costs.

Additionally, one academic researcher provided information on the CAYA program,<sup>18</sup> in British Columbia and reported that device maintenance and repair are funded since it is a loan program.

## Other Jurisdictions

In a 2005 joint survey by WHO and the United States Agency for International Development on AT services and funding, one third of surveyed countries did not have financial resources allocated to developing and providing AT products or services.<sup>8</sup> Where a budget was allocated, funding ranged from full to partial coverage of AT costs for a limited list of assistive products.<sup>8</sup> Some countries had a voucher or personal budget system where users were given choices within an AT product and/or specific price range.<sup>8,27</sup> Additionally, in most countries, determination of AT eligibility relied on clinical diagnostic criteria and definitions.<sup>8</sup> There is a need for eligibility models which come from a functional perspective and which consider the users context, ambitions, and participation in society in order to distribute available resources fairly and equitably regardless of the funding mechanisms chosen.<sup>8</sup>

Information found within the literature on funding mechanisms and eligibility criteria for various jurisdictions are outlined in Table 4.

**Table 4: Funding Mechanisms, Criteria and Coverage of Assistive Technologies**

Country	Funding Sources	Type of AT Covered & Extent of Coverage	Funding Mechanisms, Criteria, & Considerations
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Australia	National Disability Insurance Scheme (NDIS) <sup>42</sup>	Unknown	The recent operationalization of the NDIS means those without compensation may be able to register and potentially access funding for necessary and reasonable supports such as electronic AT. <sup>42</sup> NDIS is estimated to provide AT as one of several supports to approximately 450,000 eligible Australians, and will only fund a subset of users needing AT. <sup>34</sup> The NDIS provides AT devices and services as one of multiple funded supports for individuals plans. <sup>34</sup> Funding approval for complex or specialized AT requires a detailed report for the requested AT. <sup>34</sup>
	Government	<p>Australia had a total AT expenditure of \$595 million AUD in 2013, which supports 927,000 Australians from over 90 program that receive government funding.<sup>34</sup> Each program provides subsidized equipment and aids, and vehicle and home modifications.<sup>34</sup></p> <p>Full funding for at home Environmental Control Systems (ECS) that control end devices including entertainment units (DVD and TV), electric beds, and personal alarms.<sup>14</sup></p> <p>Public funding for AT does not extend to phones and computers that can be customized for communication needs.<sup>19,34</sup></p>	<p>In Australia, each territory and state government supports AT device provision and services.<sup>34</sup> In Victoria, there is the State-Wide Equipment Program, which is composed of 9 programs each with different eligibility guidelines equipment options, follow-up arrangements, and capped subsidies.<sup>34</sup> In Queensland, a Government sponsored program or insurance provided funding and the prescription may be overseen by a health professional (e.g., OT).<sup>14</sup></p> <p>Eligibility for funding and subsidies include individuals living with a range of physical disabilities.<sup>14</sup> The time frames for prescription process, trial, and assessment of ECS are developed to suit prescribers, hospital and funding organizations, which are likely not ideal for ECS users.<sup>14</sup></p>
	Not-for-profit, social enterprises in Australia (funded by consortium of philanthropists and private organizations) <sup>58</sup>	<p>At Home Grants Scheme: capped, one-off individual funding ranging from \$100 to \$10,000 AUD.<sup>58</sup></p> <p>Requests for funding included:</p> <ul style="list-style-type: none"> <li>• Home modifications (bathroom and kitchen changes)</li> <li>• Lowering and lifting devices</li> <li>• Climate control devices (air conditioning)</li> </ul>	<p>Australian non-for-profits are establishing micro-grants for individuals with complex disabilities to purchase essential aids and equipment for adults between 18-65 years old not accessible through other public or private funding schemes including NDIS.<sup>58</sup></p> <p>Selection criteria also include: applicants at risk of entry into residential aged care facility; extent of applicants needs for care; and extent to which the item will support the applicant in remaining at home, improve quality of life, complement current support and service provision, improve access to the community, and have a long-term impact on the applicant's life.<sup>58</sup></p>

		<ul style="list-style-type: none"> <li>Contemporary communication technology devices.<sup>58</sup></li> </ul>	
Finland	NR	NR	Finnish citizens have a right to receive AT devices at no cost if they face difficulty in their functional abilities or participation due to medically grounded disabilities/illnesses. <sup>23</sup>
Republic of Korea	<p>Government Sector</p> <ul style="list-style-type: none"> <li>Ministry of Health and Welfare (Department of Rehabilitation, National Health Insurance)</li> <li>Ministry of Employment and Labor (Worker's compensation, Employment Agency for the disabled)</li> <li>Veterans Affairs</li> <li>Ministry of Science, ICT, and Future Planning (National Information Society Agency)</li> </ul>	<p>From a 2014 internal database system of 14,056 client service cases, the Ministry of Health and Welfare provided full funding for 1744 service cases for Activities for Daily Living Aids.<sup>26</sup></p> <p>There was partial funding for 212 service cases for computer access, 37 service cases for augmentative and alternative communication systems, and 214 service cases for housing modification.<sup>26</sup></p>	<p>Public funding for AT in 2014 was 1,781 billion won (\$1.7 billion USD), an increase of 27 percent from the previous five years.<sup>26</sup></p> <p>AT service in the Republic of Korea is a provider-oriented service lacking individual, comprehensive approaches for AT selection, acquisition and use.<sup>26</sup></p>
US	<ul style="list-style-type: none"> <li>Medicaid,</li> <li>Medicare,</li> <li>Private insurance companies</li> <li>Schools</li> </ul>	<p>Substantial funding for electronic AT devices is often not available through insurance, state, or federal programs.<sup>43</sup></p>	<p>Medicaid, Medicare, private insurance and schools consider objective data prior to signing for AT payments.<sup>32</sup> The durable medical equipment criteria are used to justify funding based on medical necessity instead of environmental, functional, or personal necessity.<sup>32</sup></p> <p>Individuals with workers compensation are more likely to receive funding for AT compared to those with private or government insurance.<sup>43</sup></p> <p>Current funding policies negatively impact practice, particularly when high-cost, complex technologies are cost-prohibitive for many users if they have to pay out-of-pocket.<sup>32</sup></p> <p>One study found that usage pattern information can assist providers in stock planning for AT device libraries, anticipate AT</p>



		device needs, or assist with applying for funding if extended usage is needed. <sup>59</sup>
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AT = Assistive Technology, ECS = Environmental Control Systems; NR = not reported

## Objective 4 - Other Jurisdictional Decision-Making Approaches to Funding of Basic and Essential Assistive Technology Devices

This objective was addressed by research question 3 and 4 based on findings from the consultations.

### Key Factors and Considerations that Determine an Essential EADL

No literature was identified regarding any specific key factors and considerations that determine an essential EADL for individuals. Five consultation informants from 1 Canadian province (New Brunswick, n = 2), 1 Federal health care plan, and 2 academic researchers provided information on key factors and considerations that determine an essential EADL.

Two informants from the AT services of a provincial tertiary rehabilitation facility<sup>12</sup> described that the only criteria that many funders use to determine whether a product is eligible as an EADL is a letter of justification from the AT team. The AT team describes the necessity of the device in terms of how the EADL will improve independence, decrease caregiver hours, and improve the client's ability to socialize and interact with others. Furthermore, because this facility has a demonstration suite, they are usually able to state that the client has tried a variety of different EADL options, and an optimal solution was identified.

From the perspective of a Federal health care plan, the criteria defining an EADL are deliberately left open and general to allow for discretion and latitude in what to fund. When in doubt, decision makers consult with plan administrator OTs to help determine if an item is an eligible benefit and which Program of Choice would be best suited for reimbursement if not Program of Choice 13 – Equipment.

One academic researcher indicated that the principles that should guide the funding of EADLs is whether or not the device allows the client to achieve personal functional outcomes and desired goals to their satisfaction. Using functional outcomes to determine the necessity of an EADL is an equitable and opportunity-oriented approach to funding, versus restricting funding to a mere device category.

Another academic researcher recalls Canada's responsibilities as a partner in the WHO's GATE program.<sup>60</sup> The GATE program includes some EADLs on the priority assisted product list, a list that has been determined to be the bare minimum of what countries should provide to their citizens who require them.

## Limitations

The findings of this Environmental Scan present a broad overview of funding and access to EADLs for adults with physical disabilities and are based on consultations and a limited literature review. It is not an exhaustive review of the topic. There may be funding programs across Canada or internationally that were not well-documented either in the literature or online, and therefore were not captured in this report. Consultations were held with stakeholders identified by CADTH, and it is likely that not all relevant stakeholders were identified and contacted. This could potentially create a gap in information regarding funding and access to EADLs. The majority of literature findings discussed AT programs in jurisdictions outside of Canada, potentially limiting the transferability of the findings to the Canadian context. Furthermore, the majority of included publications generally discussed AT devices and service provision, with a lack of availability of information specific to EADLs devices.

## Conclusions and Implications for Decision or Policy Making

This Environmental Scan was informed by literature searches and consultations and gathered information on the organization and funding mechanisms of Canadian and international service programs that provide access to EADLs to individuals with physical

disabilities. It is important to note that this report is a reflection of the state at the time of literature publication and expert consultations, and these service programs, eligibility criteria, and funding criteria are evolving; as such, our findings may have limited permanence.

Essential components of existing AT program were identified and described. Multidisciplinary teams, generally comprised of OT, SLP, SLP assistants, and biomedical engineers, for AT service provision were recurring in programs, including having professionals trained in AT service provision to ensure integration of client needs and priorities and provide training to clients to maintain their device, thereby optimizing the use of AT devices. Furthermore, many programs require that an individual must have someone in their environment for that initial set up and ongoing device assistance, of particular relevance for those in remote settings.

Within service delivery structures, common steps exist among Canadian programs. Common steps also exist with the identified international programs using a national and/or multi-level coordinated service delivery system. Several AT service frameworks, criteria, and assessment tools exist to support the development and implementation of service structures; however, the literature is lacking with respect to the application of said assessments to existing AT service programs. Consultations revealed that, in practice, no single assessment tool is followed exactly, and tools are often adapted using the clinician's professional judgement to provide a better picture of individual needs.

Various barriers exist to providing users with equitable access to AT service programs including affordability, awareness of AT devices, adequate training through AT service providers, and limited client participation and purchasing power in AT decision-making. In addition, transition of services after age 65 often creates a gap in care while new funding sources need to be identified. Conversely, facilitators that can address these concerns include a comprehensive assessment of client needs to ensure the provision of compatible AT, and supports for accessing AT provision systems including funding and information databases. In addition, access to most programs can be through self-referral, although a health care provider referral is preferred by all programs.

Most programs have some public (i.e., provincial or federal), or local funding by charities. Similarly, clients have access to some public or charity funding for devices. However, a small proportion of clients rely on foundational grants, fundraising efforts, or donations. Consultation results highlighted that while funding does exist, there is a need for effective integration between agencies, systems, ministries, and funding sources. Furthermore, siloed funding leaves gaps (e.g., age related eligibility, those who are not eligible for third party insurance and yet cannot afford out-of-pocket expenses). In contrast, some international jurisdictions (e.g., Australia, Norway, Sweden) fund ATs through their existing health care system insurance scheme.

No single terminology for EADLs emerged from the literature or consultations, creating difficulty for jurisdictional decision-makers to equitably approach the funding of basic and essential AT devices. Some refer to all electronic devices simply as ATs, other prefer the distinction afforded by the term EADL. Additional terminology used to describe technology that can help users in their daily lives included ambient assisted living technology,<sup>61</sup> welfare technology,<sup>61</sup> and electronic assistive technology.<sup>62</sup> In addition, no clear definition of what constitutes an EADL emerged from the literature or consultations, indicating that debate still exists, and additional consensus is needed to clearly circumscribe the concept. This will complicate the task of decision-makers who rely on electronic device classifications to determine eligibility. Alternatively, decision-makers could follow some jurisdictions that chose to reimburse any electronic device (medical-grade or commercial product), so long as it allowed the client to meet their desired functional outcomes.

According to findings from the literature and consultations, user-centered approaches to AT service provision including consideration of preferences, context, and psychosocial factors, supports equitable access and implementation of AT devices. This is highlighted in a Swedish pilot project geared toward increasing client's freedom of choice in the selection of their device.<sup>27</sup>

Decision-making approaches to funding of basic and essential AT devices is varied across Canada. Many decision-makers rely on open and general criteria and "letters of justification" from a client's care team in order to base their decisions. This can be perceived as creating ambivalence around client and device eligibility, but it can also be perceived as a user-centered approach allowing for individual factors to be considered.

As previously noted in the limitations, the conclusions made in this report are based on findings from the literature and stakeholder consultations. There is limited literature evidence on electronic specific ATs and EADL programs. Findings do not present the validity and reliability of the service delivery selection and assessment organizations and tools. Further work is needed to provide research evidence to understand and support the effectiveness of AT service delivery processes, and support AT eligibility criteria and funding decision-makers, particularly in the context of EADLs.

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## Appendix 1: Consultation Questionnaire

### Introduction and Project Overview

- Participant introductions.
- Obtain consent to record the session and use responses, in aggregate form or direct quotations, in the publicly accessible final report.
- CADTH team provides an overview of the project (including context and key definitions), outlines the purpose and objectives of the consultations, and describes the final product.

### Core Questions

#### A. Funding and Components of Electronics Aids to Daily Living Programs

1. In your jurisdiction or context, how is Electronic Aids to Daily Living (EADL) defined/understood?
  - a. What are examples of devices and technologies that are included/excluded under the definition/understanding of EADLs in your jurisdiction or context?
  - b. Is device customization (for example, programming or modifying the device using customized switches or controls to address the individual's physical needs) considered part of EADL in your jurisdiction/program?
2. Is there a publicly funded program or service in your jurisdiction that provides access to EADLs? (\* If no program or service exist or if you are unsatisfied with the EADL program in your jurisdiction, is there another program that you would recommend as having ideal/essential components that an EADL program could model?) If yes, could you provide some details about the program or service, including:
  - a. Are EADLs covered under a dedicated program or through other assistive technology programs?
  - b. What EADL products or services are available? (can probe regarding the categories of EADL, perhaps they also have their own definition of EADL)
  - c. What criteria are used to determine whether a product is eligible as EADL? (examples of probes – are smart home technologies such as controlling TV, fans considered EADL? Only stand-alone units and custom environmental control systems?)
  - d. How do EADL users access the program? What are the eligibility criteria for users (e.g., financial level, diagnosis, budget cap for purchase of EADL, etc.)?
  - e. How are the needs of EADL users assessed? What types of assessment methods are used?
  - f. Is there a process for EADL users to trial various devices or have customized EADL options, or do they all receive the same type of equipment?
  - g. How is the program funded?
  - h. What is the annual budget of the program
  - i. How many team members (i.e. full-time equivalencies) are involved in providing the services related to EADLs? How is the team structured? What are the different competencies, functions, and roles of team members?
  - j. What type of follow up processes and infrastructure does the program have in place to ensure that the EADLs meet the users' needs? What is the process for evaluation of function, satisfaction or value to the consumer of the EADL - are these standardized or non-standardized measures? Is there a budget and/or process for maintaining, repairing their equipment?

#### B. Barriers and Facilitators Impacting Access to Assistive Technologies

- 943 3. Based on your experience, what are the main barriers to access to EADLs?
- 944 4. Based on your experience, what are the main enablers or facilitators of access to EADLs?
- 945 *C. Opportunity for Discussion and Questions*
- 946 5. Is there anything else that you would like to note regarding EADLs in your jurisdiction?
- 947 6. Do you have any questions for CADTH?