



AgeTech Discussions:
Exploring Perspectives on Technology

XCO Frailty Care System | Workshop Report
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Executive Summary

Canada's population is aging faster than ever before and this has many implications in terms of healthcare, social services, and the economy. In response, AgeTech, or Age Technology, a subset of the health technology industry, has emerged in recent years and uses technology to support healthy aging by enhancing and adapting alternative care approaches. Yet, for many older adults, especially those living in northern and rural communities, there exists a disconnect preventing the emerging AgeTech from getting to those that need it the most. The Centre for Technology Adoption for Aging in the North (CTAAN) focuses on bridging that technology adoption gap by testing, piloting, adapting, and implementing new and existing technology solutions tailored to address the challenges experienced by older adults and care partners in northern and rural communities. One of CTAAN's key services is AgeTech Discussions: Exploring Perspectives on Technology, heretofore referred to as ADEPT. ADEPT workshops focus on emerging AgeTech to describe the applicability, usability, and feasibility of a featured AgeTech from end users' perspectives in northern and rural BC.

This report shares the results from ADEPT Workshops featuring XCO's Frailty Care System: an objective measurement tool that brings together a divergent array of outcome measures into a single assessment, from which healthcare providers or care partners will gain a clear and comprehensive view of a patient's frailty status. Data collection occurred over 3 ADEPT Workshops with a total of 11 participants. Each workshop included pre- and post- online surveys, a tech demonstration from XCO, and a facilitated discussion period where participants discussed the usability, feasibility, and accessibility of the Frailty Care System in a northern and rural setting.

Participant findings from the workshops were analysed and 7 themes emerged which are described in this report. These themes include:

1. Potential for multipurpose use of XCO's Frailty Care System in a community health setting
2. Complexity to implement XCO's Frailty Care System in the northern and rural context
3. Need to expand the breadth of XCO's Frailty Care System to optimize utility and practicality
4. Opportunity to further understand specific care needs for aging adults to tailor technology
5. Potential for XCO's Frailty Care System to improve continuity of care and communication for patients
6. Refine XCO's Frailty Care System technology by aligning function and image
7. Value to enhance demonstration to illustrate the techs full potential

The first theme describes the multiuse potential that XCO's Frailty Care System has in a community health setting, with particular emphasis on the potential to be used as a screening tool to support earlier identification of declines in aging adults' physical health. The second theme details the complexity that comes with implementing a new technology

in a northern and rural context with respect to accessibility, resources, and logistics. The third theme underscores how expanding the breadth of the assessments included on XCO's Frailty Care System could optimize utility and practicality for allied health care providers. The fourth theme describes how older adults have specific care needs that may preclude the use of XCO's Frailty Care System, with an emphasis on functionality over accuracy of results when working with an aging population. Theme five outlines how XCO's Frailty Care System can improve informational continuity of care and communication with patients, highlighting the potential to improve adherence to treatment through goal setting. Theme six reports how refining the XCO Frailty Care System technology name with its function could improve appeal in a wider audience. Theme seven discusses how enhancing the product demonstration may showcase XCO's Frailty Care System's full potential more clearly.

While this report reveals the XCO Frailty Care System to be of relevance and interest to allied health care providers in northern and rural communities, there is opportunity to further advance this system for implementation in northern and rural communities. With purposeful partnerships, tech adjustments, and strategic planning, the XCO Frailty Care System has the potential to significantly benefit allied health care providers and aging adults in northern and rural British Columbia.

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Background

By 2036, 23%-25% of Canadians will be over the age of 65.¹ This is a fundamental and unprecedented shift; Canada's population is aging faster than ever before. Having an aging population has many implications in terms of healthcare, social services, and the economy. According to the Government of Canada, older adults currently represent 17% of the Canadian population but account for 47% of the total healthcare costs.²

In recent years, innovative solutions and technologies have begun to emerge from the AgeTech sector. AgeTech, or Age Technology, a subset of the health tech industry, uses technology to support healthy aging, and to support care partners and health professionals to improve quality of life for aging adults. By enhancing and adapting alternative care approaches through emerging technologies, it may be possible to enable and extend the ability for older adults to safely age-in-place within their own homes, decrease hospital stays, and/or long-term care costs/needs.

The Centre for Technology Adoption for Aging in the North (CTAAN) supports aging in northern and rural communities by making Age Technologies more available to older adults, care partners, and the health care systems that support them. CTAAN's programs focus on testing, piloting, adapting, and implementing new and existing technology solutions tailored to address the challenges experienced by older adults and care partners in northern and rural communities.

CTAAN is built on a partnership with UNBC, the Northern Health Authority, and AGE-WELL. CTAAN has an extensive network of partners and "Living Lab" sites that allow for evaluation, testing, and validation in real-world settings. CTAAN leads testing, research projects, and evaluation to validate technology and works collaboratively with our partners to support implementation for at home settings and in care settings across the continuum of care. This information provides companies with important third-party validation that will not only provide key product insights but will allow the company to achieve a first sale or further reinforce a value proposition that will help the company scale in the region and far beyond. These services are provided by CTAAN staff including researchers, students, older adults, community partners, and healthcare providers as required.

The first step to introducing AgeTech to the region is one of CTAAN's key services, AgeTech Discussions: Exploring Perspectives on Tech, heretofore referred to as ADEPT, which focuses on emerging AgeTech in northern and rural BC to describe the applicability, usability, and feasibility of a featured AgeTech from end users' perspectives. Through workshops, end users participate in facilitated discussions and provide important insights and recommendations to inform design and adjustments of featured AgeTech. This process provides technology developers and companies with evidence that helps form the next steps to scale their products and services to northern and rural areas.

The focus of this report is XCO Tech Inc.'s Frailty Care System. XCO Tech Inc. (www.xco.io), or XCO, as more commonly used by the XCO team and used in this report,

was founded in 2014 with the goal of advancing physical, cognitive, and biometric performance across the spectrum of health and aging. With offices in Penticton, and Vancouver, BC, the XCO team has developed a portfolio of proprietary technology solutions to provide innovative digital solutions that deliver better patient outcomes, increase efficiency, and support broader access to quality healthcare. XCO's Frailty Care System provides an objective measurement through precise motion analysis and cognitive assessment to evaluate the overall aging wellness at any given time. This system brings together a divergent array of outcome measures into a single assessment, from which healthcare providers or care partners will gain a clear and comprehensive view of a patient's frailty status.

Frailty is a medical condition of reduced function and health in older individuals. Older adults living with frailty are more vulnerable to adverse outcomes like falls, fractures, co-morbidities, and death.³ Frailty not only compromises quality of life but impedes the ability for older adults to age-in-place, increasing the need for long-term care services and hospitalization.³ Though not an inevitable part of aging, over 1.6 million Canadians are currently living with frailty. In the next 10 years, this number will increase to over 2.5 million individuals. While most Canadians live in urban areas, approximately 23% of all older adults live in rural and remote settings - 10% of whom are considered frail.⁴ Additionally, a 50% increase of frailty in northern BC is projected over the next 10 years.⁵ Older adults in northern and rural communities face both social and environmental barriers to health and healthy aging that are distinct to the geographic context.

In Canada, the term 'northern' is commonly used in a provincial context to identify the northern and more sparsely populated (e.g., rural, remote) areas, which may experience arctic/subarctic climates, political marginalisation, economic dependency on natural resource development, and larger proportions of Indigenous populations.⁶ There is much diversity across northern and rural communities based on sociospatial characteristics (e.g., population size, population density, distance from urban centre), social representation, population demographics and resource availability. Persons living in northern and rural communities face increased barriers to physical activity (e.g., extreme weather conditions) and have fewer opportunities to engage in physical activity through specialised programming. This contributes to an increased risk of non-communicable disease and disability compared with their urban counterparts. These elements may directly and/or indirectly influence physical activity opportunities and capabilities among older adults. As northern and rural communities have a relatively greater proportion of older adults and a population that is aging faster than the general population, the need to develop strategies to address context-specific barriers is urgent. In response, XCO's Frailty Care System aims to advance precision medicine and rehabilitation through an accessible and inclusive movement, balance, and cognitive-motor assessment with the penultimate goal to improve the health outcomes of aging Canadians.

Methods

This report features the XCO Frailty Care System which provides an objective measurement through precise motion analysis and cognitive assessment to evaluate an individual's overall aging wellness at any given time. XCO connected with CTAAN in fall 2021 to discuss the XCO Frailty Care System and explore potential collaborative projects that could be supported by NRC-IRAP funding through CTAAN. A project overview document was provided by XCO outlining key active research goals. Consultation with Physical Therapy leaders at UNBC suggested that the XCO FCS could be of interest to clinicians in the region and may be particularly useful in the northern and rural context.

XCO leaders identified a core outcome of the project would be to assess the feasibility and usability of the Frailty Care System by end-users working in northern and rural communities. Therefore, to gain deeper insight into current practices for assessing frailty in the region, gather usability user experience of the XCO technology, understand implementation feasibility, and get input on preferred reporting formats, CTAAN and partners agreed to lead an ADEPT workshop focused on the XCO technology to gather this information bringing together physiotherapists, occupational therapists and other clinicians and academics from northern BC.

Planning for the ADEPT workshop began through consultations with XCO, where the XCO team presented their Frailty Care System technology to the UNBC research team. Through discussions, XCO identified a need to better understand the rehabilitation tech landscape in northern and rural settings and the barriers faced by providers, patients, and families in these regions. Through a co-creation approach, a key objective was set to explore the "Feasibility and Usability of XCO Inc.'s Frailty Care System to Support Aging Adults and Care Partners living in Northern and Rural British Columbia." Further consultation was completed with experts in the rehabilitation field to inform the development of the XCO demonstration for the workshop including identifying interested and affected parties, guide development of the discussion guide, and facilitate recruitment.

Data collection occurred in June 2022 over three workshops and the target number of participants was reached. Consent was obtained from all participants prior to the workshops.

Each workshop had the same format beginning with an online pre-workshop survey. An AgeTech presentation involving a product demonstration and question and answer session with company representatives followed, with a facilitated group discussion after. Additionally, all participants completed a post-workshop survey. In the pre-survey, participants provided demographic information and answered questions about their experience with, and attitudes toward, AgeTech. In the online post-survey, participants shared further insight relating to the XCO Frailty Care System and their satisfaction with the AgeTech presentation and demonstration, general workshop facilitation, and organization.

XCO presented and detailed the health assessments available on the Frailty Care System, which included Timed-Up-and-Go, 6-minute walk test, 4 stage balance test, gait speed, dual task, and Cambridge cognition. The presentation ended with a demonstration of the first three assessments and a look at the results report generated.

The facilitated group discussions were led by trained CTAAN staff. A discussion guide was used to direct the conversations and focused on soliciting information around current frailty care assessments, the XCO Frailty Care System, northern and rural contexts, and required supports. Prompts were used to elicit participant views and experiences used both open-ended opinion/experienced-based questions. A back casting exercise was also conducted to gather further in-depth insights from participants.

Workshops lasted 2 hours each and were digitally recorded. Audio was transcribed verbatim and checked for accuracy. All identifying information was removed to ensure confidentiality. Qualitative data was analyzed using a thematic approach guided by Braun and Clarke (2006). This involved following the six-phase process outlined using an inductive approach to code and generate themes:

- 1) Familiarisation with the data: Each transcript was read several times and initial thoughts noted to establish familiarity.
- 2) Coding: Concise initial descriptive codes were generated in a systematic manner and data relevant to each code was collated.
- 3) Searching for themes: A coding framework was developed by adding, removing, and organizing the initial codes into potential themes and sub-themes.
- 4) Reviewing themes: To maximize internal homogeneity and external heterogeneity, each theme was examined and refined in relation to the codes and in relation to the entire data set.
- 5) Defining themes: The “essence” of each theme was identified and described clearly to determine the aspect of the data which each theme captured.
- 6) Producing the report: Extracts were knit together an analytical narrative with interview quotes integrated to contextualize the analysis in relation to the objectives of the research and to existing literature.

Quantitative survey data was summarized using descriptive statistics using Excel, while qualitative data was analyzed using NVivo 12. A consensus approach was applied to ensure the findings and illustrative quotes used in this report best represented the prevailing patterns across participants to provide thorough recommendations for the XCO Frailty Care System.

Ethics approval for the ADEPT workshops was provided by the University of Northern British Columbia ethics board (H22-00499), the Northern Health Operations Board (RRC-2022-004) and the National Research Council (2022-56).

Workshop Findings

PARTICIPANTS

Eleven allied health providers, from across northern BC, took part in 3 group workshops held in June 2022. Participants included physiotherapists (n=7), occupational therapists (n=3) and a speech language pathologist. Participants were experienced professionally supporting older adults in their daily practice, with 2 participants additionally working with younger populations. Participants practiced in a variety of settings including acute care, long-term care, community, inpatient, outpatient, and research.

Participants were motivated to attend this workshop to learn more about assistive technologies for their clients – aging adults. Few participants were familiar with the term AgeTech prior to the workshop – most had never heard of AgeTech or were unfamiliar. Less than one quarter of participants reported that they had seen and/or used AgeTech in clinical practice. Half of the participants reported not working in a field that uses AgeTech and no participants had used AgeTech similar to the XCO Frailty Care System. Despite most participants reporting unfamiliarity with this specific type of AgeTech, two thirds of participants reported using some kind of technology in their practice compared to one third who reported that they did not use technology in their workplace. Most participants indicated an increased use of technology during the COVID-19 pandemic.

Figure 1. Familiarity with AgeTech

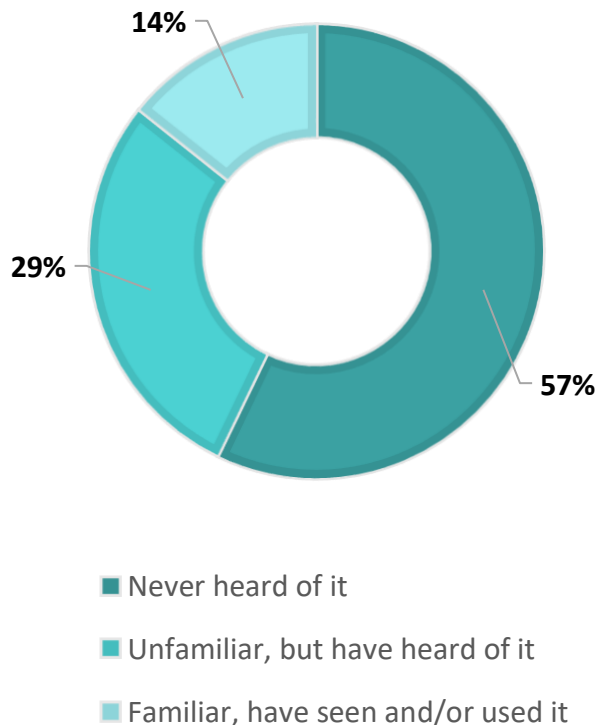
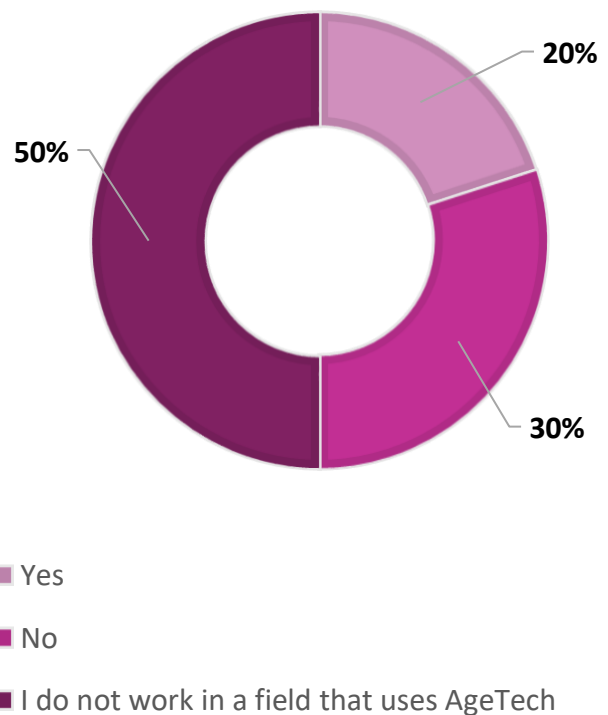


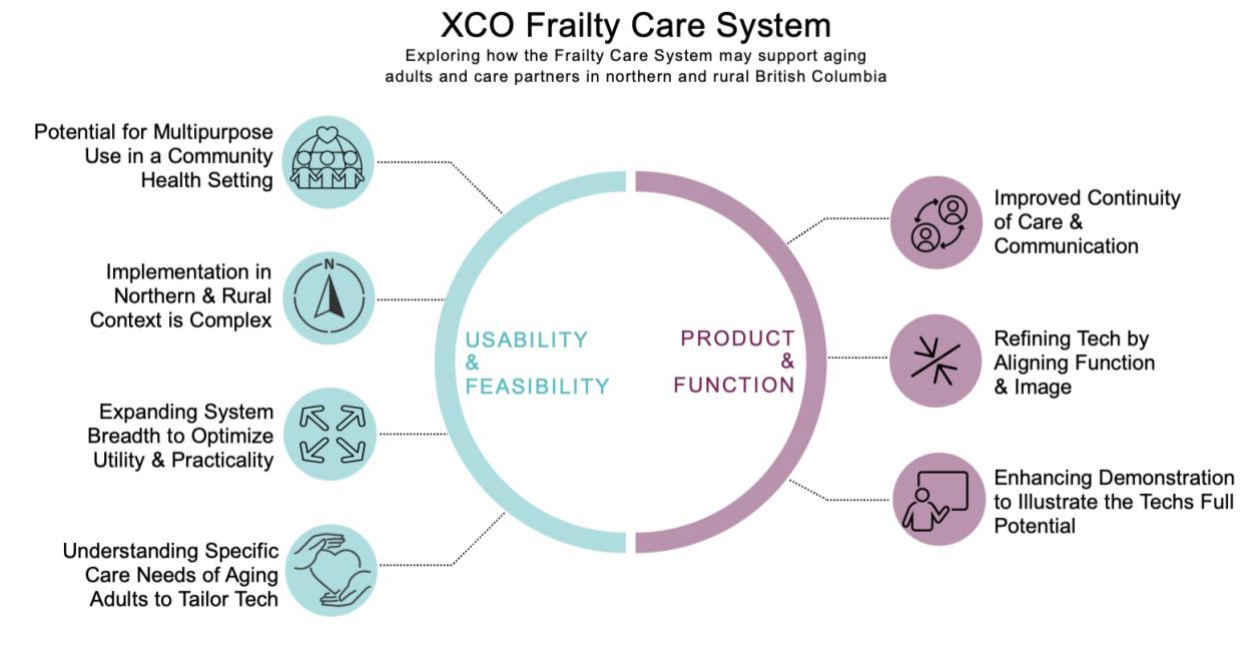
Figure 2. Use of AgeTech in Practice



FACILITATED DISCUSSION: KEY THEMES

During the workshops, participants engaged in discussions about their perspectives of the XCO Frailty Care System. Seven key themes surfaced under two overarching categories (Usability & Feasibility and Product & Function) and included: 1) the potential for multipurpose use of the XCO Frailty Care System in a community setting, 2) the complexity to implement the XCO Frailty Care System in a northern and rural geographic context, 3) the value in expanding the breadth of the XCO Frailty Care System to optimize both the utility and practicality for use in clinical practice, 4) the opportunity to further understand specific care needs for aging adults to tailor XCO Frailty Care System, 5) the improved continuity of care and communication for patients, 6) the advantage to refining alignment of the function and image of the XCO Frailty Care System, and 7) the need to enhance the XCO Frailty Care System demonstration to fully articulate all uses of the technology. The categories and themes, shown in Figure 3 below, are outlined as follows:

Figure 3. Key Themes



THEME 1: The potential for multipurpose use of XCO Frailty Care System in a community health setting

In each workshop, participants recognized the value of the XCO Frailty Care System to enhance their ability to provide patient-centred care, addressing individual needs within community settings, as a midstream intervention. Specifically, participants visualized using XCO's Frailty Care System as a screening tool for aging adults' physical health due to the technology's potential to support earlier identification of declines in their clients' physical abilities. Catching declines sooner rather than later was a priority for participants to help enhance quality and timeliness of patient care.

Participants described the potential for the Frailty Care System to help them empower their clients to be more proactive in self-management of their physical health. Earlier recognition of client decline could serve as an intervention point for further education on age-related physical declines and available interventions. One participant compared the value of the XCO Frailty Care System to that of a blood pressure machine in a pharmacy to enhance early detection of change.

Participants suggested that the XCO Frailty Care System may be beneficial for use by physicians in a primary care setting. They noted the possibility for family practitioners to use the XCO Frailty Care System as a way of facilitating timely referrals for aging adults to allied health professionals. Also highlighted was the benefit of being able to complete multiple tests at once, speeding up the process and facilitating improved patient care and workflow.

Table 1. Multipurpose potential of the XCO Frailty Care System

| Key Points | Illustrative Quotes |
|--|---|
| <p>Public Health Screening Tool</p> | <p><i>“Using it [Frailty Care System] as basically a screening... then you see problems and then you act on it. You get them referred, you get them into whatever supports needed sooner and then that will help.”</i> <small>Male, Physiotherapist, Workshop 1</small></p> <p><i>“Having something like this [Frailty Care System] down at the seniors’ center or something like that. You could get people...get that initial screen and you can use that for incentives. Screening every six months or a year and people can come back and see how they’re doing, and if they get flagged...if you scored at certain levels that are based on your age and gender [then you should] consider going to see your doctor or going to see a physio or what have you...”</i> <small>Male, Physiotherapist, Workshop 2</small></p> |
| <p>Timely Referrals</p> | <p><i>“I can really see it being useful to screen elderly or maybe senior clients in a doctor’s office for falls risk because we often, as physios, don’t see people until after they’ve had a fracture or several falls, which could have resulted in other injuries...”</i> <small>Female, Physiotherapist, Workshop 2</small></p> |
| <p>Improved Workflow</p> | <p><i>“...you have quite a number of tests to carry out [when doing a frailty assessment]. Not just one test now, this gives you the leverage to have more in one go, I think than doing it individually, one after the other, right?”</i> <small>Male, Physiotherapist, Workshop 2</small></p> |

Upstream approaches in health service delivery help keep individuals healthier in the community longer and are valuable tools to help avoid and/or delay need for more intensive levels of care. Participants spoke of how using the XCO Frailty Care System may be a way of moving toward a more upstream approach to health care delivery.

“Enhancing the healthcare systems ability to get in early [at] the prevention stage, ... not being so reactive but detecting small changes early on to put supports in place to slow the progression of dependency when we know the goal is to keep people in place for as long as possible.”

Female, Speech Language Pathologist, Workshop 1

By screening via the XCO Frailty Care System, participants noted that preventative supports could be provided for aging adults earlier, thereby enabling them to age-in-place longer.

Overall, participants conveyed that the Frailty Care System has strong potential to support healthy aging in community settings, increasing the ability for older adults to age-in-place.

“It’s a great system that has the potential to improve outcome assessment and overall health index projection.”
 Male, Physiotherapist, Workshop 2

THEME 2: The complexity of implementing the XCO Frailty Care System in a northern and rural geographic context

When considering a northern and rural context, participants shared dichotomous views with regards to the potential for successful and sustainable implementation of the XCO Frailty Care System. Participants discussed how XCO’s Frailty Care System may help improve healthcare accessibility, consistency, and precision for medically underserved communities across the diversity of clients they serve in northern and rural communities. Participants agreed with the benefits of having a system that is easy to use by a wide variety of individuals, regardless of skills or education, especially in regions with limited resources.

Table 2. Advocacy for northern and rural implementation

| Key Points | Illustrative Quotes |
|--|---|
| Accessibility & Consistency | <p><i>“We can install one of these in every kind of rural and remote hub. Like, I think it would be a great guide for people without the skills and background that therapists have to guide people... there’s a series of standardized tests and using [this] technology - that will enhance chances that it’s going to be done accurately and pick up the cases that need to be picked up, reliably.”</i></p> <p>Female, Speech Language Pathologist, Workshop 1</p> |
| Universal Usability | <p><i>“There are some communities that don’t have practitioners... and in those cases we rely on kind of mentoring supporting nurses or kind of whoever happens to be available at those sites to do assessment [but] that’s kind of out of their scope of practice and I could see this kind of system in communities like that.”</i></p> <p>Female, Physiotherapist, Workshop 3</p> <p><i>“I like...that you don’t need to have like a healthcare professional necessarily doing the actual collecting the data and doing the test, so I thought that was a good feature, so that’s a plus.”</i></p> <p>Male, Physiotherapist, Workshop 2</p> |

Conversely, participants were apprehensive regarding operational logistics, personnel capacity, accessibility, and maintenance for implementation and sustainability of XCO’s Frailty Care System across northern and rural communities. Participants voiced uncertainties around where the XCO Frailty Care System would be housed, as well as the time and resources needed to implement in traditionally underserved populations in rural and remote settings. Further, participants were unclear how the technology could be maintained over time.

Table 3. Apprehension around implementation in northern and rural context

| Key Points | Illustrative Quotes |
|--|---|
| <p>Operational Logistics & Upkeep</p> | <p><i>“And so, to get the information that this offers you have to get that suitcase to them, somehow, cause you're not going to have one presumably in every community so, you know, that's an awful lot of logistical coordination to get this there, then to set up somebody, who's got to be in the environment that person is in, to set it up.”</i></p> <p style="text-align: right;">Female, Physiotherapist, Workshop 3</p> <p><i>“So yeah, it's something that you obviously train someone to use – it's fairly easy, but I think it's more about ability and being responsible for it and who does what.”</i></p> <p style="text-align: right;">Female, Occupational Therapist, Workshop 3</p> |
| <p>Accessibility</p> | <p><i>“If the intent of the technology... is to increase equitable access to healthcare, just having it in an outpatient clinic that's already established to serve patients who can make it there doesn't really benefit the kind of rural and remote clients who aren't accessing services at this time.”</i></p> <p style="text-align: right;">Female, Physiotherapist, Workshop 2</p> <p><i>“[It wouldn't be accessible to] anyone who couldn't access the clinician offering the system due to access limitations - anyone predisposed to any sort of systemic disadvantage. Anywhere the system could not be offered due to systemic barriers - staffing, financial resources, prejudice against need for rehab of older adults, etc.”</i></p> <p style="text-align: right;">Female, Speech Language Pathologist, Workshop 1</p> <p><i>“If you're thinking about it from an access perspective, you really got to think about that logistics of coordination and how does how does it travel across the health authority - we have a vast geography. You know who's responsible for that, the risks, and all that sort of stuff.”</i></p> <p style="text-align: right;">Female, Physiotherapist, Workshop 3</p> |
| <p>Personnel Capacity</p> | <p><i>“...it's not any expertise but, it's just if I'm wanting someone on the other end to use it, you know, that's within their time. Are they going to be responsible for it? It's just another measure, you know, versus, if it's not in their usual daily workflow and I'm trying to add something new...”</i></p> <p style="text-align: right;">Female, Occupational Therapist, Workshop 3</p> |

Participants highlighted the increased use of virtual care in their everyday practice and discussed some of the current challenges with this model of care. Examples included were lack of trained personnel, time constraints, and communication barriers. Most participants agreed that XCO’s Frailty Care System could alleviate some of these difficulties. However, without additional personnel and support – especially in remote locations, participants were not confident of the feasibility to employ XCO’s Frailty Care System. Further, some participants felt that the addition of XCO’s Frailty Care System as a physical component would impact the convenience of virtual care for remote patients.

Table 4. Virtual care challenges

| Key Points | Illustrative Quotes |
|----------------------------------|---|
| Availability of Personnel | <p><i>“I also do outreach virtually to small communities, and I can definitely see this being useful in that setting because, often, I do have a helper on the other side, but they're not a physio and they're not a physio assistant so having something that kind of guides them through how to do the test would speed things up a lot, because often it's just me kind of trying to tell them how to set it up and it can be really tricky, so it would be amazing in those settings.”</i></p> <p style="text-align: right;"><small>Female, Physiotherapist, Workshop 2</small></p> <p><i>“And then as far as using it virtually, I guess I was trying to think that through - like I would still need someone on the other end to set it up, right, so...do I need a rehab assistant... [or am I] sending it to a family member and they're sending it up?”</i></p> <p style="text-align: right;"><small>Female, Occupational Therapist, Workshop 3</small></p> |
| Physical Component | <p><i>“...the whole thing about virtual [is that] you can get in [to remote locations] really easily, so the minute you add a physical thing that you want to get there, you know, that's another level of coordination”</i></p> <p style="text-align: right;"><small>Female, Physiotherapist, Workshop 3</small></p> |

Internet and mobile connectivity limitations in northern, rural, and remote locations, were described as a challenge for using technology in these regions. Participants appreciated that the Frailty Care System did not need WiFi to function, making it ideal for areas without internet connectivity.

“...even though it uses WiFi, it doesn't need an internet connection, because I think when people develop some of this stuff and they don't understand some of these places don't have cell service or internet.”

Female, Occupational Therapist, Workshop 3

Concerning design, some participants shared that XCO's Frailty Care System seemed compact and simple to use while others suggested that the system required further enhancements. For example, some participants noted that the case looked quite heavy and described their preference for the technology to be housed in something that was more portable and easier to use when transporting across remote regions. Building on this, participants also proposed that the system be available on additional, on-hand devices, such as a smart phone, which would improve functionality for providers working in rural and remote locations.

“It would be great if the technology could be developed as an app that patients and/or practitioners could put on their phone for use.”

Female, Occupational Therapist, Workshop 1

In summary, participants were divided on the capacity to implement the Frailty Care System in rural and remote settings. The divergent views revealed the complexity of delivering health care in these regions characterized by inconsistent and insufficient resources, lack of personnel, and accessibility challenges. The current XCO Frailty Care System has potential to alleviate certain barriers to care, such as improving continuity of care for rural and remote patients, while facilitating better communication between allied

health professionals. However, participants emphasized care gaps experienced by northern and rural communities that would require further reflection, community buy-in, and logistical strategies, to improve capacity and suitability for implementation.

THEME 3: The value in expanding the breadth of the XCO Frailty Care System to optimize both the utility and practicality for use in clinical practice

When considering how the Frailty Care System might fit into current practice, participants described the many multidimensional factors, both objective and subjective, that factor into diagnosing frailty. Participants described the numerous frailty assessment tools used with aging adults and how XCO’s Frailty Care System only assesses a small aspect of this.

“*I'm wondering whether it's very specific and so it might be a test that I could use in conjunction with other tests, but it might not be a test that I'd be able to use solely.*”
 Female, Occupational Therapist, Workshop 1

Increasing both the number and type of assessments available in the XCO Frailty Care System to reflect the multidimensional nature of frailty assessment was noted by participants to improve the usefulness and appeal for allied health care providers.

Table 5. Expanding XCO Frailty Care System

| Key Point | Illustrative Quotes |
|--------------------------|---|
| Expand Breadth of System | <p><i>“Keep expanding what kinds of data you could capture with the same type of sensors.”</i></p> <p style="text-align: right;">Female, Physiotherapist, Workshop 3</p> |
| | <p><i>“More practical, include other assessment areas, less gadgets.”</i></p> <p style="text-align: right;">Female, Physiotherapist, Workshop 3</p> |
| | <p><i>“It's a pretty small proportion of what I'm doing I don't think I would necessarily use it... But it just seems like another thing, honestly, too many things.”</i></p> <p style="text-align: right;">Female, Physiotherapist, Workshop 3</p> |

Altogether, participants saw value in the Frailty Care System, but underscored the need for the system to incorporate more assessments to increase utility and practicality in their everyday practice.

THEME 4: The opportunity to further understand specific care needs for aging adults to tailor the XCO Frailty Care System

All participants worked with aging adults in northern and rural communities and described the specific and specialized care needs of this population. When conducting frailty assessments participants emphasized the use of functional assessments and the necessity of focussing on the patients’ goals and ability to do everyday activities. Participants prioritized this type of care for older adults and questioned the usefulness of XCO’s Frailty Care System’s ability for precise measurements and tracking capabilities in informing patient-centered interventions and treatment outcomes in the cases where this would not improve the patient’s functional abilities. Consequently, when it would not be

possible to prevent or slow decline, highly accurate measurements of decline, such as is provided by XCO Frailty Care System, was not deemed highly valuable.

In discussion of current frailty assessments for with older adults, participants described limited use of technology, commonly citing the use of a pencil, paper, and a stopwatch. When asked about digitizing the assessments and results, participants were hesitant of incorporating new technology and unsure of the need, with most participants asserting that they use what feels comfortable and familiar – the “tried and true” methods.

Table 6. Tailoring to meet older adult population needs

| Key Points | Illustrative Quotes |
|---|---|
| <p>Specific Assessments for Older Adults vs. Need for Accuracy</p> | <p><i>“Accuracy is nice, but we know from these measures that improvement - there's like minimally clinically important differences that are generally quite large. You don't need it to be insanely accurate to the third decimal place or anything, because we know we need to see like a five second change...even if we're using a stopwatch, you can get a pretty good sense of whether they improved enough to make a clinically important difference.”</i> <small>Female, Physiotherapist, Workshop 2</small></p> <p><i>“...it's not always about: ‘are they a second faster with their timed up and go’, it's about: ‘do they seem more steady on their feet...can they go from using their hands on the arms [of the chair] to doing it without their arms’.”</i> <small>Female, Physiotherapist, Workshop 3</small></p> <p><i>“The need and place for objective data like this... I don't think that gets at our world, my world, we're really looking at functional stuff, and it's just the fact that you can do or not do a sit to stand...”</i> <small>Female, Physiotherapist, Workshop 3</small></p> |
| <p>Sticking to Familiar Methods</p> | <p><i>“And to me, I do so much other stuff that I'm not sure it's worth having that sitting in my department, when I could just do the measures slightly less accurately... I'll be honest, I'm with a pencil and paper. So, I don't know”</i> <small>Female, Physiotherapist, Workshop 3</small></p> <p><i>“Clinicians put the years in public practice, they get their tests that they like to do, or that they trust, and they become really efficient at them. And that's what I'm hearing from the [other participants] here, is that if you really had to adopt some of the technology when you're already efficient with your timed up and go...if it's measuring and has the same measurement as another test that I am used to, you know, why am I going to move over to those tests”</i> <small>Male, Physiotherapist, Workshop 1</small></p> |

In sum, participants discussed some of the frailty assessments used with older adult populations, such as the Timed-Up-And-Go, and Gait Speed, and explained how they may adapt or tailor them to meet their patients’ needs. Participants emphasized using a patient-centred care model, which focuses on functional outcomes and patient goals, rather than precise measurements. For patients where the course of treatment would not change with more accurate measurements, participants saw less value in incorporating new technology into their frailty assessments. Participants also showed hesitancy around incorporating new technology when they have a familiar and efficient routine to assess frailty in older adults that they felt was already working well.

THEME 5: The improved continuity of care and communication for patients

The need to improve continuity of care between allied health care providers in rural and remote settings was highlighted by many of the participants. In emphasizing a patient-centred model of care, participants spoke of how current healthcare management practices are not set up to facilitate informational continuity between providers for patients with multiple allied health care providers. Participants also highlighted how XCO’s Frailty Care System could facilitate efficient communication of accurate and current patient information.

Table 7. Improved care and continuity

| Key Points | Illustrative Quotes |
|---------------------------------|---|
| Informational Continuity | <p><i>“I think it helps with handing off, or handing over, to another healthcare professional. You know you see someone in [larger city], but they live in [remote community], right, or their somewhere else, so you see them for a small amount of time and there. And they’re going to other healthcare professionals in another city, and so, when you have those statistics based on this exact same program they can see that that continuity. And maybe they’re more likely to use that and then you can compare apples to apples better.”</i></p> <p style="text-align: right;">Female, Physiotherapist, Workshop 2</p> |
| Reliability | <p><i>“Practitioner to practitioner...the thing that it would help with is we all press stopwatches, for example, so we can have differences in when we stop the stopwatch...that interrater reliability would probably be better if we’re using a standardized tool.”</i></p> <p style="text-align: right;">Female, Physiotherapist, Workshop 3</p> |
| Decreasing Biases | <p><i>“Timed up and go is a subset of...the Elderly Mobility Score and I could see this tool being really useful if there is greater biases that we were trying to reduce...so I do appreciate the details.”</i></p> <p style="text-align: right;">Male, Physiotherapist, Workshop 1</p> |

In terms of patient provider engagement, participants highlighted that XCO’s Frailty Care System could be an effective communication tool, specifically in utilizing the results report. Participants found the design and layout appealing and expressed the value of receiving immediate collated reports to help communicate with patients and families, particularly in situations where the assessment results may take time to write up and the patient does not go to the provider regularly.

Table 8. Improve communication and patient engagement

| Key Points | Illustrative Quotes |
|-------------------------------|--|
| Communication Tool | <p><i>“...be able to encourage them...and they can have routine tests to just follow up on them, and this system [the Frailty Care System] will be helpful in doing that.”</i></p> <p style="text-align: right;">Female, Physiotherapist, Workshop 3</p> |
| Instant Results Report | <p><i>“I do appreciate that it instantly gives you that visual report. And I do find, depending on kind of the clients that you’re working with and the families, it can be nice sometimes to an instant visual that you can look and say like, ‘Okay, this is where you are the, this is the graph’.”</i></p> <p style="text-align: right;">Male, Physiotherapist, Workshop 2</p> |

Participants suggested that the results report graphs and charts could be useful for goal setting and to incentivize patients to maintain physical activity and healthy eating as they age.

“ There's research and evidence to show goal setting does matter. Goal setting can be something that helps motivate people and give them feedback, so you know, theoretically, it could be a more accurate way of setting goals. If you were wanting to reduce your time in the TAG or improve your gait speed or improve your balance, some of the metrics that it [the Frailty Care System] does provide could. So, it could be used as a goal setting tool potentially. ”

Male, Physiotherapist, Workshop 2

In summary, participants believed that the XCO Frailty Care System could improve the continuity of care for patients treated by multiple allied health providers by facilitating smoother patient transitions, greater patient care and more effective and consistent treatment plans. Participants also saw the Frailty Care System as a communication and goal setting tool to better engage patients and improve adherence to treatment plans.

THEME 6: The advantage to refining alignment of the function and image of the XCO Frailty Care System

In considering the XCO Frailty Care System as a product, participants discussed the technology's image and function. Participants suggested that the name, "Frailty Care System" did not truly represent the technology's function and offered ideas of what a product with this name should do.

“ I do think that the name is not accurate - you're basically using a frailty assessment tool, or something, but like 'frailty care system' implies they're going to take that information, interpret it for you to give it to a caregiver, to give it to me...when I think of frailty care system, I think of a basic, accessible, sort of like, falls risk reduction awareness system, so you get these things, it says, 'Hey, you walk really slowly - you're at risk of falls,' prompts you to physical activities, little thing on medications, a little thing on physiotherapy for balance and, like, a reducing falls risks in your home...like a system to me was this like cohesive whole, whereas I feel like that's just one piece of it made more specific. ”

Female, Physiotherapist, Workshop 3

“ I guess maybe that's what threw me off, because, I mean, it's an assessment tool with objective data, but it's, you know, unless it's actually sort of identifying or helping screening for frailty...because it doesn't seem to fit what it actually does - the name. ”

Female, Physiotherapist, Workshop 3

In suggesting an alignment of the system's name with the function, participants acknowledged that allied health care providers would have a better first impression and understanding of the tech product, improving appeal and uptake.

THEME 7: The need to enhance demonstration to illustrate the XCO Frailty Care System’s full potential

In discussing the workshop, itself, one of the main concerns that arose was the demonstration of the XCO Inc. Frailty Care System. Primarily, participants felt that the demonstration subject was not representative of the diverse population that the participants work with daily. This left participants curious if the Frailty Care System would actually perform as effectively with individuals with cognitive or mobility impairment that may be within the aging adult population.

Participants were very interested in the cognitive assessments included in the XCO Frailty Care System, but felt it was only mentioned briefly, leaving participants wanting much more detail. There was particular interest in the real-world applicability of the cognitive assessments and the supporting evidence-base, with participants indicating that cognitive barriers are a primary consideration when conducting assessments with older adults.

Table 9. Demonstration opportunities

| Key Points | Illustrative Quotes |
|--|--|
| Wider Diversity of Demo Subjects | <p><i>“...when I see people doing a demo with like a completely, you know, able bodied person, you're like, ‘oh okay, that's great’, but I actually want to see it with a person that I'm going to work with to immediately know if it's gonna work or not.”</i></p> <p style="text-align: right;">Female, Physiotherapist, Workshop 3</p> |
| More Detail on Cognitive Assessment | <p><i>“It would have been really nice to have seen the cognitive side as well, and I think with him speaking about it, I don't think it gave us the full picture.”</i></p> <p style="text-align: right;">Female, Occupational Therapist, Workshop 1</p> <p><i>“Presentation didn't touch on cognition...unclear if it would work with real clients with cognitive impairment.”</i></p> <p style="text-align: right;">Female, Speech Language Pathologist, Workshop 1</p> |

Participants felt that the presentation and the demonstration of the Frailty Care System could have been improved both in format and pace. These drawbacks ultimately overshadowed the depth of the XCO Frailty Care System’s key features and benefits, and left participants without a full understanding of the tech’s capabilities.

“ I thought the presentation was rushed and left me wanting a lot more. ”

Female, Occupational Therapist, Workshop 1

“ The demo was a bit low fi. ”

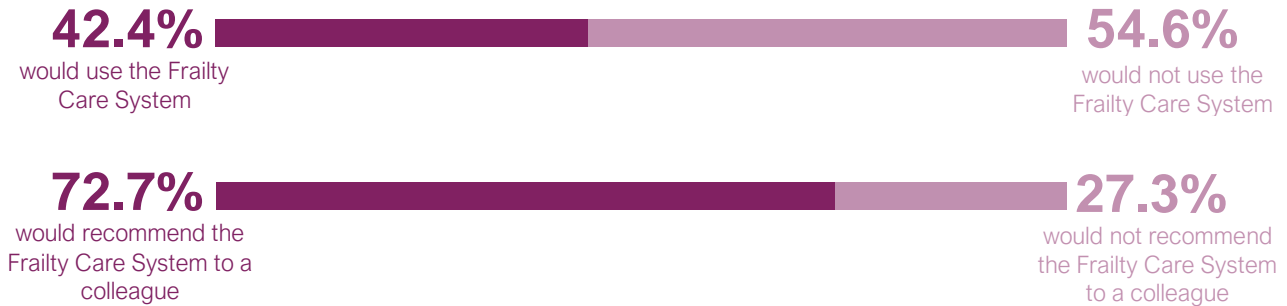
Female, Physiotherapist, Workshop 3

By enhancing the demonstration with a wider variety of demonstration subjects, expanding the depth of details focused on articulating the full range of assessments available, and improving format and pace, XCO could more clearly communicate and showcase the full potential of the XCO Frailty Care System.

POST-SURVEY & NEXT STEPS

Overall, participants enjoyed the workshop and found the Frailty Care System technology to be of relevance and interest in relation to northern and rural practice. About half of the participants could see themselves using the Frailty Care System in their practice, citing the efficiency and virtual/remote applications as benefits. Most participants reported that they would recommend the Frailty Care System to a colleague.

Figure 4. Post-workshop survey results



In moving forward to further explore implementing the Frailty Care System in northern and rural British Columbia, CTAAN can partner with local physiotherapist or occupational therapy experts to collaboratively engage in the next phases of this work. CTAAN can support XCO to scope out real-world implementation locations in rural and northern communities who are keen to work to identify the logistics to pilot implement the XCO Frailty System. CTAAN can also support an evaluation based on the pilot findings, to inform expanded real-world implementation of the XCO Frailty System.

Recommendations

The following are a list of recommendations based on the findings of this report. XCO is encouraged to:

- Explore how XCO Frailty Care System could serve as a community screening tool for a proactive public health care initiative
- Consider collaborating with physicians in the primary care settings to implement the XCO Frailty Care System for early detection and timely referrals to allied health care providers
- Strategize with northern and rural community health care leaders to reduce the logistical and resource-based restrictions that may limit the capacity to implement the XCO Frailty Care System
- Consider adapting the system for use on a smart phone for providers in northern and rural communities to increase functionality
- Partner with allied health care providers who specialize in older adult populations to tailor and expand assessment capabilities of the XCO Frailty Care System to better serve this population
- Explore adaptation of XCO Frailty Care System reports to further promote practitioner patient communication by streamlining assessment summaries for the general population
- Further examine the role of the Frailty Care System in improving communication between allied health care providers and the continuity of care for their patients
- Update the XCO Frailty Care System moniker to better align with the technologies function
- Pre-record demonstration* to strengthen promotion and messaging of the Frailty Care Systems full capabilities, including the cognitive features
- Include a variety of individuals representative of the allied health care providers patient population in demonstration to mirror real-world interactions

* Note: While an in-person demo would be preferable, due to restrictions regarding conducting research during the COVID-19 pandemic, the workshop was limited to a virtual format. This recommendation is based on the conditions at the time of the workshops.

Conclusion

This report focuses on the perspectives of allied health care providers that participated in ADEPT Workshops in June 2022, that featured the XCO Frailty Care System. Through qualitative analysis of the workshop discussions, seven themes were identified under two overarching categories. The first four themes were grouped under the Usability & Feasibility category: 1) Potential for multipurpose use in a community health setting, 2) Implementation in northern and rural context is complex, 3) Expanding system breath to optimize utility and practicality, and 4) Understanding specific care needs for aging adults to tailor tech. Continuing, the last three themes were grouped under the Product & Function category, and included: 5) Improved continuity of care and communication, 6) Refining tech by aligning function and image, and 7) Enhancing demonstration to illustrate the techs full potential.

Taken together, the findings drawn from this report reveal the XCO Frailty Care System to be of relevance and interest to allied health care providers in northern and rural communities. That said, as the Frailty Care System currently stands, there are technical, operational, and optimization opportunities to further advance the technology. With the purposeful cultivation of northern and remote community partnerships, the exploration of tech adjustments for older adult populations, and the development of a contextually sensitive strategic implementation plan, the XCO Frailty Care System has potential to support, and benefit, underserved and under resourced communities in northern and rural British Columbia.

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