The HealthTech Home

Empowering older adults through technology and innovation

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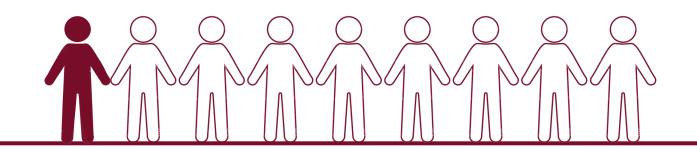
97% of Canadians age in place

82% of Canadians age 65+ believe technological advancements can help them stay in their homes longer

25% of Canadians are caregivers; one in two will become one

1 in 9 new long-term care residents potentially could have been cared for at **home**

INTRODUCTION

2021 **HelpfulHome**

Hosted by The Brenda Strafford Foundation (BSF), Health Cities, and Best Buy Canada, key stakeholders participated in the Helpful Home Virtual Roundtable to help develop a framework for how technology can be used to support older adults to age in place.

A helpful home should provide convenience, connection, safety, and security. The ultimate goal is supporting independence and empowering older adults to live healthily and safely at home, and supplementing the work of care providers.

2022 **HealthTech Home**

The HealthTech Home project, an initiative from the BSF and Health Cities, aimed to address pressure on health systems by integrating and validating consumer technology and innovative health solutions in a residential setting.
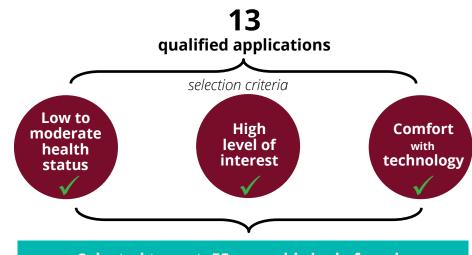
Aging at home has become a priority in the health sector. Recent studies have shown that aging at home can lower the cost to the healthcare system while enabling older adults to remain safe, independent, and connected to their homes and communities. However, understanding the technology required to support older adults to age at home is not always a straightforward selection as many products are costly or do not integrate directly with existing consumer or health systems.

The HealthTech Home project creates a sandbox environment deployed within a BSF-owned condo unit for independent older adults. The condo building is connected to one of BSF's continuing care homes in Calgary, Alberta. Health technology solutions have been selected and installed to monitor the health of a tenant over the course of one year to slow or reverse any decline in health, and to aid aging in place.

Evidence has shown that technology and innovation can help support the choice to age in place.

Tenant Selection

- An ad was posted on Rentfaster.ca.
- Top applicants were pre-screened to gauge interest and suitability.
- Seven applicants participated in a basic clinical assessment with BSF staff.
- One tenant was selected and lived there from July 15, 2022 to June 28, 2023.

13
qualified applications

selection criteria

Low to moderate health status ✔

High level of interest ✔

Comfort with technology ✔

Selected tenant: 55 year old single female

Core Technology

- Born out of the HelpfulHome concept, Best Buy Canada created a technology bundle as a starting point for a smart and connected home — AKA the 'core technology'.
- Considerations included: individualize vs pre-select technology, remaining vendor agnostic, and choosing one ecosystem (i.e., Google, Amazon, Apple).
- Geek Squad installed the core technology prior to the tenant move-in date and provided initial and follow up training once the tenant moved in.

Display & Interface

LG 4K UHD LED Smart TV | Lenovo IdeaPad 3 | iPad 9th Gen | Google Nest Hub Max | Google Nest Mini

Security & Home Safety

ecobee Smart Thermostat | August Wi-Fi Smart Lock | Google Nest Protect | Phyn Smart Water Sensor

Convenience & Personal Safety

iRobot Roomba i3+ | Philips Hue Motion Sensor | Wemo WiFi Smart Light Switch | Philips Hue Smart Light | Philips Hue Light Strip
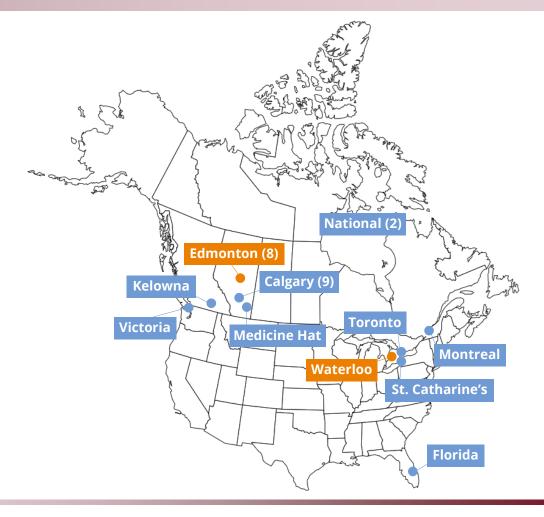
Environmental Modifications

- CBI Health conducted a home assessment with the tenant 10 days after moving in to determine the tenant's functionality within the home.
- All recommendations were implemented (see products to the right) .

Handheld Shower Head

Bidet Attachment

Winne Wagon

Soap Dispenser

Shower Grab Bars

Expression of Interest (EOI)

- Three focus areas were derived from the assessments conducted by BSF and CBI Health, as well as the tenant's personal interests and health and wellness goals:

  → Cognition & Memory

  → Mobility

  → Healthy Aging

- The purpose of the call for EOI was to find innovative health technologies that assisted with aging in place.
- 27 applications received; two vendors selected—Chirp and Rehabtronics

National (2)

Edmonton (8)

Kelowna

Calgary (9)

Victoria

Medicine Hat

Toronto

Waterloo

Montreal

St. Catharine's

Florida

Innovation Council

- An Innovation Council was established to help ensure the HealthTech Home met its objectives.
- Members were represented from various organizations and geographic locations across Alberta.
- The Council provided insight into the program model, championed the project, and assisted with selecting the three technology focus areas.
- We are grateful for the Innovation Council's contributions, commitment, and expertise provided to the HealthTech Home.
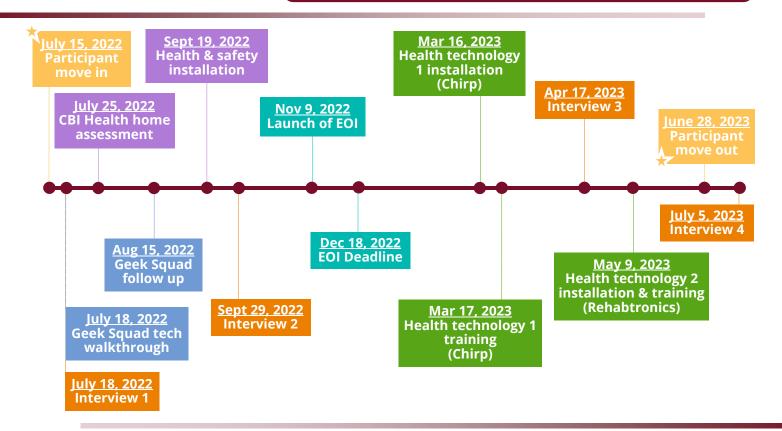

Project Partners

Project Vendors

Hypothesis

By adopting technology products and integration provided in the HealthTech Home, the tenant will be better equipped to live safely and independently, and with dignity, than if the technology was not present.

July 15, 2022
Participant move in

July 25, 2022
CBI Health home assessment

Aug 15, 2022
Geek Squad follow up

July 18, 2022
Geek Squad tech walkthrough

July 18, 2022
Interview 1

Sept 19, 2022
Health & safety installation

Sept 29, 2022
Interview 2

Nov 9, 2022
Launch of EOI

Dec 18, 2022
EOI Deadline

Mar 16, 2023
Health technology 1 installation (Chirp)

Mar 17, 2023
Health technology 1 training (Chirp)

Apr 17, 2023
Interview 3

May 9, 2023
Health technology 2 installation & training (Rehabtronics)

June 28, 2023
Participant move out

July 5, 2023
Interview 4

Gerontechnology Domains

Research shows that overall technology use is improved when products and services are equitably distributed under each of the 4 domains. The following products were in the condo.

Home & Daily Living

- Water Sensors
- Smart Lock
- Roomba
- Motion Detector Lights
- Smart Light Bulbs & Switches
- iPad
- Google Nest
- Smart Fire & CO Detector
- Apple Watch*
- Washer & Dryer

Supports home & daily tasks, improves personal safety, & increases convenience.

Communication

- iPhone*
- MacBook*
- Apple Watch*
- Google Nest
- iPad
- PC Laptop

Supports communication with others.

Healthcare

- Google Nest (sleep support)
- Grab Bars
- Bidet
- Soap Dispenser
- Shower Head & Mount
- Chirp
- ReJoyce by Rehabtronics
- Apple Watch*
- Smart Scale*
- Smart Toothbrush*

Supports management of health & health conditions.

Education & Recreation

- iPhone*
- Apple Watch*
- Smart TV

Used on a voluntary basis in free time.

*Owned by tenant

Emerging Themes

Self-Sufficiency & Independence

The ability to provide for one's own basic needs without the need to rely on external supports (ex. walkable amenities vs having to drive).

> "One of my favourite parts [of living in the HealthTech Home] is the neighbourhood."

Balancing Safety & Security with Personal Privacy

The feeling of safety without personal intrusion. While the participant wanted to feel secure and cared for (especially as it related to living alone), there was an important decision to be made when balancing security and privacy.

> "I do enjoy having the [Google Nest] camera if I'm not [at home]. When I'm there, [I] don't really like it."

Quality Convenience

Convenience means adding to one's comfort or simplifying daily living activities. The participant noted several services that they would be happy to pay for if the service provided quality.

> "On Monday last week, when [the cleaning person] was available, I was not home, and I know that she can buzz me at the entrance and I can let her in, and because the door lock of my suite is on my phone...it's easy like I just let her in, and she went to clean the suite."

Personalization & Choice

The participant noted the challenges with different 'form' (how it looks) options that were available to them when searching for the products that met a specific 'function' (how it works).

> "I think the grab bars should be able to be beautiful... I think that [the grab] bars should be customizable."

Connection & Social Needs

Building and maintaining relationships and finding ways to feel less alone was a common thread that came up when discussing current needs, as well as anticipated future needs and concerns.

> "I would [like a] phone that I could chat with someone whenever I want [about day-to-day struggles]. ...[I would like to talk to] someone that doesn't know [me], that is just there to listen."

Community

The participant cited a strong sense of community as one of their main desires when choosing where to live. They felt comforted knowing that they were not isolated and could reach out to neighbours or researchers in the study. The neighbourhood and its amenities were also important factors.

> "Knowing that I was not alone, even though I was living alone [was important to me]. If I didn't remember something I knew I could just ask. You guys were all so very supportive."

Perspective on Technology

The participant found that the technology's practicality and daily usage made learning easier and encouraged them to push past their normal comfort zone. Through their experience living in the home, the participant noted that their increased comfort led them to consider how they could continue to incorporate technology into their everyday life.

> "[I] think that you put up a wall [against] new things, like a new technology that you don't need it, or you won't be able to learn it, and I think that being part of the condo has opened my mind [to] all that technology."

Heuristics & Opportunity Statements

VISIBILITY OF SYSTEM STATUS
Helping people orient themselves through landmarks, wayfinding, and progress indicators. It also involves clearly showing the users the effect of actions and making feedback available.

OPPORTUNITY
> Select products that include audiovisual feedback to indicate when actions do not align with proper use of the product or system.

MATCH BETWEEN THE SYSTEM AND THE REAL WORLD
People's existing knowledge of how a system works based on their past experiences with real-world objects. Information should leverage the user's perception of the world rather than making them adapt. Including familiar elements and activities in the interface will help users move through the experience with ease.

OPPORTUNITY
> Select technologies that can be easily customized to cater to the user's current preferences while allowing for future adjustments as their needs evolve.

USER CONTROL & FREEDOM
Allowing for choice over technology and limiting forced inter-dependencies between systems. When it is easy for people to back out of a process or undo an action, it fosters a sense of freedom and confidence. This allows users to remain in control of the system, avoid redundancy, and prevent frustration.

OPPORTUNITY
> Introduce manual override options to allow the user freedom to maintain activities of daily living while turning off or not use the smart products when systems do not work as expected or optimally.

CONSISTENCY & STANDARDS
Using consistent wording and actions and following common conventions. Any differences from the norm should be emphasized and the user made aware. Users should not have to wonder whether different words, situations, or actions mean the same thing.

OPPORTUNITY
> Choose one operating system to reduce confusion and learning curve by new residents.

PREVENT ERRORS BY ANTICIPATING NEEDS & ABILITIES
Preventing errors from occurring in the first place by eliminating error-prone conditions or checking for them and presenting a confirmation option before users commit to the action. Technology providers are also encouraged to provide graceful recovery for mistakes and help users get back on track.

OPPORTUNITY
> Conduct a needs assessment to personalize and prioritize the technology required prior to the tenant moving in.

MINIMIZE COMPLEXITY BY EMPHASIZING RECOGNITION OVER RECALL

Making information clear, simple, and easy to find. Avoid making users remember information. Information required should be visible or easily retrievable.

OPPORTUNITY **Unify the user input on a single device so the user knows where to find everything, rather than having to remember which product is controlled by which device.**

UNIVERSAL DESIGN & AESTHETICS

Universal Design considerations are important when considering functions and features of a home within and beyond the digital world. Universal design is defined as the design of products and environments to be suitable by all people, to the greatest extent possible, without adaptation or specialized design.

OPPORTUNITY **Provide additional training to the user so they may become a more advanced user after they are comfortable with the technology in the home.**

FLEXIBILITY AND EFFICIENCY OF USE

Catering to both inexperienced and experienced users through the ability to tailor frequent actions. Shortcuts – hidden from novice users – may speed up the interaction for the expert user. Flexible processes can be carried out in different ways, so that people can pick whichever method works for them which improves efficiency as they gain mastery.

OPPORTUNITY **Provide additional training to the user so they may become a more advanced user after they are comfortable with the technology in the home.**

HELP & DOCUMENTATION

The best designs do not need additional explanation; however, it may be necessary to provide documentation and support to help users complete their tasks. The user should be provided with the necessary tools and information to help them achieve their goals.

OPPORTUNITY **Provide "cheat sheet" guides to users, related to each available technology, to help support their learning and re-learning over time.**

RECOGNIZE, DIAGNOSE, & RECOVER FROM ERROR

Ensuring that the user can recognize and understand the problem and is offered a clear solution for how to fix it. Error messages or indicators should precisely indicate a problem and constructively suggest a solution.

OPPORTUNITY **Addition of a notification, documentation, or feedback response from products or systems that provides the user with the information they would need to locate issues and know how to fix them.**

Final Thoughts

Aging in place means having the health and social supports and services needed to live safely, independently, and with dignity.

Living Safely	Living Independently	Living with Dignity
Minimizing risks and hazards to maintain a safe and accessible environment.	**Maintaining a level of self-sufficiency that aligns with one's abilities, preferences, and comfort levels.**	**Maintaining a sense of self-respect and autonomy.**
Present: Grab bars, Chirp, neighbourhood amenities, interpersonal relationships	*Present*: ReJoyce, Roomba, smart lock, walkability of community	*Present*: Ability to choose against certain technologies or features (ex. Google Nest camera), positive overall experience
Missing: Improper installation of bidet and grab bars, appliance height, inconsistency of smart lock	*Missing*: External support network unavailable to set up Chirp, limited opportunities for connections within building	*Missing*: Multiple operating systems, multiple lighting systems, aesthetics of assistive technologies

Conclusion: The evaluation supported the hypothesis that interventions like the HealthTech Home have the **potential to support aging in place** if the opportunity statements presented in this paper are taken into consideration.

Looking Forward

While the HealthTech Home Project had a case study approach with an end user of one, it helped identify several areas for future opportunities related to technology and aging place:

- Create a technology catalogue for users to identify and select technologies that are most meaningful to them.
- Create a comprehensive, user-friendly technology instruction guide for products and systems.
- Develop a financial model to support long-term funding for technology access for older adults.
- Include older adults in planning and co-design of physical environments and technology.
- Adapt the HealthTech Home Project to an assisted living or long-term care setting.

Dr. Barrie Strafford Centre for Learning, Information & Quality

On September 26, 2023, BSF launched The Dr. Barrie Strafford Centre for Learning, Innovation, and Quality (CLIQ), which focuses on solving challenges related to quality aging, the future of work, international healthcare, and community supports.

Provincial Innovation Council

Health Cities is expanding the Innovation Council to partner and engage with the continuing care spectrum. The goal is to identify and leverage projects that focus on age technologies to help inform policy and improve technology access.

Project Sponsors

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The Preservation of Dignity and The Pursuit of Happiness