Overview of the Pitt Healthy Home Lab

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Healthy Home Laboratory

Community-based laboratory bringing together people from the community and the university to tackle major problems of aging in place and provide scalable solutions to support older adults and people with disabilities to age safely and independently at home.

- **Vision**
  A world where all individuals can age safely and independently in the comfort of their home so they can enjoy healthy and vibrant lives at home and in their community.

- **Mission**
  Create new technology solutions and support services that enable people to live safely and independently at home.

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Motivation

- The population \( \geq 65 \) will more than double by 2050 \((\text{Population Report, U.S. Census Bureau, 2020})\)
- \( >75\% \) of older adults prefer to age-in-place \((\text{AARP Survey on Older Adults})\)
- \(< 10\% \) of Homes are \textbf{aging-ready} and in the northeastern U.S. \((\text{U.S. Department of Housing and Urban Development and U.S. Census Bureau, 2011})\)

* Aging-ready is defined as a housing unit that has a step-free entryway, a bedroom and full bathroom on the first floor, and at least one bathroom accessibility feature (e.g., an elevated toilet, built-in shower seat, and handrails or grab bars).

Healthy Home Laboratory Activities

- **Assessments**
  Develop and evaluate tools to assess the health of individuals and the home environment to recommend appropriate interventions to promote safe and healthy homes.

- **Technology**
  Develop and evaluate assistive and smart-home technology to support healthy living for older adults, people with disabilities, and their caregivers.

- **Services & Interventions**
  Develop and implement personalized home-based interventions that combine the best technology, caregiver support, and professional services.

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Research Registry

Through support with UCSUR, the HHL now has research registry containing socio-demographic and age-related clinical information allowing targeted recruitment, and includes the following participant groups:

• Individuals ≥ 60 years old (81%)
• Caregivers of older adults (7%)
• Adults with a disability (7%)
• Healthcare workers who provide care for older adults (4%).
January 2021
Established the Healthy Home Lab

June 2021
Grants awarded

Nov–Dec 2021 (& ongoing)
Established HHL Team

April 2022
HHL House purchase

March 2023 – ongoing
SHRS Student Training

December 2022
Grant awarded

November 2022
Official HHL Launch

May–Oct 2022
Lab spaces & prototype installations

June 2023
Established Startup

September 2023
Home Safe & Smart Partnership

November 2023
Grant pending

November 2023
Ongoing Operations

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Partners

- Center for Aging and Population Health
- UPMC Life Changing Medicine
- IMPACT
- GRECC
- Women for a Healthy Environment
- University of Pittsburgh Center for Social & Urban Research
- Wireless Tech RERC
- Center for Caregiving Research, Education and Policy

Funding Sources

- National Rehabilitation Research & Training Center on Family Support
- Allegheny County
- Pittsburgh PEPPERCENTER
- Pennsylvania Department of Aging
- VA
- U.S. Department of Veterans Affairs
- Department of Housing and Urban Development
- Healthy Home Laboratory
Safety & Mobility Risks in the Home

- Home injuries cause more than **30,000 deaths** annually, **39% among those 60+**\(^1\)

- **12.4 million nonfatal home injuries** annually, with higher injury rates among those 75+\(^1\)

- **Falls-related treatment cost $50 billion annually** (CDC)

- **Falls** are the **leading cause of nonfatal home injuries**, accounting for **41.2%** and **2\(^{nd}\) most common cause of fatal injuries**\(^1\).

- Falls are the leading cause of fatal and non-fatal injuries among older adults\(^2\) and **stairway falls** are the **leading cause of accidental death** among this age group\(^3\).

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Mobility & Safety Technology in the Home

Design Objectives & Areas of Focus

- Highly ergonomic & functional
- System integration across technology
- Single install of system with modular upgrades
- Sensor enabled to support monitoring
- Broad IP coverage

Access
Ramps & vertical lifts

Mobility
Stair climbing support

Fitness
Safe & ergonomic solutions

Safety
Railings & grab bars

Smart Home
Services & training

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Mobility & Safety Technology in the Home

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Fitness
Safe & ergonomic solutions

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Smart Home
Services & training

Smart Speakers

Sensors & Controls

Lights & Plugs

Health Monitoring

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Mobius is an adaptable rail system that is used in place of decorative architectural moulding throughout the home and serves as an anchor point for a range of accessibility components.
SafeStep is a moving handrail that reacts intuitively to the user’s needs by activating when they are ready to climb the stairs and adapting immediately to the speed of the user.

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RailBot is a powered assistive device for stair climbing, enabling and encouraging users to maintain their stair-climbing capabilities, thus contributing to their long-term physical health. RailBot is a highly compact device that can be easily installed in existing stairways or two continuous wall-mounted rails.
Mobility & Safety Technology in the Home

Modular Ramps – promoting accessibility

Concept 1 —
Right Side Garden Ramp Entrance

Concept 2 —
Left Rear Side Deck Ramp Entrance
Smart Home Technology & Monitoring

Mobile Device Assessment Tool

Smart Speaker Training

Smart Home Technology Service Delivery Models

Fall Detection
Healthy Home Laboratory

For more information visit our website at HealthyHomeLaboratory.pitt.edu

If you are interested in partnering, contributing or joining the Healthy Home Laboratory, contact us at HealthyHomeLab@pitt.edu

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