**David Lindeman, PhD**
Executive Director Health

UNIVERSITY OF CALIFORNIA | BERKELEY | DAVIS | MERCED | SANTA CRUZ

**Center for Information Technology Research in the Interest of Society**

**Digital Equity Solutions for Older Adults: From Lighthouse to Large Language Models**

Senior Health Policy Forum
**December 1, 2023**

# CITRIS Health

**David Lindeman**
Executive Director Health

Boosting Digital Health Literacy for Older Adults in Affordable Housing

# Lighthouse for Older Adults

Technology-enabled health and well-being for older residents of affordable housing during the COVID-19 crisis and beyond



A **rapidly deployable and scalable digital inclusion program** that provides **internet accessibility** and **digital literacy training** to improve wellbeing, access to health care services, and communication

# Implementation Approach: A user-centered approach

- **Broadband Access:** internet connectivity and devices (laptops, tablets, smartphones, etc.).

- **Broadband Affordability:** supporting and scaling community internet infrastructure

- **Broadband Adoption:** curriculum, outreach, and socializing technology learning/support

- **Broadband Content:** meaningful, valuable, relevant, and in-language support

# Implementation Approach: Learning Model

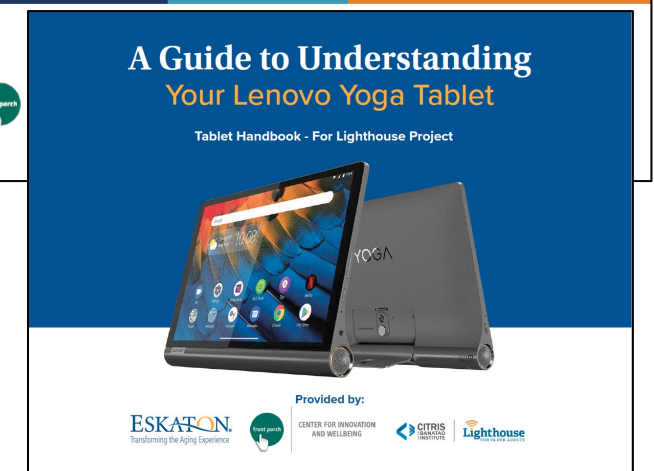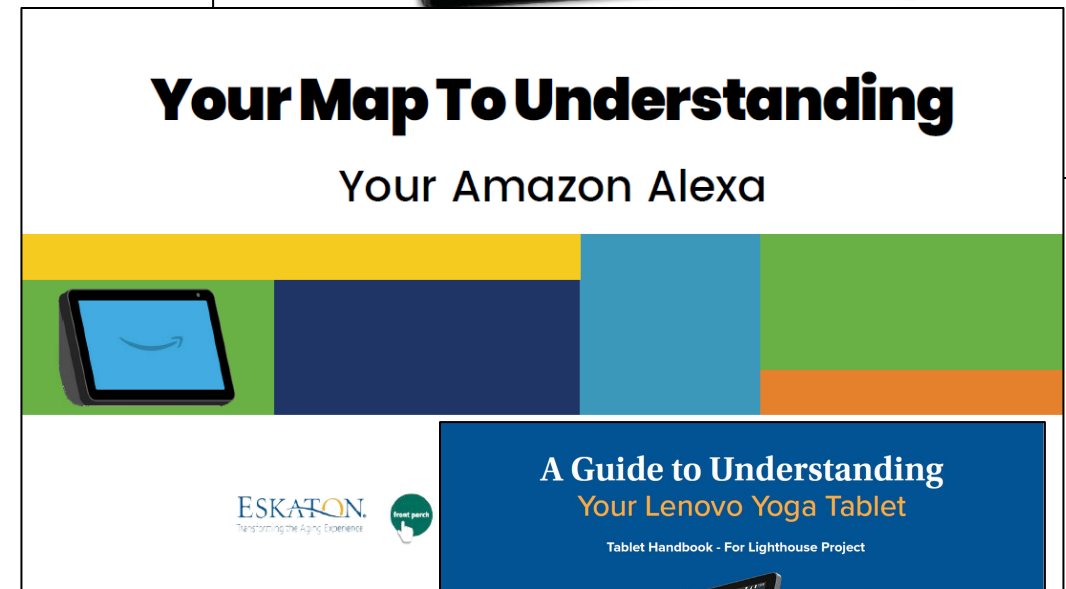## Peer- and Community-based Learning Model

- **Resident ambassadors** provided devices prior to deployment to become "super users"

- Staff and/or residents held 3-5 **initial technology workshops** after deployment

- Resident Ambassadors hosted **ongoing office hours** at community

- **Small group "Pods"** to help socialize technology learning and tech support
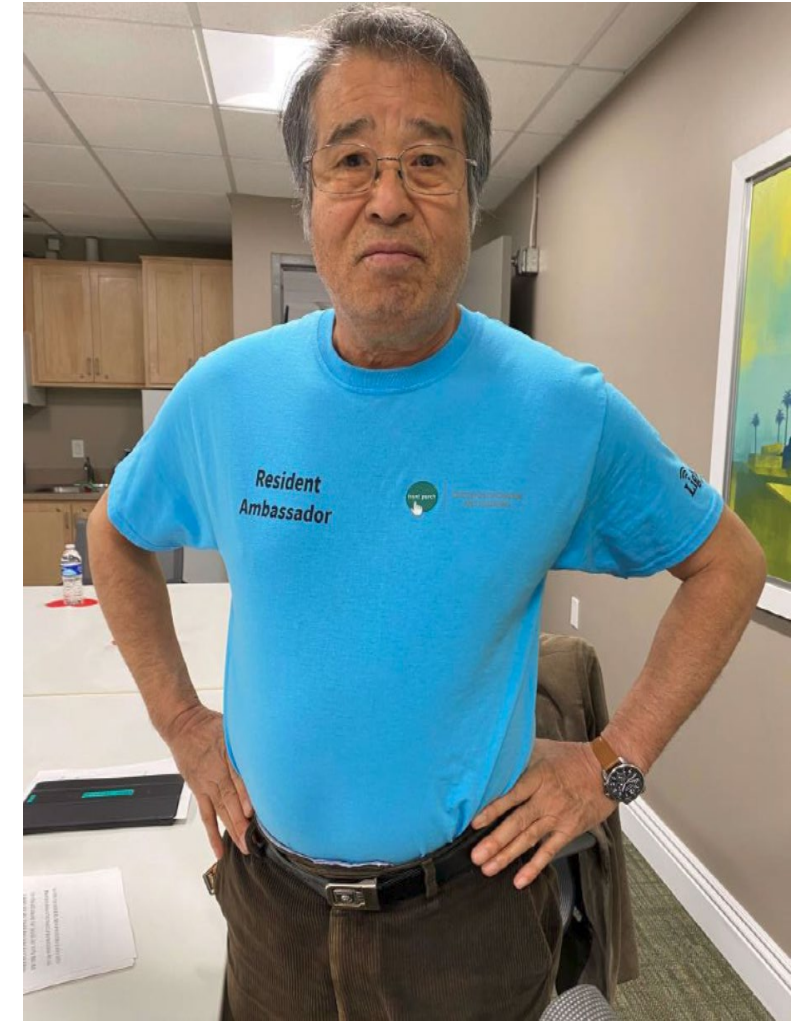
# Implementation Approach: Training Material

## User-focused training material utilized

- **In-language curriculum** for every deployment & device

- **Weekly focus areas** (i.e., device basics, camera usage, downloading apps, using apps, video calling, etc.)

- **Bite-sized content** that would not overwhelm the residents



이해를 위한 안내서
Samsung Tab A7 Tablet
태블릿 핸드북 - 등대 프로젝트용

**Your Map To Understanding**
Your Amazon Alexa

ESKATON.
Transforming the Aging Experience

A Guide to Understanding
Your Lenovo Yoga Tablet

Tablet Handbook - For Lighthouse Project

ESKATON.
Transforming the Aging Experience
Provided by:
CENTER FOR INNOVATION AND WELLBEING
CITRIS BANATAO INSTITUTE
Lighthouse

# Lessons Learned

**Tailoring is Essential:** requires flexibility and tailoring of the intervention approaches.

**Linguistic alignment is key:** In-language resources (workshops, office hours, curriculum, etc.)

**Training is necessary:** Longer training duration and continuous support

**Site staff are essential to success:** Buy-in and active participation of the site staff in the planning and implementation

**Support from outside community is key to sustainability:** Leverage existing partnerships and local non-profits/organizations for continued support

**Resident ambassadors require upfront investment:** Early training, education, and access to the device improve the success of resident-led tech support and training

# intervention components

**Across the Lighthouse communities, the intervention included six components**. High speed Wi-Fi was installed throughout each community; Resident Ambassadors (RAs) were recruited and trained to support neighbors; devices were offered to all residents; simplified user handbooks were provided in participants' languages; a series of in-person training classes were offered onsite at each community; and weekly tech support office hours were hosted by RAs and/or staff (similar to a 'Genius Bar').
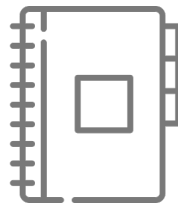
Wi-Fi available in all units

Resident Ambassadors trained

Tablet or voice-first devices offered to all residents

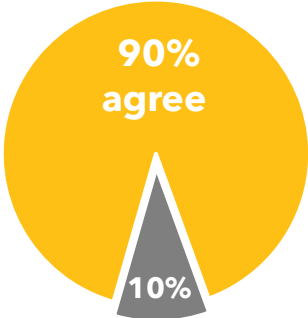Simplified user handbooks provided in participants' languages

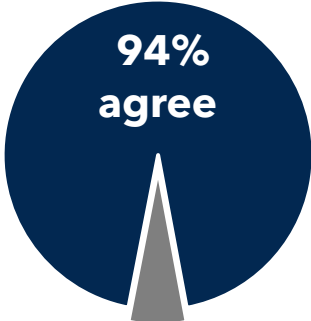Series of 2-5 training classes offered in each community

Weekly tech support office hours

# effectiveness

## Attitudes Towards Technology

**90% agree**

Ninety percent of respondents agreed that technology helps them **be connected with family and friends**.

10%

**94% agree**

Almost all respondents agreed that technology helps them **learn new information and skills**.

## Online Activities

While participants primarily used their Lighthouse devices for **entertainment**, **nearly one in four people accessed health information online**. They also used apps to **access tools** and **engage with the outside world**.

| Activity | % | Category |
|---|---|---|
| YouTube | 59% | Entertainment |
| Entertainment | 44% | Entertainment |
| Play Games | 13% | |
| Access Health Info | 23% | Desired Project Outcome |
| Check the Weather | 39% | Tools |
| Calendar | 19% | Tools |
| Alarm or Timer | 12% | |
| Take Photos | 19% | Engagement |
| Google Translate | 16% | Engagement |
| Video Chat | 12% | |
| Zoom | 11% | |
| Social Media | 6% | |
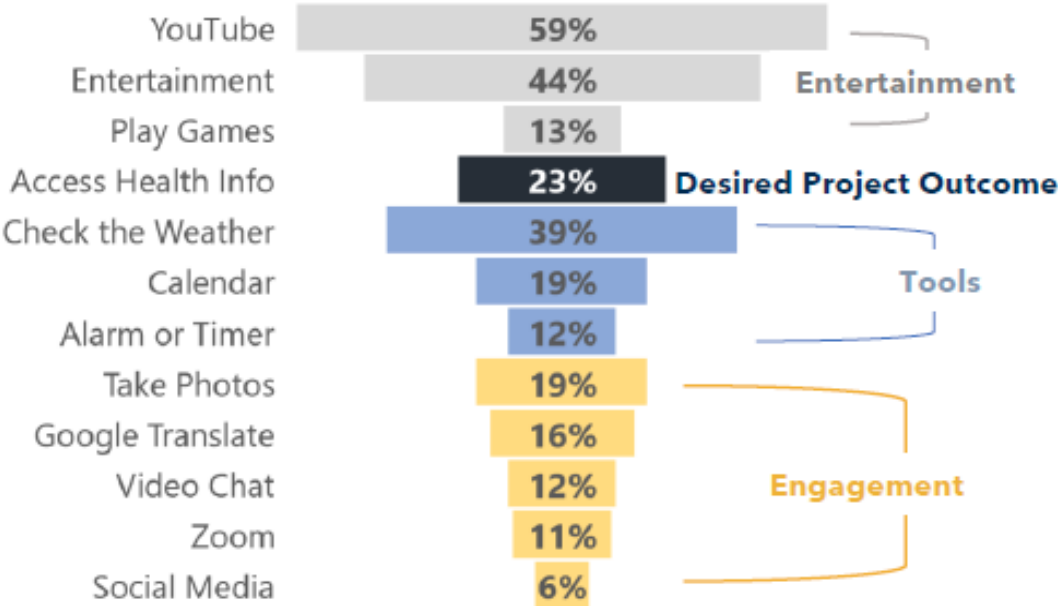
Data reported at 90 days (N=379)

# effectiveness    Lincoln Manor, Placerville



**Lincoln Manor**
Placerville
102 residents
100 units
Deployment: Feb 2022

Lincoln Manor was unique in that it was located in a rural setting. Also, 100% of its residents spoke English well or very well compared to other Lighthouse sites where residents had limited English proficiency.

The site experienced a number of other unique challenges that slowed resident engagement, such as: political division, high concern over COVID vaccination status of fellow residents, and social cliques. There was no centralized "front desk" to share community announcements. Also, the Education Director and SSC were new to the community and had less established relationships with residents.

| | Lincoln Manor |
|---|---|
| **Devices** | Amazon Alexa Show Powered by Speak2 |
| **Training Classes** | 3 core training classes; later expanded to 5 classes<br>Virtual classes were offered during COVID Omicron spike, but were discontinued due to low participation<br>The user handbook and training curriculum needed to be completely revised for the Alexa Show device used at this site |
| **Resident Ambassador (RA) Model** | 6 RAs recruited to provide feedback on training guide and curriculum and tech support to their neighbors, and to recruit project participants<br>Recruited prior to deployment<br>Languages spoken: English only, since all participants were English speaking<br>RA training covered project goals, teaching skills, tablet basics |
| **Tech Support Office Hours** | Tech support was provided as needed (e.g., participants could knock on the RAs' door or contact the RA to arrange a time to meet) |
| **Support from Offsite Staff** | Speak2 staff created the curriculum and user handbook and led the first training class<br>Eskaton Innovation Staff provided the RA training, assisted the SSC in going door-to-door to recruit participants, and led and/or assisted with all of the core training classes |

## AMAZON ALEXA SHOW POWERED BY SPEAK2



The Alexa Show device with Speak2 interface, used at Lincoln Manor, was simpler and tailored to new tech users. This made it more intuitive to learn, but it had limited functionality. Users were unable to access YouTube, social media, or browse the internet. It also required significant staff time to help participants use the devices for video calling.

One unique benefit of this device was the ability for staff to 'push' announcements to residents.

# effectiveness

## Device Satisfaction and Learning

**A majority** of respondents found it **somewhat difficult to use** the tablet.

12%
34%
**44%**
10%

very easy
somewhat easy
**somewhat difficult**
very difficult
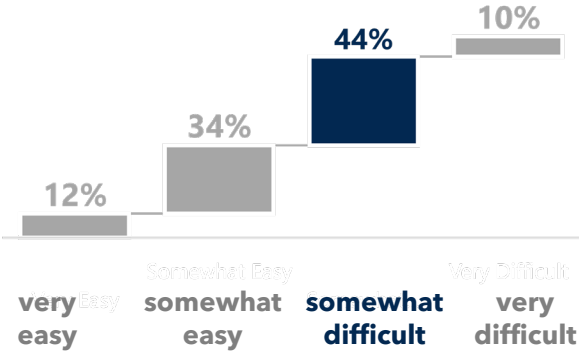
Even so,

**92%** **would recommend their device** to friends or family

# What's Next? | *LeadingAge California and Lighthouse*

**LeadingAge California is taking the following steps to ensure Lighthouse is broadly shared and utilized:**

- **Inviting subject matter experts** to join a Lighthouse Advisory Committee
- **Hosting webinars** for interested individuals
- Launching a **marketing campaign** to spread information about Lighthouse
- Creating short **educational videos** and documents
- Providing **technical assistance** on the program to members
- Capturing and sharing **success stories**

LeadingAge®CA

# Lighthouse Product Showcase

Lighthouse Video

Lighthouse Playbook

Lighthouse Evaluation Report

# Generative AI and Large Language Models: Opportunities for the Aging Network

- History of AI and Digital Technology

- Generative AI – Definition

- Use Cases in Aging
  - Residential Services
  - Health and Wellness
  - Safety and Security
  - Daily Living Support
  - Recreation and Entertainment
  - Emotional Support and Connection
  - Communication and Socializing
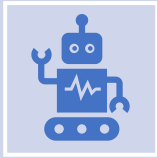
- Limitations and Regulatory Issues

- Takeaways

# Generative AI – The Potential is Now

# Progress of Technology



- Telephone
- Computer
- Internet
- Smart phone
- Generative AI
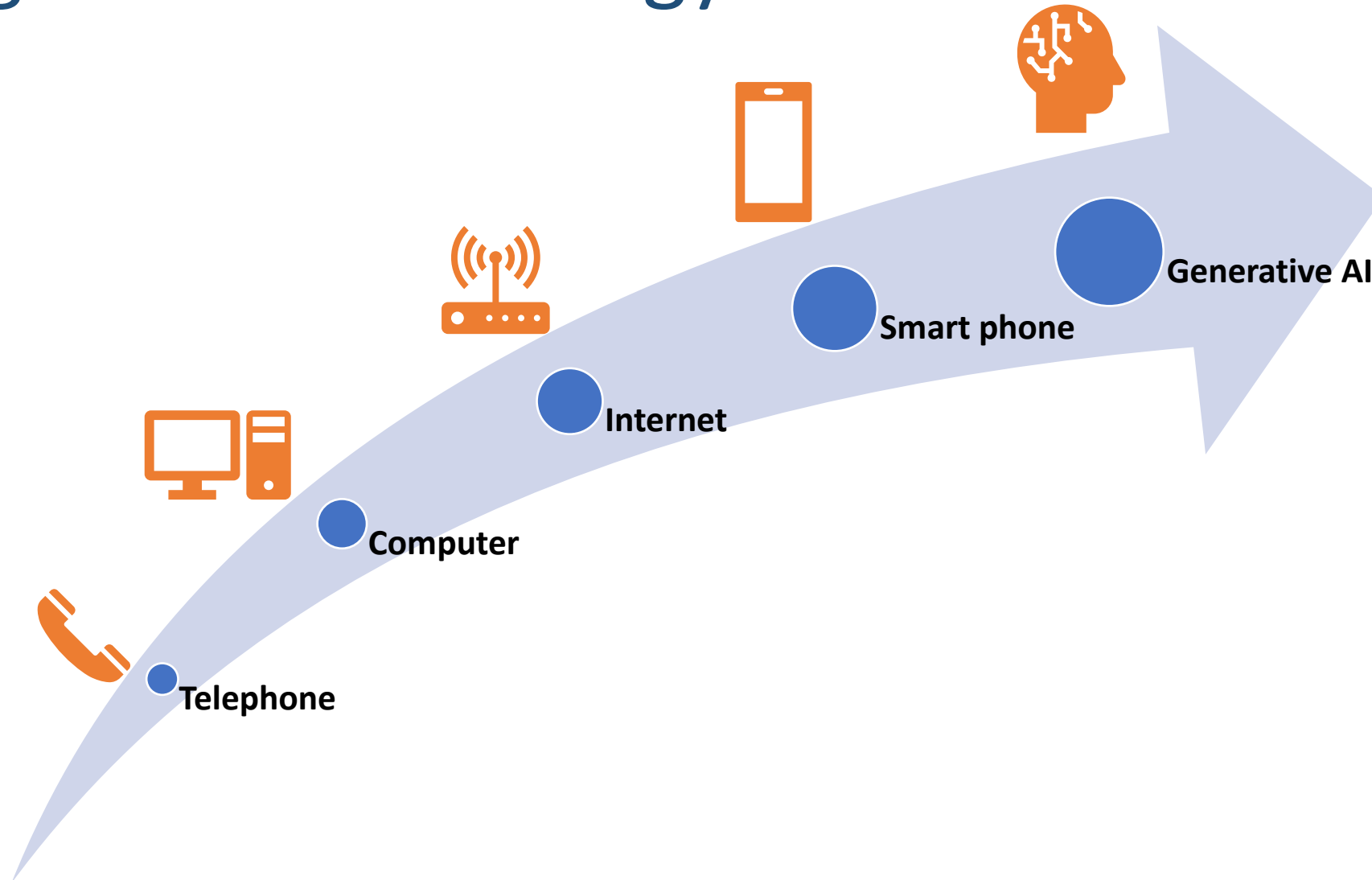
# Artificial Intelligence/Machine Learning

**Artificial Intelligence (AI):** AI is a broad field of computer science that aims to create machines or software that can **perform tasks which typically require human intelligence**. This includes things like reasoning, learning, problem-solving, perception, language understanding, and even creativity

**Machine Learning (ML):** Machine Learning is a subset of AI that focuses specifically on the development of **systems that can learn from and make decisions based on data**. ML systems are trained, algorithms are exposed to a large set of data, learn from this data, apply what they've learned to make informed decisions, and improve over time as it is exposed to more data

**Difference:** While both are rules-based, the goal of **AI** is to create systems that *can perform tasks that would otherwise require human intelligence*, while **ML** is about creating systems that can *learn from data* to make decisions or predictions.

# Generative AI – Defined

**Generative AI** refers to artificial intelligence algorithms that can create new content, whether it be text, images, or even complex data patterns.

This technology learns from vast amounts of data to generate new, original content that can be tailored to specific needs or tasks.

**"Generative"** aspect refers to the AI's ability to generate outputs that are novel and not simply a regurgitation of its training data.

- Advancements in Deep Learning
- Availability of Large Datasets
- Computational Power
- Pre-training and Fine-tuning

Differences from other forms of AI:

- Output Generation vs. Decision Making
- Creativity and Novelty
- Unstructured Data Handling
- Flexibility and Adaptability

# Generative AI and ChatGBT

**ChatGPT-4** stands for "**C**hat **G**enerative **P**re-trained **T**ransformer **4**"

Generative Pre-Trained Transformer language models developed by OpenAI:

- **GPT** (Original) – *June 2018*
- **GPT-2** – *February 2019* (1.5 billion parameters)
- **GPT-3** – *June 2020* (175 billion parameters)

These models are designed to **generate human-like text** based on the input they receive

They are **pre-trained** on a diverse range of internet text, which enables them to respond to a wide variety of prompts and questions.

# Multiple Use Cases in Health Care

## Professionals

| | | |
|---|---|---|
| Clinical documentation | Radiology interpretation | Creating discharge summaries |
| Suggesting treatment options | Generating clinical notes | Designing treatment plans |
| Insurance pre-authorization | Diagnostic assistance | Summarizing research papers |
| | Medical triage | |

## Patients/Clients

| | | |
|---|---|---|
| Analyzing laboratory results | Symptom assessment | Disease descriptions |
| Analyzing wearables' data | Interpreting physician notes | Mental health chatbot |
| Personalized health recommendations | Medication adherence | Health risk prediction |
| | Rehabilitation guidance | |

# Aging Use Case – Residential Care

**Operations**
- Communications / Marketing
- Medical Records and Reporting
- Robotic Process Automation
- Billing and Accounting

**Resident Services**
- Communications / Engagement
- Engagement
- Risk stratification
- Documentation / Notes

**AI Policies and Proceures:** Cypress Living model - Florida

**Example Companies:** Virtuoso, Arena, SafelyYou, K4Connect, AWS Textract, Rewind, Healthjay, Scena

# Aging Use Cases: Healthcare and Well-being

| | | | |
|---|---|---|---|
| Personalized Care | Mental Health Support | Wellness Monitoring | Assistance with Daily Activities |
| Remote Interaction | Fall Prevention | Emergency Response | Rehabilitation |
| | Medication Management | Predictive Health Analytics | |

# Aging Use Cases: Safety and Security

| | | |
|---|---|---|
| Detecting Elder Abuse | Financial Fraud Detection | AI-Enabled Home Adjustment |
| Wandering Tracking | Digital Security | Creating Safety Alerts |

# Aging Use Cases: Daily Living Support

| | | |
|---|---|---|
| Assistive Technology for Smartphone Usage | Online Mobility Services | Simplified Online Shopping |
| Digital Literacy | Voice Assistants for Daily Tasks | Personal Care Routine |

Source:  Northwestern University Medical Center

# Aging Use Cases:  Recreation and Entertainment

Personalized Entertainment

Gaming Assistance

Virtual Tourism

Hobby Suggestions

Social Event Recommendations

Content Accessibility

Music Therapy

Digital Art Classes

Source:  Northwestern University Medical Center

# Aging Use Cases:  Emotional Support and Connection

| | | | |
|---|---|---|---|
| Emotional Companions | Mood Therapy and Support | Therapy Chatbots | Virtual Reality Relocation |
| Emotional Awareness | Personal Cheerleader | Connecting with Loved Ones | Cultivating Positivity |

# Aging Use Cases: Communication and Socializing

Virtual Meeting Facilitation

Photo Sharing

Social Media Guidance

Event Reminders

AI Assisted Communication

Smart Home Technology

# Challenges and Regulatory Issues

**Recency** — GBT programs are based on data from 2021 and earlier

**Accuracy** — Early versions are based on limited training data

**Coherence/Hallucinations** — Outputs are based on learned associations and may include fabricated facts

**Ethical Concerns**
- Discriminatory, biases, offensive
- Privacy and security breach risks
- No established accountability
- No consensus on levels of accuracy

**Mitigation Strategies** — Current data, Additional validated data sources, Fine-tuning training, Self-improvement, Continuous review, Documented sources, Explanation of models, Stronger governance, Reporting of inaccuracies

# Takeaways for Generative AI and AI/ML

Generative AI is already here and playing a role in aging services

It is important to understand what staff, older adults and family caregivers are using Generative AI
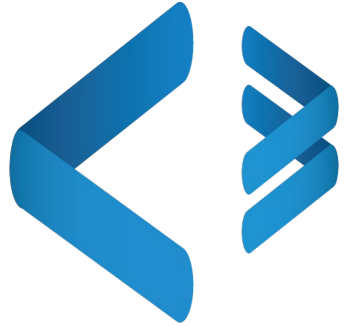
Policies and procedures should not be developed top-down – it is an organization-wide effort

Generative AI has immediate benefits for improving efficiencies and quality of care

Organizations will need to be vigilant regarding ethics, privacy and security

Generative AI applications will be rapidly changing – anticipate new AI applications

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For more information:

https://health.citris-uc.org/programs/lighthouse-for-older-adults/