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# The Future of Connected Care:

Enabling Healthy Longevity and Aging at Home

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## SAMSUNG

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### Introduction

An overwhelming majority of older adults want to age at home—<u>75 percent of people</u> over age 50 express this preference.<sup>1</sup> The ability to do so is becoming increasingly intertwined with technology as digital transformation across health, communication, and commerce shifts how people access life's necessities. The use of technology by older adults across categories is now on par with younger generations.<sup>2</sup> The average older adult <u>has seven tech devices</u>; 90 percent own smartphones and nearly 40 percent own wearable devices.<sup>3</sup> However, there remains untapped potential to bring together solutions across health, well-being, and physical environments to support healthy longevity and aging at home.

At the same time, the pressures of an aging population on systems of housing and care for older adults compel innovation. Older adults today are aging with more chronic conditions and functional limitations, increasing <u>demand for ongoing care</u>.<sup>4</sup> Traditional senior housing options are unaffordable for most—just <u>13 percent of older adults over age 75</u> can afford an assisted living facility in their area—meaning that more people do not just want to, but need to, age at home.<sup>5</sup> Aging at home, synonymous with aging in place, has been defined by the <u>Centers for Disease</u> <u>Control and Prevention</u> as "the ability to live in one's own home and community safely, independently, and comfortably, regardless of age, income, or ability level."<sup>6</sup> <u>Shortages in the</u> <u>direct care workforce</u> (i.e., personal care and home health aides) constrain the capacity to provide supportive services in the home, and fewer family caregivers are available to fill gaps in care.<sup>7</sup>

Connected care in the home offers an opportunity to address both the individual preferences of older adults and the societal imperative to care for an aging population. Bringing together concepts from several related areas such as <u>digitally enabled health care</u>, AgeTech, and smart homes, connected care links activity inside the home with care outside of the home through data sharing and tools for monitoring, communication, and intervention.<sup>8</sup> Importantly, connected care in the home spans the entire continuum of stages and health statuses that older adults experience, which fluctuate over time. Figure 1 shows elements and technology examples comprising the continuum of connected care in the home.

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Home Environment	Personal Status	Personal Safety	Personal Health	Personal Medical Status	
Smart appliances and lighting, video doorbells, security systems	Smart phone and watch, voice assistants, robot companions	PERS devices, fall detection, motion sensors, radar geofencing	Health wearables and apps, medication management, hearables	Remote patient monitoring, telehealth visits, automated care	
Daily Life				Health Care	
Source: Adapted from	Aging in Place Technology Wat	tch (2022)			

#### Figure 1. Continuum of Connected Care in the Home Technologies

"Connected care in the home must first and foremost connect people. People connect with devices and also through services. This continuum must work in a seamless way."

-Hon Pak, Senior Vice President and Head of Digital Health Team, Mobile eXperience Business, Samsung Electronics

Recent years have brought progress on critical enabling factors, including the institutionalization of telehealth and remote monitoring within models of care; the proliferation of available technology point solutions targeting different stakeholders and aspects of the care continuum; and enhanced interoperability, that is, the technical capacity for data collection, exchange, and interpretation. Although these advancements represent growth, they require additional scaling, integration, and expansion to improve the aging-at-home experience for older adults, their families, and the health care providers and systems engaged in their care.

Recognizing the ripeness of the issue and the need for collective action, the Milken Institute Future of Aging launched the Future of Connected Care in the Home Initiative (the "Initiative"). The Initiative builds upon our previous research and reporting on <u>Advancing Tech-Enabled Health</u> and Home Care and examines the interconnected people, products, processes, and systems shaping the collective capacity to realize the potential of connected care environments for healthy longevity and aging at home.<sup>9</sup> Figure 2 illustrates the three interconnecting areas that position the Initiative's focus.

#### **Figure 2. Initiative Focus**



Source: Milken Institute (2025)

This report distills findings from the Initiative's research into six recommendations, which are the building blocks for action.

- 1. Characterize wants, needs, and use cases
- 2. Taxonomize connected care at home to link solutions
- 3. Generate proof-of-concept, evidence, and validation
- 4. Develop sustainable payment models
- 5. Build a digital front door to data and solutions
- 6. Increase awareness, access, and adoption

#### **Spotlight: Research Process**

**Literature review** of eight cross-cutting topics, including technology adoption, family caregiving, and health-care payment models, to characterize the landscape.

**Semi-structured interviews** with 50 experts across health, technology, housing, policy, and research, accompanied by qualitative analysis to develop themes.

**In-person roundtable** with 25 curated leaders focused on cocreating actionable solutions to accelerate progress.

# Landscape: Macro-Level Trends and Foundational Issues

#### **Macro-Level Trends**

Shifts in the demand for care and the environments in which it occurs are significant contributors to the rise of connected care in the home. Market forecasts quantify the resultant growth to be substantial. For "ambient assisted living"—covering products for safety and security, communications, medical assistance, mobility, telemonitoring, and others—the <u>market was</u> <u>estimated at \$7.4 billion in 2023</u> and is projected to rise to \$38.25 billion in 2030.<sup>10</sup> Estimates that include <u>overlapping smart home products</u> are even larger.<sup>11</sup> Three macro-level trends, alongside population aging, underlie the expansion of connected care in the home.

The dwindling availability of family caregivers and inaccessibility of traditional home care and senior housing options require the development of force multipliers to meet the projected needs of the aging US population.

Fewer family caregivers are available for each older adult <u>with each passing year</u>.<sup>12</sup> Caregivers are <u>frequently long-distance</u>, working with loved ones from afar, and managing multiple competing demands for their time, including <u>61 percent</u> doing paid work.<sup>13</sup> Most middle-income older adults <u>cannot afford</u> facility-based care or private-pay options for home-based care focused on activities of daily living.<sup>14</sup> These conditions spur technology adoption to extend available care resources and develop new ones. The technology and health sectors have responded with investment in innovation to create hardware, software, and organizing infrastructure, <u>accelerating rapidly</u> and maturing the field.<sup>15</sup>

### Health care is moving outside of traditional settings, beyond the four walls of the physician's office and hospital.

Key drivers of this trend include the <u>increasing prevalence</u> of chronic conditions among older adults that require longitudinal, rather than episodic, care; shifts toward preventive and personalized care; the growing emphasis on patient-centered approaches that empower older adults to choose to remain at home; and post-pandemic physician comfort with telehealth and other forms of remote care.<sup>16</sup> For higher-acuity older adults, better integration among health care, long-term services and supports (LTSS), and payment models are contributing to the <u>home as a site</u> <u>of care</u>.<sup>17</sup> Although not permanent, uniform, or fully scaled, this progress creates opportunities for older adults to remain living in their communities.

### Rapid technological advancements, especially artificial intelligence (AI), are fueling a surge in digital health and home technology solutions.

Medical devices and digital health wearables support chronic disease management by monitoring heart rhythm, glucose, and other relevant longitudinal data. <u>Health apps are gaining social</u> <u>traction</u> to track health behaviors, detect problems, and spur positive change.<sup>18</sup> Ambient sensing technologies, voice assistants, and robotic companions offer paths toward connected care independent of digital literacy and can support family caregivers while being less intrusive to aging adults. As AI applications improve, connected care tools are expected to become more <u>predictive</u>, <u>personalized</u>, <u>preventive</u>, <u>and participatory</u>, enabling their broader and more impactful usage for connected care at home.<sup>19</sup> AI-driven predictive analytics have the potential to assess health risks in the home and flag pattern changes, prompting communication among older adults, family caregivers, and care teams to take preventive action.

#### **Foundational Issues**

The experience of aging at home for an older adult is not static. Needs ebb and flow over time, and support comes from a variety of sources across health-care providers, community, and family. Technology solutions are oriented toward each of these stakeholders, creating a constellation of products, services, and data that has not yet developed into an integrated ecosystem centering on the wants and needs of older adults. Within this landscape, no public or private institutional entity is responsible for coordinating the aging at-home experience, and the burden often falls to individuals and their family caregivers. Three foundational issues inform understanding of the state of connected care in the home today and point to opportunities for advancement.

Older adults are increasingly adopting technology solutions to support their health and well-being but tend to solve reactively for aging-related needs.

About half of <u>adults aged 55+ use assistive or health-related technology</u> to help them age in place.<sup>20</sup> However, age-related stigma and negative associations with age-related health problems (e.g., frailty, cognitive impairment) lead to more <u>reactive adoption patterns</u>.<sup>21</sup> There are also <u>varying degrees of awareness and planning for aging in place</u>; adults ages 65–80 and adults with disabilities, impairments, or chronic health conditions were more likely to have considered the home modifications needed to age in place, such as structural modifications (e.g., wider doorways

and lever-style door handles) and smart home devices, than their younger counterparts ages 50–65.<sup>22</sup> Older adults and their <u>family caregivers</u> often do not identify as receiving or giving care within the care ecosystem, delaying searching for and utilizing tech-enabled tools and supports.<sup>23</sup> In addition, engagement with digital health tools is difficult to sustain and is <u>hampered by high</u> levels of user attrition.<sup>24</sup>

### An array of point solutions exists, while the shift toward more comprehensive or linked solutions remains under way.

Older adults and family caregivers typically must stitch together suites of devices and apps from home monitoring to communication assistants to digital health tools. This approach presents high barriers to entry, requiring significant motivation and resources because of the lack of integration and interoperability among devices. The field is also crowded, making it difficult for users to parse relevant options. More than 350,000 mobile health apps and thousands of monitoring technologies are currently available.<sup>25</sup> With so many available point solutions—apps, services, and devices targeting a single issue or performing a standalone function—stakeholders want bundles and consolidation (i.e., fewer tools that do more). For example, nearly <u>90 percent</u> of health systems are seeking digital health solutions that cover a wide range of clinical indications to replace point solutions.<sup>26</sup>

### Health systems, payers, and private-sector innovators are driven by different incentives and processes.

Health systems seek technology solutions with quantifiable benefits, such as reduced hospital admissions or emergency room visits, to predict how investments will produce returns within value-based payment models. Medicare Advantage plans (i.e., private health insurance plans providing Medicare coverage) are looking for quality improvements and cost reductions to justify offering benefits aimed at prevention, but the <u>time horizon</u> is compressed because of enrollee plan switching with opportunities to do so annually.<sup>27</sup> Start-ups and technology companies often pursue revenue opportunities and quick paths to profitability, including focusing on direct-to-consumer marketing and seeking stable revenue by developing products tied to existing Medicare reimbursement codes. This landscape leaves untapped opportunities for greater alignment of these key groups to work together on building the future of connected care in the home.

### Recommendations: Six Building Blocks for Action

The following six recommendations form building blocks for action and are informed by the Initiative's extensive research process engaging experts to identify opportunities and cultivate consensus. Coupled with pathways to progress, they offer a blueprint for stakeholders across sectors to realize goals and outcomes advancing connected care in the home for older adults and family caregivers. Figure 3 provides a schematic illustrating the theory of change that connects recommendations, pathways, and outcomes.



#### Figure 3. Building Blocks for Action

Source: Milken Institute (2025)

#### **Recommendation 1: Characterize Wants, Needs, and Use Cases**

Use cases articulate how digital health technologies meet the specific needs and preferences of older adults aging at home and in the community. They should reflect the lived experiences of older adults, focusing on prevention and well-being, early detection of health issues, and chronic care management. This approach will enable adults, caregivers, and health-care providers to prioritize tools and recommendations that align with an individual's goals and needs, shape the development of taxonomies, and formulate strategies to foster the adoption of connected care. Collaboration across the health-care, housing, and technology sectors, with support from philanthropy, advocacy, and research partners, is essential.

#### RATIONALE

The vision for connected care at home centers on seamless, integrated solutions that meet a range of physical, social, and psychological health needs. Yet, <u>half of adults ages 50+</u> do not believe technology enables them to lead a healthy life, and two-thirds do not feel technology today is designed with their age in mind.<sup>28</sup> Connected care use cases must address barriers to adoption (e.g., awareness, stigma, ageism, privacy, lack of trust) and focus on a realistic assessment of implementation challenges (e.g., home readiness, digital infrastructure, digital health literacy). Designing technology tools in the <u>context of the end user's needs and abilities</u> contributes downstream to efficacy and adoption.<sup>29</sup>

"We need to treat older adults as people—not just as patients—who are trying to live as best they can. Weaving in this cultural change is crucial to better serve people in their homes."

-Diana Gelston, Chief Commercial Officer, Best Buy Health

#### **CONTEXTUAL INSIGHTS**

- Self-caregiving: Specific use cases show early positive impact and potential for scaling, particularly when coupled with AI-driven insights that enhance preventive "self-caregiving" and early detection of health risks. For example, ElliQ is an AI-driven social robot designed to proactively engage users in conversations, offer health and wellness suggestions, and monitor daily activities—providing companionship and reducing feelings of loneliness.<sup>30</sup> However, older adults differ in their use of digital health technologies and understanding of the motivations that shape their acceptance, and adoption in home environments is limited.
- Home health monitoring: Home health monitoring of disease-specific conditions improves health outcomes related to heart failure, chronic obstructive pulmonary disease, diabetes, and physical inactivity.<sup>31</sup> Remote monitoring can also help care teams identify subtle changes in an older adult's health and behavior. Yet, older adults may be reluctant to use these monitoring tools because of their association with negative age stereotypes (e.g., frailty, dependence), despite the potential for improved function and independence.<sup>32</sup>
- Falls prevention and detection: Safety is a ubiquitous concern among older adults and their caregivers. Falls were such an area identified by experts during interviews. They are <u>debilitating, costly, and, in many cases, deadly</u>.<sup>33</sup> Falls detection embedded into existing wearables streamlines access for users while transmitting data for timely escalation and response.<sup>34</sup> Ambient sensors and Al have the potential to detect changes in the health status of older adults and predict when the risk of falls is increased, offering windows to intervene before a fall or health incident.<sup>35</sup>

#### **PATHWAYS TO PROGRESS**

- Establish participatory codesign processes and use case development. Key stakeholders—including older adults, caregivers, healthcare providers, and technology developers—should collaboratively engage in a participatory codesign process, such as a design charrette, to identify the specific needs and preferences of older adults aging in place as well as their caregivers. Test and refine applications in real-world settings, ensuring they effectively meet users' needs.
- Convene a multidisciplinary working group of experts—including gerontologists, health-care professionals, technologists, and policymakers—to establish clear goals and standards for connected care solutions. Undertake qualitative research methods, such as focus groups and in-depth interviews with older adults and caregivers, to identify essential needs, potential challenges, and best practices to guide development and implementation of effective connected care solutions.
- Develop a person-centered roadmap for self-care and caregiving solutions. A comprehensive, person-centered roadmap must align the wants and needs of older adults with connected care solutions that support selfcare and informal caregiving. This

### Spotlight: Home as a Health Care Hub

In 2024, the Food and Drug Administration (FDA) launched the Home as a Health Care **Hub** initiative to "reimagine the home as an integral part of the health care system."36 Contracted by the FDA's Center for Devices and Radiological Health (CDRH), HKS Architects has facilitated interdisciplinary research aimed to improve the quality of life for individuals navigating their health care at home, bridging medical technology, housing design, and health-care clinical needs.<sup>37</sup> A major feature of the initiative is the Idea Lab, which provides developers with free tools to visualize how medical devices can fit into people's daily lives, integrate with other health technologies, and be tailored to better meet users' needs in their home environments. Diabetes was chosen as a **test case** to investigate how technology solutions can enhance diabetes management, particularly in low-income and rural populations within affordable housing settings.<sup>38</sup> The discovery phase—involving extensive literature review, public engagement, and stakeholder validation—generated insights about core health and user needs, technology considerations, and home design factors. These findings led to the development of a Design Concept Package, which outlines principles and design concepts to guide future innovations in home-based diabetes care.39

roadmap should outline practical steps for integrating technology into daily life, ensuring that solutions are intuitive, accessible, and tailored to individual preferences, ultimately enhancing independence and quality of life.

#### **Recommendation 2: Taxonomize Connected Care at Home** to Link Solutions

The range of technologies supporting healthy longevity and aging at home has exploded over the past decade, paving the way for a more viable connected care in the home ecosystem. These efforts aim to make home environments more intelligent, responsive, and supportive of older adults' needs. A taxonomy of types of solutions matched to use cases can serve as a map to guide stakeholders and encourage alignment of point solutions into groupings or integrated suites of tools. Further, it lays a framework to organize resourcing, payment models, and operational processes.

#### RATIONALE

Connected care in the home is a complex phenomenon with no universally agreed-upon definition and nebulous borders, demonstrated by the <u>variety of terms</u> used to describe it.<sup>40</sup> Devices and services supporting aging at home have proliferated in recent years and span provider-facing and consumer-facing digital health technologies (e.g., wearables and apps) and smart home devices (e.g., voice assistants and sensors). With an overwhelming number of options and no <u>overarching</u> <u>guidance</u> mapping solutions to use cases, categorization and organization will help establish a common lexicon, promote cultural acceptance, and overcome adoption friction.<sup>41</sup> Critically, taxonomies enable trusted information sources, such as health-care providers and care navigators, to play a more active role in steering the adoption of connected care in the home technologies as older adults' wants and needs change over time.

"With today's vast array of digital health tools and technologies, it's critical to harness them to support the whole person—fostering connection across health, home, and community."

-Sarita Mohanty, President and Chief Executive Officer, The SCAN Foundation

#### **CONTEXTUAL INSIGHTS**

- Staging in place: The novel concept of <u>"staging in place"</u> reconceptualizes aging-in-place by emphasizing the changing capacities and needs of individuals throughout the life course.<sup>42</sup> It acknowledges that people in the same age group do not necessarily have the same physical, emotional, or cognitive profiles or needs. This perspective has implications for the design of technology-enhanced living environments and how connected care in the home is organized.
- Integrated solutions: Experts interviewed noted how infeasible it is to select from and utilize the plethora of separate apps and devices, each addressing one point along the continuum of care. Fewer, more integrated, user-friendly products will enhance adoption. Yet, many

solutions still have a singular function, pointing to the need for deeper analysis of the field and the creation of resources encouraging alignment and partnership.

#### **PATHWAYS TO PROGRESS**

- Classify solutions according to their types, purposes, and functionality. Through a collaborative of stakeholders, mobilize expert working groups to match combinations of devices and services to common use cases. Translate the taxonomy of connected care in the home into resources tailored to older adults, caregivers, and providers, including a comprehensive (nonclinical) assessment and planning tool focused on the capability of the older adult to remain at home with support.
  - Existing resources to draw from include the World Health Organization's <u>Classification</u> of Digital Interventions, Services and Applications in Health, peer-reviewed journal articles on related topics (e.g., <u>falls prevention</u>, <u>smart homes</u>), and <u>market maps</u> detailing categories and companies.<sup>43</sup>
- **Construct "minimum viable bundles" for archetypes that optimize costs and functionality.** Assembling groupings of technologies that holistically support common user scenarios (e.g., an older adult living alone with diabetes, mild cognitive impairment, and some functional limitations) will enable early cost estimates for acquiring and maintaining systems. Engage start-ups, the investment community, and philanthropy to create and launch them, potentially using a prize or moonshot program to incentivize participation.

#### Recommendation 3: Generate Proof-of-Concept, Evidence, and Validation

Proof-of-concept demonstrates feasibility and justifies further investment in connected care solutions, from early-stage tech development to building user trust and adoption to pursuing reimbursement policies. Evidence and validation measure what works safely, for whom, and when, forming a bedrock of information that stakeholders can use to guide decision-making, from formulating policies to individual care plans. Tangible, measurable benefits help build a case for integrating connected care in the home into value-based care and guide what solutions to use and pay for in various scenarios. Overall, quantifying the impact for each stakeholder (e.g., older adult, caregiver, care team, health system, tech innovator, community partner) demonstrates the value proposition for connected care in the home.

#### RATIONALE

Unlike for traditional therapeutics, robust evidence on connected care technologies for aging at home is often lacking. One study of venture-backed digital health start-ups found that 80 percent had little to no published clinical evidence.<sup>44</sup> Even less is known about the collective impact of multiple point solutions used in concert.<sup>45</sup> Many connected care technologies supporting independent living, such as those for communication (e.g., voice assistant devices), home safety (e.g., smart stoves), and well-being (e.g., social engagement), may not be easily connected to measurable health outcomes of greatest clinical concern, a chief consideration for health plans and

providers.<sup>46</sup> The proliferation of start-ups presenting solutions coupled with the gaps in evidence create difficulties across stakeholder groups—for older adults and their family caregivers trying to identify the best ways to spend limited technology budgets, policymakers determining Medicare coverage, and health systems making technology investments.

"Use cases demonstrating the clear benefits of connected home technologies are still lacking. That's a barrier we have to overcome if we're going to drive broader adoption and the systems-level changes necessary to support this ecosystem."

-Abby Miller Levy, Managing Partner and Co-Founder, Primetime Partners

#### **CONTEXTUAL INSIGHTS**

- **Regulatory systems:** Participation in regulatory systems builds the evidence base, but many technologies pursue direct-to-consumer commercialization strategies with products outside of FDA jurisdiction. Consumer-facing innovations can advance more quickly than digital health technologies contending with regulatory approval processes. This discrepancy contributes to a fragmented data ecosystem, where the development of consumer-facing tools outpaces that of health care-specific digital technologies with more validation. Innovative <u>regulatory approaches</u> can maximize the potential benefits of evolving digital health technologies, such as using real-world evidence in assessing clinical outcomes.<sup>47</sup>
- Market access: Throughout interviews, many experts noted the interconnections along the challenging path to regulatory approval for health technologies, the lack of payment models and reimbursement structures for connected care at home, and the bottleneck of market access for companies in this space. As companies in the connected care space seek to grow, they often move from direct-to-consumer strategies to business-to-business strategies to overcome the "valley of death" between creating a promising product and successfully commercializing it. This transition, especially to working with health systems and insurers, requires proof-of-concept and evidence to demonstrate value and impacts on quality and costs. Supporting this process speeds maturation of the field for the benefit of older adults aging at home and family caregivers.

#### **PATHWAYS TO PROGRESS**

• Foster expansion of pilots and test beds to accelerate development of the evidence base and scaling of promising solutions. Senior housing operators, who typically lag traditional health-care settings in technology adoption, are increasingly looking for opportunities to participate in prevention and support older adults to age in the place they call home. Engaging them in pilots and test beds offers efficiencies for reaching target populations and benefits residents through increased technology access.

- The AARP AgeTech Collaborative coordinates <u>test beds</u> and connects sites, such as independent and assisted living <u>facilities</u> and university-run labs, with technologies seeking pilot opportunities.<sup>48</sup>
- Leverage states as laboratories to conduct coordinated and rapid assessments of technologies for connected care in the home. Bring together state aging and health agencies to share experiences, formulate research protocols that quantify impacts on health outcomes and costs, and identify suites of technologies matching the needs of populations, with the goal of launching programs that generate evidence and put innovations in the hands of older adults and caregivers. Draw technology partners to support the effort, along with advocates and community organizations (e.g., those providing digital literacy training).
- Engage stakeholders to explore innovative approaches for developing

#### Spotlight: NYS Innovations in Aging

The New York State Office for the Aging (NYSOFA) established the NYS Innovations in Aging collaborative to "leverage low-cost, high-impact digital solutions that are helping to combat loneliness and social isolation while improving overall health and wellness."51 Since 2018, the agency has fostered more than 20 partnerships with AgeTech start-ups and innovators to improve older adult social, physical, and mental well-being. The program addresses service gaps and workforce shortages through tech-enabled solutions that collectively address a diverse range of health needs. NYSOFA requires its partners to measure and demonstrate the impact of their interventions to prove efficacy. The evidence is positive and promising, and includes reduced hospitalization and emergency visits, reduced depression, increased social engagement, improved life satisfaction, and improved caregiver support. By combining publicprivate collaboration and data-driven approaches, NYSOFA is delivering a more comprehensive suite of aging services to eligible New Yorkers.

**clinical evidence.** Third-party evaluations, platform-based approaches to validation, assurance labs, and **regulatory pathways that incorporate a systems** approach to care at home where multiple devices are used in concert, offer starting points.<sup>49</sup>

 The Peterson Health Technology Institute is an independent source of publicly available evaluations of health technology, such as <u>digital diabetes</u> and <u>hypertension</u> management solutions.<sup>50</sup> A standardized assessment framework is applied to generate a recommendation—broad adoption, further evidence generation, and do not adopt.

#### **Recommendation 4: Develop Sustainable Payment Models**

Adoption of connected care in the home at scale will require blending and braiding sources of financial support beyond what government health insurance and other programs currently cover and older adults and family caregivers have the capacity to purchase directly. The life insurance, long-term care insurance, and housing sectors are potential partners in developing sustainable payment models that increase accessibility, affordability, and consumer choice. Expanded financial support for connected care is necessary to ensure that those least able to afford senior housing or home care can benefit from innovation enabling aging at home.

"Every other major industry has an incredible variety of financing options. When you go to buy a car—you no longer have to buy it; you can lease it or even get a subscription. We need to think creatively—the only options cannot be health insurance or buying it off the shelf."

-Joseph Coughlin, Director, MIT AgeLab

#### RATIONALE

Connected care in the home is most often an out-of-pocket expense unless technologies and services are deemed medically necessary. Although traditional (fee-for-service) <u>Medicare covers</u> some medical devices to manage chronic disease, such as blood pressure monitors, it generally does not cover preventive technology, such as smart home systems or personal monitoring devices.<sup>52</sup> Pandemic-era flexibilities, including those for telehealth and the Acute Hospital Care at Home initiative, would provide scaffolding but <u>continue</u> without permanency.<sup>53</sup> In Medicare Advantage, a crowded field of start-ups and established technology companies compete for insurers' <u>supplemental benefit</u> dollars amid <u>benefits packages</u> that shift year to year.<sup>54</sup> Uncertainty of reimbursement through health insurance creates adoption friction, especially when coupled with limited alternative avenues for older adults and caregivers to defray the costs of connected care in the home.

#### **CONTEXTUAL INSIGHTS**

- Traditional Medicare: Medicare now reimburses for <u>community health services</u>, care navigation, caregiver training, and expanded remote patient and therapeutic monitoring, which are important components of connected care.<sup>55</sup> Some health-care providers are testing bundled payment options, where the cost of technology is incorporated into a single payment covering a range of services. Medicare bundled reimbursement codes for advanced primary care management, which include digital health tech to support aging at home, are a promising payment direction introduced in the 2025 Physician Fee Schedule.<sup>56</sup>
- Medicare Advantage: Medicare Advantage plans are offering technologies and services that support healthy longevity and aging at home as supplemental benefits (i.e., services and items plans choose to cover beyond what traditional Medicare covers). For example, Essence Healthcare has partnered with Oura, a wearable health tracker, to provide smart rings and subscriptions to plan members.<sup>57</sup> Sonder Health Plans cover Aloe Care's voice-activated advanced medical alert and smart hub, and many plans now subsidize wearables (e.g., smart watches and fitness trackers).<sup>58</sup> Availability is highly variable across the 3,719 plans offered in 2025.<sup>59</sup> Support for comprehensive connected care in the home is still on the horizon, especially with the early termination of the Value Based Insurance Design

<u>Model</u>, which fostered technology innovation, and the <u>contracture across plans</u> of supplemental benefits in 2025.<sup>60</sup>

 State and local programs: State Medicaid programs covering dual-eligible older adults are rolling out technology solutions addressing <u>health-related social need</u>s, bringing opportunities for <u>Medicaid innovation</u> such as LTSS in the community.<sup>61</sup> Some area aging agencies and community organizations also have programs to supply older adults with technologies for connected care in the home.

#### **PATHWAYS TO PROGRESS**

- Identify opportunities through Medicare and Medicaid to bolster coverage and uptake of connected care in the home. Immediate avenues are stepwise. For example, Medicare Advantage supplemental benefits could be leveraged in new ways, such as expanding allowable home modifications to include infrastructure enabling connected care and the types of technology plans cover for prevention. Also, the Program for All-**Inclusive Care for the Elderly (PACE)**, which is an alternative to nursing home care and serves dual-eligible older adults aging at home, could increase access to comprehensive home-based technology, a gap noted by experts interviewed.<sup>62</sup> Convene stakeholders to develop these alongside longer-term, heavier-lift ideas, such as building upon Medicare alternative payment models being tested with providers or designing a new pilot program with the Center for Medicare and Medicaid Innovation.63
  - Two new investment-backed California-based PACE providers are opening centers and launching services that promise innovation, advancing the

#### Spotlight: Alignment Health

Alignment Health offers Medicare Advantage plans in five states and is focused on innovation in care delivery through person-centered care married with technology. As an early leader in connecting health and home, Alignment Health introduced its high-tech, high-touch Care Anywhere program in 2017, delivering in-home visits from clinicians and 24/7 access to virtual care powered by the company's AIdriven operating system, AVA®.<sup>67</sup> AVA enables connected care at home by linking Bluetoothenabled health devices that track real-time vitals, running insights through hundreds of AI models to detect risks early, and ensuring providers take action with seamless, bidirectional electronic medical record integration and omni-channel notifications. Through these programs, Alignment Health has reported better outcomes for its members in comparison to traditional Medicare-44 percent reduction in emergency room visits, 38 percent fewer inpatient admissions, 45 percent reduction in skilled nursing facility admissions, and 28 percent lower 30-day hospital readmission rate—and high member satisfaction.68

50-year-old program.<sup>64</sup> Habitat Health, launched by Kaiser Permanente and Town Hall Ventures, and Seen Health, funded by Primetime Partners, both provide tech-enabled care to older adults aging in their communities.

- Innovate with the private sector to develop novel payment mechanisms and partnerships. Experts noted the potential for a variety of new inputs, from expanding Health Spending Account eligible expenses to attracting housing developers with tax credits and other incentives for building <u>homes equipped for aging in place</u> with technology.<sup>65</sup> Life and long-term care insurance companies have a vested interest in reducing health risks and incentivizing healthier behaviors. Create a forum to engage them on expanding access to connected care in the home.
  - John Hancock incentivizes health behaviors and supports healthy longevity through its <u>Vitality program</u>.<sup>66</sup> Vitality covers smartwatches and fitness trackers, mental health and well-being apps, cancer screenings through Galleri, and healthy food purchases.

#### **Recommendation 5: Build a Digital Front Door to Data and Solutions**

A digital front door approach leverages digital marketplaces, data platforms, and visual dashboards to foster a cohesive connected care at home ecosystem. This infrastructure simplifies the steps and processes users must move through to find solutions and maximize their positive effects. It also creates efficiencies for start-ups and technology companies to reach potential individual and institutional users, a noted gap in the current infrastructure. Figure 4 provides more information on the components that converge into a digital front door to connected care in the home.

#### Figure 4. Digital Front Door Components

#### **Digital Marketplaces**

Enable navigation to relevant tools and bundles and connect users (e.g., older adults, family caregivers, health systems/providers) seamlessly.

#### **Data Platforms**

Integrate data from <u>heterogeneous</u> <u>IOT products</u>, digital health tools, and EHRs for personalization, insights, and timely intervention.

#### **Visual Dashboards**

Provide older adults and caregivers a cohesive system to help coordinate care across different digital health tools and smart home devices.

Source: Milken Institute (2025)



Digital front door to connected care in the home

#### RATIONALE

Point solutions do not typically exchange data or connect with a cohesive system to help manage care across different digital health tools and smart home devices. Data fragmentation across the connected care ecosystem limits accessibility, flow, and the ability to derive meaningful insights from data, obscuring a holistic view of older adults' health and well-being at home. Unclear pathways for older adults, caregivers, and providers to identify impactful technology meeting user needs—and for technologies to access market share—increase adoption friction and impede growth. These conditions lead to overload and complacency for stakeholders attempting to navigate and point to the need for a digital front door that unifies data and solutions.

#### **CONTEXTUAL INSIGHTS**

- Data interoperability: Even with current interoperability standards, capacity for data exchange is not yet optimal. Patient-generated health data from wearables, sensors, and apps are increasingly utilized in clinical practice, but they are typically shared manually or by using complex multi-app workflows rather than having a seamless integration with electronic health records (EHRs).<sup>69</sup> This situation leads to siloing of volumes of data and to difficulty in parsing out what is most meaningful and actionable from a clinical perspective versus what is just "noise." Progress is being made through government and private-sector efforts.
  - The Assistant Secretary for Technology Policy/Office of the National Coordinator for Health Information Technology (ASTP) has steadily issued updates to its regulations over the past five years, making data aggregation across systems and <u>applications integrating</u> health and social care more feasible.<sup>70</sup>
  - Matter, a voluntary industry-led technical standard enabling interoperability between smart home and internet of things (IoT) devices from different manufacturers, has gained significant ground since its introduction in 2022.<sup>71</sup> With key industry leaders adopting Matter, older adults and caregivers can link together devices such as home security and voice assistants in tailored configurations. The Connectivity Standards Alliance, which administers the Matter standard, convenes a <u>Health and Wellness Working Group</u> focused on improving health span through health data connectivity.<sup>72</sup>
- Information consolidation: EHRs offer immediate opportunities to unify and provide access to health data. Nearly <u>100 percent of hospitals and 80 percent of office-based providers</u> have adopted certified EHRs.<sup>73</sup> However, there are pitfalls to focusing on EHRs as the only approach. The social determinants of health and activities of daily living data that many consumer devices generate are difficult to codify into EHR modules, and providers face barriers to utilizing these data for decision-making without advancements in AI.
- Actionable intelligence: Making data meaningful and connecting it to outcomes is a significant concern among all stakeholders, whether targeting adults to engage in self-management or connecting clinicians and family caregivers who play a supporting role along an individual's aging journey. During qualitative interviews, many experts raised the question of "Data for what?"— meaning that for adoption barriers to be overcome, a technology solution and the data it produces must have a clear purpose, an audience (i.e., who or what is responsible for deriving insights and taking action), and a connection to tangible benefits.

#### **PATHWAYS TO PROGRESS**

- Define a set of agreed-upon data points generated in the home and create model data flows for sharing them with providers. Build consensus on priority data points (i.e., meaningful, actionable, and feasible) for inclusion in the data set by convening an expert working group. Engage standards-setting bodies, such as the Health Level 7 (i.e., HL7, the standards development body for electronic health information) working groups and ASTP to identify how the data set can become a baseline tool and be incorporated into certification.
  - <u>mCode</u>—Minimal Common Oncology Data—is a multi-sectoral initiative to establish a set of elements forming the basic data collected on patients with cancer for inclusion in EHRs.<sup>74</sup> The recently adopted United States Core Data for Interoperability Plus Cancer (USCDI + Cancer) defines how these data are exchanged and enables capture of the key cancer-related elements in a patient's EHR.<sup>75</sup> Together, mCode and USCDI+Cancer provide a roadmap from a related field.
- Encourage private-sector, philanthropic, and government investment in "connective tissue" that contributes to building a digital front door for connected care in the home. Foundational efforts have stimulated a robust array of available point solutions, such as the AARP AgeTech Collaborative and the National Institute on Aging Small Business Innovation Research and Small Business Technology Transfer programs. They set the stage for next-generation efforts that aggregate, analyze, and present actionable information to stakeholders.
  - For example, **Care Daily** provides an AI platform connecting multiple point solutions that can be tailored to different settings.<sup>76</sup> In addition, Samsung's Project CareHub, featured at CES 2025, provided a concept demonstration of a digital front door to connected care at home for older adults and caregivers, showing the promise of innovations on the close horizon.<sup>77</sup> The product concept combined insights from end-to-end connected health applications, devices, and services made available in the home, linkage to caregivers to providers, and a digital marketplace with solutions supporting health needs based on data.

#### Spotlight: ACTIVATE

The ACTIVATE (Accountability, Coordination, and Telehealth In the Valley to Achieve Transformation and Equity) platform combines technology and digital health tools developed by Health Tequity, University of California Berkeley's CITRIS Health, and MITRE Corp. It feeds data from FDA-approved remote patient monitoring devices to EHRs and a digital dashboard used by patients and their health coaches to support chronic disease management. Developed to provide a digital comprehensive care management resource for community health centers in underserved communities, its early outcomes include reductions in hemoglobin A1C and blood pressure, demonstrating the potential for integrated solutions—in this case, data platforms and visual dashboards-to support care at home.<sup>78</sup> ACTIVATE is currently scaling to reach more communities.

#### **Recommendation 6: Increase Awareness, Access, and Adoption**

Longevity literacy—understanding how to plan for longer lives—includes anticipating what supports are needed and available to age well at home. Leveraging new messengers to educate adults at different ages and stages can normalize aging and care preparation and foster social acceptance of connected care tools. Improving home health readiness smooths the path toward integration of tech-enabled solutions into home environments with ease and flexibility.

#### RATIONALE

Lack of awareness undermines wider adoption of digital health tools. Health-care providers and older individuals themselves may not be familiar with the available options and their potential benefits, leading to underutilization of technologies that could improve quality of life, independence, and care at home. Stigma surrounding aging can lead to resistance, delaying utilization and further reinforcing negative perceptions of aging and age-related supports. Inequitable access and the "digital divide" impede broader promotion and use.

#### **CONTEXTUAL INSIGHTS**

- Adoption friction: The value proposition of connected care technologies must be clear and greater than any adoption friction for older adults to use them. However, too often the value proposition of connected care technologies is unclear to many older adults. <u>Data privacy</u> and trustworthiness remain significant concerns, particularly with regard to AI-driven health solutions that face high levels of <u>consumer skepticism</u>: 74 percent of adults aged 50+ said they would have very little or no trust in health information generated by AI.<sup>79</sup> Affordability, especially for low- and moderate-income households, presents further challenges to adoption.
- The digital divide: Disparities in technology access and use among older adults underscore the need for efforts to <u>improve digital equity in internet access</u>, <u>devices</u>, <u>and literacy</u> <u>training</u>.<sup>80</sup> Only <u>64 percent of adults over age 65 have high-speed internet (broadband) at</u> <u>home</u>-access which is increasingly important to aging well at home.<sup>81</sup>
  - The Federal Communication Commission (FCC) operates the Affordable Connectivity Program that subsidizes high-speed internet access for eligible households. The FCC's Lifeline program also subsidizes high-speed internet access for some households with low incomes. Expanded broadband infrastructure provides a foundation for investment in connected care in the home and advances equity.
- Home readiness: <u>Inadequate housing infrastructure</u> acts as a significant barrier to connected care utilization in homes that lack accessibility features, proper wiring for smart devices, and/ or suitable layouts for assistive technology—ultimately hindering the ability of older adults to remain independent at home.<sup>82</sup>
- Social norms: Experts emphasized the <u>impact of ageism</u> on health and care decisions among older adults, including a reluctance to plan for aging at home and the implicit association between care and dependence.<sup>83</sup> Stigma surrounding age-related health conditions frequently leads older adults to "stick their head in the sand" rather than anticipate their health and care support needs.

#### **PATHWAYS TO PROGRESS**

- Stimulate public policy and private-sector support for connected care infrastructure. Convene housing, health, and tech industry experts to address policy hurdles and housing development requirements for building health-ready homes (e.g., a national conference to elevate national-level conversation and awareness).
- Integrate longevity literacy education into existing life cycle milestones and inflection points. Life transitions—retirement, divorce, empty nesting, loss of a spouse—offer a point of entry to disseminate information and resources that help adults and their loved ones plan for aging well at home. Employers, financial services companies, and life and long-term care insurance providers with established customer relationships make ideal communication partners.
  - Financial services companies are encouraging their clients to engage in longevity planning. For example, TIAA focuses on the concept of "longevity fitness," encouraging reflection on health span and wealth span together.<sup>84</sup> Edward Jones encourages assessing its four <u>pillars of retirement</u>, which discuss affording care, and how many people become caregivers as they age.<sup>85</sup>
- Invest in digital health awareness and training programs. Expand on the success of evidencebased digital health training programs, such as AARP's <u>Older Adults Technology Services</u> (OATS), with support from philanthropy and advocacy partners.<sup>86</sup> Partner with community-level organizations (e.g., senior centers, libraries, local advocacy groups, municipal aging offices, Area Agencies on Aging) to develop educational materials and tech support training that empowers older adults to understand the benefits and effective use of digital health tools.
- Position connected care as a suite of tools for healthy living and flourishing in the home. Incentivize earlier adoption and promote positive digital health behavior by shifting the narrative away from "sick care" and enhancing motivation related to risk reduction and preventive care via more nuanced health behavior strategies (e.g., fresh starts and social comparison).<sup>87</sup>

"Let's introduce connected care further upstream as part of overall health and wellness, rather than framing it as age-specific. Normalizing health technology for everyone—including younger caregivers—helps build a culture of connected care that benefits all generations as they age."

-Stephen Parodi, Executive Vice President, The Permanente Federation

### **Next Steps**

Connected care in the home is at an inflection point. Institutionalization of telehealth and remote monitoring, expanded interoperability, and a burgeoning range of tailored solutions have laid the groundwork for broader transformation. The delivery of care continues to shift toward the home and the rollout of digital health and home technology solutions is surging, as evidenced by **350,000 mobile health applications**, nearly **3,000 AgeTech companies**, and **18.8 billion IoT devices** deployed globally.<sup>88</sup> These are positive indicators that a connected care ecosystem is emerging and can serve the 58 million and growing population of older adults in the US.<sup>89</sup> However, with only about half of **adults aged 55+ using assistive or health-related technolog**y to help them age in place and integrated, comprehensive solutions still in development, action is needed now to realize the full promise of connected care in the home.<sup>90</sup>

The recommendations outlined in this report focus on centering the needs and preferences of older adults, establishing the infrastructure and shared frameworks to validate and link connected care solutions, and enabling widespread adoption through improved access, integration, and financing. Achieving these goals and outcomes will depend on a broad coalition of public and private sector stakeholders.

Providers and health systems can integrate home-based insights into person-centered care models. Technology companies can build connective infrastructure that transforms individual tools into seamless experiences. Government agencies can lead by aligning incentives, advancing policy, and building trust through regulatory provisions. Older adults and caregivers must be active partners in participatory design and testing. Across the spectrum—from payers and housing developers to philanthropy and investors—stakeholders are essential to accelerating adoption, creating sustainable business models, and closing persistent gaps. Many are already engaged at different levels of involvement. Figure 5 presents a snapshot of key stakeholders and summarizes their role in the future of connected care.

#### Figure 5. Connected Care in the Home Key Stakeholders



Source: Milken Institute (2025)

During 2025, the Milken Institute will continue to partner with stakeholders to build out select pathways to progress identified in this report and publish related resources. With ongoing convening, collaboration, and collective action, we can advance connected care environments that enable older adults to live healthier, longer lives in the homes and communities they choose.

#### Additional Milken Institute Resources

The following resources from the Milken Institute provide additional information and ideas.

#### **PUBLICATIONS**

- Supporting Family Caregiving: How Employers Can Lead
- Innovative Financing and Care Models to Scale Affordable Senior Housing Options for Middle Income Older Adults
- Advancing Tech-Enabled Health and Home Care

#### PANELS

- Silver Threads: Weaving the Caregiving Tapestry
- Building the Health Data System of the Future
- The 21st Century Home: Health Hub of the Future

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