

**INNOVATIVE TREATMENT MODELS FOR ALZHEIMER'S DISEASE
AND DEMENTIA CARE:**

**Exploring an “aging in place” approach
that maximizes cost savings and patient-caregiver wellbeing.**

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Abstract

Over five million Americans are living with Alzheimer's Disease and other dementia (AD). As the "Baby Boomer" generation continues to age, the number of individuals suffering from AD will likely grow exponentially over the next three decades. While the traditional model of AD care relies primarily on long term residential care and focuses almost exclusively on the relationship between the AD patient and primary care provider, continued focus on this model is placing increased financial strain on state and federal payment programs as well as caregivers. Further, family members and acquaintances routinely experience significant emotional and financial challenges in the course of providing personal care and support. Unless public and private stakeholders innovate care delivery models for AD patients, current pressures on reimbursement programs, caregivers, and individual patients will soon prove unsustainable.

This article examines the pressing need for developing and implementing an innovative care delivery model for individuals suffering from AD. It begins with an overview of the historical treatment model for AD and identifies the impact of such treatment on patients, caregivers, and other stakeholders. We then identify key components of a package of services facilitating an "aging in place" model of care that likely will significantly reduce the cost-burden and emotional strain of AD treatment: (i) telehealth services, (ii) home health care, and (iii) behavioral health therapies, and examine current obstacles to implementing these care mechanisms.

Finally, we analyze existing barriers to implementing the package of services discussed above and provide an overview of opportunities to remove present obstacles to care.

Introduction and Background

The growing population of Americans diagnosed with AD creates significant public health and economic challenges for public and private stakeholders. Estimates suggest that by 2050 over 16 million people in the United States will live with AD, costing the public in excess of \$1.1 trillion dollars.¹ The costs associated with treating and caring for those suffering from AD is borne not only by clinicians and health care institutions, but by family and acquaintances providing supplemental care as well. In 2016 alone, an estimated 15 million Americans provided unpaid care for individuals suffering from AD.² In economic terms, the 18.2 billion hours of care was valued at \$230 billion dollars.³ With the number of individuals over age 65 expected to double in the next thirty years,⁴ the need to explore new efficient and effective care models for those suffering from AD is immediate. Some industry experts speculate that if care costs associated with AD remain unchecked, these costs will bankrupt the Medicare program.⁵

At the federal level, Congress has begun to take steps to address the anticipated financial and human capital strain associated with the rising prevalence of AD in the United States. In November of 2017, Senator Susan Collins introduced the Building Our Largest Dementia (BOLD) Infrastructure for Alzheimer's Act, which proposes to create a nationwide network of research and care support for those suffering from AD and their caregivers. Specifically, the Act provides funding to local health departments for the purpose of implementing the *Public Health Road Map* for brain health.⁶ Additionally, the Act proposes to establish a system of "Alzheimer's Centers of Excellence" throughout the country to assist local communities and caregivers in detection and intervention, and also to assist partner federal entities in the gathering and analysis of AD population data.⁷ The BOLD Act seeks to identify innovative and efficient modes of AD care, while finding ways to lower the \$175 billion in annual Medicare and Medicaid payments made related to the disease.⁸

In January of 2018, Congress passed the Recognize, Assist, Include, Support, and Engage (RAISE) Family Caregivers Act, which tasks various federal agencies with developing a national Family

¹ *FactSheet: 2017 Alzheimer's Disease Facts and Figures*. Mar. 2017. Web. 20 Feb. 2018. Retrieved from: www.alz.org/email/alz-media-insider/downloads/2017-FF-Factsheet.pdf.

² *Id.*

³ *Id.*

⁴ Orman, Jennifer M., and Victoria A. Velkoff. 2014, *An Aging Nation: The Older Population in the United States*. Web. 20 Feb. 2018. Retrieved from: <https://www.census.gov/prod/2014pubs/p25-1140.pdf>.

⁵ Japsen, Bruce. "Alzheimer's Staggering \$259B Cost Could Break Medicare." *Forbes*, Forbes Magazine, 7 Mar. 2017. Web. 26 Feb. 2018. Retrieved from: www.forbes.com/sites/brucejapsen/2017/03/07/u-s-cost-of-alzheimers-eclipses-250-billion/#7c9f107c71e5.

⁶ United States. Cong. Senate. *BOLD Infrastructure for Alzheimer's Act*. 115th Congress S.2076. Washington: GPO, 2017. Web. 22 February 2018. Retrieved from: <https://www.congress.gov/115/bills/s2076/BILLS-115s2076is.pdf>.

⁷ *Id.*

⁸ *Id.*

Caregiving Strategy.⁹ According to the RAISE Act, the purpose of the Family Caregiving Strategy is to promote person-centered care in all health and long-term care settings, enhance service planning that involves both family caregivers and care recipients, and inform, educate, and train caregivers about care options and individual financial security.¹⁰ In addition to developing the Family Care Giving Strategy, the RAISE Act establishes a Family Caregiving Advisory Council consisting of, among others, caregivers, state and local government officials, and older adults with long-term services and supports needs.¹¹ The Family Caregiving Advisory Council will examine the status of family caregiving in the United States, and provide updates to the Department of Health and Human Services regarding the development and associates outcomes of the Family Caregiving Strategy.¹²

The BOLD Act and RAISE Act are among the first congressional initiatives identifying the need for innovative treatments for the growing AD population and addressing the strains on family care providers generally. Recognizing that reliance solely on the traditional model of AD care is unsustainable from a financial cost and human capital perspective, stakeholders and caregivers must develop and implement an alternative model of care that integrates a caregiver and provider network across disciplines. With the rise of Accountable Care Organizations, managed care arrangements, and advancing technologies in the area of care delivery, this article will focus on the merits of an aging in place care model for AD patients that emphasizes telehealth, home health care, and behavioral health therapies, in an effort to ensure a cost-efficient and preventative approach to care and treatment.

Historic Treatment of Alzheimer’s Patients

Treatment for patients with AD has traditionally revolved around the relationship between the patient and the primary care provider. Reliance on the patient-provider dyad created a model of care that remains largely “reactionary,” whereby treatment is sought by the patient due to acute medical needs. AD patients and their families often interface directly with the patient’s primary care provider, resulting in an emphasis on providing long-term care options during the later stages of AD. A review of Center for Disease Control data regarding long term residential care populations confirms the traditional reliance on long term and late-stage care, as the CDC study found that in 2013-2014, 50.4% of long-term care service users had a diagnosis of AD or other dementia.¹³

The dependence on long term care for treatment of AD is evidenced in the fact that the average annual Medicare and Medicaid payments, private insurance payments, and out-of-pocket payments made on behalf of an AD patient greatly exceed the average annual payments in these

⁹ Recognize, Assist, Include, Support, and Engage Family Caregivers Act of 2017, Pub. L. No. 115-119 (2018). Sec. 3.

¹⁰ *Id.* at Sec. 3(b).

¹¹ *Id.* at Sec. 4(b)(2).

¹² *Id.* at Sec. 4(d)(1).

¹³ United States Department of Health and Human Services Centers for Disease Control (2016) Long-Term Care Providers and Services Users in the United States: Data From the National Study of Long-Term Care Providers. Web. 20 Feb. 2018. Retrieved from https://www.cdc.gov/nchs/data/series/sr_03/sr03_038.pdf.

categories made on behalf of an individual not suffering from the disease.¹⁴ Further reflecting the traditional focus on late-stage care is the prevalence with which AD patients are admitted to long term care facilities when compared to the general population. By age 80, 75% of individuals with AD are admitted to a nursing home compared to only 4% of the general public.¹⁵ These figures represent a historical reliance on long term care for AD treatment that continues through the present, and is largely driven by the traditional dependence upon primary care providers and hospitals for acute treatment needs.

Cost Burdens Associated with the Traditional AD Treatment Model

A reliance on the traditional care model for AD patients is creating an unsustainable strain on state and federal payor programs. In 2017 alone, Medicare and Medicaid are estimated to have spent a combined \$131 billion on Alzheimer's care.¹⁶ On a per capita basis, the average Medicare spending on AD is three times higher than the average spending on behalf of other seniors.¹⁷ By 2050, one out of every three Medicare dollars is expected to be spent on AD.¹⁸ Current Medicare and Medicaid programs focused on cost-containment among the senior population, such as the Program of All-inclusive Care for the Elderly (PACE), are not readily provided in every state and require program participants to enroll with a program-eligible primary care physician.¹⁹ These barriers to entry are among the reasons that federal and state capitation models such as PACE have not maximized their cost-savings potential.

Early detection and diagnosis of AD, coupled with a shift away from the traditional AD care model, will likely garner significant cost savings to payor programs and family caregivers. One estimate suggests that early detection of AD and the establishment of a disease management program can result in Medicare and Medicaid savings of \$22 billion by 2025.²⁰ In a 2010 study, seven VA Medical centers implemented a routine AD and dementia screening assessment during participants' regularly-scheduled primary care visits. Upon a detection of AD or dementia, participants were assigned a dementia care team to work directly with the patient and the patient's family to discuss treatment recommendations and identify individual patient needs. Researchers found that, on average, the total outpatient healthcare costs of a study participant suffering from AD declined by 29%, or a total of \$1,991, following diagnosis, compared to savings of \$406 for

¹⁴ *Id.*

¹⁵ Testimony of Robert Egge, Vice President, Public Policy, Alzheimer's Association, to Commission on Long-Term Care. August 16, 2013. Web. 20 Feb. 2018. Retrieved from: <https://www.alz.org/national/documents/Long-Term-Care-Commission-8-16-13.pdf>.

¹⁶ *Id.*

¹⁷ *Id.*

¹⁸ *Id.*

¹⁹ "Measuring the Costs and Savings of Aging in Place." *Evidence Matters: Transforming Knowledge into Housing and Community Development Policy*, Office of Policy Development and Research (PD&R), U.S. Department of Housing and Urban Development, 2013. Web. 20 Feb. 2018. Retrieved from: www.huduser.gov/portal/periodicals/em/fall13/highlight2.html#title.

²⁰ Borson, Soo et al. "Improving Dementia Care: The Role of Screening and Detection of Cognitive Impairment." *Alzheimer's & dementia : the journal of the Alzheimer's Association* 9.2 (2013): 151–159. *PMC*. Web. 16 Feb. 2018. Retrieved from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4049530/>

non-participating patients diagnosed through a similar screening.²¹ The results of VA study underscore the potential cost-savings associated with implementing an integrative AD treatment model.

Proposing an Integrated and Proactive Approach to Care Focused on Aging in Place

Transforming the traditional model of AD care begins with recognizing and emphasizing the importance of “aging in place” as a means of slowing the progression of the disease and eliminating unnecessary medical spending. The concept of “aging in place” emphasizes the importance of seniors remaining in the home – whether a traditional residence, independent living facility or potentially assisted living facility-- and providing support and care services that allow seniors to achieve this goal. Prioritizing aging in place is consistent with public opinion regarding the aging process, as 89% of Americans over age 50 wish to remain in the home for as long as possible.²² Aging in place not only ensures familiarity and dignity within the course of care, but also enhances continuity of care. As Amjad et al indicate, lower continuity of care is associated with increased rates of AD patient hospitalization and overall healthcare spending.²³ Additionally, studies suggest that AD patients receiving treatment in the home are significantly less likely to leave home for a long term care facility. In a 2012 study by Johns Hopkins School of Medicine entitled “Maximizing Independence at Home (MIND),” researchers assigned a group of participants suffering from AD to a dedicated Dementia Care Coordinator. The Care Coordinator met with the participant regularly to assess home safety and nutrition, and to identify unrelated but potentially exacerbating health issues (such as high blood pressure). Researchers compared the participants supported by a Care Coordinator with a control group receiving their regular course of care. Compared to the control group, researchers found that the group meeting regularly with a Care Coordinator remained at home significantly longer than the control group. The MIND study researchers also suggest that efforts to keep individuals with dementia in the home will garner significant cost-savings, as those without supplemental in-home care tend to rely heavily on hospital and nursing home care for acute medical needs.

The physical and financial benefits of aging in place are also evidenced by the ongoing “Aging in Place Project,” managed by the University of Missouri-Columbia. The Project provides community-based care to residents at a local retirement community, with the goal of maximizing mental, physical, and psychosocial wellbeing of each program participant through the implementation of care services and wellness programs.²⁴ According to statistics published by

²¹ Alzheimer's Association. “Early Detection, Diagnosis & Care Management for People with Dementia May Reduce Healthcare Costs.” *Alz.org/blog*, Alzheimer's Association, 14 July 2010. Web. 16 Feb. 2018. Retrieved from: blog.alz.org/early-detection-diagnosis-care-management-for-people-with-dementia-may-reduce-healthcare-costs/.

²² “HUD USER.” *Measuring the Costs and Savings of Aging in Place, HUD USER*. Web. 20 Feb. 2018. Retrieved from: <https://www.huduser.gov/portal/periodicals/em/fall13/highlight2.html#title>

²³ Amjad, Halima et al. “Continuity of Care and Healthcare Utilization in Older Adults with Dementia in Fee-for-Service Medicare.” *JAMA internal medicine* 176.9 (2016): 1371–1378. *PMC*. Web. 21 Feb. 2018. Retrieved from: <https://www.ncbi.nlm.nih.gov/pubmed/27454945>.

²⁴ “Aging in Place Project.” *Aging in Place Project - American Academy of Nursing Main Site*. Web. 20 Feb. 2018. Retrieved from: <http://www.aannet.org/initiatives/edge-runners/profiles/edge-runners--aging-in-place-project>

The Aging in Place Project, care coordination doubled the length of stay of residents in the retirement community compared to the national average, and the average annual cost of nursing-home eligible residents from 2009-2012 was \$20,000 less per year compared to individuals in nursing homes.²⁵

In addition to private stakeholders, state and local governments are beginning to recognize the cost-savings benefits of promoting aging in place for individuals suffering from AD. Minnesota's Act on Alzheimer's initiative includes promoting the "health care home" model of care in an attempt to lower medical and long-term care costs, reduce hospitalizations, and promote a team-based approach to care.²⁶ In Georgia, the state legislature adopted the "Georgia Alzheimer's Disease and Related Dementias (GARD) State Plan," which commits to funding long-term care options other than skilled nursing homes and creating innovative aging in place-centric housing.²⁷ State coordination and assessment of AD care is a growing trend. As of January 2017, 46 states, the District of Columbia, and Puerto Rico all published AD plans, with varying levels of focus on home and community based services, training, quality of care, and case management.²⁸

The efforts of private and public stakeholders emphasize the clinical and financial benefits of modeling AD care delivery around aging in place. By maximizing the time aging safely in the home, AD patients, caregivers, providers, and the public will likely experience significant cost savings.

Modern advances in medical technology and remote care capabilities, regardless of the patient's acuity level, allow providers and caregivers to maximize a patient's ability to age in place. Specifically, a package of services, including telehealth care and monitoring, home health care, and behavioral health therapies, will ensure that AD patients remain safely at home for as long as possible and will result in lower overall costs compared to the traditional AD care model.

Telehealth

Shifting away from the traditional AD care delivery model will be enabled by increased use of telehealth as a vehicle for AD patient treatment and monitoring. Telehealth is broadly defined as the use of electronic information and telecommunication technologies to support and promote long-distance clinical health care, public health, and health education.²⁹ Telehealth care generally falls into one of three categories: synchronous care, classified as care delivered in "real-time,"

²⁵ *Id.*

²⁶ *Preparing Minnesota for Alzheimer's: the Budgetary, Social and Personal Impacts.* The Minnesota Board on Aging Alzheimer's Disease Working Group, 2011. Web. 19 Feb. 2018. Retrieved from: <http://alzworkinggroup.pbworks.com/f/Preparing%20MN%20for%20Alzheimer%27s%20The%20Budgetary%2C%20Social%20and%20Personal%20Impacts.pdf>.

²⁷ *Id.*

²⁸ For more information on state care plans, see *State Alzheimer's Disease Plans.* Alzheimer's Association (2017). Web. 2 Mar. 2018. Retrieved from: http://act.alz.org/site/DocServer/STATE_AD_PLANS.pdf?docID=4641.

²⁹ "Telehealth Programs." *Health Resources & Services Administration*, 1 Nov. 2015. Web. 20 Feb. 2018. Retrieved from: <https://www.hrsa.gov/rural-health/telehealth/index.html>.

asynchronous care, classified as the stored and transferred communications reviewed on delay, and remote patient monitoring.³⁰

Establishing a network of care through the use of remote technologies accomplishes a number of goals that contribute to positive cost-saving outcomes. First, telehealth allows for an AD patient to remain in the home while receiving care, ensuring continuity of the care environment and avoiding a change that may trigger unfavorable patient behaviors or reactions, such as anxiety or agitation. Second, telehealth may also improve AD patient safety within the home. Researchers cite medication reminders, wandering-prevention tracking, and caregiver education support as present uses of telehealth technologies that result in an enhanced level of safety for AD patients.³¹ In one study, certain tracking programs reduced the risk of nighttime AD patient falls by 48.8%.³² In another study, the use of video monitoring was shown to increase the likelihood of medication compliance among dementia-afflicted individuals living alone.³³ Finally, widespread use of telehealth may also lead to a decrease in the number of unnecessary AD patient hospitalizations and the costs associated with these unneeded services. On average, over 25% of individuals suffering from AD or other dementia experience a preventable hospitalization.³⁴ These hospitalizations represent not only a significant social and emotional burden on a patient and their caregivers, but a substantial cost to Medicare as well. In 2013, these preventable hospitalizations resulted in over \$2.5 billion in Medicare payments on behalf of patients suffering from AD or other dementia.³⁵

Although the AD patient population presents unique challenges in ensuring end-user acceptance and implementation of telehealth services, evidence suggests that elder populations in general recognize the utility and benefits of telehealth as compared to adult day health or nursing home services.³⁶ While most studies involving the use of telehealth among the elder population focus on the use of these services to address depression, Myers and Turvey note that “the majority of acceptance rates have been reported as ‘high,’ or among those that provide statistics, at 80% or

³⁰ Mechanic OJ, et al. *Telehealth Systems*. [Updated 2017 Oct 14]. Treasure Island (FL): StatPearls Publishing; 2018 Jan-. Web. 5 Mar. 2018. Retrieved from: <https://www.ncbi.nlm.nih.gov/books/NBK459384/>.

³¹ Bossen, Ann L et al. “Emerging Roles for Telemedicine and Smart Technologies in Dementia Care.” *Smart homecare technology and telehealth* 3 (2015): 49–57. *PMC*. Web. 23 Feb. 2018. Retrieved from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4666316/>.

³² Bossen, Ann L et al. “Emerging Roles for Telemedicine and Smart Technologies in Dementia Care.” *Smart homecare technology and telehealth* 3 (2015): 49–57. *PMC*. Web. 21 Feb. 2018. Retrieved from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4666316/>.

³³ Smith, G. E., et al. “Telehealth Home Monitoring of Solitary Persons with Mild Dementia.” *American Journal of Alzheimer's Disease and other Dementias*, 22 (2007), 20-26. Retrieved from: <http://journals.sagepub.com/doi/abs/10.1177/1533317506295888?journalCode=ajae>.

³⁴ Alzheimer's Association. (2017). *Policy Brief: Reducing Potentially Preventable Hospitalizations for People Living with Alzheimer's and Other Dementias*. Web. 20 Feb. 2018. Retrieved from: <https://www.alz.org/publichealth/downloads/policy-brief-preventable.pdf>.

³⁵ *Id.*

³⁶ Onor, Maria L. et al, “Effectiveness of Telecare in Elderly Populations – A Comparison of Three Settings” *Telemedicine and e-Health*. March 2008, 14(2): 164-169. Web. 16 Feb. 2018. Retrieved from: <http://online.liebertpub.com/doi/pdf/10.1089/tmj.2007.0028>.

more.”³⁷ This analysis suggests that despite the perceived barriers to engaging and connecting AD-diagnosed elders with telehealth services, these services can be implemented among elders upon proper demonstration and education of the technology. Promoting telehealth use by informal AD caregivers, such as friends and family members of the patient, will help to ensure that the technology is adopted and benefits are maximized in the course of patient monitoring and treatment. Furthermore, the use of telehealth by formal home health caregivers will ensure better coordination of services and enhance the efficiency of care delivery.

States are increasingly recognizing the legitimacy and utility of telehealth, as 48 states provide reimbursement for telehealth services in their respective Medicaid fee-for-service programs.³⁸ Within those jurisdictions, 28 states and the District of Columbia also require private payors to provide reimbursement for certain telehealth services.³⁹ However, only 3 such states require that the reimbursement for a service provided through telehealth mirror the “in-person” reimbursement for such service.⁴⁰ A similar expansion of telehealth coverage is occurring at the federal level. Although Medicare reimbursement for telehealth services was historically limited and highly dependent upon the location of an originating site and status of the provider supplying services to the patient, the recently-passed Bipartisan Budget Act of 2018 greatly expanded the population of Medicare enrollees eligible for telehealth services. Under the Act, the Medicare Advantage program and certain ACOs are now able to provide telehealth coverage.⁴¹ For eligible enrollees assigned to an ACO, the enrollee’s home is considered an approved originating site without any geographic restriction.⁴² In addition to expanding telehealth services covered under the Medicare Advantage program and eligible ACOs, the Act makes specific provision for the expansion of Medicare telehealth coverage for stroke patients and covers diagnosis, evaluation, and treatment this subset of chronic illness.⁴³ Future expansion of the chronic illness categories eligible for telehealth care under Medicare, including AD, will accelerate broader acceptance of this innovative care delivery vehicle all public and private reimbursement programs and reduce the federal and state payor cost burdens associated with AD care.

Home Health Care Services

In addition to the benefits of implementing telehealth in the course of AD-patient treatment and monitoring, maximizing the use of home health care services in the AD context will both prolong the lives of AD patients and enhance cost-savings. Home health care agencies provide a broad

³⁷ Turvey, Carolyn, et al (eds.). *Telemental Health: Clinical, Technical, and Administrative Foundations for Evidence-Based Practice*. Elsevier Insight, 2013, 177.

³⁸ State Telehealth Laws and Reimbursement Policies: A Comprehensive Scan of the 50 States and District of Columbia. Public Health Institute, 2017, 3. Retrieved from: <http://www.cchpca.org/sites/default/files/resources/50%20STATE%20PDF%20FILE%20APRIL%202017%20FINAL%20PASSWORD%20PROTECT.pdf>.

³⁹ Center for Connected Health Policy. 2017, *Telehealth Private Payer Laws: Impact and Issues*, 9. Retrieved from: http://www.cchpca.org/sites/default/files/resources/CCHP_%20Milbank-Telehealth-Report-FINAL.pdf.

⁴⁰ *Id.*

⁴¹ Bipartisan Budget Act of 2018, Pub. L. No. 115-123 (2018).

⁴² *Id.* at §50324(a) (2018).

⁴³ *Id.* at §50325(2) (2018).

spectrum of services to patients, typically falling within four silos of care: (i) skilled nursing, (ii) skilled therapy, (iii) personal care services, and (iv) home-maker services.

Implementing a continuum of home health services addresses the significant challenges faced by AD patients and caregivers alike in receiving much-needed support to remain in the home. The reliance of AD patients on family members and friends for personal care and the emotional burdens associated with such care is well documented. As of 2017, 35% of caregivers for individuals suffering from AD or another dementia report a decline in their own health due to the responsibilities of providing care.⁴⁴ Stress and depression are prominent among non-professional AD caregivers.⁴⁵ One-quarter of caregivers provide care not only to an aging parent or loved one, but to a child as well.⁴⁶

The physical and financial strains associated with providing care for AD patients are largely the result of inadequate caregiver training regarding the progression of the disease and best-practices for addressing specific caregiving scenarios. Studies have shown that increased access to educational resources and support groups through the use of internet technology has directly contributed to a decrease in the incidence of depression found amongst the AD caregiver population.⁴⁷ Furthermore, enhanced caregiver support intervention is shown to dramatically delay placement of an AD patient into a nursing home.⁴⁸ The presence of health care professionals in the home affords the non-professional caregiver opportunities to gain valuable insight into methods of care and avoid activities or attempts at treatment that may exacerbate symptoms of the disease. Thus, expanding access and use of home health care services can significantly impact the quality of life for both the AD patient and the non-professional caregiver.

Utilizing telehealth services in the home health care context has shown to improve clinical outcomes of patients generally. In a study conducted by Finkelstein et al, patient outcomes were compared among three groups receiving home health skilled nursing services through varying uses of telehealth. The control group consisted of patients receiving care in-home without the use of telehealth (“Group One”), a second group consisted of patients receiving a mix of in-home traditional care together with virtual visits from providers (“Group Two”), and a third group consisted of patients receiving in-home care, virtual visits from providers, and physiological monitoring of the patient’s underlying condition (“Group Three”).⁴⁹ Researchers tracked the

⁴⁴ *FactSheet: 2017 Alzheimer’s Disease Facts and Figures*. Mar. 2017, www.alz.org/email/alz-media-insider/downloads/2017-FF-Factsheet.pdf

⁴⁵ “Caregiver Health: A Population At Risk.” *Caregiver Health | Family Caregiver Alliance*, 2006. Web. 21 Feb. 2018. Retrieved from: <https://www.caregiver.org/caregiver-health>

⁴⁶ *FactSheet: 2017 Alzheimer’s Disease Facts and Figures*. Mar. 2017, www.alz.org/email/alz-media-insider/downloads/2017-FF-Factsheet.pdf

⁴⁷ Eisdorfer, Carl et al. “The Effect of a Family Therapy and Technology-Based Intervention on Caregiver Depression.” *The Gerontologist* 43.4 (2003): 521–531. Web. 22 Feb. 2018. Retrieved from: <http://pubmedcentralcanada.ca/pmcc/articles/PMC2413057/>

⁴⁸ Mittleman, Mary S. et al. “Improving Caregiver Well-being Delays Nursing Home Placement of Patients with Alzheimer Disease.” *Neurology* 67 (9): 1592-1599. Web. 22 Feb. 2018. Retrieved from: <https://pdfs.semanticscholar.org/5f34/b671a314749a7856dd49828fff3d94fab876.pdf>

⁴⁹ Finkelstein, Stanley M. et al. “Home Telehealth Improves Clinical Outcomes at Lower Cost for Home Healthcare.” *Telemedicine & Health* 12 (2006) 128 Web. 22 Feb. 2018.

progress of care among the groups as well as changes to the level of care required, finding that the patients in Group One were discharged to a higher level of care more frequently (in 40% of cases) than patients in Group Two and Group Three (21% and 15%, respectively).⁵⁰ The study also tracked the cost of the caregiver visits across all groups, and found that the traditional, in-person visits cost significantly more, on average, than the video conference visits and the virtual monitoring visits.⁵¹ While the Finkelstein study did not specifically focus on a population of patients suffering from AD, the results of the research confirm that proper use of telehealth services in the delivery of home health care has the potential to decrease costs associated with treatment while bettering patient outcomes in the AD context.

Coordinating home health services with a focus on promoting aging in place has also shown to improve clinical outcomes compared to the traditional model of home health care. Participants in the aforementioned Aging in Place Project received coordinated care services compared to their non-participant counterparts, resulting in a drastically reduced rehospitalization rate compared to non-participants.⁵² In a study analyzing the clinical outcomes of Aging in Place Project participants, Popejoy et al speculate that this favorable clinical outcome is likely the result of intense at-home care monitoring and service plan implementation by the participants' care coordinators.⁵³ Participants also experienced lower average costs than those individuals receiving traditional home health care services.⁵⁴

As healthcare providers continue to examine the role of home health care in minimizing patient and payor costs, the acuity of care available through home health is rising. A select number of large health systems are even utilizing hospitalization in the home as a means of keeping patients with certain conditions protected from the various risks associated with inpatient care. For example, Mount Sinai Hospital's in-home hospitalization program evaluates qualifying patients in the hospital itself and sends the patients home for care and treatment through Mobile Acute Care Team (MACT) services for a period of 30 days.⁵⁵ The MACT provides the continuum of care that the patient would otherwise receive in the hospital, consisting of physicians, care coaches, physical therapists, occupational therapists, and nurses, and including services such as radiology, lab services, durable medical equipment, pharmacy services, and telemedicine.⁵⁶ The MACT not only provides acute care and treatment, but also assists with the patient's transition to community

⁵⁰ *Id.*

⁵¹ In-person visits cost an average of \$48.27 per patient, while video conference visits and virtual monitoring visits cost an average of \$22.11 and \$33.11 per patient, respectively. *Id.*

⁵² Popejoy, Lori L. et al. "Comparing Aging in Place to Home Health Care: Impact of Nurse Care Coordination On Utilization and Costs." *Nursing economic* 33.6 (2015): 306–313. Web. 3 Mar. 2018. Retrieved from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4749163/>.

⁵³ *Id.*

⁵⁴ *Id.*

⁵⁵ "New Program to Provide Hospital-Level Care at Home." *Inside Mount Sinai*, Mount Sinai Health System, 4 Jan. 2018. Web. 27 Feb. 2018. Retrieved from: <http://inside.mountsinai.org/blog/mobile-acute-care-team-mact-provides-hospital-level-care-at-home/>.

⁵⁶ "Health Care Innovation Awards Round Two: Project Profile." *Health Care Innovation Awards Round Two: Project Profile | Center for Medicare & Medicaid Innovation*, Centers for Medicare & Medicaid Services. Web. 27 Feb. 2018. Retrieved from: <https://innovation.cms.gov/initiatives/Participant/Health-Care-Innovation-Awards-Round-Two/Icahn-School-Of-Medicine-At-Mount-Sinai.html>.

providers following the admission period.⁵⁷ Mount Sinai estimates that in-home hospitalizations, if scaled, can generate significant cost savings to Medicare. Under an estimate provided to the Centers for Medicare & Medicaid Services, implementing an in-home hospitalization program for 20% of patient cases nationwide could save Medicare \$45 million.⁵⁸

In addition to the financial benefits of in-home hospitalization, this mode of care often leads to better clinical outcomes for patients in these programs compared to their inpatient counterparts. For example, patients in the Hospital at Home Program administered by the Johns Hopkins University School of Medicine and Public Health experienced lower mortality rates during admission, higher patient satisfaction, and, on average, incurred patients costs that were 19% lower than their inpatient counterparts.⁵⁹ The Mount Sinai and Johns Hopkins University School of Medicine programs reflect that providers increasingly are adequately equipped to provide acute, hospital-level care in the home, and that care in the home environment has positive clinical benefits compared to patients receiving care in the traditional hospital setting.

Much like government payor programs lack coverage for the wide-ranging potential uses of telehealth, Medicare's fee-for-service coverage for home health services is limited. Coverage extends to the skilled nursing and skilled therapy home health services, provided that a recipient is under the care of a physician and receiving the home health services pursuant to a plan of care regularly reviewed by the recipient's physician.⁶⁰ However, services provided outside of a plan of care, 24-hour care, and homemaking services are typically not covered by the Medicare program.⁶¹ While certain state Medicaid programs provide personal care and homemaking services through home health aide services, the level of services varies greatly across the country.

Behavioral Health

Behavioral comorbidities are common among patients with AD, and can present at any stage of the disease.⁶² While statistics on the prevalence of behavioral symptoms associated with the disease vary, some studies estimate that up to 90% of patients with AD suffer from behavioral disorders such as depression, anxiety, psychosis, agitation, aggression, sleep disturbances, and

⁵⁷ *Id.*

⁵⁸ Charney, M.D., Dennis S. "HaH-Plus" (*Hospital at Home Plus*) Provider-Focused Payment Model. United States Department of Health and Human Services, Office of Health Policy, "HaH-Plus" (*Hospital at Home Plus*) Provider-Focused Payment Model. Appendix I. Web. 27 Feb. 2018. Retrieved from: <https://aspe.hhs.gov/system/files/pdf/255906/HaHPlusProviderFocusedPaymentModel.pdf>.

⁵⁹ Cryer, et al "Costs For 'Hospital at Home' Patients Were 19 Percent Lower, With Equal or Better Outcomes Compared to Similar Patients." *Health Affairs* 31 (2012): 1237-1243. Retrieved from: <https://www.healthaffairs.org/doi/pdf/10.1377/hlthaff.2011.1132>.

⁶⁰ "Your Medicare Coverage." *Medicare.gov: The Official U.S. Government Site for Medicare*, U.S. Centers for Medicare & Medicaid Services, www.medicare.gov/coverage/home-health-services.html.

⁶¹ *Id.*

⁶² Dillon, Carol et al. "Behavioral Symptoms Related to Cognitive Impairment." *Neuropsychiatric Disease and Treatment* 9 (2013): 1443–1455, 1444. *PMC*. Web. 23 Feb. 2018. Retrieved from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3788702/pdf/ndt-9-1443.pdf>

disinhibition.⁶³ While pharmacologic treatments of behavioral symptoms are prevalent, non-pharmacologic behavioral health treatments and therapies are becoming increasingly popular in managing and decreasing episodic changes in behavior among AD patients. Studies indicate that an AD patient's physical environment and social interactions with caregivers may be partially responsible for the onset of the behavioral and psychological symptoms of AD and other dementia.⁶⁴ Triggering changes in the environment include: changes in routine; competing or misleading stimuli; and demands that exceed an AD patient's physical capabilities.⁶⁵ Research suggests that, in addressing certain behavioral changes in an AD patient, intervention by a family caregiver is more effective than antipsychotic drugs.⁶⁶

Maximizing the benefits of home-based behavioral health therapies for AD patients will require a significant expansion of current Medicare coverage. While Medicare may cover psychiatric diagnostic interviews and individual psychotherapy, Medicare does not cover environmental intervention.⁶⁷ Further limiting coverage is the Social Security Act's requirement that Medicare only make payments for items and services that are reasonable and necessary for the treatment or diagnosis of an illness.⁶⁸ Although fee-for-service Medicare reimbursement for behavioral health services has traditionally been limited, the Bipartisan Budget Act of 2018 signals a potential shift in the federal government's views on the efficacy and utility of telehealth and alternative care delivery options. Continued expansion of Medicare coverage for behavioral health services to AD patients is necessary to ensure the availability of a continuum of care to this patient population.

Implementation Barriers and Emerging Opportunities

Notwithstanding the potential cost savings and clinical benefits of promoting aging in place through the use of telehealth, home health services, and behavioral health therapies, a number of present barriers must be addressed prior to widespread implementation of these services.

The first impediment relates to the current status of services reimbursement. As previously discussed, federal and state fee-for-service reimbursement programs are limited in the scope of coverage for home health and telehealth care. While states are continuing to expand the level of telehealth services covered by Medicaid programs and private insurers, more uniformity is needed to ensure that coverage requirements are symmetrical across all jurisdictions. That said, and as

⁶³ Müller-Spahn, Franz. "Behavioral Disturbances in Dementia." *Dialogues in Clinical Neuroscience* 5.1 (2003): 49–59. Web. 23 Feb. 2018. Retrieved from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3181717/>.

⁶⁴ E. Mintzer, Jacobo, Dario F. Mirski, and Kathleen S. Hoernig. "Behavioral and Psychological Signs and Symptoms of Dementia: A Practicing Psychiatrist's Viewpoint." *Dialogues in Clinical Neuroscience* 2.2 (2000): 139–155. Web. 23 Feb. 2018. Retrieved from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3181597/pdf/DialoguesClinNeurosci-2-139.pdf>.

⁶⁵ Kales, Helen C, Laura N Gitlin, and Constantine G Lyketsos. "Assessment and Management of Behavioral and Psychological Symptoms of Dementia." *The BMJ* 350 (2015): h369. *PMC*. Web. 23 Feb. 2018. Retrieved from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4707529/?report=printable>.

⁶⁶ *Id.*

⁶⁷ United States Centers for Medicare & Medicaid Services. "Mental Health Services." *Mental Health Services*, Medicare Learning Network, Jan. 2015. Web. 26 Feb. 2018. Retrieved from: <https://www.cms.gov/Outreach-and-Education/Medicare-Learning-Network-MLN/MLNProducts/Downloads/Mental-Health-Services-Booklet-ICN903195.pdf>.

⁶⁸ 42 U.S.C. 1395y(a)(1)(A).

indicated above, recent federal legislation has eliminated certain barriers to Medicare/Medicaid reimbursement for telehealth services. More broadly, value-based purchasing models of care will create new cost and quality incentives for ACO and other networks to offer telehealth and home health services.

Similarly, entity, practitioner, and telehealth licensure varies widely from state-to-state, with differing degrees of certification requirements. The lack of commonality among state licensure requirements, for example widely variable state regulation as to what acuity level of service is permitted in independent living and assisted living facilities, and variations in the ability to provide care through telehealth across state lines, is a barrier to scaling the discussed “aging in place” model. Finally, acuity levels of home health service and availability of such service must be consolidated and standardized to ensure that caregiving staff is sufficiently trained and that the full spectrum of services are readily available to the general population in their homes.

As with any rapidly expanding and emerging area of health care delivery, regulation will need to catch up with the pace of care innovations such as the hospital at home program and advances in behavioral health care methods. Limited regulation in the home health and behavioral health sectors in particular have led to pockets of abuse of public payor systems and substandard patient care. In Massachusetts for example, which presently does not employ state licensure standards for home health agencies, an audit of the Massachusetts Medicaid program revealed over \$22 million in improper billing by nine home health agencies and nine adult foster care agencies operating in the state.⁶⁹ The audit cited insufficient medical record maintenance and the provision of unauthorized services to patients.⁷⁰ In August of 2017, the United States Department of Justice announced a 480-month sentence for the owner and operator of five Texas home health agencies that defrauded Medicare and the state’s Medicaid program of more than \$17 million.⁷¹

Although the Centers for Medicare & Medicaid Services recently revised the conditions of participation that home health agencies must meet to participate in the Medicare and Medicaid programs, with particular focus on patient rights and enhancing the quality of patient care, continued instances of fraud and abuse reflect the reality that additional regulatory safeguards are needed as new care models evolve. While these regulations serve as a layer of protection against abuses, public and private stakeholders must work to implement regulations in a manner that does not constrain care innovation.

Despite the obstacles to implementation, AD patient treatment and the senior care industry generally are ripe for innovation and disruption. This is due in large part to the recognized need for a change in the approach to care, driven by the increased financial pressures on public and

⁶⁹ MassHealth Audit Finds \$22.9 Million in Improper Billing by Home Health and Adult Foster Care Programs.” The Massachusetts Department of Health and Human Services, 5 Aug. 2017. Web. 8 Mar. 2018. Retrieved from: <http://www.mass.gov/eohhs/gov/newsroom/masshealth/masshealth-audit-finds-22-9-million-improper-billing.html>.

⁷⁰ *Id.*

⁷¹ “Houston Home Health Agency Owner Sentenced to 480 Months in Prison for Conspiring to Defraud Medicare and Medicaid of More Than \$17 Million.” The United States Department of Justice, 18 Aug. 2017. Web. 8 Mar. 2018. Retrieved from: <https://www.justice.gov/opa/pr/houston-home-health-agency-owner-sentenced-480-months-prison-conspiring-defraud-medicare-and>.

private stakeholders and the growing senior demographic. The Center for Medicare & Medicaid Services Innovation Center is presently committing resources to exploring alternative models of care based on value—rather than volume—of services. The Transforming Clinical Practice Initiative and the Medicare Advantage Value-Based Insurance Design Model are examples of short-term projects assessing the potential cost savings of a value-based care model.⁷² Assuming that these initiatives result in positive clinical outcomes for patients and projected cost savings for the Medicare program, one can expect a long-term federal government focus on maximizing the financial and clinical benefits of value-based care.

Private companies are also presented with a unique opportunity in innovating care models. As seen in the recently proposed acquisition of Aetna by CVS Health as well as the announcement by Amazon, Berkshire Hathaway, and JPMorgan of a partnership to establish a health insurance plan, private companies are keenly aware of the public appetite for lower healthcare costs. A recent poll suggests that over one-third of Amazon customers surveyed would enroll with an Amazon health insurance plan.⁷³ Furthermore, private companies and private equity groups are uniquely situated to invest in the consolidation of care services. Co-opting services among inter-related parties will likely result a more efficient and financially viable delivery system for the AD patient population that best promotes aging in place.

Conclusion

The traditional AD treatment model is creating unsustainable financial pressures on caregivers and reimbursement programs alike. In addition to increasing care costs, caregivers experience significant physical and emotional strains as a direct result of providing care. The confluence of these issues requires a new and innovative approach to the AD treatment model. By prolonging aging in place through the use of telehealth treatment and monitoring, home health services, and behavioral health therapies, all stakeholders are likely to enjoy significant cost savings while decreasing the prevalence of caregiver physical and emotional stressors related to care.

Although implementing the package of services for AD patients discussed above requires a paradigm shift in the approach to AD patient care, demographic and cost indicators suggest that wide-scale change and innovation is necessary. The time appears ripe to develop a comprehensive care, reimbursement, and regulatory approach based on an aging in place approach to AD.

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⁷² United States Centers for Medicare & Medicaid Services, Center for Medicare and Medicaid Innovation. *Report to Congress*. 2016, *Report to Congress*. Web. 1 Mar. 2018. Retrieved from: innovation.cms.gov/Files/reports/rtc-2016.pdf.

⁷³ Ellison, Ayla. “35.8% of Americans would use an Amazon health insurance plan.” *Beckers Hospital Review*. Web. 1 Mar. 2018. Retrieved from: www.beckershospitalreview.com/payer-issues/35-8-of-americans-would-use-an-amazon-health-insurance-plan.html

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