

Telehealth in Geriatrics



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KEYWORDS

- Telehealth • Telemedicine • Virtual • Remote • Mobile • Technology • Synchronous
- Older • Geriatrics

KEY POINTS

- Telehealth has demonstrated feasibility for geriatric patient care. Telehealth interventions should be designed with the unique needs of geriatric patients in mind for effective implementation.
- Telemedicine has the potential for synchronous communication between patients, caregivers, primary care providers, and specialists to enhance care coordination.
- Current evidence supports the use of telehealth for remote geriatric assessments including medication review, fall and safety risk, frailty and functional status, and nutritional status.
- Telehealth has applications for chronic disease management in older adults, including dementia, depression, hypertension, diabetes mellitus, and heart failure.
- More research is needed to evaluate health outcomes and cost-effectiveness of telehealth interventions in the geriatric population, which will help guide appropriate reimbursement policies.

INTRODUCTION

Telehealth is now an integral part of health care, although questions remain about its effective utilization in geriatrics. Rising health care costs and increasing numbers of age-related diseases are seen with the continued expansion of our aging population.¹ Lack of transportation may lead to older patients' inability to visit a health care provider's office, particularly in rural areas. Geriatric patients are more likely to have mobility and sensory impairments, increasing their chance of injury when leaving the home.^{2,3} Timely, high-quality geriatric care which effectively addresses the above issues is needed, ideally guided by patient-centered medical homes. Virtual home-based visits can improve access to care while also promoting patient safety.²

This review presents current evidence for the use of various telehealth applications in the geriatric population. Virtual geriatric clinics have been increasingly used during

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the SARS-CoV-2 pandemic.² Despite initial widespread use out of necessity, telehealth is now commonly used for comprehensive geriatric assessment, health promotion, and disease management.^{2,4} Nonetheless, more data are needed regarding the overall utility of telehealth and impact on health care quality and costs. Health care providers should be aware of new and changing policies for the reimbursement of telehealth services.

In this article, the term telehealth broadly refers to all health care modalities provided at a distance, which may or may not include interaction with a medical provider. Telemedicine refers to video, audio, or written remote clinical encounters between a provider and a patient. Remote patient monitoring (RPM) is the technology that enables providers to monitor patient health data outside of conventional clinic settings. Mobile health (mHealth) is a term for mobile phone applications or other wireless devices that help provide either provider-driven or consumer-driven medical advice. Generally, electronic health (eHealth) is the term used when providers use wireless devices to provide care.⁵

DISCUSSION

Patient Safety

Coordination of care

Virtual geriatric clinics enable geriatricians to collaborate with allied health professions including nursing, pharmacy, home health, and occupational and physical therapy with a high degree of patient and physician satisfaction.^{2,4} They enhance the coordination of care across multiple settings, inclusive of the community, nursing home (NH), and hospital, resulting in successful pharmacy reviews and reduced hospitalizations. Interactions with caregivers of older adults can be enhanced with telemedicine, improving communication and quality of care. Telemedicine has the potential for three-way, synchronous communication between patients, caregivers, primary care, and specialists to reconcile potentially conflicting recommendations from different providers.

Assisted-living facility (ALF) and NH virtual care has helped protect vulnerable seniors during the COVID-19 pandemic, and its widespread adoption also highlighted other benefits beyond supporting isolation and contact precautions. In an international meta-analysis of 16 studies from 2014 to 2020, a wide spectrum of ALF and NH telehealth services were shown to have cost savings benefits by using virtual geriatrician and specialist consultations, psychiatric care, wound care, and RPM.⁶ Some studies demonstrated reductions in hospitalizations and unnecessary transfers.

Home safety and falls

For in-home patient safety assessments, telemedicine enables providers to directly observe the patient's home environment and visualize the mechanics of their daily activities. Fall screening questionnaires can be used in the telehealth setting.⁴ Some mobility assessment tools like the Timed-Up-And-Go-Test are not practical in a virtual encounter, but the validated 30 Second Chair Stand Test can easily be used (**Table 1**). For patients with mobility impairment, assistive devices may be appropriately prescribed. Further evaluation of the interior of the home should be conducted for patients with increased fall risk. A virtual home tour alerts the provider to fall hazards such as stairs, inadequate lighting, loose throw rugs, electrical cords, signs of hoarding, or crowded furniture. Providers should visualize the patient's bedroom and bathroom to determine if there is a need and adequate space for durable medical equipment (DME) like a shower chair, commode seat lift, grab bars, or bedside commode. Home modifications to promote safety and reduce the risk of fall or injury

Table 1
Summary of telemedicine geriatric assessment (GA) tools

GA Category	Traditional GA Tool	Telehealth Modified GA Tools and Applications	Current Evidence for Use of Telehealth GA
Home Safety, Mobility, and Falls	Tinetti Performance Oriented Mobility Assessment Timed Up-And-Go Test 30 s Chair Stand Test In-Home Occupational Therapy home safety evaluation	30 s Chair Stand Test Virtual Occupational Therapy home safety evaluation	Virtual home safety assessment conducted by Occupational Therapy is technologically feasible for dementia patients and caregivers ⁸ Remote home assessments made by home modification experts are feasible and the recommendations made concur with traditional in-home visits ⁷
Medication Review	In-person clinician- or pharmacist-led medication review Beers criteria STOPP/START criteria	Telephonic or live synchronous video clinician- or pharmacist-led medication review Beers criteria ⁵⁰ STOPP/START criteria Direct visualization of pillbox and medicine cabinet	Benefit of pharmacist telephonic medication management in transitional care ¹¹⁻¹³ Benefit of polypharmacy management ² Improved medication rationalization ² Decreased ER visits, hospitalizations, and readmissions ^{2,11,12} Reduced clinical alerts and adverse drug events ¹³
Functional Status	Katz ADL Scale OARS IADL Scale Fall screening questionnaire	Katz ADL Scale OARS IADL Scale ⁴ Fall screening questionnaire ⁴ Electronic or mobile health Interventions	eHealth interventions may increase physical activity (steps/d, min/d of moderate-vigorous activity) ¹⁷ Mixed data regarding the use of mHealth apps to increase

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Table 1
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GA Category	Traditional GA Tool	Telehealth Modified GA Tools and Applications	Current Evidence for Use of Telehealth GA
			physical activity, decrease sedentary time, and improve physical fitness ¹⁴⁻¹⁶
Frailty	Weakness (grip strength, sarcopenia) Gait speed Self-reported low level of physical activity Self-reported exhaustion Unintentional weight loss	Limited - ask patient about perceived weakness or instruct caregiver to perform strength testing Evaluate gait speed if patient/caregiver able to set up camera Reported low level of physical activity by patient/caregiver Self-reported exhaustion Ask about perceived weight loss or change in clothing size	Limited data on the feasibility of diagnosing frailty and sarcopenia via telehealth Limitations in telehealth physical examination for frailty/sarcopenia diagnosis ² Telehealth is useful for the chronic management of frail older adults ³ Remote interventions resulted in improvements in quality of life, mentation, balance, and depression in frail elders ⁶
Nutritional Status	Mini Nutritional Assessment BMI, waist circumference	Modified Mini-Nutritional Assessment (omit calf circumference, omit BMI if scale not available) ^{4,18} BMI (ask about perceived weight loss or change in clothing size if scale not available) 24-h dietary recall Virtual kitchen, dining, and pantry tour Telehealth/telemonitoring nutritional interventions for older adults	Mixed data regarding telemonitoring nutritional interventions on improved macronutrient intake, quality of life, energy intake, and physical function ^{18,19}

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Table 1
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GA Category	Traditional GA Tool	Telehealth Modified GA Tools and Applications	Current Evidence for Use of Telehealth GA
Neuropsychiatric Assessment	MMSE MoCA PHQ-2, PHQ-9 Geriatric Depression Scale	MMSE ^{24,25} MoCA (original) or MoCA Abbreviated Telephone Version ^{24,25,36} PHQ-2, PHQ-9 ^{4,24} Geriatric Depression Scale ^{4,24}	Telehealth is feasible and well accepted for dementia care with mixed data on cognitive outcomes ^{3,27,28} Reliability of GA tools administered via telehealth is comparable to in-person visits; may be limited by hearing/vision impairment ^{2,3,24} Videoconferencing and smartphone apps may be useful for dementia patients and caregivers to track clinical progression markers ²⁶ Virtual care is an effective alternative for rural patients with dementia ^{27,28} Video counseling enhances geriatric depression care in nursing home residents ²⁹ Video psychotherapy is noninferior to in-person psychotherapy for veterans with depression ²⁹

Abbreviations: ADL, activities of daily living; IADL, instrumental activities of daily living; MMSE, Mini-Mental State Examination; MoCA, montreal cognitive assessment; PHQ-2, Patient Health Questionnaire 2-item; PHQ-9, Patient Health Questionnaire 9-item; STOPP/START, Screening Tool of Older Person's Prescriptions/Screening Tool to Alert to Right Treatment.

can be recommended such as adding or repairing handrails, installing a ramp or lift, or rearranging furniture.⁷

Research shows that real-time home safety evaluations are most effective when delivered by occupational therapists. While telehealth ostensibly offers a view into the patient's living situation, there is little data about the feasibility or challenges of these assessments. A study of 10 Veteran's Administration (VA) dementia patients

and their caregivers examined the feasibility of telehealth for occupational therapy home safety assessments.⁸ The study evaluated the resource, device, and software requirements of such visits. Technological difficulties occurred in nearly all visits, including total loss of audio using a laptop (50% of visits), periodic loss of audio (70%), audio latency or lag (20%), video pixilation (50%), and freezing of video (40%). Nevertheless, the authors concluded that overall visits were technologically feasible. The study had some limitations affecting the generalizability of the results to practice in other settings. It included a small sample and a racially homogenous population. Additionally, the researchers conducting the study were highly motivated to troubleshoot any problems during visits to ensure their success, with resources and technological support from the VA health system. The study did not evaluate the clinical impact of the telehealth evaluations.

Another study compared 2 types of remote assessments, a “zero-tech” paper-and-pencil protocol and a “high-tech” video conference protocol, to traditional in-home assessments in 73 households.⁷ The study aimed to determine if remote assessment was feasible and concurred with in-home assessment by expert home-modification specialists, as evidenced by the effectiveness of each intervention to identify problems and prescribe appropriate solutions. The study showed the rate of correct problem identification was significant for both remote paper-and-pencil (96.4%) and remote video (87.1%) protocols. There was also a high rate of agreement on recommended solutions for both types of remote assessments (78.8% and 77.4%, respectively). This study suggests virtual in-home assessments may have similar efficacy to their traditional in-home counterparts.

Medication review

Medication review via telemedicine provides unique insights that may not be gleaned from an office visit. During a virtual encounter, patients can be asked to show all medications they are taking, which are not always consistent with those reported in the office.^{9,10} A study of discrepancies between physician and patient medication lists in older patients showed that 37% of medications were being taken without their family physician’s knowledge, 6% were not being taken by patients although their physician thought they were, and 10% had dose or frequency discrepancies, which all increase the likelihood of drug interactions.⁹ During a virtual visit, providers should reconcile medications from other clinicians, evaluate how patients store and organize their medications, visualize pillboxes to assess adherence, and instruct patients to discard old and expired medications.

Benefits of virtual medication management were evaluated in a recent systematic review. Seven studies reported clinical outcomes of geriatric virtual clinics.² All the studies were an observational design and heterogeneity was noted with the structure of virtual models. Polypharmacy was one of the outcomes felt to be amenable to assessment with virtual visits. Four studies suggested benefits in medication rationalization. Several studies reported a decrease in emergency department visits and hospitalizations with the reconciliation of polypharmacy.

Resource utilization is a common outcome for studies evaluating telemedicine interventions, particularly in transitional care. Two retrospective studies suggested the benefit of pharmacist telephonic medication reconciliation for older adults discharged from the hospital. Liu and colleagues¹¹ evaluated a transitional care program in a geriatric clinic. Using claims data, they found significantly higher odds of hospital utilization (OR: 1.69, 95% CI: 1.06–2.68) and inpatient admission (OR: 2.54, 95% CI: 1.18–5.44) within 30 days after discharge for patients receiving usual care versus telephone follow-up. Paquin and colleagues¹² studied a service that included medication

reconciliation, safety review, and a telephone call with patients or caregivers. Patients were at high risk of dementia or taking dementia medications. The intervention was associated with a lower likelihood of readmission 60 days after discharge compared with those without a pharmacist call (OR: 0.72, 95% CI: 0.57–0.91) and saved \$804 per patient. These 2 studies suggest that telephonic strategies are beneficial and feasible in vulnerable older adults, including those in underserved communities and those at high risk of cognitive impairment.

In a study of NH residents, a pharmacist-led telehealth intervention was compared with usual care.¹³ Pharmacists performed medication reconciliation and medication regimen review within 72 hours of admission for patients with high-risk medications, then the evaluation of clinical alerts throughout the resident's stay using video tablet-based telemedicine. Telemedicine was used only if residents were cognitively intact. The intervention resulted in less clinical alerts (2.60 vs 9.52/1000 resident days, $P = .009$) during the residents' stay. There was also a lower incidence of alert-specific adverse drug events (0.14 vs 0.61/1000 resident days, $P = .002$). Telemedicine interaction between residents and pharmacists may have resulted in earlier opportunities to resolve medication-related problems and avoid adverse events.

Remote Health Evaluation

Functional status

Standardized functional status assessment tools such as the Activities of Daily Living and OARS Instrumental Activities of Daily Living scales have been used in telehealth visits (see [Table 1](#)).⁴ Remote assessments alert physicians to mobility and safety issues within the home and enable them to recommend solutions such as DME and home modifications to improve the patient's functional status.⁷ Direct observation of the patient's home environment and its impact on their activities of daily living through the telehealth platform may help the provider document medical necessity of equipment or homebound status.

Several types of telehealth interventions have been evaluated regarding physical activity, fitness, and functional capacity in community-dwelling older adults. A systematic review and meta-analysis of studies using mHealth interventions showed in a pooled analysis that mHealth apps may increase physical activity, decrease sedentary time, and improve physical fitness. All but one of the studies were randomized controlled trials (RCTs). There was a high degree of heterogeneity among the studies and effects were not significant.¹⁴ In 5 of the 6 studies, interventions used apps that synced with a separate device. Various attributes of apps in individual studies that seemed to confer more benefit included goal-setting, self-monitoring, instructions for performing the behavior, social reward and support, and risk communication. Two of the more effective interventions used mHealth apps in combination with provider support.^{15,16}

Several types of eHealth interventions may increase physical activity in healthy older adults. A systematic review and meta-analysis of 19 studies by Nunes de Arenas-Arroyo and colleagues included RCTs evaluating eHealth interventions.¹⁷ The types of interventions were web-based or through mobile phones. Those that used a website often provided feedback through email or interactive forums. Text messaging and phone calls were used in mobile interventions; one study used a mobile app. Education and goal setting were common elements of interventions. The meta-analysis of 18 studies showed mostly moderate effect sizes and pooled mean increases of approximately 1616 steps/d, 7.4 min/d of moderate-to-vigorous physical activity, 40.5 min/wk of physical activity, 56.4 min/wk of moderate-to-vigorous physical activity. The highest degree of heterogeneity among the studies was related to steps/d and

moderate-to-vigorous physical activity measured in min/d. Nonetheless, these results suggest the positive effects of eHealth interventions in promoting physical activity.

Frailty

Objective assessment of weakness and grip strength may be challenging in the telehealth setting. There is concern that the limited physical examination via telemedicine reduces the feasibility of diagnosing important geriatric syndromes.² However, some criteria for frailty may be evaluated virtually, such as asking about the patient's perception of fatigue or exhaustion, and decreased level of activity (see [Table 1](#)). Patients who lack access to a scale may be asked if they have gone down in clothing size to screen for unintentional weight loss. Slow walking speed can be evaluated via video if the patient or caregiver is able to set up the device to capture their gait. Telehealth has been used for the chronic management of frail, community-dwelling older adults. In a scoping review by Doraiswamy and colleagues³ of 79 studies, 24 articles discussed the use of telehealth for specific disease conditions in geriatric patients. Among these, frailty was the second-most common condition for which telehealth services were used (5/24 studies; 20.8%), following dementia (9/24; 37.5%). Small RCTs of different remote interventions for frail elders have shown improvements in quality of life from video exercises paired with weekly phone calls, mentation from computer-based exercises, balance with home exercise paired with phone calls, and reduced depression from therapy delivered via telehealth.⁶ However, there are few studies that directly compare the efficacy of delivery of these services via telehealth with face-to-face delivery.

Nutritional status

Nutritional screening and interventions for under- or overweight and obese seniors have been conducted via live video and remote telemonitoring. Standard tools like the Mini-Nutritional Assessment (MNA) or modified versions can be used (see [Table 1](#)).^{4,18} A virtual pantry assessment by live video connection helps corroborate a forgetful patient's informal dietary recall. It can also give insight into problems like food insecurity that may not be apparent at an office visit, prompting referral to appropriate community resources like Meals on Wheels, food banks, or a social worker. For patients reporting a decline in food intake, touring the layout of the kitchen and dining areas through live synchronous video may help the provider determine if the problem is due to mobility issues or physical impairments that impede food preparation and feeding. Collaboration with caregivers during virtual visits is essential for elders who depend on others for shopping, meal preparation, or feeding.

Data regarding the efficacy of telehealth for nutritional status evaluation and management in older adults are mixed. A telemonitoring nutritional intervention study was conducted on 214 older, community-dwelling Dutch adults.¹⁸ Participants were allocated to control, or intervention groups based on municipality. The 6-month intervention included multi-faceted nutritional telemonitoring, nutrition education, and nurse follow-up. Telemonitoring consisted of patients self-measuring their weight, steps, and blood pressure using a provided scale, pedometer, and sphygmomanometer that displayed results on their television and sent data to nurses via secure connection for review at regular intervals. The authors concluded the intervention improved the nutritional status of patients at risk for poor nutrition and improved dietary intake of some macronutrients and fiber, but did not affect body weight, appetite, physical functioning, or quality of life.

A systematic review and meta-analysis aimed to determine the efficacy of telehealth for delivering nutritional interventions to community-dwelling older adults found

different results. Nine studies were included in the analysis; in 2 studies, interventions were delivered to disease-specific groups (kidney disease and cancer), and the remaining 7 included patients with mixed morbidities following inpatient discharge. Telehealth interventions varied and included telephone calls by dietitians and providers at regular intervals; use of a telemonitoring device in which patients entered data about body weight and answered questions about appetite, supplements, well-being, and fluid intake; and use of a tablet-based app to order energy- and protein-enriched meals for delivery to patients following hospital discharge. The interventions resulted in improved protein intake by 0.13 g/kg/d as well as improvements in quality of life, with trends toward improved nutrition status, energy intake, physical function, and clinical outcomes.¹⁹

Medicare Annual Wellness Visit

Medicare Annual Wellness Visits (AWV) are an important touchpoint to conduct health risk assessments, provide preventive health recommendations, and update screenings for seniors.²⁰ Data on the full impact of the pandemic on Medicare AWV are still pending, but preliminary studies show a drastic decrease in national breast, cervical, and colorectal cancer screenings.²¹ Patterns through April 2020 showed steep declines in cervical and breast cancer screenings by 94%, and in colorectal cancer screening by 86%.²² Screenings that require in-person visits decreased by 91% between March and June 2020.^{22,23} In comparison, screening by home-based tests like the multi-targeted stool-based colorectal screening test (Cologuard) and fecal immunochemical test (FIT) decreased to a lesser degree (65% and 87%, respectively).

The Medicare AWV (both initial and subsequent) are permitted via telemedicine by the Centers for Medicare and Medicaid Services (CMS) and their adoption could ameliorate the decline in preventive services while enabling vulnerable adults to stay safe at home. Self-reported vital signs collected by patients may be used. The required elements of health risk assessment, review of functional ability and level of safety, review of past medical and family history, screen for cognitive impairment and depression, medication reconciliation, and list of current providers and DME suppliers can easily be conducted via live synchronous video connection. The visit concludes with preventive health education and counseling based on individual risk factors and referrals for screenings and community support, which can be accomplished via telemedicine. The written preventive screening checklist should be published on the patient's electronic portal or mailed after the visit.

Chronic Disease Management

Dementia

Telemedicine is more frequently used for neuropsychiatric care than other specialties and is effective for this application in geriatric patients. There is evidence that standardized tools like the Mini-Mental State Examination (MMSE) and Montreal Cognitive Assessment (MoCA) can reliably be administered in telehealth encounters (see **Table 1**).^{24,25} A recent systematic review evaluating synchronous video visits suggested reliability similar to in-person visits.²⁴ These assessments may also be applied in other forms of telehealth, such as smartphone-based assessments, internet-based reminders and games, web-based educational programs, mobile text messaging, and chat forums.²⁶

Dementia was one of the most common conditions using telehealth in a recent review of published articles during the COVID-19 pandemic.³ Strengths of telehealth included the provision of holistic health care in the home and other remote settings while avoiding infection risk. Studies show telehealth is feasible and well-accepted

in this setting; however, data on the cognitive effects of dementia care are limited with mixed results. Outcomes of telemedicine via audio-visual consultation for dementia in rural elderly patients were reported in a systematic review of 12 studies by Sekhon and colleagues.²⁷ All the studies were observational, with one comparing telemedicine to face-to-face visits. In this study, video consultation was provided by a dementia specialist with assistance from providers at a rural public health center.²⁸ The mean point decline in MMSE per year was not significantly different between groups (0.60 for telemedicine vs 1.03 for face-to-face visits), suggesting that telemedicine is an effective alternative to face-to-face visits for rural patients with dementia.

Depression

There are validated tools for the assessment of mental health status that can be used through telehealth, such as the Patient Health Questionnaire 2-item (PHQ-2) and the Geriatric Depression Scale (GDS).^{4,24} One study in NH residents using video counseling once per week showed a significant difference in the GDS compared with standard NH care. In another randomized, noninferiority trial, Egede and colleagues²⁹ compared telemedicine to same-room treatment of major depressive disorder. The intervention was delivered by videophone in 8 weekly psychotherapy sessions in the veteran population. About 70% of the participants were rural residents. The criteria for noninferiority were met at 12 months of follow-up for the GDS with treatment response of 22% in the telemedicine group and 20% in the same-room treatment group. Similar results were seen for the Beck Depression Inventory (BDI) with responses of 24% and 23%, for telemedicine and same-room treatment, respectively.

Heart failure

In an open-label RCT, Comin-Colet and colleagues³⁰ evaluated a heart failure program with telemedicine in place of face-to-face visits. Patients assigned to telemedicine used automated home telemonitoring with virtual encounters. Biometric data and patient-reported symptoms were gathered through a Bluetooth-enabled tablet and sent to a clinical workstation. The mean age of patients was 74 years and 25% were considered frail. The primary endpoint was nonfatal heart failure events during 6 months of follow-up. The hazard ratio was 0.35 (95% CI, 0.20–0.59, $P < .001$) for telemedicine compared with face-to-face visits. In addition to reducing heart failure events, there was a reduction in readmissions in the telemedicine group with a decrease in costs. There was a high degree of acceptance and satisfaction with telemedicine.

Diabetes mellitus

In another randomized study of older adults (mean age 71 years) with diabetes, Trief and colleagues³¹ compared telemedicine case management to usual care. The intervention consisted of video visits every 4 to 6 weeks with an educator to monitor progress and set goals to improve adherence to self-care. The outcome was measured using a questionnaire whereby higher scores indicated more days of adherence to diet, exercise, and blood glucose testing. During 5 years of follow-up, subjects in the telemedicine group had higher mean scores than usual care indicating better adherence ($P < .001$). Overall adherence was also a significant mediator of better glycemic control.

Hypertension

Remote patient monitoring has been evaluated in older adults with several chronic health conditions, including heart failure, diabetes, hypertension, and chronic obstructive pulmonary disease. Programs for heart failure and hypertension may be less costly than other programs.³² Rifkin and colleagues³³ randomized 43 participants at

a VA clinic (mean age 68 years) with uncontrolled hypertension and chronic kidney disease to telemonitoring or usual care for 6 months. The RPM technology used a Bluetooth-enabled blood pressure device linked to a home transmitter that sent data to a secure website. Blood pressure readings were reviewed by study providers who called participants if it was out of range. The change from baseline in blood pressure was not significantly different between the telemonitoring and usual care groups (systolic change -13 mm Hg vs -8.5 mm Hg, respectively and diastolic change -3.5 mm Hg vs -8 mm Hg, respectively). Nearly all participants reported they would continue to use the technology if it was available after the study.

Overcoming Barriers to Telemedicine Care

User-specific considerations

The application of telehealth may be limited by user-dependent factors. Older patients and caregivers may lack access to the technology required for telemedicine care. Also, this population may not have the interest or ability to operate the technology.³ Interventions that are designed to be simple are associated with positive clinical outcomes.^{30,33}

A focus group interview-based study revealed acceptance of technology by older people was related to several predictors, including perceived usefulness, effort expectancy, computer anxiety, perceived security, social influences, and facilitating conditions.¹ In most of the focus groups, the recommendation of the physician was reported to influence the patient's decision to use home telemedicine services. A recent systematic review identified lack of staff training and health care provider resistance to the system as barriers to patient uptake of home telehealth systems.³⁴ This suggests the provider's message to the patient and efforts to facilitate the use of telemedicine influence its adoption by older adults.

It may be more challenging to treat patients with cognitive impairment or sensory limitations like visual acuity issues or hearing loss via telemedicine.^{2,3} Doraiswamy and colleagues suggest future efforts include the development of automatic speech analysis to diagnose and monitor dementia, and improved technology to accommodate cognitive or sensory impairment.

Technology-specific considerations

Telehealth care may be affected by technical difficulties inherent to any technology-based system. Adequate support personnel are necessary to maintain equipment and troubleshoot technical difficulties.³⁵ Various technological issues such as difficulty establishing connection, transmission failure, poor audio-video connection, and equipment failure have been reported.^{2,3,8} Back-up processes should be developed to enable continued care in the event of equipment malfunction or audio-visual disconnection. Dedicating time to addressing patient technological concerns and barriers and directing them to resources within the community or health care system to strengthen digital literacy may improve telehealth services for older people.³

Patient privacy and security are a concern in the vulnerable elderly population. The virtual platform may present missed opportunities for identifying clues of elder abuse due to lack of privacy.³ In an analysis of 9 studies of 975 patients, 4 studies reported physician concern about confidentiality in telemedicine, like perceiving patients or their caregivers were unable to speak openly on the platform.² Secure software must be used to prevent hacking.

There are limitations to the physical examination that can be performed via telemedicine.² Many physicians perceive this as a weakness of the virtual platform.^{2,3} In a national survey, 71% of older adults also voiced concern that their health care provider

would not be able to do a thorough examination.³⁶ Diagnostic clues that are usually detected by the traditional in-person examination, like the detection of cardiac arrhythmia by auscultation or a subtle mass on abdominal palpation, may be missed in the remote examination. Therefore, it is important to obtain consent from the patient, advise them of potential limitations, and set expectations at the start of the virtual visit.³⁷ Currently, data are limited in comparing the validity of the virtual examination with the traditional examination.³⁷ Dewar and colleagues³⁶ published a model for an adapted physical examination for virtual geriatric clinic encounters, using the basic components of inspection, palpation, percussion, and auscultation. The “laying of hands” by the clinician in the traditional bedside examination, which strengthens the therapeutic physician-patient connection, is lost in a remote telemedicine examination and may increase the risk of depersonalized care. These barriers can be overcome by using an in-person encounter for the initial consultation, with follow-up conducted virtually.²

A limitation to the virtual Medicare AWW is the inability to administer vaccinations or draw bloodwork at the point of care that are available in a typical office-based encounter, potentially leading to delays in preventive care. Research efforts should be directed toward gauging the long-term effects of delayed preventive health screenings during the pandemic on seniors, as well as the adoption and efficacy of the virtual AWW by providers.

Financial Impact and Reimbursement Policies

Health care costs

As the Baby Boomer generation ages, US health care expenditures continue to rise in response to more prevalent complex disease states.³⁸ Prior research has shown that telehealth can reduce health care costs and improve health outcomes through improvement in health metrics like hospital readmission rates, emergency department visits, glycosylated hemoglobin A1C, blood pressure, and heart failure morbidity and mortality.³⁹ In opposition to this, there is concern about telehealth being overutilized by patients and providers, and some evidence demonstrating higher downstream health care costs due to increased testing and follow up visits.⁴⁰ As the future of telemedicine continues to be debated, more research is needed to better inform providers, payers, and policy makers on the nuanced cost-effectiveness of telehealth patient care.⁴¹

New Medicare policies

The SARS-CoV-2 pandemic provided a catalyst for CMS to adopt both short-term and long-term telehealth policy changes for patients with Medicare. Policy changes temporarily permitted providers to bill for remote services for both new and established patients inside their homes, including across state lines. Initially, in 2020, the 3 main Medicare virtual services included audio-only and video telehealth visits, virtual check-ins, and e-visits.⁴² Approximately 40% of primary care visits received by Medicare beneficiaries early in the pandemic were telemedicine visits, both audio-only and audio-video visits.⁴³

Temporary versus permanent Centers for Medicare and Medicaid Services policy changes

As part of CMS policy changes for the 2021 Physician Fee Schedule (PFS), both temporary and permanent policy categories for telehealth services were created. Permanent “Category 1” virtual services include psychiatric care, simple remote home visits, and prolonged services. Temporary policies are “Category 3” virtual services reimbursed during the public health emergency (PHE) only, including complex remote

CPT Code	2021 CMS Payment	wRVU	Description
97802	\$37.69	0.53	Medical nutrition, individual ^a
97804	\$17.10	0.23	Medical nutrition, group ^a
99202–05	\$73.97, \$113.75, \$169.93, \$224.36	1.10, 1.51, 2.04, 2.62	Office/outpatient visit new ^b
99212–15	\$56.88, \$92.47, \$131.20, \$183.19	0.88, 1.25, 1.70, 2.80	Office/outpatient visit established ^b
99347–48	\$54.78 \$83.74	1.00 1.56	Home visit established patient ^a
99349–50	\$129.10 \$178.65	2.33 3.28	Home visit established patient ^a -Available up to December 31st, 2023
99406	\$15.70	0.24	Behavioral change for smoking (3–10 min, >10 min) ^a
99407	\$25.82	0.50	
99495	\$207.96	2.78	Transitional care management, moderate (<14 d) or high (<7 d / p discharge) ^b
99496	\$281.59	3.79	
99497	\$85.84	1.50	Advanced care planning ^a
G0438	\$169.23	2.60	Annual Wellness Visit (AWV), initial ^a
G0439	\$133.64	1.92	
			Annual Wellness Visit (AWV), subsequent ^a
G0442	\$18.84	0.18	Annual alcohol screening ^a
G0443	\$26.87	0.45	Brief alcohol misuse counselling ^a
G0444	\$18.84	0.18	Annual depression screening ^a
G0446	\$26.87	0.45	Intensive behavioral therapy, CV disease ^a
G0447	\$26.87	0.45	Behavioral counseling for obesity ^a
G2252	\$26.87	0.50	Brief patient check-in, 11–20 min ^a

^a Audio-only is permitted, under certain circumstances.

^b Requires both audio AND video technology.

Data from Refs.^{44,51}

home visits, physical and occupational therapy, emergency department and hospital care, and NH care. Virtual NH visits were expanded so that providers could bill a visit every 14 days instead of every 30 days. Other virtual services added by CMS in 2021 included virtual Medicare AWV (initial or subsequent AWV, but not the Initial Preventive Physical Examination), cognitive impairment assessments, advance care planning, RPM, and transitional care management services (Table 2).⁴⁴

Audio-only telemedicine

A new G code (G2252) introduced by CMS in the 2021 PFS covered audio-only assessments, which can be billed if greater than 5 to 10 minutes is required to determine the need for an in-person visit.⁴⁵ Of note, reimbursement for outpatient video follow-up visits and for audio-only follow-up visits were not included in the 2021 or 2022 CMS PFS changes. During the pandemic, audio-only telemedicine visits were temporarily reimbursed by CMS, given that some seniors lacked access to or experience with

video technology.⁴³ Current telehealth reimbursement policies often require video to be incorporated, as video visits are generally thought to provide better patient assessments and allow for better physician-patient communication using visual cues and rapport building. Audio-only encounters have been shown to take less time, although physician medical decision-making can be the same as with an in-person encounter.⁴³ Late in 2021 through advocacy efforts from the American Medical Association and other organized medicine groups, modifier 93 was adopted by the CPT (Current Procedural Terminology) Editorial Panel to allow reporting of audio-only synchronous telemedicine services. This modifier became effective on January 1st, 2022, although payment has yet to be determined.⁴⁶

Extension of services added during the pandemic

As more is learned about the benefits and limitations of various telehealth services, CMS continues to revise the PFS. Certain services temporarily covered during the pandemic were extended for 2022 and 2023, permitting additional evaluation and data collection. When diagnosing and treating a mental health disorder, it is permissible for the originating site to be the patient's home, with a requirement of at least one in-person visit at least every 12 months.⁴⁷ Specific nursing facility, nutrition, and remote home visit services were added to permanent CMS telehealth services, as well as the initial and annual Medicare AWW and associated counseling services. New and established outpatient telemedicine visits continue to be reimbursed into 2022, requiring both audio and video. Of note, virtual home visits and outpatient telemedicine visits have different reimbursement amounts and requirements.⁴⁴

Regulatory advocacy

To promote the Triple Aim in virtual geriatric care (improve quality of care, the patient experience, and reduce cost), it is imperative for all primary care providers to advocate for responsible and ethical virtual services.⁵ Telehealth policies and procedures should be written to protect patient privacy, ensure equity and access for all patients, and define an expected level of patient care at or above generally accepted standards of in-person and virtual health care.⁴⁸ Providers should help revise telehealth licensure requirements, billing laws, and documentation guidelines. Telehealth policies should be regulated by the medical community and not by financially motivated stakeholders. Meaningful regulatory and health care policy changes are essential for ensuring appropriate and equitable telehealth care for our vulnerable aging patient population, driven by local and national health care provider advocacy efforts.⁴⁹

SUMMARY

Telehealth provides an opportunity for expanded health care services for a growing geriatric population facing challenges related to health care. For older adults with limited transportation, it offers a way for patients, family, caregivers, and providers to communicate and coordinate care. Telehealth is a viable alternative to in-person care for common geriatric assessments by videoconferencing or medication reconciliation by telephone. Various forms of telehealth have been evaluated for health promotion and disease management, including mHealth, remote telemonitoring, online forums or portals, email, and text-messaging. Studies evaluating outcomes of telehealth in older adults have suggested benefits in many areas of care. However, there is variability in the design of studies and more RCTs are needed to establish benefits. Even so, data that are available support the feasibility of telehealth and patient satisfaction with this model of care. Telehealth interventions should be designed carefully to ensure usability and security. As the field of telehealth continues to evolve, it is

imperative that both patients and providers advocate for national regulatory policies and reimbursement strategies promoting equitable, high-quality, and cost-effective geriatric telehealth models.

CLINICS CARE POINTS

- Clinicians should become comfortable using various telehealth interventions (including telemedicine encounters, RPM, and mobile health technologies) when caring for geriatric patients, ideally partnering with caregivers and other health care professionals when obstacles are identified.
- It is important for clinicians to familiarize themselves with evidence-based telemedicine geriatric assessment tools to optimize remote evaluation of geriatric patients.
- Having a simplified onboarding process, with both office-based and home-based support systems to enhance usability, will help older patients overcome barriers to telehealth.
- Clinicians should continually be aware of CMS telehealth policy changes, as reimbursement and regulatory policies will continue to change as more is learned about the field of telehealth.
- Promotion of responsible virtual geriatric care should be encouraged through local and regional advocacy efforts, focusing on the triple aim of health care (quality, patient experience, and cost).

DISCLOSURE

The authors have nothing to disclose.

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