Providing Rural Veterans With Access to Exercise Through Gerofit

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Clinical video telehealth can be used to deliver functional circuit exercise training to older veterans in remote locations.

Exercise increases endurance, muscle strength, and functional performance with corresponding gains in mobility, survival, and quality of life.1 However, even with these benefits and improvements in clinical outcomes, only 15% of adults aged ≥ 65 years follow current guidelines for exercise.2 Despite their prior military training, the majority of veterans do not meet physical activity recommendations.3 Time, travel, and support are common barriers to exercise participation and adherence—barriers that are further amplified among older adults.

The Veterans Health Administration (VHA) is recognized as a world leader in telehealth service development. Currently, 677,000 veterans have received telehealth services, which represents 12% of the 5.6 million veterans under VHA care.4 Clinical video telehealth (CVT) is widely used within the VHA system to deliver health care that otherwise would not be available to veterans. Veterans who have difficulty traveling to the nearest US Department of Veteran Affairs (VA) medical center (VAMC) can access CVT programs at a participating VHA community-based outpatient clinic (CBOC). The VA has more than 45 CVT programs, including programs for mental health, weight management, cardiology, and dermatology. Outside the VA, cardiac exercise rehabilitation provided by CVT has been shown to be as effective as center-based programs in improving cardiovascular risk factors and functional capacity.5 A VA exercise program that leveraged CVT resources and was dedicated to older adults with a wide range of comorbid conditions would have a high impact on the health and well-being of older adults.

Gerofit is a VA clinical demonstration program of supervised center-based exercise for veterans aged ≥ 65 years. Developed at the Durham VAMC Geriatric Research, Education, and Clinical Center (GRECC) in North Carolina, it has demonstrated improved clinical outcomes, including physical function, mobility, quality of life, and survival.6,7,8,9 The program offers veterans individualized exercise in a group setting that focuses on improving endurance, strength, and balance. The exercise prescription is based on the patient’s physical limitations as identified in a physical performance assessment.

With support from VHA Geriatric Extended Care (GEC) and the Office of Rural Health (ORH), Gerofit was implemented in 10 VAMCs across 8 VISNs. However, barriers such as travel time, distance, and transportation limit participation. Previously, we found that rural veterans lack access to exercise programs.10,11 Although some do aerobic exercise (AEX), most do not do resistance training (RT), though they are willing to learn. Access to Gerofit for rural veterans is expanding with recent support from the ORH Enterprise Wide Initiative. Rural programs administer 5 items of the Senior Fitness Test: 6-minute walk, 10-meter walk, 10-meter run, 30-second 1-arm curl, and 8-foot up-and-go.12 The side-by-side, tandem, and tandem standing balance tests from the short physical performance battery also are performed at initial enrollment; 3 months, 6 months, and 1 year later; and annually after that. Currently, the center-based Gerofit programs administer 5 items of the Senior Fitness Test: 6-minute walk, 10-meter walk, 30-second 1-arm curl, 30-second chair-stand test, and 8-foot up-and-go.13 The side-by-side, tandem, and tandem standing balance tests from the short physical performance battery also are performed.14 In addition, participants complete a questionnaire that includes items from the physical functioning scale of the 12-item Short Form Health Survey (SF-12).

To participate in Gerofit, veterans must be able to perform activities of daily living and self-manage an exercise prescription developed by the exercise instructor based on physical performance testing. These physical performance tests include measures that are independent predictors of disability, loss of independent living, and death, as well as surrogate measures of exercise capacity (eg, strength, endurance, balance).15,16 A novel aspect of Gerofit is that the physical performance assessment is used not only to determine physical limitations, but also to individualize the exercise prescription based on the observed deficits in strength, endurance, or balance. These assessments are performed at initial enrollment; 3 months, 6 months, and 1 year later, and annually after that. Currently, the center-based Gerofit programs administer 5 items of the Senior Fitness Test: 6-minute walk, 10-meter walk, 30-second 1-arm curl, 30-second chair-stand test, and 8-foot up-and-go.17

Gerofit was established in 1986 at the Durham GRECC as an exercise and health promotion program for veterans aged ≥ 65 years.18 Its goal is to prevent or improve functional decline from physical inactivity and age-related conditions. Gerofit targets the geriatric patient population and thus extends beyond cardiac and pulmonary rehabilitation or weight loss programs. The primary exclusion criteria are based on safety issues in the context of a group exercise setting of older adults and include oxygen dependency, unstable cardiac disease, and moderate-to-severe cognitive impairment. To participate in Gerofit, veterans must be able to perform activities of daily living and self-manage an exercise prescription developed by the exercise instructor based on physical performance testing. These physical performance tests include measures that are independent predictors of disability, loss of independent living, and death, as well as surrogate measures of exercise capacity (eg, strength, endurance, balance).19,20

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After each assessment, the Gerofit exercise instructor reviews the results with the veteran and formulates an individualized
exercise prescription along with goals for improvement. Veterans are encouraged to attend supervised center-based exercise sessions 3 times weekly. Classes are offered in a gym or fitness center at the VAMC or in leased space. Each patient uses a cue card a gym or fitness center at the VAMC or in leased space. Each patient uses a cue card that lists an exercise plan personalized for intensity and duration for aerobic exercise (AEX; eg, treadmill walking, stationary bicycling, arm ergometry), RT using dumbbells and weight equipment, and functional exercises for flexibility and balance. Some medical centers also offer yoga, tai chi, or exercises for flexibility and balance. Some medical centers also offer yoga, tai chi, or exercises for flexibility and balance. Some medical centers also offer yoga, tai chi, or exercises for flexibility and balance and provide patients with the pilot CVT Gerofit classes in Los Angeles and Miami, the target setting was rural CBOCs. The goal for Salem VAMC Tele-Gerofit was to modify Gerofit delivery to the CVT format and a CVT setting with minimal modification of the content and personnel requirements of both physical performance testing and exercise training procedures. Key stakeholders included the salem VAMC telehealth program, which provided dedicated video technology equipment at the medical center and support of CBOC telehealth clinical technicians. CBOC medical facilities, some CBOC directors have asked that heart rate monitors be used as an extra safety precaution to ensure that high-risk participants do not exceed a heart rate limit that may be set by their cardiologists.

Key Largo veterans participated before the CVT classes were placed on hold owing to the demands of other CVT programs and limited availability of the telehealth clinical technicians (TCT). The Homestead CBOC continues to offer CVT Gerofit exercise classes and has 6 regular participants. Notably, the physical space at the Homestead CBOC is smaller than that at the Key Largo CBOC, the Homestead CBOC is smaller than that at the Key Largo CBOC, the Homestead CBOC is smaller than that at the Key Largo CBOC. The Homestead CBOC has 6 regular participants. Notably, the physical space at the Homestead CBOC is smaller than that at the Key Largo CBOC.

Adaptation of Gerofit to CVT Delivery. The Greater Los Angeles VAMC Gerofit program conducted a pilot CVT exercise class of 6 veterans at the rural Bakersfield CBOC in California. Each week, a different exercise instructor broadcast a 60-minute exercise class that included warm-up, RT with bands, progressive balance training, and flexibility. Trained student volunteers from California State University in Bakersfield kinesiology program were on site at the Bakersfield CBOC to perform the assessments and aid in exercises during the CVT sessions. Desmin lack of AEX per se, veterans showed significant improvement in endurance as measured by an increase in the number of steps completed in 2 minutes at the 3-month assessment (P < .049). Although exercises were not delivered in a circuit format, the improved endurance supported the potential for cardiovascular benefit from RT in older adults.

This pilot project also demonstrated that key components of the Gerofit program could be delivered safely by telehealth with onsite supervision. The Miami VA Healthcare System also offers CVT Gerofit exercise classes broadcast to the rural Florida CBOCs of Key Largo and Homestead. The exercise activities offered for the Miami CVT participants incorporate components of AEX (calisthenics) and RT (resistance bands). Veterans enjoyed the classes, and adherence was good. However, availability of staff and space are an ongoing challenge. In Key Largo, 5 veterans participated before the CVT classes were placed on hold owing to the demands of other CVT programs and limited availability of the telehealth clinical technicians (TCT). The Homestead CBOC continues to offer CVT Gerofit exercise classes and has 6 regular participants. Notably, the physical space at the Homestead CBOC is smaller than that at the Key Largo CBOC. The Homestead CBOC has 6 regular participants. Notably, the physical space at the Homestead CBOC is smaller than that at the Key Largo CBOC.

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The Baltimore, Maryland VAMC Gerofit program offers other innovative CVT exercise classes, including a tai chi class, and a class with exercise performed while sitting in a chair. Although the Baltimore VAMC CVT exercise classes do not cover the scope of the center-based exercise prescriptions, they are unique in that they are broadcast not only to their affiliated CBOCs, but also other Gerofit program and non-Gerofit veterans enrolled in the Salem VAMC Gerofit Program. The center-based Salem VAMC Gerofit program was established in July 2015. In fiscal year 2017, its initial exercise facility had more than 5,000 patient visits. Despite the program’s success, we prioritized establishing Tele-Gerofit because of the medical center’s rural location in southwest Virginia and the large number of veterans who receive care at CBOCs. Therefore, much as with the pilot CVT Gerofit classes in Los Angeles and Miami, the target setting was rural CBOCs. The goal for Salem VAMC Tele-Gerofit was to modify Gerofit delivery to the CVT format and a CVT setting with minimal modification of the content and personnel requirements of both physical performance testing and exercise training procedures. Key stakeholders included the Salem VAMC telehealth program, which provided dedicated video technology equipment at the medical center and support of CBOC telehealth clinical technicians. CBOC medical staff, referred patients and helped develop safety procedures, and CBOC facility directors, who allocated space and time in the CVT schedule. Differences between Tele-Gerofit and the center-based Gerofit program are summarized in Table 1.

Adjustments for CBOC Setting. The enrollment process for Tele-Gerofit is the same as that for the center-based program. To start, a veteran’s primary care provider reviews the list of eligibility criteria and, if the veteran meets the criteria, refers the veteran to the TCT. The TCT member then contacts the veteran by phone to describe the program and schedule an assessment. At the baseline physical performance assessment, American College of Sports Medicine guidelines on exercise participation, health screening, and exercise intensity are used to evaluate veterans and rank them by their cardiovascular risk. All new program participants start with low-intensity exercise and gradually progress to recommended levels of exercise. Before starting an exercise class, participants are instructed on use of the 10-point rating of perceived exertion scale (RPE).

Each CBOC site is supplied with an RPE poster that is displayed for participants’ use. During a Tele-Gerofit class, the exercise instructor ranks participants’ perceived intensity and intensity and provides them with their RPE. This class differs slightly from the center-based exercise sessions in which RPE is primarily assessed when a different exercise is introduced or the duration or intensity of an exercise is increased. The Gerofit instructor monitors exercise and treatment fidelity, but the onsite TCT observes for safety during class. The TCT also takes initial vital signs and sets up the room for the class. Emergency contacts and procedures are posted in each CBOC CVT room and are available to the center-based exercise instructor. Because the CBOCs are not inside medical facilities, some CBOC directors have asked that heart rate monitors be used as an extra safety precaution to ensure that high-risk participants do not exceed a heart rate limit that may be set by their cardiologists.

Modifications to Physical Performance Assessment. Physical performance testing had to be adapted to the small rooms available in the CBOCs. For measuring normal gait speed, the 10-MWT was replaced with the 4-meter walk test (4-MWT). The 4-MWT has excellent test–retest reliability with an intraclass correlation coefficient (ICC) of .93, but the discrepancy in gait speed between the 4-MWT and the 10-MWT is such that the tests cannot be used interchangeably. For measuring endurance, the 6-minute walk test was replaced with the 2-minute step test (2-MST). In older adults, the 2-MST has a moderate correlation with 6-minute walk distance (r = 0.36; P = .04) and health-related quality of life (r = 0.28; P = .09). The 20-second chair-stand test and the 8-foot up-and-go test are performed without modification and require only dumbbells, a chair without wheels, and a stopwatch.

The exercise instructor at the Salem VAMC conducts physical performance testing by 2-way videoconferencing with the veteran in a room at the CBOC. The TCT at the CBOC assists by measuring and demarcating 4 meters on the floor and a designated height on the wall for knee elevation for 4-MWT

### Table 2: Examples of Aerobic Exercise and Resistance Training Used in Functional Circuit Class

<table>
<thead>
<tr>
<th>Circuit</th>
<th>Aerobic Exercise</th>
<th>Resistance Training*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Step-ups</td>
<td>Chest press</td>
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<tr>
<td></td>
<td></td>
<td>Lateral shoulder raise</td>
</tr>
<tr>
<td>2</td>
<td>Shadowboxing</td>
<td>“Romanian” dead lift</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Calf raises</td>
</tr>
<tr>
<td>3</td>
<td>Step-ups</td>
<td>Squat</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reverse “wood chip”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bent over row</td>
</tr>
<tr>
<td>4</td>
<td>Lateral side steps</td>
<td>Wide pull</td>
</tr>
<tr>
<td></td>
<td>Lateral band walk</td>
<td>Calf raises</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Triceps extension</td>
</tr>
</tbody>
</table>

*Dumbbell and band options.
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strategies into telehealth delivery. However, its effects on physical performance remain to be demonstrated. To address this question, we are conducting a single-arm pilot study of Tele-Gerofit with CVT broadcast to 3 sites (Veterans Health Administration [VHA] affiliates: Wytheville, Staunton, and Danville, Virginia) The goal is to determine the effect on physical performance and collect feasibility data, including attendance rates and patient satisfaction with the video broadcast. In addition, we are planning an effectiveness trial to compare the impact of functional circuit exercise delivered in-person (center-based, not CVT) with the parent Gerofit exercise program on direct measures of endurance and strength, in addition to physical performance.

Implementation research is needed to determine how Tele-Gerofit can be disseminated to other VAMCs and community-based centers beyond CBOCs. Although the cost of the equipment used to implement Tele-Gerofit is minimal, the program requires dedicated and experienced exercise instructors, and the sharing of telehealth resources with other clinical programs. The authors expect that a diverse group of stakeholders is needed across service lines of primary care, geriatrics and extended care, physical medicine and rehabilitation, and telehealth. Of note, this multidisciplinary collaboration is a hallmark of the Gerofit program. The recent success of the implementation of center-based Gerofit in VAMCs across the US demonstrates the feasibility and robustness of this model.

The authors also include refining strategies for physical performance testing and exercise monitoring. For instance, we would like to adapt telehealth technology for heart rate monitoring devices that can be worn by high-risk veterans at the CBOC and viewed in real time by the exercise instructor. Gerofit is currently being developed nationally for home use, which would remove the need to travel to a CBOC.

CONCLUSION

Gerofit, which is designed to help older veterans maintain independent living and prevent disability, has been demonstrated to improve quality of life and survival. Our goal has been to adapt Gerofit to CVT and provide a supervised, individualized exercise program on a group setting—a program that can be widely disseminated. Salem VAMC Tele-Gerofit is an innovative and prescriptive program that delivers CVT functional circuit exercise training to remote locations without the need for stationary exercise equipment. This approach has the potential to become an effective and feasible exercise strategy for preventing and minimizing disability in the increasing population of older veterans. Work is needed to determine whether Tele-Gerofit provides a rapid translation of Gerofit to clinical practice and improved outcomes with substantial cost savings from reduced hospitalization and institutionalization.

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