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Editorial

Physical Activity and Exercise for Older People During and After the Coronavirus Disease 2019 Pandemic: A Path to Recovery



Catherine M. Said PhD, BAppSc (Physio)^{a,b,c},
 Frances Batchelor PhD, BAppSc (Physio)^{a,d,e}, Gustavo Duque MD, PhD, FRACP, FGSA^{c,f,*}

^a Department of Physiotherapy, The University of Melbourne, Melbourne, Victoria, Australia

^b Department of Physiotherapy, Western Health, St. Albans, Victoria, Australia

^c Australian Institute for Musculoskeletal Science (AIMSS), The University of Melbourne and Western Health, St. Albans, Victoria, Australia

^d National Aging Research Institute (NARI), Parkville, Victoria, Australia

^e School of Nursing and Midwifery, Deakin University, Melbourne, Victoria, Australia

^f Department of Medicine-Western Health, The University of Melbourne, St. Albans, Victoria, Australia

The current Coronavirus Disease 2019 (COVID-19) pandemic has disproportionately impacted older people. The most immediately obvious impact is the devastatingly high mortality rate; 80% of reported mortalities in the United States are in people over the age of 65, and case-fatality increases with age.¹ Countries around the world have implemented a range of “lock down” and “social distancing” strategies to limit the spread of COVID-19, which have undoubtedly been essential in “flattening the curve” in many countries.^{2,3} As countries review their restrictions and guidelines, given the high mortality and morbidity rates in older people, it is likely that older people will be advised to continue to adhere to strict lockdowns and social distancing protocols, particularly if they have other acute or chronic health conditions. These restrictions are likely to remain in place until a vaccine has been developed and widely disseminated.^{4,5} Given this, it is important to seriously consider the likely medium- to long-term impact of these restrictions on the health of older people and consider ways to minimize any negative consequences.

One of the possible impacts of social distancing restrictions on older people is a reduction in physical activity. There is likely to be a reduction in both incidental physical activity because of reduced participation in community activities such as shopping and socializing, and a reduction in participation in formal exercise, such as attendance at exercise classes, gyms, golf, bowls, and other group activities. These activity and exercise restrictions may have deleterious effects on older persons because physical activity is linked to many health benefits in this population. There is strong evidence that physical activity is linked with functional abilities, including mobility and independence in personal and community activities of daily living, particularly in older people.^{6–9} Physical activity also improves outcomes in older people with chronic diseases such as cardiovascular

and cerebrovascular disease, dementia, and cognitive impairment.¹⁰ Reduced function and mobility are often precursors to reductions in independence, quality of life, institutionalization, and mortality. Exercise, particularly balance and strength exercises, have been shown to reduce risk of falls⁸ and improve function, particularly in older people who are frail or who have limited mobility.⁹

Physical activity guidelines have been developed specifically for older people^{11–13} and for older people with mild cognitive impairment.¹⁴ These guidelines reflect the importance of including aerobic, strengthening, and balance exercises, and are summarized in [Table 1](#). However, evidence indicates that even during “normal” times, many older people do not meet physical activity guidelines.¹⁵ Older people with mobility limitations, disability, chronic disease, or cognitive impairment are particularly unlikely to meet physical activity guidelines.¹⁶ Unfortunately, the negative consequences of reduced activity are likely to have the greatest impact on function in older people who are frail, who have health conditions, or who already have impaired mobility.¹⁷

What Physical Activity or Exercise Should Older People Be Doing?

Older people should be engaging in physical activity and exercise programs that reflect current evidence and are in line with current guidelines, as outlined in [Table 1](#). Exercise programs should include a mix of strength, balance, and aerobic exercise. Walking is often

Table 1
 A Summary of Physical Activity Guidelines for Older People^{11–14}

- Older people should accumulate at least 150 min to 300 min of moderate intensity physical activity (Aus, WHO, US) or 75–150 min vigorous intensity a week (WHO, US), or an equivalent combination of moderate and vigorous intensity exercise.
- Older people should do aerobic, strengthening, and balance training.
- Aerobic exercise can be done in bouts of 10 min.
- Older people who are not able to meet the guidelines because of health conditions should be as active as their conditions and abilities allow.
- Some physical activity is better than none.

C. M. Said and F. Batchelor were involved in the development of the *Safe Exercise at Home* Website. The website is freely available, and they do not receive any financial compensation from the website.

* Address correspondence to Gustavo Duque MD, PhD, FRACP, FGSA, Australian Institute for Musculoskeletal Science (AIMSS), Sunshine Hospital, 176 Furlong Rd, St Albans, VIC 3021, Australia.

E-mail address: gustavo.duque@unimelb.edu.au (G. Duque).

Table 2
Selected Online Resources to Support Older People with Physical Activity and Exercise

Resources	Web Address	Brief Description
Homestrong	https://www.homestrong.net/exercise-tips-1	Developed by a physical therapist. Three 10-min exercise videos focused on lower limb strength and balance.
Preventing Falls: Strength and Balance Exercises	https://www.nhsinform.scot/healthy-living/preventing-falls/keeping-well/strength-and-balance-exercises	Developed by Scotland National Health Service. Three levels of exercise videos that focus on strength and balance exercises. There is a self-test to help people determine the most appropriate level.
Safe Exercise at Home	www.safeexerciseathome.org.au	Developed by physiotherapists. Provides advice and exercises for people at 3 levels of function. Includes cardiovascular, strength, and balance exercises. Resources can be downloaded and printed.

This selection is not exhaustive. The authors have highlighted resources that are appropriate for older people with a range of functional abilities, have sufficient information to allow people to determine their suitability, and provide sufficient advice to enable people to exercise safely in the home environment.

recommended as a cheap and easily accessible form of exercise, however, walking on its own does not provide older people with sufficient strength or balance challenge to reduce fall or fracture risk. Inclement weather, traffic, concern for personal safety, terrain, and other environmental factors can also be barriers to walking outdoors. Thus, although walking may be a component of an exercise program, it must be supplemented by strength and balance exercise and alternative forms of aerobic exercises should also be included. In the current climate, the program needs to be able to be completed in the person's own home and utilize readily available equipment. Exercise programs need to be tailored so they are suitable for older people with a range of functional abilities. For older people with mild cognitive impairment or dementia, this is particularly important. Functional exercises, such as practicing sit to stand, can be a good option particularly for older people who are new to exercise or are frail. These exercises target large lower limb muscle groups and can provide a mix of strengthening and balance exercise. They can also be made easier or harder with simple modifications, for example by allowing use of the arms to push up.

How Can We Support Older People to Remain Active or Increase Activity during the Pandemic?

It is essential that health systems consider how best to support older people to remain physically active during this crisis. Recommendations from a health professional can increase the likelihood of people engaging in physical activity.¹⁸ It is, therefore, imperative that health professionals discuss the importance of remaining physically active with older people and support them to incorporate physical activity into their day. Consultation with or referral to specialists in exercise prescription such as physical therapists or exercise physiologists can be used to provide individualized advice about an exercise program tailored to an older person's health conditions, functional abilities, environment, and personal preferences and goals. In some health systems, these consultations can be done using telehealth to reduce risks associated with face to face contact. Where telehealth consultations are not available, health professionals should advocate for the inclusion of these services to support older people to remain active.

Older people and health professionals working with older people need to have ready access to trustworthy resources to support physical activity and exercise in the home environment. It will not always be practical for all older people to receive individualized plans from a health professional. Resources should, therefore, enable older people or their carers to identify the exercises that are most appropriate for them, promote safety, and provide guidance as to when specialist advice is required. Online resources are relatively easily and cheaply disseminated and can provide video demonstrations of exercises. Some of the online resources that provide examples of physical activity and exercise and are appropriate for older people with a range

of functional abilities are detailed in Table 2. However, not all older people may be able to access this information online, therefore, hard copy resources should also be available.

There is increasing recognition that increasing physical activity requires a change in behavior.¹⁹ Resources should support behavior change and provide practical tips and suggestions for increasing physical activity. Some simple strategies that can promote engagement with exercise can include planning a time to exercise, checking in with a family member or friend about your exercise plans, and tracking exercise using either an exercise diary or activity tracker. Many people may be daunted by the physical activity guidelines, particularly if they have not exercised regularly in the past. It is, therefore, important to reassure people that even small amounts of physical activity and exercise are better than nothing, and that it is good to start slowly and gradually increase your activity levels, particularly if you have been inactive.

As the world moves from the first wave of the pandemic to the second, third, and fourth waves,²⁰ it is essential that we consider how best to support the health of older people and people with chronic health conditions. During the pandemic, it is likely that function will have declined in some older people because of suboptimal management of acute or chronic conditions,²¹ suboptimal access to rehabilitative services,²² or physical inactivity. As restrictions ease and health services resume normal activities, health providers must identify older people who have developed functional deficits and provide appropriate management. Health services and residential aged care facilities need to ensure there are adequate resources available to accommodate any increased demand for rehabilitation or restorative care. Innovative ways of providing care including exercise to vulnerable populations must be considered, such as the expansion of telehealth services. Physical activity and exercise are cornerstones of healthcare. It is, therefore, essential that physical activity and exercise are key components of current and future pandemic plans, particularly for vulnerable groups.

References

1. CDC COVID-19 Response Team. Severe outcomes among patients with coronavirus disease 2019 (COVID-19)— United States, February 12–March 16, 2020. *MMWR Morb Mortal Wkly Rep* 2020;69:343–346.
2. Anderson RM, Heesterbeek H, Klinkenberg D, et al. How will country-based mitigation measures influence the course of the COVID-19 epidemic? *Lancet* 2020;395:931–934.
3. Tanne JH, Hayasaki E, Zastrow M, et al. Covid-19: How doctors and healthcare systems are tackling coronavirus worldwide. *BMJ* 2020;368:m1090.
4. Mahase E. Covid-19: What do we know so far about a vaccine? *BMJ* 2020;369:m1679.
5. Thanh Le T, Dreadadakis Z, Kumar A, et al. The COVID-19 vaccine development landscape. *Nat Rev Drug Discov* 2020;19:305–306.
6. Ekelund U, Tarp J, Steene-Johannessen J, et al. Dose-response associations between accelerometry measured physical activity and sedentary time and all-cause mortality: Systematic review and harmonised meta-analysis. *BMJ* 2019;366:14570.

7. Liu C-J, Latham Nancy K. Progressive resistance strength training for improving physical function in older adults. *Cochrane Database Syst Rev* 2009;3: CD002759.
8. Sherrington C, Fairhall NJ, Wallbank GK, et al. Exercise for preventing falls in older people living in the community. *Cochrane Database Syst Rev* 2019;1: CD012424.
9. Roberts CE, Phillips LH, Cooper CL, et al. Effect of different types of physical activity on activities of daily living in older adults: Systematic review and meta-analysis. *J Aging Phys Act* 2017;25:653–670.
10. de Almeida SIL, da Silva MG, de Dias Marques ASP. Home-based physical activity programs for people with dementia: systematic review and meta-analysis. *Gerontologist*; 2019:gznz176.
11. Department of Health. Australian Government. Recommendations on physical activity for health for older Australians. Available at: <https://www1.health.gov.au/internet/main/publishing.nsf/Content/phd-physical-rec-older-guidelines>. Accessed May 20, 2020.
12. World Health Organization. Physical Activity and Older Adults: Recommended levels of physical activity for adults aged 65 and above. Available at: https://www.who.int/dietphysicalactivity/factsheet_olderadults/en/. Accessed May 19, 2020.
13. U.S. Department of Health and Human Services. Physical Activity Guidelines for Americans. 2nd edition. Washington, DC: U.S. Department of Health and Human Services; 2018.
14. Dementia Centre for Research Collaboration. Australian physical activity guidelines: for adults aged 60 years and older who experience mild changes to their memory; 2018. Available at: http://www.dementiaresearch.org.au/images/dcrc/output-files/1568-v5_physical_activity_guidelines_lay_version.pdf. Accessed May 20, 2020.
15. Sun F, Norman IJ, While AE. Physical activity in older people: A systematic review. *BMC Public Health* 2013;13:449.
16. Delaney M, Warren M, Kinslow B, et al. Association and dose-response relationship of self-reported physical activity and disability among adults ≥ 50 years: National health and nutrition examination survey. 2011–2016. *J Aging Phys Act*; 2019:1–8.
17. Lazarus NR, Izquierdo M, Higginson IJ, Harridge SDR. exercise deficiency diseases of ageing: The primacy of exercise and muscle strengthening as first-line therapeutic agents to combat frailty. *J Am Med Dir Assoc* 2018;19: 741–743.
18. Spiteri K, Broom D, Bekhet AH, et al. Barriers and motivators of physical activity participation in middle-aged and older adults—A systematic review. *J Aging Phys Activity* 2019;27:929–944.
19. Michie S, Ashford S, Sniehotta FF, et al. A refined taxonomy of behaviour change techniques to help people change their physical activity and healthy eating behaviours: The CALO-RE taxonomy. *Psychol Health* 2011;26: 1479–1498.
20. Kohli P, Virani SS. Surfing the waves of the COVID-19 pandemic as a cardiovascular clinician. *Circulation*; 2020.
21. Markus HS, Brainin M. COVID-19 and stroke—A global World Stroke Organization perspective. *Int J Stroke* 2020;15:361–364.
22. Prvu Bettger J, Thoumi A, Markevich V, et al. COVID-19: Maintaining essential rehabilitation services across the care continuum. *BMJ Global Health* 2020;5: e002670.