



Exercise and Dementia: A Step-by-Step Approach to Prescribing Exercise

ABSTRACT

Dementia is a threat to the aging population. Although dementia cannot be reversed there is evidence that physical exercise can improve activities of daily living, balance, quality of life, function, strength, and mental function through various parameters. This article will focus on aerobic training, resistance training, and flexibility training.

KEYWORDS: dementia, exercise, aerobic training, resistance training, flexibility training, exercise prescription



Dementia is a major threat to our aging population. It is estimated there are nearly 50 million persons with dementia in the world growing to 130 million by 2020.¹ It is evident this will have major repercussions to medical systems with social and economic impacts that we are presently unprepared for. Although dementia cannot be reversed there is evidence that physical exercise can improve activities of daily living, balance, quality of life, function, strength, and mental function through various parameters.²⁻⁴ There are also a long list of benefits to brain volume, enhanced neuroplasticity, expression of neurotrophic factors and cleaning of amyloid and tau protein which we will not cover.⁵ We have seen the effect of the Covid-19 pandemic on society and caregivers so this article will discuss the ways we can use simple treatments like physical exercise to reduce the risk of developing and reducing the symptoms of dementia.

We will concentrate on aerobic training, resistance training, and flexibility (for prevention of injuries) training. Here is my approach to exercise prescription.

ABOUT THE AUTHORS

Dr. Alykhan Abdulla, BSC, MD, LMCC, CCFP, DipSportMed CASEM, FCFP, CTH (ISTM), CCPE, Masters Cert Phys Leader, ICD.D Assistant Professor University of Ottawa Faculty of Medicine, Academic Clinical Professor University of Ottawa Faculty of Nursing Medical Director The Kingsway Health Centre, The Kingsway Travel Clinic, The Kingsway Cosmetic Clinic, Editor in Chief/Author Journal of Current Clinical Care SPORTS MEDICINE, Past Chair Section of General and Family Practice Ontario Medical Association, Bruyere Foundation



Approach to Exercise Prescription

During every visit, it has become my routine to ask about a patient's level of physical fitness. If a patient is active on a regular basis, I usually review their activities, assessing the intensity, duration, and frequency (to be described fully in constituents of the exercise regimen) and then develop a fitness goal. If a patient is minimally active, an assessment must be done to determine if there are any contraindications to exercising and if investigations should be done prior to starting an exercise programme. With those who are minimally active but have no contraindications to exercise, I use my step-by-step approach. It is based on years of clinical experience in integrating exercise science methodologies from various sources with behavioural techniques. Christmas and Andersen have developed an

approach to exercise prescription, which also has some merits.⁶ There is a review article that focuses on providing an approach to motivating the sedentary older patient, rather than on describing how to develop an exercise regimen, which happens to be my focus. Neither approach has been validated in clinical trials.

Questioning

Typically, I inquire about the patient's knowledge about the benefits of exercise. More often, these days, patients are very well-educated and have some interest in exercising but are not exercising. It is best to review their previous levels of physical activity to ensure that you challenge them appropriately. This often lets you determine the appropriate starting point, the pace of progress, and their expectations.

Preliminary Programme

In order to create long-term compliance and attain the individual patient's goals, a balance is required between the following principles of exercise prescription and human motivational techniques.⁷ Every attempt should be commended, and any indiscretion should not be belaboured. The patient should be veered back to his goals without guilt. I ask the patient to choose an aerobic activity and to commit to a frequency of three to four times



a week on non-consecutive days. This is recorded in the chart as a tacit contract. There are no limits placed on the minimum duration at this stage because our interest is to increase physical activity. This type of programme is acceptable as the only exercise prescription for the frail or demented elderly. At this stage, so that it becomes a habit and prevents injury, I usually include a stretching programme that follows the aerobic activity. A series of easy-to-understand stretches are published in the American College of Sports Medicine's Fitness Book.⁷

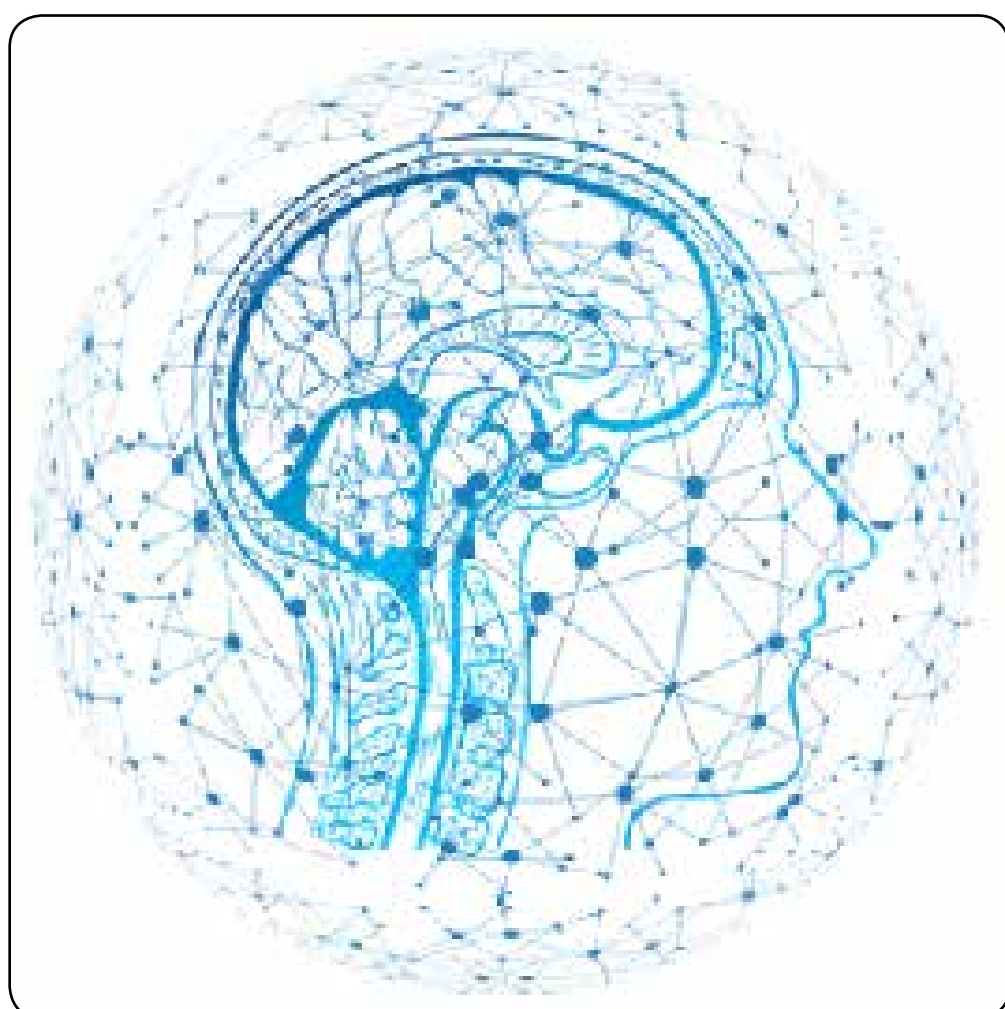
Finally, I ask each patient to record their heart rate upon waking and their post-exercise heart rate. This is the beginning of their exercise log, which will include the type of exercise, duration,

intensity, and frequency. Patients should be encouraged to bring it to each appointment. This serves two purposes—one, it helps familiarize the patient with his or her level of exertion and progress, and two, it helps, within the actual exercise regimen, to target appropriate intensity levels. The appropriate juncture for promotion to the next stage is based on the dialogue between the patient and his/her physician-coach. Typically, this preliminary programme entices the patient into the first stage of the true exercise regimen.

Constituents of the Exercise Regimen Step-By-Step Approach

Stage One—Initial Conditioning

This stage is often an almost imperceptible extension of the preliminary programme. Each of these stages will include a warm-up, a stretching programme, resistance training, and a cardiovascular endurance component. This stage can last four to eight weeks depending upon the individual's interest and their ability to adapt to each new stage of the programme. The expectation is to follow the exercise regimen three to four days per week on non-consecutive days. The exercise programme's duration should begin at about 10 minutes and progress to 20-30 minutes (it is possible to divide this into ten-minute aliquots). This stage should start with a five-minute walk, a



five-minute stretching programme, and light resistance exercises using whatever appliances or devices are available (e.g. various sizes of canned goods). As the regimen progresses the walk can be lengthened, or replaced with another low level aerobic activity (like stationary biking, swimming, walking stairs), or can be split in two, for before and after the resistance training. In detail, the aerobic component involves a target heart rate of between 40 to 60% of maximum heart rate (MHR), which is compatible with mildly laboured ability to talk during exercise. The simplified calculation for determining MHR is $MHR = (220 - \text{age})$.⁷ This is probably the simplest method for calculating MHR, although there are considerable limitations to this calculation.⁷

In detail, the resistance training involves 6 to 8 repetitions of each exercise using proper form, taken through a full range of motion (ROM), and with a normal breathing pattern. The latest research confirms that only one set per exercise is required to have the same benefit as multiple sets. Individual goals should guide progression. Patients should be realistic and should receive generous praise for their efforts.⁷

Stage Two—Improvement

This stage has the same pattern of warm-up, stretching, resistance

and aerobic training. This stage typically lasts four to six months. The exercise regimen continues at the same frequency of three to four times per week, but can alternate between aerobic and resistance weight training days. The resistance training should attempt to train all major muscle groups and to increase the number of repetitions up to 10. The goals for the end of this stage are for the patient to be able to reach 70 to 75% of maximal heart rate with aerobic training, to participate in a regular resistance training programme using stable weights and to be able to endure a programme lasting up to 40-45 minutes. All of this should be accomplished with the patient experiencing a minimum of muscle soreness, discomfort, or injury. Commonly, progression to the next stage in exercise duration and an increase in the intensity of both resistance and cardiovascular endurance occurs every 2-3 weeks.⁸ The most important caveat is not to progress if pain, discomfort, or interposing illness is encountered. Sometimes a holding pattern or regression is required and that is why the preliminary stages of education and training are so important.

Stage Three—Maintenance

This stage is usually achieved after six months of training. The key in this stage lies in providing





SUMMARY OF KEY POINTS

Approach to Exercise Prescription includes asking questions during a patient's routine visit.

1. Ask about a patient's level of physical fitness.

2. Review their activities, assessing intensity, duration, and frequency.

3. Develop a fitness goal.

alternatives to ensure that exercise is enjoyable, not monotonous, finding a comfortable intensity, duration, and frequency (at least three times and not more than five times a week), and in setting new goals based on the patient's newly evoked awareness and health.^{7,8}

Patients at this stage are very proactive because they feel the impact of their training and tend to want to exercise even during illness or disability. It is important to maintain realistic goals for each individual.

Physical exercise is a powerful tool to help reduce the dementia and improve function. The above article provided a clear, cogent step-by-step approach that is easy to incorporate into a busy family doctor's practice.

References

1. Prince M, Wimo A, Guerchet M, Ali G, Wu Y, Prina M. Alzheimer's Disease International: World Alzheimer Report 2015: The Global Impact of Dementia: an Analysis of Prevalence, Incidence, Cost and Trends; London 2015.
2. Forbes D, Forbes SC, Blake CM, Thiessen EJ, Forbes S. Exercise programs for people with dementia. *Cochrane Database Syst Rev*. 2015(4):CD006489.
3. Blondell SJ, Hammersley-Mather R, Veerman JL. Does physical activity prevent cognitive decline and dementia?: a systematic review and meta-analysis of longitudinal studies. *BMC Public Health*. 2014; 14:510.
4. Barreto PD, Demougeot L, Pillard F, Lapeyre-Mestre M, Rolland Y. Exercise training for managing behavioral and psychological symptoms in people with dementia: a systematic review and meta-analysis. *Ageing Res Rev*. 2015; 24:274–85.
5. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3258000/>
6. Christmas C and Andersen RA. Exercise and Older Patients: Guidelines for the Clinician. *J Am Ger Soc* 2000; 48:318-24.
7. Kenney WL (Sr. Ed.). *ACSM's Guidelines for Exercise Testing and Prescription*. 5th ed. Pennsylvania: Williams & Wilkins, 1995.
8. Fiatarone MA et al. Exercise training and nutritional supplementation for physical frailty in very Elderly people. 1994; 330:1769-75.



CLINICAL PEARLS

Prescribing exercise to patients with dementia that includes focus on aerobic training, resistance training, and flexibility for the prevention of injuries will help reduce the symptoms of dementia and improve function.

