

Mellen Center Approaches – Exercise in MS

Framework: Physical exercise is generally recommended to promote fitness and wellness in individuals with or without chronic health conditions. Implementing and maintaining an exercise routine is a way to empower patients with MS, and to promote self-management and self-efficacy. However, there are known barriers to exercise in MS. At the Mellen Center, our approach is to encourage all patients (regardless of their level of disability) to engage in exercise, to provide them with individualized recommendations and training, and to monitor and adapt their exercise program over the course of the disease.

Q: What is exercise?

Exercise (or exercise training) can be described as a planned, structured, repetitive physical activity undertaken to attain specific goals (such as improving strength or fitness). While any safe physical activity is encouraged, exercise is a specific type of physical activity.

Q: What types of exercises are recommended in MS?

Traditional forms of exercise include flexibility training (stretching, range of motion), aerobic training, and progressive resistance training (strength training).

Task-specific training can also be performed to optimize specific movements or functions, usually under the direct supervision of a rehabilitation therapist:

- gait training exercises are performed to optimize a person's gait pattern, with the ultimate goal of improving mobility;
- balance deficits, a very common problem, have been shown to be positively affected by a vestibular rehabilitation program in clients with MS.
- in addition to balance deficits, many individuals with multiple sclerosis (49-59%) report dizziness or vertigo that can negatively impact their daily lives. Structured intervention by a rehabilitation therapist specializing in vestibular rehabilitation can both improve balance and reduce complaints of dizziness or vertigo.

There is no definitive evidence showing the superiority of one type of training over the others. The various types of exercise are generally combined in exercise programs based on the individual's needs. A rehabilitation therapist can help to design a proper exercise program based on the client's symptoms and their specific goals.

While many of the exercises used in MS are the same as those recommended for the general population, although the frequency, duration, and intensity of training sessions are often lower, and the contents may need to be adapted to ensure feasibility and safety in the presence of neurologic impairments. The same applies to exercise equipment: for example, the use of a stationary bicycle is often recommended over a treadmill for the purpose of aerobic training, for people with gait and balance impairment.

Other forms of exercise have been proposed, such as Pilates, yoga, or tai-chi. These “alternative” forms of exercise often encompass other modalities in addition to physical exercise (e.g. meditation, breathing). While some encouraging results have been published, there is overall limited evidence on their efficacy.

Exercise can also be performed in water, as long as the temperature of the water is kept lower (generally around 84 F) to avoid overheating.

Commercially available virtual reality game equipment can represent a motivating medium for exercise, providing immediate feedback and quantified progressive goals.

Q: Why do patients with MS need to exercise, and is exercise effective?

Exercise is recommended in the general population to maintain and improve fitness and general wellness, and this applies to individuals with MS as well. It has been demonstrated that persons with MS are significantly less physically active than the general population. Physical deconditioning due to low activity level contributes to fatigability and weakness.

In addition, there is a growing body of evidence suggesting that exercise decreases the severity of various MS symptoms, including fatigue and depressive symptoms, improves walking and balance, and enhances quality of life. Several reviews and meta-analyses have been published, and generally the magnitude of change attributed to exercise is small but significant, although methodological limitations of the exercise studies reviewed are noted. In addition, a majority of exercise studies enroll patients with low to moderate levels of physical disability. Some studies suggest that exercise may improve cognitive performance, as shown in other populations.

Comorbidities (e.g. obesity, cardiovascular and musculoskeletal comorbidities) were shown to be associated with higher disability level in individuals with MS. Exercise is recommended in the management of many of these comorbidities, and may therefore indirectly help with MS management.

Q: Are there safety issues regarding exercise in MS?

Published clinical trials of exercise in MS do not report significant safety issues.

It is now well documented that exercise does not cause MS exacerbations. However, exercise may cause transient worsening of pre-existing MS symptoms, such as weakness, paresthesias, or visual disturbance. This worsening could be explained in part by an increase in body temperature, which can be minimized by using fans or cooling garments. It may also be necessary to decrease the intensity and duration of exercise if it takes the person more than 2 hours to return to baseline after an exercise session.

Exercise may also cause musculoskeletal pain, which may require a modification of the exercise routine. The exercise program should also be adapted to minimize the risk of falling.

Q: What are barriers to exercise in MS?

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This information is not intended to replace the medical advice of your health care provider. Please consult your health care provider for advice about a specific medical condition.

It is important to acknowledge and address barriers to initiating and maintaining an exercise routine experienced by individuals with MS.

Physical barriers include motor impairment, fatigue, pain / sensory symptoms, and heat sensitivity.

Psychological barriers may include: beliefs regarding the efficacy and safety of exercise in MS, such as the fear of triggering new MS activity (particularly if exercise generates a worsening of symptoms); depression; lack of self-efficacy. Environmental barriers include the lack of adequate transportation and accessible exercise facilities for people with mobility limitations. Online physical activity and exercise programs have been developed to help address this issue.

Addressing these barriers involves education, information regarding community resources, and individualized assessment and guidance.

As barriers to exercise are addressed, it is often helpful to use the acronym SMART when setting goals for exercise programs:

1. **S**pecific: Set goals for exercise that are relevant and important for the individual
2. **M**easurable: Set goals that have a specific task in mind. For example, instead of a goal to “get stronger”, set a goal to “improve leg strength to be able to safely walk up the stairs”
3. **A**ttainable: Goals should be reasonable to achieve
4. **R**ealistic: Goals should be realistic given constraints of time, transportation, etc.
5. **T**ime-based: Allow enough time to achieve the goal, but not so much time that the client’s attention to the goal loses focus.

Q: What is the adherence to exercise in MS?

Although evidence regarding adherence to exercise in MS is scarce, there is data suggesting that a large number of individuals discontinue or become less consistent with their exercise routine over time. This may explain why the benefits of exercise are not maintained after several weeks or months in some studies.

It is therefore important to inquire about exercise habits during follow-up visits, and to address barriers, including the fact that the routine may need to be adjusted as disability worsens.

Q: What is the difference between exercise and physical or occupational therapy?

Physical rehabilitation involves exercises performed under the supervision and guidance of a trained therapist. The intensity and complexity of exercises is often greater during rehabilitation, and specialized equipment which is not widely available may be used (e.g. body weight supported treadmill training). The rehabilitation approach also involves other aspects, such as the recommendation of assistive devices (and training to use these devices appropriately and safely), and education regarding fatigue management

A referral to physical and occupational therapy can help address many of the barriers to exercise, as the design of a home exercise program is an integral part of the rehabilitation process.

Q: Are there any guidelines for exercise in MS?

We refer to the Canadian Physical Activity Guidelines for adults with MS, and the National Center on Health, Physical Activity and Disability (NCHPAD) guidelines for exercise in MS. Guidelines are lacking for individuals with severe disability, particularly for non-ambulatory individuals. It is important that the exercise program is designed and prescribed on an individual basis, so that an individual’s capabilities, impairments, and environmental barriers can be taken into account.

	Canadian guidelines	NCHPAD guidelines
Aerobic training	<p>Two times per week.</p> <p>Gradually increase duration to at least 30 minutes per session.</p> <p>Moderate intensity (5 to 6 /10)</p>	<p>At least three to four days per week.</p> <p>20 to 60 minutes per session.</p> <p>Set an exercise pace that feels good to you. Attempt to maintain a Rate of Perceived Exertion of 12-14 (range 6-20)</p>
Strength training	<p>Two times per week.</p> <p>Gradually increase to 2 sets of 10-15 repetitions for each strengthening exercise.</p> <p>Adapt resistance to the goal of 10-15 repetitions, rest for 1-2 minutes between sets and exercises.</p> <p>Rest for at least 1 day between strength training sessions</p>	<p>Two to three times per week</p> <p>Three sets consisting of eight to 12 repetitions per exercise. Each session should last 10 to 15 minutes.</p> <p>Begin at 70 percent of a 10-repetition maximum. When this weight can be performed for 25 repetitions for two consecutive sessions, increase the weight by 10 percent.</p> <p>Do not train the same muscle groups on consecutive days.</p>
Flexibility training	Not addressed	Perform daily for at least 10 to 15 minutes. Stretching exercises should be

		<p>performed before and after all cardiovascular and strength training sessions.</p> <p>Stretches should be held for a minimum of 15 to 30 seconds for maximum benefit, and static stretches should be held for a minimum of five to 15 seconds for maximum benefit.</p> <p>Stretching should not be painful.</p>
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Resources:

National MS Society – Exercise

<http://www.nationalmssociety.org/Living-Well-With-MS/Health-Wellness/Exercise>

National Center on Health, Physical Activity and Disability (NCHPAD) – Multiple sclerosis exercise guidelines

<http://www.nchpad.org/70/520/Multiple~Sclerosis>

Canadian physical activity guidelines

http://www.csep.ca/CMFiles/Guidelines/specialpops/CSEP_MS_PAGuidelines_adults_en.pdf

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