

Getting the Balance Right Programme

Physiotherapy Exercises for People with MS



Strand A

People who use at most a stick to walk outdoors.



University of Limerick
Physiotherapy Department

This booklet is designed as a tool for Chartered Physiotherapists to enable them to implement the Strand A programme from the Getting the Balance Right project.

Everyone completing these exercises should be assessed by a Chartered Physiotherapist to ensure their safety and the suitability of the exercises.

The exercise programme should be carried out under the supervision of a Chartered Physiotherapist or suitably qualified fitness instructor (who has achieved level 2 NCEF qualification) to ensure safety and appropriate progression of the programme.

The 10 week programme consists of a strengthening (Part 1) and aerobic (Part 2) component.

There are different levels of difficulty suggested and the starting point and progression of the exercises should be tailored to each individual in consultation with a Chartered Physiotherapist or suitably qualified fitness instructor. The difficulty of the exercise should be progressed so as to continuously challenge the participant.

Participants should be aware that overheating due to exercise can cause a temporary worsening of symptoms, which is known as Uhthoff's phenomenon. For most people the worsening of symptoms is temporary and resolves within 30 minutes of stopping exercise. Strategies to minimise heat gain can include; exercising outdoors or near an open window or fan, drinking iced water, wearing light clothing, exercising in a normally heated pool.

People who took part in this programme on average had the following statistically significant improvements:

- 10% reduction in physical impact of MS
- 15% reduction in psychological impact of MS
- 19% reduction in fatigue levels
- 17% of people who took part moved from a category of clinically important fatigue levels, to non fatigued
- 7% improvement in walking speed

We hope that this information is useful to you in implementing the programme in your area of clinical practice

Maria Garrett, Dr Susan Coote
On behalf of the UL Physiotherapy Team

Part 1 – Strengthening

This component ideally takes place once a week for 10 weeks under the supervision of a Chartered Physiotherapist or a Fitness Instructor whose education included the components of exercise prescription for people with MS.

It can be run as a circuit style training class:

Warm up – walking briskly for 5 mins

1. Sit to Stand/Squats (for Quadriceps and Gluteus muscles)
2. Bridging (for Gluts)
3. Arm lifts (for shoulder flexors)
4. Walking/Bicycle (Quads and Gluts)
5. Elbow bends (Biceps/Brachioradialis)
6. Lunges/Knee Extensions (Quadriceps)
7. Hip Extension (Gluts)
8. Calf Raises

Cool down

In order to achieve a strengthening effect, it is important that the load is such that the participant is failing on the last repetition. The primary aim of the strengthening element is to achieve “overload” of the muscle and to progress the programme to ensure this. This follows the ACSM guidelines for progressive resistance i.e: work at 50 – 80% of 1RM or increase load by 2-5% when 12 – 15 reps achieved. There is a bias towards lower extremity exercises as impairment is more prominent in the LE.

When the participant can complete 12 repetitions of the exercise the load should be increased by between 2 and 5%. If the next available load is greater than that (e.g. moving from 1kg to 2kg hand weights for shoulder flexion) then the number of repetitions can be increased instead.

From week 6 onwards, participants can be encouraged to do a second set of strengthening exercises at home when possible.

Part 2 – Aerobic Exercise

Participants should complete two sessions of aerobic activity of their choice each week in weeks 1-4. From week 5, they will be asked to aim to complete this three times a week. The main aim is to exercise sufficiently hard to increase heart rate to a target, or for those who have difficulty taking a heart rate to Level 11 to 14 on the Borg scale below. The activities could consist of one of the following; brisk walking or cycling in a gym or outdoors, swimming, running.

During the first strengthening class advice regarding aerobic exercise should be given (see attached). 10 minutes will be devoted to formally explaining aerobic exercise, Uhtoff's phenomenon (whereby increasing heat in people with MS can temporarily exacerbate symptoms) and the evidence supporting aerobic activity.

The Chartered Physiotherapist or fitness instructor will calculate the target heart rate using the Karvonen formula:

$$\text{Target Heart Rate} = \text{Resting Heart Rate} + 65\%(\text{Maximum Heart Rate}).$$

The maximum heart rate is $220 - \text{age}$. The resting heart rate is that found first thing on waking. The first beat is counted as 0 when counting for 15 seconds, then multiply that by 4.

e.g. Mary is 34, her resting heart rate first thing in the morning is 70

Her target heart rate is $70 + 0.65(143) = 162.95 = 163$

Borg Rating of Perceived Exertion Scale

6	No exertion at all
7	Extremely light
8	
9	Very light - (easy walking slowly at a comfortable pace)
10	
11	Light
12	
13	Somewhat hard (It is quite an effort; you feel tired but can continue)
14	
15	Hard (heavy)
16	
17	Very hard (very strenuous, and you are very fatigued)
18	
19	Extremely hard (You can not continue for long at this pace)
20	Maximal exertion

Education for participants at Session 1

Previously it was thought that exercising make MS symptoms worse. However, it is now known this is not the case. Evidence shows many benefits of exercise in people with Multiple Sclerosis (MS). Studies do date have shown that a people with mild to moderate MS participating in an exercise programme can benefit from improvements in fatigue, strength, fitness, body composition, disability, walking, lung function and participants can enjoy feeling confident, normal, experience improved mood and improvements in social support. Additionally there are the benefits that are well documented for example it's good for your heart, muscles, bones and controlling weight.

There are two type of exercise – Aerobic Exercise and Resistance Training (Strengthening).

The [American College of Sports Medicine](#) (ACSM) defines aerobic exercise as "any activity that uses large muscle groups, can be maintained continuously, and is rhythmic in nature." It is a type of exercise that overloads the heart and lungs and causes them to work harder than at rest. The important idea behind aerobic exercise today, is to get up and get moving!! There are many activities to choose from, whether it is a new activity or an old one. Find something you enjoy doing that keeps your heart rate elevated for a continuous time period and get moving to a healthier life. Examples of aerobic activities include, walking, swimming or cycling. The intensity should be high enough to make you sweat a little! We will teach you how to achieve the appropriate intensity for exercise when you have MS. Everybody will be given a target heart rate to try and achieve during aerobic exercise. It is measured as you were shown in the assessment – at the pulse in your neck. Every ten minutes that you are exercising (aerobic) just stop and check that you are achieving the correct intensity. This is more accurate but if you find this difficult, please consult with the physiotherapist for an alternative.

Resistance training has been shown to be the most effective way of improving musculoskeletal strength. It takes approximately 6 weeks to see changes in strength.

That's why this programme is ten weeks long. To allow you to get the maximum benefit possible. There are many principles of resistance training – one of the most important is “overload” - this means that to get increase in strength you must work the muscle hard. This type of training has also been shown to be beneficial in people with MS. To do this correctly you must gradually build up to 12 - 15 repetitions of each exercise and repeat this 2 – 3 times. You get a break after each “set”. When you can do this easily, it's time to increase the difficulty of the exercise

Many of the effects of MS such as weakness and fatigue are made worse by the secondary effects of a sedentary lifestyle. These can be prevented by an active lifestyle. Research shows that almost all aspects of the physiological profile of people with MS improve after exercise programmes. However it must be done at the correct intensity to achieve this.

This intervention will focus on both aerobic exercise and resistance training. Don't worry we'll ease you in gradually and you won't have to do anything that you are not able to do. Gradually week by week you will be able to do more and more. All exercises should be pain free. However, it is completely normal and even beneficial to be sore the day after exercise. This means that the muscles are adapting and it normally resolves within at most three days and it decreases with time. It is also normal for people with MS to experience some fatigue after exercise. This normally resolves within about 40 minutes of exercising.

We know there can be many things that can make exercise difficult for example fatigue, lack of motivation and fear of falling amongst many others. If anything proves to be getting in the way of a good work out please let me (Physio) know and together we'll try and overcome it.

Information Handout for Participants at Week 4

Exercise guidelines for People with MS

Aerobic Exercise:

Frequency:	2-3 times a week	
Intensity:	65% - 75% of Maximal Heart Rate or a Rate of Perceived Exertion of 11-14. Count beats of pulse after every 10 minutes of exercise as shown by physiotherapist	The original Borg scale of perceived exertion ranges from 6 to 20 (6 = no exertion at all and 20= maximal exertion). Ratings of 11- 14 represent moderate intensity and the ideal target intensity zone in the absence of symptoms.
Type (self selected):	Walking/Cycling/Swimming/Running	
Duration:	20-30 mins	

*Note: Aerobic exercise can bring on a **temporary** exacerbation of any sensory symptoms, this usually resolves within 30-40 mins*

Strengthening:

When you can perform 12 -15 repetitions correctly in consecutive training sessions the weight can be increased by 2-5 %

Aerobic and resistance programmes should alternate on separate days of the week with 24 – 48 hours of recovery between training sessions. In this manner strength exercises will typically be performed on average of twice per week

This class has included:

Sit To Stand/Squat , Bridging , Resisted shoulder flexion , Resisted elbow flexion , Lunges/Resisted knee extension ,Hip extension and Calf raises, which can be repeated at home (use imagination for resistance eg: bottle of water/can of beans, bottle of sand etc...)

Ideally 15 repetitions should be repeated 3 times (3 sets), when this can be done without too much effort, it's time to make it harder to get strength gains in the muscles.

If you would like advice on any other strengthening exercises. Please Ask!