MS Fitness Specialist

Module 11

Goals and Program Design

Learning Objectives

1. Learn how to establish a goal profile for MS clients
2. Learn the different muscle contractions for program design
3. Learn the different training methods for MS
4. Understand the goal of each exercise designed for MSers using concept and theory)
5. Learn how to design and exercise program for MSers
6. Learn what components make up an exercise session

Chapter Eleven
Goals and Program Design

Goal Profile

Once the health and fitness professional has screened and assessed the client, it is imperative to set clear and concise goals to track one's health and fitness progress. It is helpful for the client to think about the different aspects of his/her life and where he/she would like to make changes. Goals can and should include the support of a partner or a family member.

Some common goals for many people with MS include:
To exercise on a regular basis and feel good doing it.
To be less short of breath.
To learn how to select and prepare healthy meals.
To lose or gain weight.

The goals must be S.M.A.R.T.
Specific
Measurable
Attainable
Realistic
Time-Bound

The main focus for clients with MS achieving their goals is *time*. It does not matter how long they spend in each phase of the program. They may spend as much time as they need in any phase, or they may never progress to the next phase. Their goals and abilities determine how they move through the different phases the trainer develops for them. Make sure the goals that are set for them and they set for themselves are reasonable and attainable. A person living with MS should not approach the training with the intention of becoming the next Mr. or Mrs. Universe, instead they should look at the workout routine as a way to regain strength, health, and independence, or as a supplement to physical therapy.

Each day of the program is adaptable, as well. If day one is too intense as it is written, simply cut back on the volume of training. They can cut back on the number of exercises or the number of sets performed for each exercise. If the program calls for 3 chest exercises, but they can only do 1, then they should start there and add a second one when they get a little stronger. This is a lifelong journey of health and fitness, not a mad dash to an unrealistic (or unsafe) finish line. Clients should challenge themselves but work at their own pace and keep safety as the number one priority.

While a health and fitness program will not cure MS, one can take control of his/her chronic condition, manage it, and increase the quality of life. He/she should work with his/her healthcare team including the health/fitness professional and focus on reaching the goals he/she sets at the beginning of the program.

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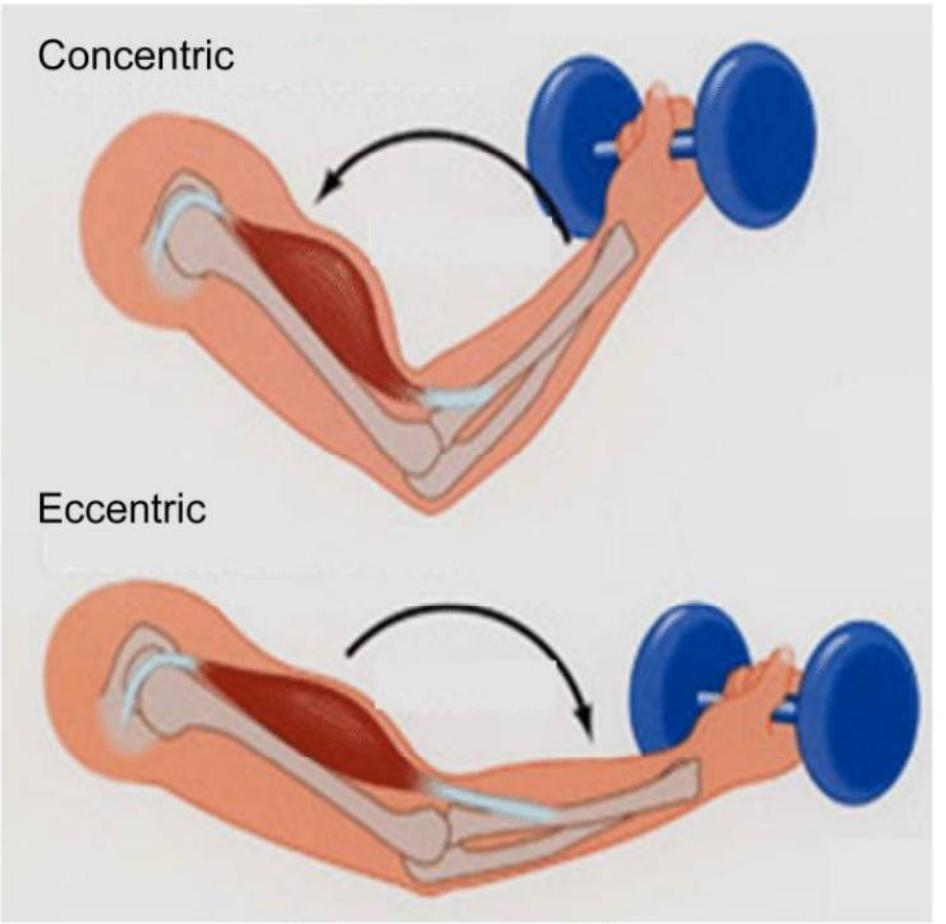
Concentric and Eccentric Muscle Contractions for MS Programming

Concentric (Positive) Contractions: This contraction **shortens** the muscle as it acts against resistive force (like a weight). For example, during a biceps curl, the biceps contract concentrically during the lifting phase of the exercise.

Eccentric (Negative) Contractions: The muscles **lengthen** while producing force—usually by returning from a shortened (concentric) position to a resting position. Using the same example above, the lowering the weight back down during a biceps curl is an eccentric contraction for the biceps. One is slowing the descent of the weight back down instead of allowing the weight (and gravity) to just pull the arm back down passively.



So Why Do the Different Types of Contractions Matter?
It's essential to include both concentric and eccentric contractions in one's strength-training program. Most traditional exercises include these movements—a lifting phase (using the shortening or concentric phase) and a lowering phase to return to the start position. However, how much time is spent in each phase can affect the results. Here are some facts about the difference between concentric and eccentric movements:

- The muscles can generate more force during the eccentric phase of an exercise. For example, one may only be able to lift a 10-pound dumbbell for a biceps curl. But likely, one could hold and *lower* (the eccentric phase) a 15- or 20-pound weight.

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- By slowing down the negative (eccentric) phase of the exercise, the muscle can build greater strength. This is why, typically, people are advised to lower weights or return them to the start position slowly.

Training Methods for MS

In the world of fitness for strength and conditioning, there are a multitude of training styles, methods and programs you can follow. With the various adaptations of every method whether it's an adjustment to the reps, sets, speed, rest, etc., the possibilities are endless. Each one has its merits and if one trains properly, they all will yield results in some way shape or form. Having MS does not change the fact that one has to keep the muscles from getting "bored" of the exercise routine. The best way to to keep the routine fresh and to continue to progress is to challenge the body with different training methods. The following are some of the most common methods along with why and how they can help one develop more strength and conditioning in one's battle to conquer MS through fitness.

• Time Under Tension Training

There is much being written on both sides about the training method time under tension (TUT) being a positive way to work out or a complete waste of time. The style of training for MSers involves "challenging" the MS body to perform and move in ways the nerves are saying it cannot. If one builds muscles and strengthens them through resistance training those muscles will be strong enough to push, pull and move where they want. What really counts when it comes to building and strengthening muscle is progressive overload. Muscle will grow in direct proportion to the amount of work it's required to do. By focusing on timed sets rather than going for a specific number of reps, you can directly influence the intensity of the set and stimulate results.

What is 'time under tension' training (TUT)?

TUT essentially refers to how long a muscle is under strain during a set. A typical set of 10 reps for an average person will take anywhere from 15-25 seconds depending on lifting speed. By putting a muscle under longer time of strain such as 120 seconds, you can cause extensive muscle growth. But there is a debate on how long that time of strain needs to be to turn a regular set into a TUT set. Trying to figure out the optimal TUT per set in order to accelerate muscle growth is an overly simplistic view on hypertrophy training without substantial scientific support. Based off of scientific research, this program of fitness for MSers recommends TUT of a 6 count up and 6 count down repetition pace.

Muscle Fiber Types and TUT

People have two general types of skeletal muscle fibers: slow-twitch (type I) and fast-twitch (type II). Slow-twitch muscle fibers help enable long-endurance feats such as distance running, while fast-twitch muscle fibers fatigue faster and are used in powerful bursts of movements like sprinting. To make the argument that TUT is an important type of training we have to answer the question, "Does TUT make a difference in the strengthening of any muscle fibers?" Research shows that is possible that high TUT may promote greater hypertrophy in slow-twitch muscle fibers, which are more fatigue-resistant than fast-twitch muscle fibers and therefore can't be adequately stimulated with short TUT and heavy loads (Schoenfeld, 2013, Netreba, et al., 2007; Netreba, et al., 2009; and Popov, et al., 2006). In order to be fully developed, slow-twitch fibers require to be put under tension for extended periods of time.

Different training methods must be used when trying to fully develop strength and muscle development in addition to fighting off muscle wasting in people with multiple sclerosis. TUT is not the only method of training but should absolutely be incorporated into any MS fitness program at some point. Walking

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with MS or doing any movement/activity that takes a considerable amount of time is taxing on the slow-twitch muscle fibers. MS is a disease of fatigue so even cleaning out a cabinet where you are using your arms for an extended time frame to accomplish that chore is demanding on slow-twitch fibers as opposed to fast-twitch ones. Proper TUT training will help combat the fatigue associated with these types of activities for MSers.

• Rest/Pause Training

What is it?

Rest/Pause Training requires one to take as little as 10-15 second breaks between each set unlike standard training where you take as much as 3-4 minute rest periods between sets. But there are many variations of the rest/pause method which alter the amount of repetitions each set from as little as 3 to as many as 20 and where the rest is increased to 25-30 seconds. The most widely used variation of rest/pause requires you to perform a set to "failure", rest 25-30 seconds, perform another set to failure, rest 25-30 seconds, and perform a final set to failure. "Failure" is when the set ends when technique starts to falter.

Why use it?

Rest/Pause training is s a great way to increase both training intensity and efficiency by utilizing shorter rest periods between sets. There's no wasted time in rest/pause training and one can't diminish the results by resting too long between the sets. This training allows one to get stronger and create more muscle density by challenging the muscles to keep up with the non-stop pace. This training also ensures proper technique throughout an exercise.

Who should use it?

Rest/Pause is a method that helps increase muscle and strength. High Rep Training seems to be a more common method of training with beginners; however, rest/pause is an effective way to make sure a beginner uses proper technique in the workout. Therefore, whether an exercise beginner or a seasoned fitness enthusiast, one will see results using the rest/pause training.

• Supersets

A superset is a form of strength training in which one moves quickly from one exercise to a separate exercise without taking a break in between the two exercises. Typically, one will take a brief break to catch his/her breath or grab a drink of water between sets of an exercise. This also gives time for the muscles to recover. But when doing supersets, one moves from one set to another without a break. There are two main methods in which supersets can be performed. These two methods are quite different, and thus, the results derived from them vary greatly. The two main methods of supersets are **opposing muscle group supersets** and **same muscle group supersets**.

Advantages of Superset Workouts

Supersets can be used as a way to do more exercises in a given length of time. While the muscles are recovering from one set, he/she is performing another exercise rather than taking a break. One can switch back to the first exercise to perform another set and continue with that pattern until he/she needs a break for a drink or recovery. Supersets place an emphasis on stamina and ability, as the lack of a break between sets can be extremely challenging.

Opposing Muscle Group Supersets

One very common form of a superset workout includes working two opposing muscle groups back to back and then repeating the circuit. For example, a common superset includes performing one upper

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body exercise (such as the bench press) and then immediately moving to a lower body exercise (such as the leg press).

Another easy method to plan supersets is to alternate with opposing muscle groups. One can alternate the bench, which works the chest, with the seated row, which engages the back. These supersets are very similar to a circuit training routine. Although supersets tend to focus on two exercises at a time, and circuit training routines often have up to 10 stations. Both the circuit and the superset workouts require little rest between exercises.

Same Muscle Group Supersets
The second way to perform a superset workout is to choose two different exercises that work out the same muscle group and then perform them back to back without a rest. Performing quadriceps extensions immediately after squats is an example of this type of superset. This type of superset works one individual area especially hard. It is a great way to focus on a particular area of the body.

• Negative Training

Negative training is a type of strength training designed for greater strength gains. It involves using heavier weights than one could typically lift concentrically and focuses on just the eccentric phase of the exercise. This does pose a higher risk for injury and should not be practiced by beginners.

One can also use negative training to his/her advantage as a way to progress to exercises that are currently too difficult. For example, maybe one has a goal to perform real pull-ups, but he/she doesn't have the strength yet to lift all the way up (concentric phase). He/she could work up to that movement by focusing on the lowering phase. Stand on a box or step to come up to the "up" position and then work on slowly lowering back down. After each lowering, step back up onto the box and repeat the lowering phase again. One will be working the same muscles and still benefit from the exercise this way.

If one ever hits a plateau in a strength-training program, he/she should focus a little more on the negative part of the training. This could be just what is needed to take one's fitness or strength to the next level.

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The Goal of Each Exercise Designed for MSers (Concept and Theory)

1. To retrain the nervous system to perform basic tasks in movements with less energy.
2. To place muscle in proper position to induce movement with the least amount of force necessary. Thus, allowing participant to feel the muscle working again and establishing mind muscle contact.
3. To promote and retain muscle mass in order to protect bones, build bone density and protect joints and connective tissue.
4. To add enough resistance to force nervous system to adapt and become better, allow for better movement and balance.
5. To engage simultaneously, fine motor units, to improve better focus, attention and tension in each muscle and movement, allowing for better control, strength and muscle development.
6. To vary loads and tempo with dynamic movement to elicit a superior nervous system response, creating better efficiency of thought and control of each muscle and movement.
7. To build cardiovascular output through anaerobic conditioning, thus sparing more muscle, while burning fat through better body composition and for longer duration; improving sugar and lipid profiles.
8. To increase speed of movement and mind muscle connection.
9. To outsmart the effects of MS, allowing the body and mind to gain an advantage.

Why Specific Adaptive MS Exercises Work

1. Focuses on load, instead of repetition, to trigger nervous system adaptation.
2. Emphasizes tempo change to fire muscles quickly to improve mind/muscle connection while forcing a superior nervous system adaptation.
3. Uses bilateral, unilateral and simultaneous movements to trigger varying neuronal forces, which should lead to more power, strength and control of each muscle.
4. Forces the body's internal wisdom to react, instead of a conditioned mind, thus improving confidence and awareness of true capabilities. Silences fear.
5. Harnesses speed, volume and load to help build and strengthen the body through adaptation and cardiovascular endurance, thus improving oxygenation, muscular balance, dexterity and activation.

(See Appendix H for Exercise Library)

Program Design

A comprehensive health and fitness program for those with MS should include cardiorespiratory exercise, strength training, core conditioning, flexibility training, breathing exercises, proper nutrition, and education. The overall exercise program should include milestones of progression. In other words, as one improves his/her cardiorespiratory fitness and strength, the program should be adjusted to become more challenging to continue improvements. Periodic testing every 3 months will provide data for the health and fitness professional to make concessions for adaptations that have occurred in one's fitness level. The health and fitness professional can use the FITT principle to adjust specific components of the exercises to elicit a continued positive response to exercise.

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Exercise Session Format

Each exercise program should include 5 components: Warm-up, cardiorespiratory exercise, strength exercise, core exercise, and cool-down/stretching. Depending on one's personal schedule and time, he/she can follow different programs to ensure all five components to an exercise program are accomplished during the week. Each session must include a warm-up at the beginning and flexibility at the end of each session.

Warm-Up and Cool-down: Warm up and cool-down are usually 5 to 10 minutes and may involve gentle stretching or exercise at a lower intensity or workload. It prepares the heart, lungs and muscles for the work to be done during exercise and cools them after a workout to prevent muscle soreness or injury.

Cardiorespiratory Exercise: Cardiorespiratory exercises like cycling, walking, and swimming should be performed 20-60 minutes per session at an RPE of 12-14 (somewhat hard) 3-5 days per week. If one is incorporating interval training, no more than 3 days a week of intervals should be performed

Strength Training: Resistance exercises should include all major muscles performing exercises at a load that can only elicit 8-12 repetitions for 2-3 sets for 2-3 days per week.

Core Conditioning: The core section of the workout should include exercises that focus on the rectus abdominis, obliques, transverse abdominis, and lower back. Each workout should include a section on core.

Flexibility: Every workout should finish with a series of stretches that focus on the entire body, especially the muscle that were trained. Hold each stretch for approximately 20-30 seconds each for 3 sets.

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Sample Weekly Workout Formats

When first beginning an exercise program, one should introduce exercise at the low end of the recommendations. For example, one should only exercise 3 days a week incorporating cardio every time and one strength element at a time (i.e., only upper body on one day, only lower body on one day, and only core on one day). This method establishes a routine so not to start off too much too soon and get burned out.

Sample #1	**Total Body**	**3 Day/Week**				
Monday	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Saturday**	**Sunday**
Warm-up		Warm-up		Warm-up		
Cardio 30 min		Cardio 30 min		Cardio 30 min		
Chest		Leg Press		Ball Ab Crunches		
Upper Back		Leg Extension		Forearm Plank		
Shoulders		Leg Curl		Bosu® Obliques		
Biceps		Stretch		Bridge		
Triceps				Stretch		
Stretch						

Sample #2	**Split Body**	**4 Day/Week**				
Monday	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Saturday**	**Sunday**
Intervals Upper Body Core		**Cardio Lower Body**		**Intervals Upper Body Core**		**Cardio Lower Body**
Warm-Up		Warm-Up		Warm-Up		Warm-Up
Cardio Intervals 20 min		Cardio 45 min		Cardio Intervals 20 min		Cardio 45 min
Chest		Leg Press		Chest		Leg Press
Upper Back		Leg Extension		Upper Back		Leg Extension
Shoulders		Leg Curl		Shoulders		Leg Curl
Biceps		Stretch		Biceps		Stretch
Triceps				Triceps		
Ball Ab Crunches				Ball Ab Crunches		
Forearm Plank				Forearm Plank		
Bosu® Obliques				Bosu® Obliques		
Bridge				Bridge		
Stretch				Stretch		

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Sample #3	Split Body	5 Day/Week				
Monday	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Saturday**	**Sunday**
Intervals Upper Body	**Cardio Lower Body**	**Cardio Core Balance**	**Intervals Upper Body**	**Cardio Lower Body**		
Warm-Up	Warm-Up	Warm-Up	Warm-Up	Warm-Up		
Cardio Intervals 20 min	Cardio 45 min	Cardio 45 min	Cardio Intervals 20 min	Cardio 45 min		
Chest	Leg Press	Ball Ab Crunches	Chest	Leg Press		
Upper Back	Leg Extension	Forearm Plank	Upper Back	Leg Extension		
Shoulders	Leg Curl	Bosu® Obliques	Shoulders	Leg Curl		
Biceps	Stretch	Bridge	Biceps	Stretch		
Triceps		Stretch	Triceps			
Stretch			Stretch			

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