

Module 3:

Exercise and Lifestyle Physical Activity in MS

Speakers:

Emily Reilly, CPT



MICHELLE, DIAGNOSED IN 2001



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Objectives

Understand	Understand role of the fitness professional
Differentiate	Differentiate training variations & how to measure intensity (HR vs RPE)
Describe	Describe exercise and lifestyle physical activity recommendations for all levels of ability
Gain	Gain confidence in creating/implementing safe and effective workouts



Role of the Fitness Professional

Do's	Don'ts
Gauge fitness experience	Assess and treat symptoms
Make time to rest	Dismiss client's concerns
Encourage journaling	Assume clients will verbalize needs
Encourage independence	Attempt to transfer the participant or allow other participants in the class to assist



Measuring Intensity - Rate Of Perceived Exertion

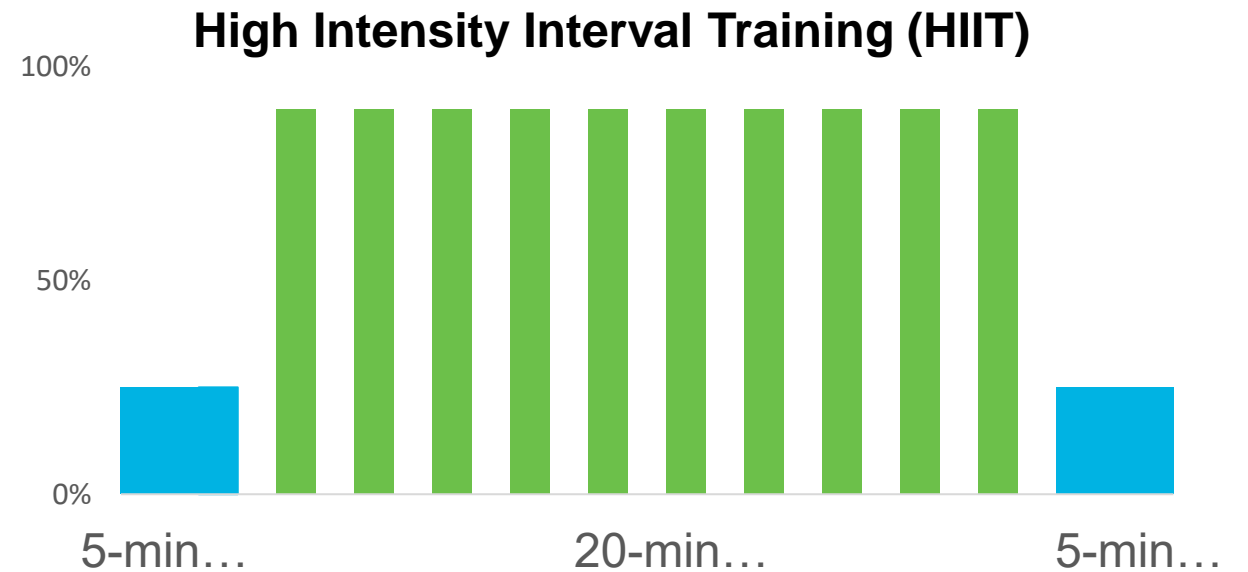
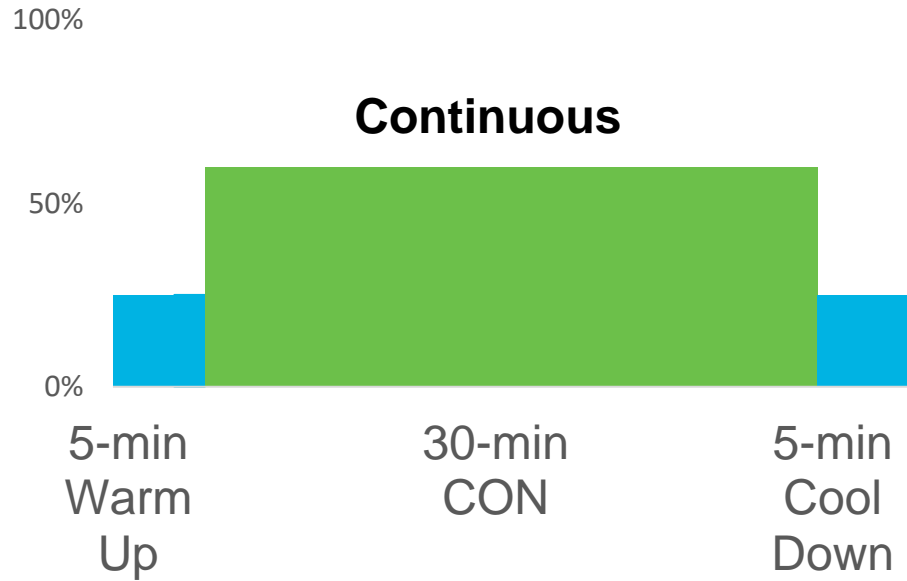
10	Max Effort	Feels almost impossible to keep going. Unable to talk. Cannot maintain for more than a very short time.
9	Very Hard	Very hard to maintain exercise intensity. Can speak only a few words.
7-8	Vigorous	Borderline uncomfortable. Short of breath, can speak a sentence.
4-6	Moderate	Breathing heavily, can hold short conversation. Still somewhat comfortable but becoming more challenging.
2-3	Light	Feels like you can maintain for hours. Easy to breathe and carry on a conversation.
1	Very Light	Hardly any exertion, but more than sleeping, watching TV, etc.



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<https://www.cdc.gov/physicalactivity/basics/measuring/index.html>

Workout Variations



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Hubbard et al., 2018

Campbell et al., 2019

Exercise Recommendation Guidelines



L TO R: NICK, DIAGNOSED IN 1998
EMILY, DIAGNOSED IN 2005
ANGELA, DIAGNOSED IN 2002

Aerobic

Resistance

Flexibility

Neuromotor (agility/ coordination)

Breathing

Bushman, 2012

Martin –Sanchez et. al 2020

Recommendations for Little to No Support (EDSS 0-4.4)



TIFFANY, DIAGNOSED IN 2004



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Exercise Recommendations – Little to No Support needed (EDSS 0-4.5)

Aerobic	Two to three/week- moderate intensity
Resistance	Two to three/week 1-3 set of 8-15 reps
Flexibility	Daily, 2–3 sets of each stretch
Neuromotor	Three to six/week, 20–60 minutes with individualized intensity

Kalb et. al, 2020 Table 2

Advanced Exercise Recommendations –Little to No Support needed (EDSS 0-4.5)



ANDREW, DIAGNOSED IN 2013

- 5x week 40 min of moderate intensity
- HIIT 1x/week, five 30-90 second intervals at 90-100% max effort with rest
- *Replaces continuous exercise



Lifestyle Physical Activity Recommendations – Little to No Support Needed (EDSS 0-4.5)

DONNA, DIAGNOSED IN 1989



Physical activity tracked by journal or devices (recommend 7,500 steps)

PETER, DIAGNOSED IN 2015



Lifestyle physical activity can be accumulated as part of work, household and leisure activities

Kalb et. al, 2020 Table 3

Activity	Exercise Examples for Little/No Support	Minutes
Warm up	Dynamic, gentle movements/stretchers to warm up body <ul style="list-style-type: none"> • Side stepping, hamstring curls, knee raises No equipment needed	3-5
Aerobic	Increase heart rate + build stamina <ul style="list-style-type: none"> • Use HIIT (i.e., 20 seconds of work 10 seconds rest, repeat 4-6 times for 3-5 exercises) <ul style="list-style-type: none"> • Standing mountain climbers • Standing crossover punches • Standing cherry pickers • Standing push-up while marching/jogging in place No equipment needed	5-15
Strength	Increase/maintain strength + engage major muscle groups <ul style="list-style-type: none"> • Sit to stand with shoulder press (5-10 reps) • Alternating lunge with bicep curl (6-12 reps) • Chest press in static hip bridge (5-10 reps) Use free weights, resistance bands, or household goods like cans or water bottles	5-15
Neuro-Motor/Balance	Improve/maintain physical function + prevent falls <ul style="list-style-type: none"> • Agility drills (narrow to wide quick feet in place or moving forwards/backwards) • Single leg balance drills • Tennis ball exercise 	5-10
Yoga/Stretch	Increase/maintain range of motion and flexibility + improve spasticity + prevent injury <ul style="list-style-type: none"> • Downward dog • Childs pose • Glute stretch (lying down or seated) • Quad stretch 	3-5
Breathing	Reduce heartrate + reduce stress/anxiety <ul style="list-style-type: none"> • 1-2 minutes of square breathing (4-4-4-4) Do either seated or lying on the floor	1-3
Goals	Quality over quantity = good form + progression in time and intensity	150 min/week

Recommendations for Moderate Level of Support (*EDSS 5-6.5*)



KAREN, DIAGNOSED IN 2012



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Exercise Recommendations for Moderate Level of Support (EDSS 5-6.5)

Aerobic

Two to three/week; 10–30 minutes at a moderate intensity

Resistance

Two to three/week, 1–3 sets for each exercise, 8–15 repetitions

Flexibility

Daily, 2–3 sets of each stretch, hold 30–60 sec/stretch

Neuromotor

Three to six/week, 20–60 minutes with individualized intensity

Can use
← neuromuscular
electrical stimulation

Kalb et. al, 2020 Table 2

Lifestyle Physical Activity Recommendations for Moderate Level of Support (EDSS 5-6.5)



CHRIS, DIAGNOSED IN 1993

Adapted leisure activities can increase physical activity levels

Using the appropriate mobility aid can promote physical activity and safety



LISA, DIAGNOSED IN 1998

Kalb et. al, 2020 Table 3



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Activity	Exercise Examples for Moderate level of Support	Minutes
Warm up	Dynamic, gentle movements/stretchers to warm up body <ul style="list-style-type: none"> • Side stepping, hamstring curls, knee raises (using chair or tall surface for balance) • Seated warmup (marching, knee raises, leg extensions, arm circles) Chair or tall surface	3-5
Aerobic	Increase heartrate + build stamina <ul style="list-style-type: none"> • Use HIIT (i.e., 20 seconds of work 10 seconds rest 4-6 times for 3-5 exercises) <ul style="list-style-type: none"> • Modified mountain climbers • Standing crossover punches • Standing cherry pickers • Standing push-up while marching/jogging in place No equipment needed	5-15
Strength	Increase/maintain strength + engage major muscle groups <ul style="list-style-type: none"> • Sit to stand/seated leg extension • Shoulder press • Bicep curls • Seated dips/tricep extension Use free weights, resistance bands, or household goods like cans or water bottles	5-15
Neuro-Motor/Balance	Improve/maintain physical function & prevent falls <ul style="list-style-type: none"> • Single leg balance drills (using chair for balance) • Seated tennis ball exercise • Modified “get up” 	5-10
Yoga/Stretch	Increase/maintain ROM and flexibility + improve spasticity + prevent injury	3-5
	<table border="0"> <tr> <td> <ul style="list-style-type: none"> • Neck stretch • Cat/cow pose • Half moon • Forward fold </td> <td> <ul style="list-style-type: none"> • Spinal twist • Seated hamstring • Seated glute </td> </tr> </table>	
<ul style="list-style-type: none"> • Neck stretch • Cat/cow pose • Half moon • Forward fold 	<ul style="list-style-type: none"> • Spinal twist • Seated hamstring • Seated glute 	
Breathing	Reduce heartrate + reduce stress/anxiety <ul style="list-style-type: none"> • 1-2 minutes of square breathing (4-4-4-4) Do either seated or laying on the floor	1-3
Goals	Promote quality of life + maintain/improve independence to perform activities of daily living	150min/wk

Recommendations for High Level of Support (EDSS 7.0-9.0)



JOSEPH, DIAGNOSED IN 2008



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Exercise Recommendations for High Level of Support (EDSS 7.0-7.5)

Aerobic	Up to 20 min/day, 3–7 days/week
Breathing	Every other day, 3 sets using resistive breathing equipment
Flexibility	Once/day, hold 30–60 seconds
Upper Extremity	<ul style="list-style-type: none">• Six 3-minute intervals at moderate intensity• Three times/week, 3 sets with rest in between

Kalb et. al, 2020 Table 2

Exercise Recommendations for High Level of Support Continued (EDSS 7.0-7.5)

Lower Extremity

- Walking with a walker (up to 10 feet)
- 3 sets, 10 repetitions/set of sit-to-stand
- Three to five/week, 30 minutes, power assist cycling
- Three times/ week, 30 minutes of standing
- Two to five/week, 30–60 minutes, body weight supported walking on treadmill

Core

- Two/day, isometric abdominal exercises hold 10-15
- 3–5 min/day of moving or stationary seated balance
- Every 1–2 hours, posture exercises (hold 10-15 sec)

Kalb et. al, 2020 Table 2

Exercise Recommendations for High Level of Support (EDSS 8.0-8.5)

Breathing	3 sets of 10 reps using resistive breathing equipment
Flexibility	One/day, hold 30–60 seconds with assistance
Upper Extremity	<ul style="list-style-type: none">• Six 3 min intervals with active range of motion (i.e., arm bike)• Three/ week 3 sets of 10 using resistance equipment
Lower Extremity	<ul style="list-style-type: none">• Two to three/ day, 1-2 minutes of standing with assistance• Three/week 30 minutes of standing frame
Core	<ul style="list-style-type: none">• Various core exercises that focus on stability and posture

Kalb et. al, 2020 Table 2

Exercise Recommendations for High Level of Support (EDSS 9.0)

Breathing

3 sets of 10 reps using resistive breathing equipment (ie Spirameter)

Flexibility

Focus on daily passive range of motion of all joints and if able, practice active ROM

FES

Incorporate FES for ROM and to maintain muscle mass

Kalb et. al, 2020 Table 2

Activity	Exercise Examples for High Levels of Support	Minutes
Warm up	Dynamic, gentle movements/stretchers to warm up body <ul style="list-style-type: none"> • Scapular squeezes, arm raises, arm circles Seated or in standing frame	3-5
Aerobic	Increase heartrate & build stamina <ul style="list-style-type: none"> • Mountain climbers (or rope climb, as able) • Crossover punches • Cherry pickers • Push-up Seated or in standing frame	3-10
Strength	Increase/maintain strength + maintain/improve range of motion (5-8 reps) <ul style="list-style-type: none"> • Lat pull downs (use resistance band and partner) • Rows (use resistance band and partner) • Bicep curls (free weights, resistance bands, or household goods like cans or water bottles) • Shoulder press (free weights, resistance bands, or household goods like cans or water bottles) Seated or in standing frame	3-7
Neuro-Motor/Balance	Improve/maintain physical function + trunk stability <ul style="list-style-type: none"> • Seated tennis ball exercise • Trunk stability exercise on bed 	3-5
Yoga/Stretch	Increase/maintain range of motion and flexibility + improve spasticity <ul style="list-style-type: none"> • Neck stretch • Half moon • Modified cat/cow pose • Assisted hamstring stretch • Assisted glute stretch 	3-5
Breathing	Reduce heartrate + reduce stress/anxiety <ul style="list-style-type: none"> • 1-2 minutes of square breathing (4-4-4-4) • 1-2 minutes of 4-7-8 breathing • 1-2 spirometer exercise 	3-6
Goals	Promote quality of life + maintain/improve independence to perform or assist ADLs	Varies by EDSS

How to Adapt/Modify Exercise

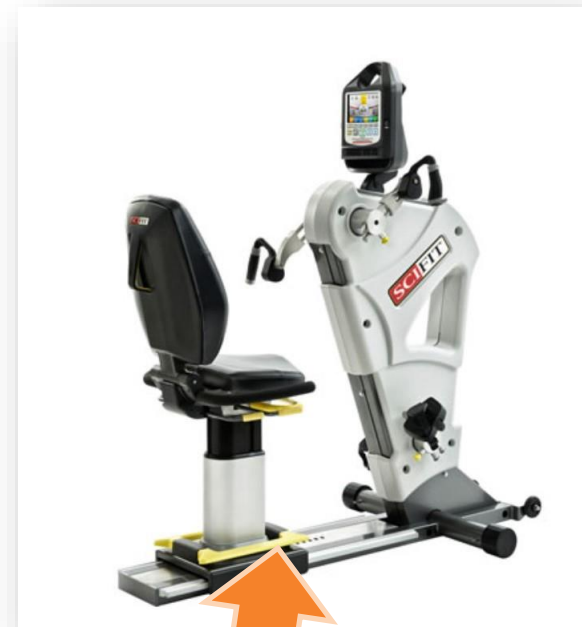


ADAPTIVE GLOVES



<https://news.sphp.com/emergency-news/sunnyview-acquires-new-fes-cycling-system/>

**FES Cycle
(functional electrical stimulation)**



<https://www.scifi.com/product/pro2/>

**Adaptive
Cardio Equipment**



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<https://www.activehands.com/product/general-purpose-gripping-aid/>

Standing Is Exercise

Motor function

Hip and ankle motion

Quality of life

Cardiorespiratory

Bowel and Bladder



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Lancet Neurol 2019; 18: 736–47

Freeman J et al 2019

Lifestyle Physical Activity Recommendations for High Level of Support (EDSS 7.0-9.0)



Brian Diagnosed in 2012

Key Message:

- Daily physical activity is essential
- Be creative and think outside the box
- Functional movement is physical activity
- Adaptive sports/physical activity may be beneficial
- Rehabilitation professionals can help clients integrate physical activity into their day



Scott (left) diagnosed in 1999

Kalb et. al, 2020 Table 3



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Up Next...

Module 4

Barriers and Facilitators to Exercise and LPA



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