# **REH25**

Orchestrating a New Path for **Multiple Sclerosis** Rehabilitation: Empowering Patients Through **Both Physical and Music Therapies** 

Megan Weigel<sup>1</sup>, Wendy Su<sup>2</sup>, Renée Fleming<sup>3</sup>, Brian Hutchinson<sup>4</sup>, Wendy L Magee<sup>5</sup>

<sup>1</sup>First Coast Integrative Medicine, Jacksonville Beach, FL, USA; <sup>2</sup>Novartis Pharmaceuticals Corporation, East Hanover, NJ, USA; <sup>3</sup>John F. Kennedy Center for the Performing Arts, Washington, DC, USA; <sup>4</sup>MS Achievement Center, Sacramento, CA, USA; <sup>5</sup>Temple University, Philadelphia, PA, USA

## Introduction

- full range of symptoms<sup>1-3</sup>
- Although disease-modifying therapies (DMTs) delay disability progression (Figure 1), symptoms (eg, ambulation, cognition, fatigue, depression) may continue to worsen<sup>1-3</sup> • Overall, 33-88% of people with MS seek complementary and alternative therapies<sup>4,5</sup>
- Physical therapy (PT) and music therapy (MT) may improve well-being and health-related quality of life (HRQoL) in MS
- Access to PT and MT is limited; nonpharmacological healthcare services are often underused owing to lack of awareness and financial support<sup>6</sup>

## Objective

focusing on PT and MT

# Methods

- Narrative review of published literature relating to use and effectiveness of PT and MT in people with MS
- MEDLINE searched without date restriction to identify studies; important themes and research studies identified by a panel of PT and MT experts

## Results

### **Physical therapy**

- PT includes use of physical methods, such as exercise and neurofacilitation, to improve/regain or maintain movement, strength, endurance and flexibility
- Early intervention may help to slow the loss of motor skills<sup>7</sup>
- PT can lead to improvements in mobility and balance • A systematic review of 16 randomized controlled trials showed that treadmill training 3 times per week for 8 weeks improved walking endurance by 26.5 m from Baseline<sup>8</sup>
- Exercise intervention to improve core strength and balance led to an increase of 16.4 m in the 2 minute walk test at 30 weeks versus controls, who received standard of care on walking therapy<sup>9</sup>
- PT can also provide clinically meaningful improvements in fatigue, mood, cognition and HRQoL
- In a Cochrane review of 26 clinical studies, exercise therapy led to a clinically important reduction in fatigue versus nonexercise interventions  $(p<0.01)^{10}$
- 20 people with MS, who performed high-intensity resistance training twice a week for 12 weeks, had significant reductions in anxiety (p=0.002), depression (p=0.019) and fatigue (p=0.001); and improvements in cognitive processing speed (p=0.04)<sup>11</sup>
- There are few, if any, negative side effects of PT<sup>12</sup>

## Music therapy

- MT addresses active patient-centered health goals through playing music, singing, songwriting, or listening and responding to music<sup>13</sup>
- MT may help to improve a range of functional and psychosocial domains
- Listening to or performing music integrates functioning across multiple neurological domains (eg, cognitive, motor, language, auditory, emotional)<sup>14,15</sup>
- Entrainment, the use of rhythm-based training to improve gait and mobility, can successfully combine MT with PT to help patients with MS<sup>16</sup>

• As multiple sclerosis (MS) progresses, a multidisciplinary approach is required to provide supportive therapy for the

• Review the role of nonpharmacological therapies in MS,

Figure 1. FDA-approved DMTs for relapsing and progressive MS



een withdrawn from the market in the USA since April 30, 2018 Active form of SPMS only; indication obtained in 2019 CIS, clinically isolated syndrome; DMTs, disease-modifying therapies; FDA, Food and Drug Administration (USA); MS, multiple sclerosis; PPMS, primary progressive multiple sclerosis; RRMS, relapsing-remittin SPMS, secondary progressive multiple sclerosis From Weigel M, et al. Orchestrating a new path for MS: empowering patients through physical and music therapies (in development)

### Figure 2. Effect of music-cued, metronome-cued and no intervention on walking (A and B), fatigue (C), and HRQoL (D



Music-cued Metronome-cued Control



T25FW, timed 25-foot walk Adapted from Seebacher B, et al. 2017<sup>16</sup>



6MWT, 6-minute walk test; HRQoL, health-related quality of life; MFIS, Modified Fatigue Impact Scale; MS, multiple sclerosis; MSWS-12, multiple sclerosis walking scale-12; SF-36, Short Form-36 Health Survey;

	<ul> <li>MT can improve p</li> <li>(Figure 2)</li> </ul>
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	Mean chang -17.1 m <sup>16</sup>
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kimel fumarate RRMS, SPMS <sup>b</sup>	<ul> <li>MT can also improved memory<sup>17-19</sup> and or responses to the provide the providet the provide the providet the providet the providet the pr</li></ul>
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D) in MS <sup>16</sup>	<ul> <li>symptom worse long-term healt</li> <li>Current studies of</li> </ul>
	beneficial tools for motor skills, impro health factors and
**p<0.001	<ul> <li>Earlier intervention decline of patients</li> </ul>
	<ul> <li>A multidisciplinary optimal results in with MS</li> </ul>
	<ul> <li>Further research of and also the effect may further improvided</li> </ul>
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- ohysical symptoms and HRQoL in MS
- ng music-cued (music and rhythm) and led (rhythm only) motor imagery versus no und that individuals in the two intervention valk a mean of 62.1 m and 60.9 m further respectively, versus Baseline
- ge in the no intervention group was
- s in fatigue and HRQoL (physical function, perception, vitality, social function, mental ed in both intervention groups versus no
- ove fine motor skills, learning and offers a forum for exploring emotional physical changes experienced in MS<sup>20,21</sup>

- approach is fundamental to achieve treatment and rehabilitation of people
- logical rehabilitative therapies are an nct for managing daily life
- ion may have the potential to lessen ening and reduce polypharmacy and thcare costs<sup>22</sup>
- PT and MT indicate they are highly r delaying the loss of both fine and gross oving overall well-being and psychosocial d, ultimately, preserving HRQoL<sup>23</sup>
- on may potentially lessen the functional s through adaptive neuroplasticity<sup>24</sup>
- <sup>r</sup> approach is fundamental in achieving the treatment and rehabilitation of people
- on combined PT and MT interventions. ct of these therapies on neuroplasticity, ove outcomes in MS
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To: 8NOVA (86682) US Only +18324604729 North, Central and South Americas; Caribbean; China +447860024038 UK, Europe and Russia +46737494608 Sweden, Europe

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