Supplemental Table 1. Summary of Selected Evidence on Activity- and Participation-Based Occupational Therapy–Related Interventions for People With Multiple Sclerosis

Author/Year	Study Objectives	Level/Design/Participants	Intervention and Outcome Measures	Results	Study Limitations
			Rehabilitation Programs		
Craig, Young, Ennis, Baker, & Boggild (2003)	To compare the effect of comprehensive MDR with standard care on disease severity and motor function	Level I RCT, 3-mo follow-up *N* = 41 participants with MS (time since onset, range = 0–24 yr)	*Intervention* *Intervention group:* MDR focused on goals set during initial assessments; OT included adapted equipment, fatigue and stress management, and referral to social services *Control group:* Intravenous methylprednisolone management only *Outcome Measures* Disease severity, motor impairment	The intervention group showed significant reduction in disease severity and improvement in motor function from baseline to 3-mo assessment compared with the control group. ADLs, activity profile, and QOL also significantly improved.	The reliability and validity of the primary outcome measure were not provided. Assessors were not blinded.
Grasso, Troisi, Rizzi, Morelli, & Paolucci (2005)	To evaluate the effect of inpatient MDR on, and prognostic factors for, disease severity and functional status	Level III One group *N* = 230 participants with MS (*M* age = 49.42 yr; *M* disease duration = 16.90 yr, *SD* = 9.89)	*Intervention* Individualized, goal-oriented, inpatient MDR focused on promoting ADL skills, maintaining use of upper limbs for ADL, and enhancing communication skills and attention span *Outcome Measures* Disease severity, ADL performance, mobility	No change was found in disease severity. Significant improvement in functional status was found at discharge. Participants with mild and moderate MS showed significantly higher effects on ADLs and mobility. Cognitive impairment and longer disease duration were closely and negatively associated with effectiveness in ADLs but not in mobility. Participants without severe sphincteric disturbances had better improvement in ADLs.	No control group or follow-up assessments were used.
Khan, Pallant, Brand, & Kilpatrick (2008)	To evaluate the effect of an individualized rehabilitation program on activity and participation	Level I Stratified RCT *N* = 101 participants with MS Data from 48 participants in the treatment group and 50 participants in the control group were available for analysis. Inpatient program, *n* = 24 Outpatient program, *n* = 25	*Intervention* Comprehensive MDR over 12 mo; OT included fatigue management and functional retraining in ADL *5-day inpatient group:* 3 hr of therapy per day *Individualized outpatient group:* Therapy 2–3×/wk for ≤6 wk *Control group:* 8 weekly monitoring phone calls regarding medical and hospital visits in the previous month *Outcome Measures* Functional performance, health-related QOL	The treatment group showed more improvement in activity and participation and the control group more deterioration over time. No significant results were found for QOL. 12 control participants required treatment. Significant differences were found between groups on the FIM™ motor scale and FIM domains of self-care, sphincter, transfers, and locomotion.	Data were obtained from a single site.

(*Continued*)

Supplemental Table 1. Summary of Selected Evidence on Activity- and Participation-Based Occupational Therapy–Related Interventions for People With Multiple Sclerosis (*cont.*)

Author/Year	Study Objectives	Level/Design/Participants	Intervention and Outcome Measures	Results	Study Limitations
Khan, Ng, & Turner-Stokes (2009); Kahn, Turner-Stokes, Ng, & Kilpatrick (2008)	To evaluate the effect of organized MDR on activity, participation, or both	Level I Systematic review *N* = 7 RCTs, 1 controlled clinical trial	*Intervention* Trials comparing MDR with routinely available local services, lower levels of intervention, or interventions in different settings or at different levels of intensity *Outcome Measures* Levels of evidence; subgroup analysis—type, setting, and intensity of rehabilitation	No change was found in impairment level. Inpatient MDR produced short-term effects on levels of activity and participation. For outpatient and home-based MDR, limited evidence was provided for short-term improvement in symptoms and disability with high-intensity programs, and strong evidence was provided for longer term improvement in QOL in low-intensity programs.	Few high-quality studies were found.
Maitra et al. (2010)	To evaluate the effect of OT intervention in an urban inpatient rehabilitation setting	Level II Secondary retrospective analysis of medical charts *N* = 193 charts (148 women; *M* length of stay = 13.34 days)	*Intervention* OT services, establishment of initial goals, reevaluation of goal status at discharge *Outcome Measures* Specific OT interventions, duration, functional performance at initial assessment, expected performance, discharge performance (FIM scores)	Patients received OT on 56% of days. The most common OT interventions were self-care, therapeutic exercise, and occupation-based therapeutic activities. The greatest improvements were found in ADLs. Increasing OT intensity had a positive effect on all FIM scores except feeding. Self-care training was positively associated with independence in all ADL categories, indicating that clients may improve self-care by practicing self-care activities directly.	Data were obtained from a single site. The analysis was retrospective.
Patti et al. (2002, 2003)	To evaluate the effect of a 6-wk comprehensive outpatient rehabilitative MDR on quality of life, depression, fatigue impact, social experience, impairment, and disability	Level I RCT, 6-wk follow-up *N* = 111 participants with confirmed MS (EDSS score = 4.0–8.0)	*Intervention* *Intervention group:* 6 wk of individualized, goal-directed MDR and 6 wk of home self-exercise *Wait-list control group:* 12 wk of home self-exercise *Outcome Measures* QOL, depression, fatigue impact, social experience, impairment, disability	The intervention group improved in self-perceived health-related QOL. At follow-up, the intervention group had improved QOL; reduced fatigue impact; and improved social functioning, depression, and motor function. No significant changes were found in impairment.	Little detail was provided about the rehabilitation program.
Storr, Sorensen, & Ravnborg (2006)	To evaluate the effect of an MDR inpatient program on health-related QOL and level of activity	Level I Double-blinded RCT	*Intervention* *Intervention group:* 3–5 wk of MDR based on personal needs, three 30-min OT sessions per week	No significant changes were found between groups on outcome measures.	Cointervention was not controlled for. Sample sizes were unequal between groups.

(*Continued*)

Supplemental Table 1. Summary of Selected Evidence on Activity- and Participation-Based Occupational Therapy–Related Interventions for People With Multiple Sclerosis (*cont.*)

Author/Year	Study Objectives	Level/Design/Participants	Intervention and Outcome Measures	Results	Study Limitations
		N = 106 participants with MS (EDSS scores < 9.0; median time since diagnosis = 9.0 yr) Intervention group, n = 41 (3 withdrew) Control group, n = 65 (13 withdrew) for both groups	*Wait-list control group:* No intervention *Outcome Measures* QOL, impairment, level of activity	Cointervention was observed in both the intervention and control groups.	No information was provided about intervention except for physical therapy.
Fatigue Management Courses					
Ghahari, Leigh Packer, & Passmore (2010)	To evaluate the effect of an online fatigue self-management program on fatigue impact, activity participation, and QOL	Level I RCT, 3-mo follow-up N = 95 participants; 74 with fatigue secondary to MS, 8 with fatigue secondary to Parkinson's disease, and 13 with fatigue secondary to postpolio syndrome Attrition rate: 9% at posttest, 21% at follow-up	*Intervention* *Fatigue self-management group (FG):* 7-wk online program with content, activities, and discussion *Information-only group (IP):* Identical content but no access to fatigue group *Control group:* No intervention *Outcome Measures* QOL, activity participation, fatigue impact	No significant differences were found among the 3 groups on the primary outcome measures except for a posttest difference in the Personal Wellbeing Index between the IP and control groups. Significant improvement was found on fatigue impact and activity participation in the FG and IP groups over time. The observed power for the FG group was extremely low.	Diagnoses in the sample were mixed. Subgroups were unequal in size.
Hugos et al. (2010)	To evaluate the effect of the Fatigue: Take Control program on fatigue and self-efficacy	Level I RCT N = 30 participants with MS (M age = 56.87 yr; M EDSS score = 5.2 for Fatigue: Take Control group and 4.0 for control group)	*Intervention* *Fatigue: Take Control group:* Six 2-hr weekly sessions consisting of DVD viewing, topic-focused group discussion, individual goal setting, and homework assignments; topics were identification of treatable or secondary causes of fatigue, priority setting, environmental modifications, management of mobility problems, energy effectiveness strategies, and importance of exercise *Wait-list control group:* 20- to 30-min biweekly meeting to complete study documents *Outcome Measures* MFIS, Fatigue Severity Scale, self-efficacy	No significant changes were found in fatigue severity in either group. Participants in the Fatigue: Take Control group had significant improvement in MFIS total, physical, and psychosocial scores. After taking the course, the wait-list control group showed improvement that did not reach significance. A significant effect was observed in overall mean self-efficacy scores for the Fatigue: Take Control group.	Sample size was small. A higher percentage of participants in the experimental group (33.3%) than in the wait-list group (13.3%) received interferon.

(*Continued*)

Supplemental Table 1. Summary of Selected Evidence on Activity- and Participation-Based Occupational Therapy–Related Interventions for People With Multiple Sclerosis (*cont.*)

Author/Year	Study Objectives	Level/Design/Participants	Intervention and Outcome Measures	Results	Study Limitations
Mathiowetz, Finlayson, Matuska, Chen, & Luo (2005); Mathiowetz, Matuska, Finlayson, Luo, & Chen (2007)	To evaluate the efficacy and effectiveness of a 6-wk energy conservation course in terms of fatigue impact, QOL, and self-efficacy	Level I RCT, crossover, 1-yr follow-up *N* = 169 participants with MS (*M* age = 48.34 yr; *M* time since diagnosis = 9.47 yr) Attrition rate = 23%	*Intervention* *Managing Fatigue course:* Six 2-hr weekly sessions on importance of rest, communication, body mechanics, ergonomic principles, environmental modification, changing standards, priority setting, activity analysis and modification, and balanced lifestyle *Control period:* No treatment *Outcome Measures* FIS, QOL, self-efficacy	A significant decrease was found in intervention group scores immediately postcourse except on the cognitive subscale (moderate to large effect sizes for all subscales). Significant increases were found in Vitality, Role–Physical, and Mental Health subscale scores (moderate to large effect sizes) for the intervention group postcourse. Self-efficacy improved significantly postcourse. These beneficial effects were maintained at 1-yr follow-up.	The attrition rate was high. No placebo control group was used.
Health Promotion Programs					
Bombardier et al. (2008)	To evaluate the effect of a 12-wk motivational interviewing–based telephone counseling program on health promotion activities and other health outcomes	Level I Single-blinded RCT *N* = 130 community-dwelling adults (age range = 19–70 yr) able to walk ≥90 m without assistance	*Intervention* *Treatment group:* One 60- to 90-min motivational interview and goal-setting meeting and 5 follow-up telephone counseling sessions to promote follow-through with the plan *Wait-list control group:* No treatment *Outcome Measure* HPLP II	6 participants in the treatment group and 1 in the wait-list control group did not complete the study. The majority of participants (58.6%) chose exercise promotion activities. The treatment group showed significant improvement in physical activity, spiritual growth, and stress management. Those who chose exercise engaged in more health promotion activities and self-reported minutes of exercise per week, but no significant improvement was found for fatigue.	Reliability and validity of the primary outcome measure were not provided.
Ennis, Thain, Boggild, Baker, & Young (2006)	To evaluate the effect of a health promotion education program (OPTIMIZE) on self-efficacy and health-promoting behaviors	Level I RCT, 3-mo follow-up *N* = 62 adults, most with moderate relapsing–remitting MS (*M* age = 45 yr, treatment group; 30 yr, control group)	*Intervention* *Treatment group:* Eight 3-hr weekly sessions of group OPTIMIZE program providing knowledge, skills, and confidence to undertake health-promoting activities; 5 components were exercise and physical activity, lifestyle adjustment and fatigue management, stress management, nutritional awareness, and responsible health practices	Significant differences between the two groups were observed at the postintervention evaluation (HPLP Total scores and HPLP Health Responsibility, Physical Activity, Spiritual Growth, and Stress Management subscales). The benefit of the program was maintained 3 mo postintervention.	Group composition was heterogeneous. Reliability and validity of the primary outcome measure were not provided.

(*Continued*)

Supplemental Table 1. Summary of Selected Evidence on Activity- and Participation-Based Occupational Therapy–Related Interventions for People With Multiple Sclerosis (*cont.*)

Author/Year	Study Objectives	Level/Design/Participants	Intervention and Outcome Measures	Results	Study Limitations
			Control group: Continuation of present level of care *Outcome Measures* HPLP II		
Plow, Mathiowetz, & Lowe (2009)	To compare the efficacy of individualized physical rehabilitation (IPR) with a group wellness intervention (GWI) in promoting physical activity and health	Level I RCT, 8-wk follow-up *N* = 42 participants with MS (*M* age = 48.5 yr) able to walk with or without an assistive device *N* = 38 in primary analysis because of 4 missing participants at posttest	*Intervention* *IPR:* 4 physical therapy exercise sessions once every other week and phone calls between sessions to emphasize functional limitations or to make exercises more challenging *GWI:* Discussion of physical activities and incorporation of selected portions of the energy conservation course, 2 hr/wk for 7 wk *Both groups:* Home exercise program, 45 min 5 days/wk, consisting of indoor bicycling and stretching (3 days/wk) and strength and balance training (2 days/wk) *Outcome Measures* QOL, MFIS, Mental Health Inventory	In terms of overall effects (postintervention), both groups significantly improved in health and physical activity, but no significant differences were found between the two groups. In terms of immediate effects, the intervention group significantly decreased in QOL Physical Summary but improved on the Mental Health Inventory at posttest. No improvement in MFIS scores was found. At follow-up, significant improvement was found in MFIS scores. No significant improvement was noted in QOL and Mental Health Inventory scores. The IPR had a greater effect in reducing fatigue impact (.66) and impeding the decline of physical health (−.28), whereas GWI had a greater effect on mental health (.65).	A true control group was not used.

Note. ADL = activity of daily living; EDSS = Expanded Disability Status Scale; FIS = Fatigue Impact Scale; HPLP II = Health Promoting Lifestyle Profile II; *M* = mean; MDR = multidisciplinary rehabilitation; MFIS = Modified Fatigue Impact Scale; MS = multiple sclerosis; OT = occupational therapy; QOL = quality of life; RCT = randomized controlled trial; *SD* = standard deviation.

Suggested citation: Yu, C.-H., & Mathiowetz, V. (2014). Systematic review of occupational therapy–related interventions for people with multiple sclerosis: Part 1. Activity and participation (Suppl. Table 1). *American Journal of Occupational Therapy, 68,* 27–32. http://dx.doi.org/10.5014/ajot.2014.008672