Table 1. Results of title-and-abstract screening and full-text article review

Articles identified:	1487
Abstracts:	
Included	739
Excluded	748
Full-text articles:	
Included	168
Excluded	571

Table 2. Included full-text articles by research question

Question 1a *(diagnostic reliability of McDonald criteria)*	13
Question 1b *(inter-rater reliability of diagnosis with McDonald and Poser criteria)*	2
Question 2 *(predictors of physical and mental impairments at 12 months)*	12
Question 3a *(disease-modifying therapies and long-term improvement)*	51
Question 3b *(symptom management and improvement)*	68
Question 4 *(association of clinical findings with work ability)*	22
Question 5 *(environmental factors and work ability)*	1
Total	168*

* Note: One article was included for both Question 4 and Question 5

Table 3. Data supporting the validity of MRI components of the McDonald criteria

Study	Diagnosis	Time to diagnosis of CDMS	Para-clinical test(s)	Findings associated with CDMS	Proportion developing CDMS	SN	SP
Barkhof et al. 1997[22]	CIS	Median follow up (with range): 9 mo (1-48 mo) for patients with CDMS (n = 33); 39 mo (23-96 mo) for patients without CDMS (n = 41)	MRI	No. of T2 lesions ≥ 9 No. of abnormal MRI criteria:* 0 1 2 3 4 Specific MRI criteria: Final model Paty et al. 1988[35] Fazekas et al. 1988[36]	24/30 (80%) 16% 11% 54% 75% 87%	73% 82% 88% 88%	80% 78% 54% 54%
Brex et al. 2001[23]	CIS	1-year follow up (n = 68)	MRI	T2 lesions Enhancing lesions T2 lesion at baseline and new T2 lesion Enhancing lesion at baseline and new enhancing lesion	16/48 (33%) 11/21 (52%) 15/27 (56%) 7/10 (70%)	89% 61% 83% 39%	36% 80% 76% 94%
CHAMPS Study Group 2002[24]	CIS	18-month follow up (n = 190)	MRI	No. of T2 lesions: 2-4 5-8 9-12 13-21 22-34 > 35 No. of enhancing lesions: 0 1 > 1 > 2	 20% 15% 33% 33% 26% 20% 23% 33% 43% 52%		
Comi et al. 2001[25]	CIS	2 years (n = 241)	MRI	No. of T2 lesions: 0-8 > 8	NR (OR, 3.64; 95% CI, 1.3 to 10.2; p = 0.014)		

Table 3. Data supporting the validity of MRI components of the McDonald criteria (continued)

Study	Diagnosis	Time to diagnosis of CDMS	Para-clinical test(s)	Findings associated with CDMS	Proportion developing CDMS	SN	SP
Filippi et al. 1994[28]	CIS	Mean follow up, 63 months (n = 89)	MRI	Initial MRI normal Initial lesion load > 1.23 cm^3 Initial MRI abnormal, but lesion load < 1.23 cm^3	2/32 (6%) 19/21 (90%) 17/31 (55%)		
Morrissey et al. 1993[30]	CIS	5-year follow up (n = 89)	MRI	No. of lesions: 0 1 2-3 4-10 > 11	 2 (6%) 1 (17%) 12 (67%) 12 (92%) 16 (80%)		
Optic Neuritis Study Group 2001[32]	Optic Neuritis	5-year follow up (n = 388)	MRI	No. of lesions: 0 1 2 > 3	 16% 44% 26% 51%		
O'Riordan et al. 1998[31]	CIS	10-year follow up (n = 81)	MRI	No. of asymptomatic lesions at baseline MRI: 0 1 2-3 4-10 > 10	 3/27 (11%) 1/3 (33%) 14/16 (87%) 13/15 (87%) 17/20 (85%)		
Sastre-Garriga et al. 2003[33]	CIS (brainstem syndrome)	12-month follow up (n = 51)	MRI CSF EPs	Abnormal MRI Abnormal CSF-OCB Abnormal EPs Specific MRI criteria: Paty et al. 1988[35] Fazekas et al. 1988[36] Barkhof et al. 1997[22]	17/46 (37%) 11/25 (44%) 10/29 (34%) 16/32 (50%) 16/33 (48%) 14/27 (52%)	94% 100% 89% 89% 78%	42% 42% 52% 48% 61%

*Abnormal MRI criteria: ≥ 1 gadolinium-enhancing lesions, ≥ 1 juxtacortical lesions, ≥ 3 periventricular lesions, and ≥ 1 infratentorial lesions.

Abbreviations: CDMS = clinically definite multiple sclerosis; CI = confidence interval; CIS = clinically isolated syndrome; CSF = cerebrospinal fluid; EPs = evoked potentials; mo = month(s); MRI = magnetic resonance imaging; No. = Number; OCB = oligoclonal bands; OR = odds ratio; SN = sensitivity; SP = specificity

Table 4. Studies validating the McDonald criteria

Study	Diagnosis	Time from onset of symptoms	Time to diagnosis of CDMS	Sensitivity	Specificity	PPV	NPV	Accuracy
Dalton et al. 2002[27]	CIS	3 months (n = 79)	1 year	0.73	0.87	0.58	0.93	0.84
		1 year (n = 50)	3 years	0.94	0.83	0.77	0.96	0.87
Tintoré et al. 2003[34]	CIS	1 year (n = 86)	49 months (mean follow up)	0.74	0.86	NR	NR	0.80

Abbreviations: CDMS = clinically definite multiple sclerosis; CIS = clinically isolated syndrome; NPV = negative predictive value (predictive value of a negative test result); NR = not reported; PPV = positive predictive value (predictive value of a positive test result)

Table 5. Kappa statistics for multiple raters using Poser and McDonald criteria

Poser criteria		**McDonald criteria**	
Diagnosis of MS (all categories):	0.57	Diagnosis of MS (all categories):	0.57
Clinically definite MS:	0.39	MS:	0.57
Clinically probable MS:	0.37	Possible MS:	0.49
Dissemination in time:	0.69	-	
Dissemination in space:	0.46	-	

Abbreviation: MS = multiple sclerosis

Table 6. Relapse rate outcomes from placebo-controlled RCTs of disease-modifying therapies

Study	Therapy	Relapse rate parameter	Active	Placebo	Difference	P-value
Achiron et al. 1998[53]	IV IgG	ARR:				
		Baseline	1.85	1.55	0.30	0.34
		Year 1	0.75	1.80	1.05	0.0002
		Year 2	0.42	1.42	1.0	0.0009
Fazekas et al. 1997a[63] Fazekas et al. 1997b[64]	IV IgG	ARR:				
		Year 1	0.49	1.30	0.81	0.011
		Year 2	0.42	0.83	0.41	0.006
Cohen et al. 2002[59]	IFNβ-1a	ARR	0.20	0.30	0.10	0.008
Jacobs et al. 1996[76] Rudick et al. 1997[97] Fischer et al. 2000[65] Jacobs et al. 2000[75] Rudick et al. 2000[96]	IFNβ-1a	ARR	0.67	0.82	0.15	0.04
SPECTRIMS Study Group 2001[100]	IFNβ-1a	ARR	0.50	0.71	0.21	0.001
European Study Group on Interferon beta-1b in Secondary Progressive MS 1998[62]	IFNβ-1b	ARR	0.44	0.64	0.20	0.0002
IFNB Multiple Sclerosis Study Group 1993[72] IFNB Study Group 1995[73] IFNB Study Group 1996[74] Pliskin et al. 1996[92]	IFNβ-1b	ARR:				
		Year 1	0.96	1.44	0.48	
		Year 2	0.85	1.18	0.33	
		Year 3	0.66	0.92	0.26	
		Year 4	0.67	0.88	0.21	
		Year 5	0.57	0.81	0.24	
PRISMS Study Group 1998[93] Liu et al. 1999[82] Liu et al. 2002[84] Patten et al. 2001[89]	IFNβ-1a	Relapse rate, not annualized, ~ 2 years	1.73	2.56	0.83	
Bastianello et al. 1994[54]	Mitoxantrone	Mean RR	0.54	1.67	1.13	0.014
Millefiorini et al. 1997[86]	Mitoxantrone	No. of relapses	0.89	2.62	1.73	0.0002
Johnson et al. 1995[78] Weinstein et al. 1999[103] Liu et al. 2000[83] Johnson et al. 1998[77]	Glatiramer	ARR	0.59	0.84	0.25	NR
Goodkin et al. 1991[68]	Azathioprine	ARR:				
		Year 1	0.74	1.17	0.43	0.16
		Year 2	0.30	0.79	0.49	0.05
Romine et al. 1999[95]	Cladribine	Relapse rates, annualized (?)	0.77	1.67	0.90	NR

Abbreviations: ARR = annual relapse rate; IFNβ-1a = interferon β-1a; IFNβ-1b = interferon β-1b; IV IgG = intravenous immunoglobulin-G; No. = Number; NR = not reported; RCTs = randomized controlled trials; RR = relapse rate

Table 7. Improvements in physical function (EDSS) in placebo-controlled RCTs of disease-modifying therapies

Study	Therapy	Definition(s) of improvement (change in EDSS)	Active	Placebo	Difference
Achiron et al. 1998[53]	IV IgG	-1.0 point over 2 years	31%	14%	17%
Fazekas et al. 1997a[63] Fazekas et al. 1997b[64]	IV IgG	-1.0 point over 2 years	31%	14%	16%
Cohen et al. 2002[59]	IFNβ-1a	Improvement not defined	7.5%	7.3%	0.2% (NS)
Jacobs et al. 1996[76] Rudick et al. 1997[97] Fischer et al. 2000[65] Jacobs et al. 2000[75] Rudick et al. 2000[96]	IFNβ-1a	-1.0 point (not sustained) -0.5 point (not sustained) -1.0 point (sustained) -0.5 point (sustained)	19.3% 15.7% 18.2% 25.5%	11.5% 11.5% 8.9% 16.1%	8.2% 4.2% 9.7% 9.4%
Patti et al. 1999[90]	nIFNβ	-0.5 or -1.0 point: Relapsing-remitting Secondary progressive	 52% 40%	 3% 5%	 49% 35%
Johnson et al. 1995[78] Weinstein et al. 1999[103] Liu et al. 2000[83] Johnson et al. 1998[77]	Glatiramer	-1.0 point: 2-year trial Extension trial	 24.8% 27.2%	 15.2% 15.0%	 9.6% 12.2%
Bornstein et al. 1987[55]	Glatiramer	-1.0 point over 2 years -2.0 points over 2 years -3.0 points over 2 years	20.0% 12.0% 0	8.7% 0 4.4%	11.4% 12.0% -4.4%
Ghezzi et al. 1989[67]	Azathioprine	Improvement not defined: Relapsing Relapsing-progressive	 16% 5%	 0 7%	 16% (NS) -2% (NS)
Goodkin et al. 1991[68]	Azathioprine	Improvement on EDSS or 9HPT	22.2%	20%	2.2%
van de Wyngaert et al. 2001[102]	Mitoxantrone	Improvement not defined	35%	22%	13% (NS)
Canadian Cooperative Multiple Sclerosis Study Group 1991[58]	Cyclo-phosphamide	-1.0 point sustained for: 1 year 2 year Final	 6% 6% 4%	 2% 0 2%	 4% 6% 2%
Canadian Cooperative Multiple Sclerosis Study Group 1991[58]	Plasma exchange	-1.0 point sustained for: 1 year 2 year Final	 8% 3% 2%	 2% 0 2%	 6% 3% 0
Khatri et al. 1985[80]	Plasma exchange	> 1.0 point at 11 months: ≥ 3 points 2 points 1 point	 10% 13% 13%	 0 3% 14%	 10% 10% -1%

Abbreviations: 9-HPT = 9-Hole Peg Test; EDSS = Expanded Disability Status Scale; IFNβ-1a = interferon β-1a; IV IgG = intravenous immunoglobulin-G; nIFNβ = natural interferon-β; NS = not statistically significant; RCTs = randomized controlled trials

Table 8. Randomized controlled trials of symptomatic treatments for spasticity

Treatment	Study	Baseline EDSS	No. of patients started (completed)	Outcomes/Results
Baclofen PO (to 80 mg/d) vs. Placebo *Crossover*	Feldman et al. 1978[109]	NR	33	Spasm frequency (p < 0.05) Resistance to movement (p < 0.05) Clonus (knee) (p < 0.001) Ambulation (p = NS) Transfer activity (p = NS) Spastic limb pain (p = NS) Use of spastic limb (p = NS) Functional assessment (Barthel) (p = NS)
Baclofen PO (to 80 mg/d) vs. Placebo	Sachais et al. 1977[129]	NR	166 (106)	Flexor spasm severity (p < 0.02) Ankle clonus (p = NS) ADL (p = NS) Overall disability (p = NS)
Baclofen PO (to 45 mg/d) vs. Placebo *Crossover*	Ørsnes et al. 2000[124]	5.0 (median) 3.5-6.0 (range)	14	Voluntary power (0-5 scale) (p = NS) Ashworth Scale (p = 0.33) Tendon reflexes (p = 0.14) EDSS & Ambulation Index (p = NS) NRS (p = NS) MSIS (p = NS)
Baclofen PO (to 80 mg/d) vs. Placebo	Levine et al. 1977[117]	NR	19 (18)	Ashworth Scale (p = NS)
Baclofen PO (to 60 mg/d) vs. Placebo *Crossover*	Sawa et al. 1979[130]	NR	21 (18)	Muscle tone (p = NR)
Baclofen PO (to 20 mg/d) vs. Stretching exercises + baclofen vs. Stretching exercises vs. Placebo *Crossover*	Brar et al. 1991[105]	NR	38 (30)	Spasticity: Cybex flexion scores (p < 0.05; baclofen and combination vs. placebo) Ashworth Scale (p = 0.1; combination vs. placebo) Self-rated questionnaire of functional abilities (p = NR)
Baclofen intrathecal vs. Placebo *Crossover*	Penn et al. 1989[125]	NR	20 (10 MS)	Ashworth Scale (p < 0.0001) Spasm score (p < 0.0005)
Tizanidine PO (to 36 mg/d) vs. Placebo	Smith et al. 1994[133]	NR	257 (159)	Ashworth Scale (p = 0.46) Spasm response (p = 0.03) Clonus response (p = NS)
Tizanidine PO (to 36 mg/d) vs. Placebo	UK Tizanidine Trial Group 1994[137]	NR	187 (155)	Ashworth Scale (p < 0.004) Spasm frequency (p = NS) Muscle strength (p = NS) EDSS (p = NS) Tendon reflexes Intermediate motor skills (p = NS) Upper limb function (p = NS) Impact on physical therapy (p = NS) Impact on nursing care (p = 0.09)

Table 8. Randomized controlled trials of symptomatic treatments for spasticity (continued)

Treatment	Study	Baseline EDSS	No. of patients started (completed)	Outcomes/Results
Gabapentin PO 2700 mg vs. Placebo *Crossover*	Cutter et al. 2000[107]	6.0-9.0 (range)	22 (21)	Spasm frequency scale (p = 0.0001) Spasm severity scale (p = NS) Interference with function scale (p = 0.02) Painful spasm scale (p = NS) Global assessment scale (p = 0.003) Modified Ashworth Scale (p = 0.0005) EDSS (p = NS)
Gabapentin PO 400 mg vs. Placebo *Crossover*	Mueller et al. 1997[121]	NR	15	Visual Faces Scale rating of pain and spasticity (p = 0.008) Ashworth Scale (p = 0.007) Clonus (p = 0.1) Reflex withdrawal to pain (p = NS) EDSS (p = 0.03)
Dantrolene PO (to 350 mg/d) vs. Placebo *Crossover*	Gambi et al. 1983[111]	NR	24 (22)	Hip flexor movement (p = NS) Spasticity scale (p < 0.05) Muscular strength (p = NS) Clonus (p = NS) Knee and ankle tendon reflexes scale (p = NS)
Delta-9-THC vs. Cannabis sativa extract vs. Placebo	Zajicek et al. 2003[138]	NR	630 (611)	Muscle tone (p=0.4) Pain (p=0.003; favoring active treatments) Subjective spasticity (p=0.01) 10-meter walk (p=0.015; favoring delta-9-THC)
Delta-9-THC vs. Cannabis sativa extract vs. Placebo *Crossover*	Killestein et al. 2002[115]	6.2 ± 1.2 (mean ± SD)	16	MSFC score (p = 0.09; favoring placebo) 9-HPT (p = 0.02; favoring placebo) EDSS (p = NS) Muscle tone (p = NS) SF-36 mental health subscale (p = 0.02) and psychological status domain (p = 0.02) Other parameters (p = NS)
Progabide PO (to 45 mg/kg/d) vs. Placebo *Crossover*	Rudick et al. 1987[128]	6.3 ± 1.7 (mean ± SD)	32 (25)	Ashworth Scale (p < 0.01) EDSS (p = NS) 8-meter walk (p = 0.62) Spasm frequency (p = 0.28) Reflex scores (p = 0.20) Strength (p = 0.77) Various functional tasks (p = NS)
Progabide PO (14.3-32.7 mg/kg/d) vs. Placebo *Crossover*	Mondrup et al. 1984[119,120]	NR	17 (14)	Spasticity (0-4 scale) (p < 0.01) Spasms (p < 0.01) Reflex response (p < 0.01, patellar; p = NS, Achilles) Flexor reflexes (p = NS) Muscle strength (p = NS) Spasm frequency (p < 0.05) Spasm pain (p = NS)

Table 8. Randomized controlled trials of symptomatic treatments for spasticity (continued)

Treatment	Study	Baseline EDSS	No. of patients started (completed)	Outcomes/Results
Botulinum toxin IM vs. Placebo	Hyman et al. 2000[114]	7.5 (median [estimated])	74 (60)	Hip abduction (p = NS) Modified Ashworth Scale (p = NS) Spasm frequency (p = NS) Hygiene assessment (p = NR)
Botulinum toxin IM vs. Placebo *Crossover*	Snow et al. 1990[135]	8.0-9.5 (range)	10 (9)	Spasticity score (Ashworth Scale + spasm frequency) (p = 0.009) Hygiene score (p = 0.02)
Threonine PO (7.5 g/d) vs. Placebo *Crossover*	Hauser et al. 1992[112]	4.7 ± 1.5 (mean ± SD)	26 (21)	Spasticity (clinician scale) (p = 0.04) Spasticity (patient scale) (p = 0.18)
Threonine PO 6 g/d vs. Placebo *Crossover*	Lee et al. 1993[116]	7.4 (mean) 2-9 (range)	41 (33)	Spasticity score (based on Ashworth) (p = NR) Barthel Index (p = NS) EDSS (p = NS)
Electrical neuromuscular stimulation vs. Sham stimulation	Livesley 1992[118]	NR	40 (39)	Spasticity, active movement, and function (p = NS) Subjective evaluation (p = NR)
Magnetic stimulation vs. Sham stimulation	Nielsen et al. 1996[123]	NR	38	Ashworth Scale (p = NR) Tendon reflexes (p = NR) Patient's self-score for ease of daily activities (p = NS)
Tizanidine PO (to 32 mg/d) vs. Baclofen PO (to 80 mg/d) *Crossover*	Bass et al. 1988[104] Rice 1989[126]	NR	66 (48)	Spasticity (6-point ordinal scale) (p = NS) Strength (7-point ordinal scale) (p = NS) EDSS (p = NS) Pedersen functional disability scale (p = NR) Overall evaluation (patient, clinician) (p = NR)
Tizanidine PO (to 36 mg/d) vs. Baclofen PO (to 80 mg/d)	Smolenski et al. 1981[134]	NR	21	Muscle strength (p = NR) Ashworth Scale (p = NR) Spasms scale (p = NR)
Tizanidine PO (to 24 mg/d) vs. Baclofen PO (to 60 mg/d)	Eyssette et al. 1988[108]	NR	100	Flexor spasms (p = NS) Muscle tone (p = NS)
Tizanidine PO (to 24 mg/d) vs. Baclofen PO (to 60 mg/d) *Crossover*	Hoog-straten et al. 1988[113]	6.1 ± 0.8 (mean ± SD)	16 (11)	Ashworth Scale (p = NS) EDSS (p = NS) Functional systems (p = NS) Isometric strength (p = NS)
Tizanidine PO (to 16 mg/d) vs. Baclofen PO (to 40 mg/d) *Crossover*	Newman et al. 1982[122]	NR	36 (26)	Ashworth Scale (p = NS) EDSS (p = NS) Pedersen functional disability scale (p = NS)

Table 8. Randomized controlled trials of symptomatic treatments for spasticity (continued)

Treatment	Study	Baseline EDSS	No. of patients started (completed)	Outcomes/Results
Tizanidine PO (to 35 mg/d) vs. Baclofen PO (to 90 mg/d)	Stien et al. 1987[136]	NR	40 (38)	Ashworth Scale (p = NS) EDSS (p = NS) Pedersen functional disability scale (p = NS) Overall evaluation (p = NS)
Tizanidine PO (to 18 mg/d) vs. Diazepam PO (to 22.5 mg/d)	Rinne 1980[127]	NR	30 (26)	Ashworth Scale (p = NS)
Baclofen PO (30-60 mg/d) vs. Diazepam PO (15-30 mg/d) *Crossover*	Cartlidge et al. 1974[106]	NR	40 (34)	Ashworth Scale (p = NS) Subjective impression (p = NS)
Baclofen PO (30-120 mg/d) vs. Diazepam PO (10-40 mg/d) *Crossover*	From et al. 1975[110]	NR	17	Ashworth Scale (p = NR) Spasms (p = NS) Clonus (p = NS) Urine retention, incontinence (p = NR) Walking (p = NR)
Dantrolene PO (25 or 75 mg, 4 times per day) vs. Diazepam PO (to 2 or 5 mg, 4 times per day) *Crossover*	Schmidt et al. 1975[131,132]	5.5 (mean)	46 (42)	10- item exam evaluating spasticity, clonus, hyperreflexia, muscle stiffness, cramping (p = NR) Subjective evaluation (p = NR)

Abbreviations: 9-HPT = 9-Hole Peg Test; ADL = activities of daily living; d = day(s); EDSS = Expanded Disability Status Scale; g = gram(s); IM = intramuscular; kg = kilogram(s); mg = milligram(s); MRD = Minimal Record of Disability; MS = multiple sclerosis; MSFC = Multiple Sclerosis Functional Composite; MSIS = MS-Impairment Scale; No. = Number; NR = not reported; NRS = Neurologic Rating Scale; NS = not statistically significant; PO = per os (by mouth); SD = standard deviation; SF-36 = Medical Outcomes Study 36-Item Short-Form Health Survey; THC = tetrahydrocannabinol

Table 9. Randomized controlled trials of rehabilitation interventions

Treatment	Study	Baseline EDSS	No. of patients started (completed)	Outcomes/Results
Inpatient rehab (3 mo) vs. Outpatient rehab	Francabandera et al. 1988[139]	NR	84 (73)	ISS ($p < 0.05$) Need for home assistance ($p = 0.17$)
Inpatient rehab (20 d) vs. Wait-list control	Freeman et al. 1997[140]	6.5 (median) 5-9 (range)	70 (66)	EDSS (p = NS) FIM motor score ($p < 0.001$) LHS ($p = 0.01$)
Inpatient rehab (3 wk) vs. Home exercise program	Solari et al. 1999[145]	5.5 (median) 3-7 (range)	50 (45)	FIM ($p < 0.01$) EDSS (p = NS) SF-36 (p = NS)
Outpatient rehab (6 wk) vs. Self-exercise treatment	Patti et al. 2002[142]	6.2 (mean) 4-8 (range)	111 (106)	Fatigue Impact Scale ($p < 0.001$) EDSS (p = NS) SET ($p < 0.001$) BDI ($p < 0.001$) SF-36 ($p < 0.05$ on all subscales)
Home PT (8 wk) vs. Outpatient PT vs. No PT *Crossover*	Wiles et al. 2001[148]	6.0 (median) 4-6.5 (range)	42 (40)	Rivermead mobility index ($p < 0.001$, each active treatment vs. control) Balance time ($p = 0.004$; $p = 0.001$) Walk A ($p < 0.003$; $p = 0.002$) 9-HPT ($p = 0.01$; $p = 0.08$) Global mobility ($p < 0.001$; $p < 0.001$)
Supervised exercise (15 wk) vs. No treatment	Petajan et al. 1996[143]	3.4 ± 1.0 (mean $\pm$ SD)	54 (46)	FSS (p = NS) SIP physical dimension subscale ($p < 0.05$) EDSS (p = NS) ISS (p = NS) VO_{2max} ($p < 0.01$) POMS (p = NS)
Home-based management (rehab, nursing, education, psychological support, social services) vs. Usual care	Pozzilli et al. 2002[144]	5.9 ± 1.5 (mean $\pm$ SD)	201 (188)	FSS (p = NS) FIM (p = NS) SF-36 ($p < 0.05$ for bodily pain, general health, social function and emotional role subscales, and physical and mental component scores) EDSS (p = NS) MMSE (p = NS) STAXI (p = NS) STAI (p = NS) CDQ ($p = 0.11$)
Professionally guided self-care vs. No treatment	O'Hara et al. 2002[141]	NR	183 (169)	SDDR subscale O ($p = 0.6$) SDDR subscale E ($p = 0.04$) SF-36 ($p < 0.05$ on mental health and vitality subscales)
Education in health behaviors and lifestyle change vs. Usual care	Stuifbergen et al. 2003[146]	NR	142 (113)	SF-36 ($p < 0.05$ for bodily pain and mental health subscales) Self-efficacy ($p < 0.01$) Barriers scale (p = NS) PRQ (p = NS) HPLP-II ($p < 0.01$)

Table 9. Randomized controlled trials of rehabilitation interventions (continued)

Treatment	Study	Baseline EDSS	No. of patients started (completed)	Outcomes/Results
Multifaceted outpatient intervention (educational, behavioral) vs. Usual care	Wassem et al. 2003[147]	3.4 (mean) 0-9 (range)	27 (16)	Fatigue (p = 0.09) Sleep disturbance (p = 0.07) Pain (p = NS) Sum of symptom severity (p = 0.03) SEAB (p = 0.55) PAIS-SR (p = 0.72)

Abbreviations: 9-HPT = 9-Hole Peg Test; BDI = Beck Depression Inventory; CDQ = Clinical Depression Questionnaire; d = day(s); EDSS = Expanded Disability Status Scale; FIM = Functional Independence Measure; FSS = Fatigue Severity Scale; HPLP-II = Health Promoting Lifestyle Profile-II; ISS = Incapacity Status Scale; LHS = London Handicap Scale; MMSE = Mini Mental State Examination; mo = month(s); No. = Number; NR = not reported; NS = not statistically significant; PAIS-SR = Psychosocial Adjustment to Illness Scale-Self-Report; POMS = Profile of Mood States; PRQ = Personal Resources Questionnaire; PT = physiotherapy; SD = standard deviation; SDDR = Standard Day Dependency Record; SEAB = Self-Efficacy for Adjustment Behaviors Scale; SET = Tempelaar Social Experience Checklist; SF-36 = Medical Outcomes Study 36-Item Short-Form Health Survey; SIP = Sickness Impact Profile; STAI = State-Trait Anxiety Inventory; STAXI = State-Trait Anger Expression Inventory; VO_{2max} = maximum oxygen consumption with exercise; wk = wk(s)

Table 10. Randomized controlled trials of treatments for depression

Treatment	Study	Baseline EDSS	No. of patients started (completed)	Outcomes/Results
Psychotherapy vs. Active control (current events discussion group) vs. Passive control (no treatment)	Crawford et al. 1985[149]	NR	32	MMPI Depression-30 scale (p = 0.025) IECS (p = 0.005) ASQ (p = NS) SES (p = NS)
CBT vs. Wait-list control	Larcombe et al. 1984[151]	NR	21 (19)	BDI (p < 0.01) HRSD (p < 0.01) Significant-Other Rating Scale (p < 0.01) Worst mood (p < 0.05) Best mood (p = NS) Average mood (p = NS)
CBT + relaxation vs. Wait-list control	Foley et al. 1987[150]	6 (mean) 1-8 (range)	41 (36)	BDI (p < 0.05) STAI-S (p < 0.05) STAI-T (p = NS) Hassles Scale (p < 0.05) PFC (p < 0.05)
Cognitive remediation (CBT + memory aids) vs. Active control (support group)	Mendoza et al. 2001[152]	NR	20	BDI (p = NS)
CBT vs. Support group (SEG) vs. Sertraline (200 mg/d)	Mohr et al. 2001[153]	2.4 (mean) 0-8 (range)	63 (52)	BDI CBT vs. SEG (p = 0.003) Sertraline vs. SEG (p = 0.05) CBT vs. sertraline (p = NS) HRSD CBT vs. SEG (p = 0.02) Sertraline vs. SEG (p = 0.45) CBT vs. sertraline (p = 0.13)
CBT (telephone-administered) vs. Control (usual care)	Mohr et al. 2000[154]	NR	32 (23)	POMS Depression-Dejection scale (p < 0.003, completers; p < 0.01, ITT population)
Amitriptyline vs. Placebo	Schiffer et al. 1985[155]	NR	17 (12)	Improvement in number of episodes of pathological laughing or crying; BDI; HRSD (p = 0.011)
Desipramine + psychotherapy vs. Placebo + psychotherapy	Schiffer et al. 1990[156]	4.6 (mean)	32 (28)	Clinical improvement in psychosocial function (p = 0.05) BDI (p = 0.16) HRSD (p = 0.02)

Abbreviations: ASQ = Anxiety Scale Questionnaire; BDI = Beck Depression Inventory; CBT = cognitive behavioral therapy; d = day; EDSS = Expanded Disability Status Scale; HRSD = Hamilton Rating Scale for Depression; IECS = Internal-External Control Scale; ITT = intention-to-treat; mg = milligram(s); MMPI = Minnesota Multiphasic Personality Inventory; No. = Number; NR = not reported; NS = not statistically significant; PFC = Problem-Focused Coping score from Ways of Coping Checklist; SEG = supportive-expressive group therapy; SES = Self-Esteem Scale; PFC = Problem-Focused Coping score from the Ways of Coping Checklist; POMS = Profile of Mood States; STAI-S = State-Trait Anxiety Inventory-State; STAI-T = State-Trait Anxiety Inventory-Trait

Table 11. Randomized controlled trials of treatments for fatigue

Treatment	Study	Baseline EDSS (Mean ± SD)	No. of patients started (completed)	Outcomes/Results
Amantadine (100 mg twice per day x 3 wk) vs. Placebo	Canadian MS Research Group 1987[157]	4.3 ± 1.9	115 (109)	Change in VAS fatigue score (p = NS) Most affected activity VAS (p < 0.05) ADL total score (p = 0.09)
Amantadine (100 mg twice per day x 4 wk) vs. Placebo	Cohen et al. 1989[158]	4.0 ± 1.4	29 (22)	Fatigue score (p = 0.58)
Amantadine (100 mg twice per day x 6 wk) vs. Pemoline vs. Placebo	Krupp et al. 1995[161]	2.9 ± 0.9	119 (93)	MS-FS A vs. placebo (p = 0.04) P vs. placebo (p = 0.4) FSS A vs. placebo (p = NS) P vs. placebo (p = 0.8)
Amantadine (100 mg twice per day x 6 wk) vs. Pemoline vs. Placebo	Geisler et al. 1996[159]	2.6 ± 0.7	45	SDMT A vs. placebo (p < 0.05) P vs. placebo (p = NR) Digit Span (p = NS) Selective Reminding Test (p = NS) Benton Visual Retention Test (p = NS) Finger Tapping Test (p = NS)
Pemoline vs. Placebo	Weinshenker et al. 1992[163]	3.6 ± 2.0	46 (41)	EDSS (p = NS) Fatigue VAS (p = NS) Fatigue 4-point scale (p = 0.06)
Transdermal histamine/caffeine vs. Placebo	Gillson et al. 2002[160]	NR	29 (26)	MFIS (p < 0.02) 25-foot timed walk (p =NS) 9-HPT (p = NS) PASAT (p = NS)
4-aminopyridine vs. Placebo	Rossini et al. 2001[162]	6.2 ± 0.8	54 (49)	FSS (p = 0.19) EDSS (p = NS)

Abbreviations: 9-HPT = 9-Hole Peg Test; ADL = activities of daily living; EDSS = Extended Disability Status Scale; FSS = Fatigue Severity Scale; MFIS = Modified Fatigue Impact Scale; mg = milligram(s); MS = multiple sclerosis; MS-FS = MS-Specific Fatigue Scale; No. = Number; NR = not reported; NS = not statistically significant; PASAT = Paced Auditory Serial Addition Test; SD = standard deviation; SDMT = Symbol Digit Modalities Test; VAS = visual analog scale; wk = week(s)

Table 12. Randomized controlled trials of treatments for voiding dysfunction

Treatment	Study	Baseline EDSS	No. of patients started (completed)	Outcomes/Results
Desmopressin nasal spray (20 mcg/d) vs. Placebo nasal spray	Fredrikson 1996[164]	NR	27 (22)	No. of voidings in 6 hr ($p < 0.05$) No. of voidings in 24 hr (p = NS)
Desmopressin nasal spray (20 mcg/d) vs. Placebo nasal spray	Hilton et al. 1983[165]	NR	16	Subjective benefit in nocturia ($p < 0.01$) Daytime urinary frequency (p = NS) Nighttime urinary frequency ($p < 0.001$)
Desmopressin nasal spray (20 mcg/d) vs. Placebo nasal spray	Hoverd et al. 1998[166]	NR	28 (24)	Daytime urinary frequency ($p = 0.008$) Nighttime urinary frequency ($p = 0.26$) Urine volume in 6 hr ($p = 0.006$) Urine volume in 24 hr ($p = 0.052$)
Desmopressin nasal spray vs. Placebo nasal spray	Kinn et al. 1990[167]	NR	13 (12)	No. of voidings in 6 hr ($p < 0.05$) No. of voidings in 24 hr (p = NS) Urine volume in 6 hr ($p < 0.05$)
Desmopressin nasal spray (10 mcg/d) vs. Placebo nasal spray	Valiquette et al. 1996[170]	6.7 (mean) 2.5-8.5 (range)	17 (11)	Nights with nocturia ($p < 0.01$) Incontinence ($p = 0.08$) Frequency of nocturia ($p < 0.01$) Uninterrupted sleep hours ($p < 0.01$)
Abdominal vibration vs. Abdominal pressure vs. No treatment	Prasad et al. 2003[168]	NR	30 (28)	No. of patients with no incontinence in 72 hr (p = NR) No. of voidings in 72 hr (p = NR) Post-void residual volume: Vibration vs. placebo ($p = 0.002$) Vibration vs. pressure ($p = 0.059$)
Pelvic floor rehabilitation (biofeedback + exercise) vs. No treatment	Vahtera et al. 1997[169]	4.4 (mean) 1-6.5 (range)	80	Incontinence ($p < 0.05$) Nocturia ($p < 0.05$) Frequency of UTIs (p = NS) Urinary symptom-related handicap ($p < 0.05$)

Abbreviations: d = day(s); EDSS = Extended Disability Status Scale; hr = hour(s); mcg = microgram(s); No. = Number; NR = not reported; NS = not statistically significant; UTIs = urinary tract infections

Table 13. Included studies by type of measure used and type of function considered (physical, mental, other)

Type of measure used	Type(s) of function considered	Study
Hyllested criteria, etc.	Physical and mental	Rozin et al. 1975[191] Rozin et al. 1982[190]
Expanded Disability Status Scale (EDSS) and Disability Status Scale (DSS)	Physical	Canadian Burden of Illness Study Group 1998a[174] Grima et al. 2000[180] Hammond et al. 1996[183] LaRocca et al. 1982[187] Miller et al. 2000[188] Verdier-Taillefer et al. 1995[193]
Mobility aids	Physical	Dyck et al. 2000[176] Kornblith et al. 1986[186]
Job characteristics	Physical, mental, symptoms	Dyck et al. 2000[176] Grønning et al. 1990[181] LaRocca et al. 1982[187] Rozin et al. 1975[191] Scheinberg et al. 1980[192] Verdier-Taillefer et al. 1995[193]
Cognitive function	Mental/cognitive and physical	Beatty et al. 1995[172] Beukelman et al. 1985[173] Edgley et al. 1991[177] Genevie et al. 1987[179] Rao et al. 1991[189]
Disease subtype	–	Jacobs et al. 1999[184] Verdier-Taillefer et al. 1995[193]
Self-report	Physical, mental, symptoms	Dyck et al. 2000[176] Edgley et al. 1991[177] Freal et al. 1984[178] Gulick et al. 1989[182] Scheinberg et al. 1980[192]

Table 14. Studies by Rozin et al.[190,191] measuring ability to work among individuals with MS

Rozin et al. 1975[191]	**Rozin et al. 1982[190] (Series I and II combined)**
1) Study participants (n = 172) initially grouped: n = 41 – Group A: Completely handicapped with no rehabilitation potential n = 37 – Group B: Potential for vocational rehabilitation, but unemployed or currently employed, but needs rehabilitation services for continuation of employment n = 94 – Group C: Currently working, holding previous jobs, or changed jobs without intervention of rehabilitation	**1) Study participants (n = 299) initially grouped:** n = 71 – Group A: Completely handicapped with no rehabilitation potential n = 53 – Group B: Potential for vocational rehabilitation, but unemployed or currently employed, but needs rehabilitation services for continuation of employment n = 175 – Group C: Currently working, holding previous jobs, or changed jobs without intervention of rehabilitation
2) Type of MS disability by group: No disability: NR – Group A NR – Group B 50% – Group C Physical disability due to MS: 39% – Group A 81% – Group B 41% – Group C Physical and mental disability due to MS: 56% – Group A 19% – Group B 3% – Group C Mental disability due to MS: NR – Group A NR – Group B 1% – Group C Other causes of disability not connected with MS: 5% – Group A NR – Group B 5% – Group C	**2) Type of MS disability by group:** No disability: NR – Group A 3% – Group B 29% – Group C Physical disability due to MS: 59% – Group A 75% – Group B 61% – Group C Physical and mental disability due to MS: 30% – Group A 11% – Group B 6% – Group C Mental disability due to MS: 1% – Group A 2% – Group B 1% – Group C Other causes of disability not connected with MS: 7% – Group A 2% – Group B 1% – Group C MS and other causes of disability: 3% – Group A 7% – Group B 2% – Group C

Table 14. Studies by Rozin et al.[190,191] measuring ability to work among individuals with MS (continued)

Rozin et al. 1975[191]	**Rozin et al. 1982[190] (Series I and II combined)**
3) Hyllested criteria of disability: Group A (no rehabilitation potential) (n = 41) 0% – Mild (0-2) 0% – Moderate (3-4) 100% – Severe (5-6) Group B (vocational rehabilitation needed among unemployed and employed) (n = 37) 0% – Mild (0-2) 57% – Moderate (3-4) 43% – Severe (5-6) Group C (working) (n = 94) 70% – Mild (0-2) 30% – Moderate (3-4) 0% – Severe (5-6)	**3) Hyllested criteria of disability:** Group A (no rehabilitation potential) (n = 71) 15% – Mild (0-2) 38% – Moderate (3-4) 46% – Severe (5-6) Group B (vocational rehabilitation needed among unemployed and employed) (n = 53) 36% – Mild (0-2) 51% – Moderate (3-4) 13% – Severe (5-6) Group C (working) (n = 175) 74% – Mild (0-2) 25% – Moderate (3-4) 0.6% – Severe (5-6)

Abbreviations: MS = multiple sclerosis; NR = not reported

Table 15. Cross-sectional studies examining current employment status and EDSS level among individuals with MS

Canadian Burden of Illness Study Group 1998a[174]	**Grima et al. 2000[180]**	**Miller et al. 2000[188]**
EDSS ≤ 2.5 (n = 62): 37% - Full-time 13% - Part-time 29% - Unemployed 13% - Other	EDSS 1-2 (n = 78): 44% - Full-time 14% - Part-time 15% - Not working due to MS 27% - Not working, other reasons	EDSS 0-3.0 (n = 113): 42.0% - Full-time 20.5% - Part-time 37.5% - None
EDSS 3-6: (n =68) 28% - Full-time 10% - Part-time 44% - Unemployed 18% - Other	EDSS 3-6: (n = 75) 15% - Full-time 8% - Part-time 51% - Not working due to MS 13% - Not working, other reasons 4% - NR	EDSS 3.5-6.5 (n = 131) 15.4% - Full-time 10.0% - Part-time 74.6% - None
EDSS ≥ 6.5: (n = 68) 4% - Full-time 6% - Part-time 57% - Unemployed 32% - Other	–	EDSS 7.0-8.5 (n = 56) 8.9% - Full-time 5.4% - Part-time 85.7% - None

Abbreviations: EDSS = Expanded Disability Status Scale; MS = multiple sclerosis; NR = not reported

Table 16. Cognitive function and work status among individuals with MS

Study, number of subjects	Cognitive function measures	Primary findings
Beatty et al. 1995[172] N = 102 38 employed 64 retired	Categories: ▪ Verbal ability (SILS Vocabulary Test) ▪ Naming (Boston Naming Test) ▪ Visuospatial (Perception-LOT) ▪ Attention/Concentration (Digit Span) ▪ Information processing (Speed, SDMT, FAS) ▪ Category fluency ▪ Memory (STM–Correct, NMT-Delay, SRT-Total, SRT-Delay Recall, SRT-Delay Recognition) ▪ Problem solving/abstraction (SILS-Abstraction, SILS-Conceptual Quotient, WCST-Categories, WCST-% Perseverative Responses) ▪ Ambulatory Index (score 1-6) (highly correlated with EDSS: r = 0.96) ▪ Beck Depression Index	Significant differences between workers and non-workers were observed on all measures except Digit Span, LOT, and WCST-% Perseverative Response 49% of the variance in employment status was explained by walking ability, age, two measures of memory, and one test of verbal fluency Partial R^2 ▪ Ambulation index: 0.25 ▪ STM (short term memory): 0.13 ▪ SRT (delay recall/memory): 0.04 ▪ Age (29-62 years): 0.03 ▪ FAS (verbal ability/letter fluency): 0.03
Edgley et al. 1991[177] N = 602	PDQ score – sum of 4 subscales: 1. attention/concentration 2. planning/organizing 3. retrospective memory 4. prospective memory (each subscale ranked 0-4: 0 = never 1 = rarely 2 = sometimes 3 = often 4 = almost always) Mobility assistance: 1. no ambulatory problems 2. a bit unsteady 3. need cane/brace 4. wheelchair 5. can't walk	PDQ score (mean [SD]): Unemployed: 1.6 (0.7) Employed: 1.4 (0.7) $p < 0.001$ Mobility assistance (mean [SD]): Unemployed: 3.1 (1.2) Employed: 2.2 (1.0) $p < 0.001$ "A significant multivariate main effect for employment status was obtained. Compared to individuals who were employed, unemployed individuals had more mobility problems (indicated above), obtained higher scores on the self-report PDQ (indicated above), had fewer years of education. Occupational level, number of people living at home and illness duration did not impact employment status."
Rao et al. 1991[189] N = 100 52 intact 48 impaired	A battery of 36 tests were used to evaluate the following: Dementia Screen (MMS) Verbal Intelligence (WAIS-R) Memory Immediate Memory Recent Memory Remote Abstract Reasoning Attention/Concentration Language Visuospatial Perception 100 MS patients were grouped as being either intact or impaired	From the Environmental Status Scale (ESS), one of seven domains – Actual Work Status – was compared to cognitive impairment (yes/no) Mean score of ESS scale (range 0-4) for Actual Work Status was lower (approximately 1.8) for cognitively impaired versus intact (approximately 2.8; $p < 0.01$)

Table 16. Cognitive function and work status among individuals with MS (continued)

Abbreviations: EDSS = Expanded Disability Status Scale; ESS = Environmental Status Scale; FAS = letter fluency test (saying as many words as possible that begin with F, A, and S, 60 seconds each); LOT = Line Orientation Test; MMS = Mini-Mental State; MS = multiple sclerosis; N = number of subjects; NMT = New Map Test; PDQ = Perceived Deficit Questionnaire; SD = standard deviation; SDMT = Symbol Digit Modalities Test; SILS = Shipley Institute of Living Scale; SRT = Selective Reminding Test; STM = Short Term Memory Test; WCST = Wisconsin Card Sorting Test; WAIS-R = Wechsler Adult Intelligence Scale-Revised

Table 17. Job type/characteristics and current work status among individuals with MS

Study	Findings
Grønning et al. 1990[181]	Univariate analyses of time to unemployment: Non-remittent MS vs. remittent ($p < 0.001$) Heavy vs. light work ($p < 0.01$) Male vs. female ($p < 0.05$) Age > 30 at onset ($p < 0.01$) Multivariate analyses, when disease subtype was not considered, occupation (heavy work) and age (> 30 years) were predictive of early unemployment
Hammond et al. 1996[183]	"Authors noted that trade and farm workers were less likely to be in paid employment than professional or clerical workers as their level of disability increased." (Researchers provided no data to support this statement.)
LaRocca et al. 1982[187]	84% of variability in employment status was unexplained by age, sex, education, marital status, occupation, and parenthood However, variability in employment status was explained by factors such as premorbid personality, coping style, characteristics of the workplace, and social support systems. Authors suggested that these findings contribute to the probability of a patient with MS staying at work. (Researchers provided no data to support this statement.)
Scheinberg et al. 1980[192]	Job category of currently employed subjects (n = 51): 35.3% - Clerical 23.5% - Professional 13.7% - Semi-professional 13.7% - Skilled labor 7.8% - Managerial 2.0% - Unskilled labor 3.9% - Other
Verdier-Taillefer et al. 1995[193]	Job characteristics and odds of unemployment (odds ratio [95% CI]): Desk job - 0.3 (0.1 to 0.5) Sitting position - 0.3 (0.1 to 0.7) Possibility of obtaining specific arrangements - 0.4 (0.2 to 0.8) Travel time > 30 minutes - 1.7 (0.9 to 3.2) Daily work > 8 hours - 2.6 (1.2 to 5.7) Accessibility problems - 1.9 (0.9 to 4.0) Work requirements and odds of unemployment (odds ratio [95% CI]): Close attention - 0.9 (0.4 to 1.8) Good memory - 0.7 (0.3 to 1.5) Physical strength - 7.6 (3.2 to 18.2) Manual precision - 3.1 (1.6 to 6.3) Rigid work schedule - 2.2 (1.1 to 4.6) Decision making - 1.7 (0.7 to 3.4) Frequent moves - 2.5 (1.3 to 4.9)

Table 17. Job type/characteristics and current work status among individuals with MS (continued)

Study	Findings
Rozin et al. 1975[191]	Study participants were initially grouped into A, B, or C (described below), followed by examination of changes in work status/job type Changes in work status are from onset of MS to time of study in 1971; work type by predetermined work groups Group A (n = 41): Completely handicapped with no rehabilitation potential Unskilled labor: 18% – onset of MS 0% – at time of study Skilled, semiskilled, service: 27% – onset of MS 0% – at time of study Clerical, professional, student: 37% – onset of MS 0% – at time of study Housewives: 2% – onset of MS 0% – at time of study Not working: 6% – onset of MS 100% – at time of study Group C (n = 94): Currently working, holding previous jobs, or changed jobs without intervention of rehabilitation Unskilled labor: 22% – onset of MS 8% – at time of study Skilled, semiskilled, service: 18% – onset of MS 17% – at time of study Clerical, professional, student: 40% – onset of MS 37% – at time of study Housewives: 12% – onset of MS 38% – at time of study Not working: 8% – onset of MS 0% – at time of study Group B (n = 37): Potential for vocational rehabilitation, but unemployed or currently employed, but needs rehabilitation services for continuation of employment Unskilled labor: 28% – onset of MS 3% – at time of study Skilled, semiskilled, service: 31% – onset of MS 3% – at time of study Clerical, professional, student: 31% – onset of MS 21% – at time of study Housewives: 5% – onset of MS 8% – at time of study Not working: 5% – onset of MS 65% – at time of study Authors note that “of the 131 clients with working potential (groups B and C), only 18% stopped working because of MS”

Abbreviations: CI = confidence interval; MS = multiple sclerosis

Table 18. Self-report on why individuals with MS continued or terminated employment

Study	Findings
Dyck et al. 2000[176]	Factors contributing to maintaining employment – 44% of currently employed women were limited in the kind and amount of work they could do because of MS including: NR - fatigue "most common" 16% - difficulty with standing and stairs 15% - walking 12% - writing 11% - memory/concentration 17% no longer working indicated "inability to negotiate reduced work hours" with their manager as reason for quitting work
Edgley et al. 1991[177]	Study participants who indicated that they quit working because of MS symptoms were asked an open-ended question about types of symptoms (n = 313; 78% of sample) 41% - Ambulation problems 39% - Fatigue 12% - Memory problems 10% - Emotional problems 12% - Visual difficulties 6% - Coordination problems 2% - Pain 1% - Incontinence 22% left for reasons unrelated to MS. Women (26%) were significantly more likely than men (11%) to cite reasons unrelated to MS as the primary cause of unemployment ($\chi^2 = 9.3$, $P < 0.01$)
Gulick et al. 1989[182]	Ranked comparison of conditions/situations that impede work performance (data on housewives and retired participants not described here): Fatigue: Employed: 50% Unemployed: 25% Tremors: Employed: NR Unemployed: 10% Walking: Employed: 12% Unemployed: NR Use of wheelchair: Employed: NR Unemployed: 10% Standing: Employed: 8% Unemployed: 12% Restricted mobility: Employed: NR Unemployed: 9% Numbness: Employed: 8% Unemployed: 5% Stiffness: Employed: 5% Unemployed: NR

Table 18. Self-report on why individuals with MS continued or terminated employment (continued)

Study	Findings
Scheinberg et al. 1980[192]	Among those having left employment, the most common reason for leaving among multiple reasons given by 182 subjects (categories not mutually exclusive): 52.7% - Physical difficulty 15.9% - Visual difficulty 12.1% - Transportation difficulty 9.3% - Fatigue 1.3% - Emotional difficulty 37.4% - Other (mainly marriage and/or pregnancy)

Abbreviations: MS = multiple sclerosis; NR = not reported

Table 19. Conditions/situations impeding or enhancing performance of work/chores

	Employed outside home	Homemaker	Unemployed	Retired
Conditions/situations *impeding* performance of work/chores (% of respondents citing)				
Fatigue	50%	51%	25%	25%
Balance	10%	16%	11%	19%
Vision	12%	9%	11%	7%
High temperature	7%	6%	-	-
Conditions/situations *enhancing* performance of work/chores (% of respondents citing)				
Intermittent rest	21%	22%	12%	19%
Assistance with tasks	18%	22%	22%	11%
Adaptive aids	16%	18%	12%	26%
Self-pacing	13%	11%	12%	13%
Cool temperature	-	8%	-	6%
Positive attitude	6%	5%	5%	6%