

Supplementary Table 3. Detailed information on studies focusing on wearables in mixed setting (i.e., combination of laboratory and real-life setting). Time is expressed in years. Mean (SD) and median [IQR]. MS: multiple sclerosis, HC: healthy controls, RR: remitting relapsing, PP: primary progressive, SP: secondary progressive, PDDS: patient determined disease steps, EDSS: expanded disability status scale, RW: real-world, ns: non-significant, s: significant, nt: not tested. Domain “other” includes: strength (torque % body weight) *refer to Box 1

First author, year DOI	Population of interest		Type of MS	Severity Duration of disease	Comparator population type	Wearables	Domain* Results reported (significance)
	Number of patients	% female			Sample size (% female) Age (unless stated otherwise)	type of sensor, number of axes, number of wearables, primary position (respectively)	
Pilutti et al, 2012 10.1155/2012/868256	n=52 80.8% 48.5 (11.6)		RR: n=43 SP: n=8 Not reported: n=1	PDDS: 3.0 [3.0] 13.8 (9.6)	MS (overweight, obese) n=116 (70.6%) overweight: 51.5 (9.5), obese: 52.5 (10.6) Type: RR: n=91, PP: n=8, SP: n=11, not reported: n=3 Severity: PDDS: 3.0 [3.0] Disease duration: overweight: 10.9 (7.8), obese: 11.2 (10.3)	ActiGraph GT3X accelerometer 3 axes 1 wearable waist	RW and lab: Physical activity Group difference MS vs MS (ns)
						ActiGraph 7164 accelerometer 1 axis 1 wearable waist	
Sandroff et al, 2013 10.3109/09638288.2012.707745	n=41 87.8% 47.4 (8.8)		RR: n=37 Not reported: n=4	PDDS: 1.0 (median), range: 0.0-4.0 11.0 (7.9)	healthy n=41 (88%) 47.2 (9.1)	ActiGraph GTX3 accelerometer 3 axes 1 wearable waist	RW and lab: Physical activity
						Motionlogger accelerometer 3 axes 2 wearables wrist	RW and lab: Physical activity Association with other measure (s) Group difference MS vs HC (s)
Lamers et al, 2013 10.1177/1352458513475832	n=30 50.0% 58.2 (10.9)		PP: n=5, SP: n=25	EDSS: 7.5 (median), range: 7.0-8.0 21.8 (11)	healthy n=30 (33%) 57.9 (10.9)		RW and lab: Physical activity, Lab: Gait Group difference MS vs HC (s)
						Xsens accelerometer, gyroscope 3 axes 6 wearables waist	Group difference MS vs MS (s) Responsiveness to change (mixed)
Spain et al, 2014 10.1016/J.GAITPOST.2013.12.010	n=27 66.7% 41 (mean), range: 24-67		RR: n=27	SR-EDSS: 3.3 (mean), 4.0 (median), range: 0- 5.5 10 (mean), 5 (median), range: 0-46	healthy n=18 (78% female) age: 34 (mean), range: 27-60		

Sandroff et al, 2014 10.1016/J.JMSARD.2013.04.003	n=212 80.2% 50.0 (10.3)	RR: n=173, PP: n=12, SP: n= 22, not reported: n=5	not reported 11.4 (8.8)	none	ActiGraph GTX3 accelerometer 3 axes 1 wearable waist	RW: Physical activity Lab: Cognition Association with other measure (s)
Motl et al, 2014 10.1159/000356116	n=82 80.5% 49.2 (9.0)	RR: n=67	PDDS: 3.0 [3.0] 11.8 (8.2)	none	ActiGraph GTX3 accelerometer 3 axes 1 wearable waist	RW and lab: Physical activity Test-retest reliability (s)
Stellmann et al, 2015 10.1371/JOURNAL.PONE.0123822	n=28 64.3% 45 [38-51], range: 27-68	RR: n=14, PP: n=5, SP: n=8	EDSS: 3.2 [2.5-4.1], range: 1.0-6.5 9 [4-17], range: 1-24	none	Actibelt accelerometer 3 axes 1 wearable waist	RW: Physical activity Lab: Gait Association with other measure (mixed)
Kasser et al, 2015 10.3109/09638288.2015.1019008	n=10 80.0% 52 (mean), 95% CI: 45-59	RR: n=7, PP: n=2, SP: n=1	EDSS: 3.1 (1.7), range: 1-6 not reported	none	ActiGraph GT1M accelerometer 2 axes 7 wearables not reported, sternum, waist, wrist, ankle APDM Opal IMU accelerometer, gyroscope, magnetometer 3 axes 6 wearables wrist, ankle, waist, chest	RW: Physical activity Lab: Gait, balance Association with MS severity (mixed) Association with other measure (mixed) Responsiveness to intervention (mixed)
Stellmann et al, 2016 10.1016/J.JNS.2016.07.051	n=28 60.7% 49 (8.6)	RR: n=3, PP: n=7, SP: n=18	EDSS: 4.75 [4-6.5] 11.0 (8.4)	none	Actibelt accelerometer 3 axes 1 wearable waist	RW and lab: Physical activity Responsiveness to intervention (s)
Storm et al, 2018 10.1371/JOURNAL.PONE.0196463	n=14 50.0% 54.8 (11)	not reported	two groups: EDSS 5-5.5 and EDSS 6.0-6.5 not reported	none	Mc Roberts PAM Move Monitor accelerometer 3 axes 1 wearable lower back APDM Opal IMU accelerometer, gyroscope, magnetometer 3 axes 2 wearables ankle	RW: Physical activity, Lab: Gait Group difference MS vs MS (mixed)

Boukhvalova et al, 2018 10.3389/FNEUR.2018.00740	n=76 56.6% 56.5 (mean)	RR: n=23, PP: n=35, SP: n=18	EDSS: 4.91 (mean) 16.7 (mean)	none	Google Pixel XL 2017 (smartphone) touchscreen 1 wearable hand	RW and lab: Dexterity/Tremor Association with other measure (s) Group difference MS vs HC (s)
Ehling et al, 2019 10.1371/JOURNAL.PONE.0220613	n=76 not reported 47.9 (8.3)	RR: n=46, PP: n=17, SP: n=13	EDSS: 3.0 [2-5.5] 11.9 (8.8)	none	ActiGraph GTX3 accelerometer 3 axes 1 wearable position not reported Cardiac and Activity Monitor accelerometer, photoplethysmograph (PPG), electrocardiogram (ECG), skin impedance, temperature, light exposure, air pressure 3 axes 3 wearables (real-world), 9 wearables (lab setting) sternum, lower back, waist, wrist, upper leg, ankle	RW and lab: Physical activity Responsiveness to change (mixed)
Chitnis et al, 2019 10.1038/S41746-019-0197-7	n=25 92.0% 46.5 (7.4)	not reported	EDSS: 3.4 (mean), range: 1.0-6.5 16 (5) EDSS by MS type: RR: 3.3 (1.6), 3.0 (median), range: 1.0-6.5 SP: 6.0 (1.1), 6.5 (median), range: 3.5-7.5 PP: 5.7 (1.3), 6.0 (median), range: 2.5-8.0 Duration of disease by MS type: RR: 12.4 (10.1), SP: 26.8 (11.2), PP: 15.7 (8.3)	none		RW and lab: Gait Association with MS severity (mixed) Association with other measure (mixed)
Boukhvalova et al, 2019 10.1038/FNEUR.2019.00358	n=93 53.8% Age by MS type: RR: 50 (10.2), SP: 60 (8.2), PP: 58.8 (7.8)	RR: n=35, PP: n=38, SP: n=19	RR: 12.4 (10.1), SP: 26.8 (11.2), PP: 15.7 (8.3)	healthy n=15 (53%) not reported	Google Pixel XL 2017 (smartphone) accelerometer 3 axes 1 wearable hand APDM Opal IMU accelerometer, gyroscope, magnetometer 3 axes 1 wearable lower back	RW and lab: Dexterity/Tremor Association with MS severity (mixed) Association with other measure (mixed) Group difference MS vs HC (s)
Shema-Shiratzky S et al, 2020 10.1007/S00415-020-09759-7	n=44 72.7% 49.2 (10.7)	RR: n=44	EDSS: 3.5 [2.5-5.0] 13.3 (9.3)	healthy n=60 (51%) 52.1 (7.1)		RW and lab: Gait Group difference MS vs HC (mixed)
Shah et al, 2020 10.1186/S12984-020-00781-4	n=15 (not reported) 49.0 (10.0)	RR: n=15	not reported not reported	healthy n=16 (not reported) 45 (11)	APDM Opal IMU accelerometer, gyroscope, magnetometer 3 axes	RW and lab: Gait Group difference MS vs HC (mixed) Group difference MS vs MS (mixed)

					3 wearables lower back, foot	
Karle et al, 2020 10.3390/IJERPH17239044	n=20 75.0% 44.2 (12.2)	RR: n=14, PP: n=2, SP: n=4	EDSS: 3.1 (1.4), range: 1-6 9.1 (7.7)	none	ActiGraph GT3X accelerometer 3 axes 1 wearable waist	RW and lab: Physical activity Association with other measure (ns)
					ActiGraph GT3X accelerometer 3 axes 1 wearable wrist	
Pau et al, 2021 10.1097/MD.00000000000024931	n=31 54.8% 52.5 (11.3)	RR: n=31	EDSS: 3.1 (1.7), range: 1.0-6.0 not reported	none	BTS Bioengineering G- Sensor accelerometer, gyroscope, magnetometer 3 axes 1 wearable lower back	RW: Physical activity Lab: Gait Association with other measure (mixed)