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# Whole Body Vibration training for Multiple Sclerosis patients

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## Abstract

**Introduction:** The purpose of this study was firstly to investigate whether 8 weeks of whole body vibration (WBV) training was an acceptable form of exercise for patients with Multiple Sclerosis (MS) and secondly what effect it may have on measures of functional capacity.

**Methods:** Fifteen participants with MS volunteered for WBV training three times a week on a commercialised Galileo Sport™ vibration machine with an oscillating platform. Training consisted of two four week blocks based on an increasing stimulus training programme (overload principle). The first four weeks involving five sets of 1-min WBV with 1-min rest in between with increasing vibration frequency (15-25Hz, 2.6mm-4.1mm amplitude); the second four weeks training increased to eight sets of 1-min WBV (15-20Hz, 6.1mm amplitude). Functional performance measures (Timed up and Go, Standing Balance, Functional Reach and Timed walk) and quality of life questionnaire (SF-36) were conducted prior to training, at 4 weeks, 8 weeks and 2 weeks (10wk) following the completion of the training.

**Results:** The 10m walk test showed significant improvements at the 2m, 8m and 10m measure between pre vs. 8wk ( $P<0.05$ ) and pre vs. 10wk ( $P<0.05$ ). Timed up and Go demonstrated a significant time effect ( $P<0.05$ ). Standing balance showed significant improvements at pre and 4 week ( $p<0.05$ ) and pre and 10 week ( $p<0.05$ ).

**Conclusions:** This is the first study to investigate WBV as an exercise training modality for MS patients. It was shown that not only is WBV training safe, well tolerated by MS patients but it also improved standing balance and walking speed in MS patients.

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## Abbreviations

|          |                                  |
|----------|----------------------------------|
| C        | Celsius                          |
| cm       | centimetres                      |
| CMAP     | Compound muscle action potential |
| CNS      | Central nervous system           |
| CSA      | Cross sectional area             |
| EDSS     | Expanded disability status scale |
| FP       | Foot placement                   |
| Fri      | Friday                           |
| FRT      | Functional reach test            |
| FS       | Functional system                |
| <i>g</i> | Gravity                          |
| HHV      | Human herpes virus               |
| HLA      | Human leukocyte antigen          |
| hrs      | Hours                            |
| Hz       | Hertz                            |
| Kg       | Kilograms                        |
| Km       | Kilometres                       |
| MHC      | Major histocompatibility complex |
| m        | metres                           |
| mm       | millimetres                      |
| mmHg     | millimetres of mercury           |
| Mon      | Monday                           |
| min      | minutes                          |

|       |  |
|-------|--|
| MS    | Multiple Sclerosis                     |
| MU    | Motor unit                             |
| mV    | millivolt                              |
| MVC   | Maximum voluntary contractile          |
| PCr   | Phosphocreatine                        |
| $P_i$ | Inorganic phosphate                    |
| RPE   | Rating of perceived exertion           |
| RRMS  | Relapsing remitting multiple sclerosis |
| SB    | Standing balance                       |
| SD    | Standard deviation                     |
| SF-36 | Short form-36                          |
| TUG   | Timed up and go                        |
| WBV   | Whole Body Vibration                   |
| Wed   | Wednesday                              |
| Wk    | Week                                   |
| y     | Years                                  |