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## Massed versus Distributed Practice in Retention Effects After Gait Exercise

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**key words** massed practice • distributed practice • gait exercise

### 【Purpose】

The aim of this study was to compare the retention effects in kinematic patterns after gait exercise between massed and distributed practice.

### 【Methods】

Twenty healthy male volunteers participated in this study ; they were evenly assigned to either a Massed (MP) or Distributed practice (DP). Subjects in both practices were fitted with a dorsiflexion block affecting the ankle and underwent gait exercise of 1000 steps (500 steps for each leg). DP consisted of four gait exercises of 250 steps units on a single practice. In the DP there was a 1 hour interval between the gait exercises. MP consisted of all four units being completed during a gait exercise of 1000 steps. In the MP a break of 4 hours after gait exercises was taken. Measurements were made barefoot walking before exercise (pre-test), walking at 4 hours after exercise (4h-test), and walking at 24 hours after exercise (24h-test). Their walking was measured using an optoelectronic motion capture system with ten infrared cameras (VICON612) and a ground reaction force platform (AMTI: OR6-6). Kinematic data were calculated using the inverse-dynamics method. Differences between kinematic parameter of MP and DP in retention effects were analyzed using the two-way analysis of variance with repeated measures. Significance between-group differences were determined using Bonferroni post-hoc test.

### 【Results】

In both MP and DP, kinematic pattern of the ankle and hip showed significant differences when comparing the 4h-test and 24h-test to the pre-test ( $p < 0.05$ ). However, there were no significant differences in kinematic pattern of the knee. In addition, there were no significant differences in retention effects of between MP and DP.

### 【Discussion】

This study showed that there were retention effects after gait exercise in MP and DP. Further, MP and DP were both effective and comparable in motor learning effects after gait exercise.