Interlimb Transfer of Learning of Ankle Isometric Force Control
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Background
Interlimb transfer (ILT) is the ability for one limb to perform a task learned by the opposite limb.
- ILT is used to improve motor control in patients with hemiparesis following stroke.
- Previous studies have examined ILT in the upper extremity and position control, however less have investigated the lower extremity and force control.

Aims of the Study
The goal of our research is to advance the knowledge of ILT to improve stroke rehabilitation. Specifically, the purposes of this study were to:
- (a) Determine if healthy individuals demonstrate ILT of ankle force control, and
- (b) Determine if an asymmetry exists between the degree of transfer from the dominant to non-dominant side and vice versa.

Research Design. A randomized comparison design was used.
Subjects. 18 healthy individuals were conveniently sampled and randomly assigned to dominant or non-dominant practice groups.
Instrumentation. The Virtually-Interfaced Robotic Ankle and Balance Trainer (vi-RABT) is a platform ankle robot interfaced with virtual reality games. The maze game was used in this study to measure force control.
Procedures. Subjects practiced an ankle force control task using the vi-RABT. Subjects then performed a test on the practice limb to assess learning and a test on the non-practice limb to assess ILT.
Outcome Variables. The outcome variable of this study was the Ankle Control Index (ACI), which is derived from movement accuracy (MA) and movement time (MT). The ACI was calculated as: ACI = 50%MA + 50% MT.

Results
- Both dominant and non-dominant practice groups significantly improved ankle force control on the practice side following 15 learning trials. The amount of learning was similar between groups.
- The non-practice side also experienced significant improvement. The degree of improvement was greater when the non-practice side was the dominant side.

Discussion
- Healthy individuals demonstrate learning and transfer of ankle force control. While the dominant and non-dominant ankles exhibited equal learning, the amount of transfer was greater from the non-dominant to dominant side.
- The results show laterality of the motor control system in transfer of ankle force control.
- Rehabilitation of the unaffected ankle has the potential to benefit motor recovery of the affected ankle through ILT in patients with one-sided neurological pathologies.

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