Orthotics and Prosthetics

Intrepid Dynamic Exoskeletal Orthosis Use Produces Improvements in Pain and Walking Speed

The Intrepid Dynamic Exoskeletal Orthosis (IDEO) is a unique, custom-designed dynamic response device prescribed for patients with a wide variety of severe neuromusculoskeletal foot and ankle injuries. Researchers at the Center for the Intrepid at Brooke Army Medical Center (BAMC; San Antonio, TX) conducted a prospective study to quantify changes in pain and function when individuals with severe lower limb injury wear an IDEO compared to when they do not. It was hypothesized that the IDEO would (1) reduce walking pain, (2) increase walking speed, and (3) improve agility. Participants were assessed when they received their initial IDEO before they participated in any formal physical therapy with the device. Walking pain and physical performance (walking speed and agility) were evaluated.

Thirty-seven subjects completed testing. Subjects' injuries included fracture, nerve injury, osteoarthritis, Achilles tendon rupture, and compartment syndrome. On average, participants reported their pain to be 55 percent lower when walking with the IDEO as compared to walking without the IDEO. Average walking speed was 0.28 m/sec faster with the IDEO (1.30 ± 0.25 m/sec) than without the IDEO (1.14 ± 0.27 m/sec). Participants completed an agility assessment an average of 0.32 sec faster with the IDEO (8.19 ± 1.99 sec) as compared to without the IDEO (8.51 ± 2.42 sec). Improvements in pain and walking speed were immediate with the IDEO alone (without physical therapy). However, IDEO use without physical therapy did not significantly affect agility.

The IDEO provides several benefits to Service members with a wide variety of foot and ankle injuries. Understanding of the impact of the IDEO will help refine the IDEO prescription process for Service members with severe lower limb neuromusculoskeletal injuries.

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