



**Medical
Blueprints**

ROBOTS GETTING REHAB PATIENTS BACK ON THEIR FEET FASTER REPORT #2830

BACKGROUND: The integration of body-weight support (BWS) systems, such as ZeroG, into gait rehabilitation strategies following stroke, spinal cord injury, and other neurological disorders allows patients to practice gait and balance activities in a safe, controlled manner. The unloading system can provide up to 300 pounds of static support and 150 pounds of dynamic (or constant force) support using a custom-series elastic mover. The unloading system is mounted to a driven trolley, which rides along an overhead rail.

(Source: <https://www.rehab.research.va.gov/jour/11/484/hidler484.html>)

THE STUDY: Therapists with patients using ZeroG and z-tracks can select the amount of dynamic BWS (between 10-150 pounds) for the machine to help take support of. Therapist can also train patients using static BWS. The custom-series elastic mover control algorithm will then begin controlling the rope force. When first starting up, the trolley tracking algorithm is off, which causes the system to hold its current position on the track but once the patient is ready to walk the trolley tracking that executes the algorithm can be turned on. When dynamic BWS is enabled, the therapist can set the maximum fall distance for the patient so that when the patient drops past this distance, ZeroG will switch from dynamic to static BWS, which will prevent the patient from falling any farther. In addition, if trolley tracking is on when a fall is detected it will prevent any further trolley movement along the track.

(Source: <https://www.rehab.research.va.gov/jour/11/484/hidler484.html>)

NEW STUDY FOR ZEROG TECHNOLOGY: Advances in robotics and biomedical engineering are expanding the options for rehabilitative care and researchers are applying new technologies to gait training that may offer advantages over traditional labor-intensive physical therapy. An inpatient study of a robotic exoskeleton demonstrated the potential to improve gait training after acute strokes toward the goal of earlier recovery of motor functions. A study comparing just using conventional standard of care (SOC) to using both SOC with an option for overground gait training for the same amount of time showed that the exoskeleton allowed therapists to increase the dose of gait training without increasing the duration of inpatient rehabilitation. The study also showed that early intervention with this type of gait training promotes brain plasticity that may lead to greater functional improvements and more lasting effects when combined with SOC training.

(Source: <https://www.news-medical.net/news/20210129/Robotic-exoskeleton-gait-training-may-aid-early-rehabilitation-for-stroke.aspx>)

✉ **For More Information, Contact:**

Julie Kiefer, Public Relations
julie.kiefer@hsc.utah.edu
(801) 597-4258

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