

Gait and Balance Rehabilitation for the Amputee Population

Versatile technology focused on lower-extremity rehab is at the heart of a protocol that aims to return amputees to independent ambulation quickly and safely

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Physical therapists are tested daily in all different settings to reach what is most patients' common goal: to walk. One thing is consistently lacking in these environments, however: the ability to challenge someone at their highest potential while assuring safety and prevention of falls or injury. This can be exceptionally difficult when working with patients who are void of any type of proprioceptive or kinesthetic awareness at their knee, ankle, and/or foot because of an amputation.

Baton Rouge Rehabilitation Hospital (BRRH), located in Baton Rouge, La, has served as an institute for rehabilitation for the past 30 years, treating patients who are affected by a gait and balance deficiency as the result of spinal cord injury, neurological conditions, orthopedic injuries, amputations, and a variety of other causes. The primary goal of the rehab staff at BRRH is to assist patients in improving function and regaining the maximum amount of independence possible. Amputees face a number of challenges in recovering gait and balance, and one of the primary focuses of this facility is to leverage technology to overcome these obstacles.

Amputations can result from a variety of issues, ranging from vascular disease, diabetes, peripheral arterial disease, trauma, infection, and cancer. Therefore, this patient population tends to present with additional medical concerns. Taking these factors into consideration along with the psychological implications and adjustments of losing part of one's body presents a multifaceted challenge for some.

To accommodate the needs for this patient population, the rehab team began looking for equipment that could aid in overcoming the obstacles of fear while allowing both the patient and therapists to work in a "free" environment and return patients to independent ambulation more quickly. After evaluating the marketplace, the functions and features of the ZeroG from Aretech LLC, Ashburn, Va, seemed to be the best fit for BRRH. The ZeroG offers two different options of static body weight support (BWS) or dynamic body weight support that can be used overground, in a static state, or with a unique split belt treadmill.

The technology is able to store a patient's clinical gait parameters through the use of an advanced interface system, and its control devices (iPod Touch or iPad) are portable and able to communicate with the home system through a wireless connection. These instruments allow therapists to monitor and track levels of body weight support, distance walked, fall settings, and training duration.



Body weight support systems can allow therapists to move away from the patient to gain a holistic view of the patient's gait.

TECHNOLOGY BENEFITS

Body weight support systems are available from several manufacturers, and include products such as the Vector, available from Valencia, Calif-based Bioness, and Solo-Step, offered by Sioux Falls, SD-headquartered Solo-Step. Two other BWS products on the market include the Lokomat from Hocoma Inc USA, based in Norwell, Mass, and the SafeGait from Gorbelt Medical, Fishers, NY. Though these products are offered to the market with a set of features and benefits spe-

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