Home
Products
Education
Research
Support
Facilities
Newsletter
Pictures
Videos
Request Info
LiteGait Benefits

LiteGait photos

LiteGait Page

Clinical Support

Covered Topics:

Gait Components

- Posture
- Balance
- Coordination

New Treatment

- Partial Weight Bearing Gait Therapy
- How the Therapy is Performed
- Therapy Sessions
- Who Receives this Therapy

Balance Training with LiteGait

Indications & Contraindications

Partial Weight Bearing Gait Training Protocol using LiteGait

One of the most debilitating aspects of many central nervous system (CNS) and musculoskeletal disorders is the loss of the ability to ambulate. There are three main components of locomotion: posture, balance, and coordination. One or more of these components can be affected by a variety of neurologic or musculoskeletal disorders, thus limiting the individual's ability to walk with normal patterns. The Partial Weight Bearing Gait Training technique frees the therapist to facilitate proper gait patterns for patients with even severe gait deficits by providing a safely supported environment for the patient.

Gait Components: Posture, Balance, and Coordination

Posture

Posture can be affected by a number of musculoskeletal or neurologic disorders. Contractured and/or weak muscles, osteoporotic bones, or displaced joints make the upright posture, necessary for normal walking, difficult or impossible to attain. For example, children with spastic cerebral palsy, with limited range of motion due to shortened muscle-tendon length, are unable to stand upright. The walking patterns developed without proper posture can be inefficient and unsafe.

Balance

When balance is compromised or nonexistent (for example, due to stroke, vestibular lesion, or natural aging), an individual can either be too afraid, or unable, to walk normally. Impaired walking is often slow and asymmetric. Slow walking rates have high energy requirements and therefore limit the functional use of walking for activities of daily living. This form of walking relies more on sensory feedback and less on automatic processes of the brain and spinal cord.

Current physical therapy treatments incorporate the use of parallel bars to provide some degree of balance and safety during gait training. This requires the patient to have considerable upper body strength and often modifies the posture of the upper body. A biomechanically compromised posture often leads to formation of inappropriate patterns of walking. Walking aids (e.g., walkers) also impose an unnatural posture while providing some degree of safety and balance.

Coordination

The complex coordination of the legs during locomotion is one of the main output features of the CNS. Most neurologic impairments affecting the brain or spinal cord interfere with coordination of movements especially during gait function. Proper timing of toe-off, heel strike, and weight shifting-as well as bilateral symmetry-are the main goals of gait retraining. However, these parameters are difficult to achieve with the current treatment techniques. A wide range of patients do not receive coordination training for ambulation until late in their rehabilitation process due to present technique limitations. This could limit the patient's long term functional gain.

New Treatment

Recently, a new form of treatment has been explored based on experimental evidence derived from Spinal Cord Injured (SCI) subjects. This form of treatment has

in the retraining of walking function for a wide range of impairments. These Techniques are called Partial Weight Bearing (PWB) Gait Therapy. PWB Gait Therapy relies on a combination of two elements: 1. A postural control device that reduces the amount of weight born by the patient; and 2. A treadmill operated at slow speed to retrain proper patterns of walking. Researchers in Canada, Germany, and the United States have clinically tested and established the usefulness of this gait retraining program.

Partial Weight Bearing Gait Therapy

Partial Weight Bearing (PWB) Gait Therapy makes use of a suspension system to provide proper upright posture as well as balance and safety during treadmill walking. This is accomplished through a harness that removes a controllable portion of the weight from the legs, and redistributes it to the trunk and groin. This arrangement permits free movement of the patients arms and legs. The horizontal movement is provided by a slow moving treadmill. The treadmill's constant rate of movement provides rhythmic input which reinforces a coordinated reciprocal pattern of movement. Proper coordination is further assisted by the manual placement of the feet and/or weight shifting by the therapist. Once coordination is established, treadmill rates and the degree of weight bearing are increased.

In addition to establishing coordination of the legs, PWB Gait Therapy calls for gradual increase of weight bearing. Dynamic balance can be safely trained by reducing the weight supported by the suspension mechanism and increasing treadmill rates. Once therapy goals are achieved on the treadmill, it is necessary to transition the patient to over ground therapy, with the ultimate goal of transferring skills to independent or assisted over ground walking.

How the Therapy is Performed

The patient is placed in the suspension mechanism which provides an upright posture appropriate for walking. This is accomplished by transferring a portion of the patient's weight away from the legs and redistributing it to the lower stomach and groin area. Comfort is maximized while proper gait posture is preserved. With the patient's weight supported, the treadmill establishes a slow, yet constant, rhythm of movement. As patterns of movement form (or improve), the patient's balance and possible need for any assistive device are addressed. Gradually, the amount of postural support (i.e., weight support) is decreased and the treadmill rate is increased to simulate more natural conditions of walking. In cases of severely involved patients, the legs are moved manually in order to establish a proper gait pattern.

Therapy Sessions

Typically, the treatments are one half to one full hour long, and occur once or twice a week for outpatients and three to four times a week for inpatients. Each hour of therapy is divided into 3 to 4 sessions of therapy, each followed by a rest period. For severely involved patients, sessions may be as short as 3 minutes, with 5 minutes of rest. Each therapy session for partially or fully supported patients should not exceed 15 minutes. It is imperative that most, if not all, of the "steps" taken during therapy are taken with correct patterns. Each session should end when time has expired, the patient's gait has deteriorated, or the therapist / patient is feeling fatigued. Over a two week evaluation period, the patient is expected to make some gains in their ability to coordinate movement of the legs during treadmill walking. The program continues for eight to twelve weeks (3 to 4 times per week) if there is progress, and may continue for an additional four weeks in cases of slower improvement.

In acute cases, an evaluation after the first two weeks of therapy is suggested. If no improvement is made, therapy time may be better spent on other activities. In chronic cases, this is more difficult to judge, especially for severely involved patients. The improvement in some cases may be in the form of therapist assessment that the provision of gait has become easier. This may be due to some participation by the patient, reduction of dynamic tone, or formation of new patterns.

Since the repetition of good walking patterns is the essential element of this therapy, it is important to provide therapy as prescribed, continuously over the course of training, without interruptions or breaks.

Who Receives this Therapy

PWB walking therapy has been clinically applied to patients with a wide range of walking disorders. It is appropriate to use this protocol whenever gait therapy has been prescribed. Additionally, many patients not considered for gait training may be trained with PWB protocols. Severely involved patients-those unable to support their own weight, those inappropriate for assistive devices, or those too weak in upper body strength-may benefit from training aimed at developing the coordination needed for walking during the earliest stages of their recovery. Extreme caution must be taken to assure stability of autonomic reflexes (in acute stages), and bone and muscle integrity (in chronic cases).

Balance Training with LiteGait

LiteGait® can be used to train balance in standing or seated positions, or even while walking. Some protocols include the following: Patients with compromised posture and balance mechanisms are brought to supported standing. Posture is disturbed with a nudge or with a ball thrown for the patient to catch. The device assists in recovery of posture and balance. The same task is repeated with minimal suspension. The device prevents falls but allows controlled amount of movement. Feedback about desired responses can be provided to the patient. This routine is repeated many times with a gradual reduction in the amount of support provided. This allows the assistance provided by LiteGait to be gradually replaced by the returning function of the patient.

Indications & Contraindications

LiteGait and WalkAble are effective when there is a need for intervention in the learning or relearning of ambulation when balance, coordination or postural control is a problem. The harness system redistributes the load from the lower extremities to the abdominal region making gait training possible. As such, minimal pressure exists in the abdominal region and potential for additional pressure in the groin area can result with improper application of the harness. When evaluating the appropriateness for use, the above-mentioned must be taken into consideration. When in doubt, consult with us at Mobility Research by calling 800.332.9255 or email info@litegait.com.

The following is a non-exhaustive list of the indications, contraindications and precautions for LiteGait and WalkAble:

Indications

- Spinal Cord Injury
- Cerebral Vascular Accident (Stroke)
- Head Injury
- Muscular Dystrophy
- Parkinson's Disease
- Multiple Sclerosis
- Cerebral Palsy
- Lower Extremity Joint Pain
- Amputee (prosthetic fitting and training)
- Balance / Coordination / Postural Training in Sitting or Standing
- Ambulation Training
- Ambulation Training with Assistive Devices
- Endurance Training
- Vestibular Therapy
- Classroom Activities with Children

Contraindications

- When loading of the hip, pelvic, abdominal and chest regions is prohibited
- Fractured Ribs
- Large Disc Bulge / Rupture
- Groin Infections
- Skin Graft in Groin Region

Precautions

- Gastrointestinal Tubes (requires padding)
- Colostomy (requires padding)
- Acute Total Hip Replacements[1]
- Hip Fractures[1]
- Spondylolisthesis[2]
- Compromised Skin Integrity[3]
- Certain Metastatic Diseases

[1] May need to unbuckle the groin piece on the affected side.
[2] May require modification of harness application.
[2] Consultation with the physician is strongly advised.

Please contact Clinical Support for further information.

800.332.WALK • clinicalsupport@litegait.org