

Locomotor Training

Frequently Asked Questions

Question: What is Locomotor Training?

Answer: Locomotor training (LT) is a new and emerging rehabilitation therapy based on current knowledge about the capacity of the spinal cord to develop new pathways, and to recover a specific motor task driven by repetitive sensory input. LT is an activity-based therapy that is delivered using three primary treatment components:

1. Step Training Using Body Weight Support on a Treadmill (BWST) with Manual Assistance
2. Over-Ground Walking Training
3. Community Ambulation Training

Question: Describe manual-assisted BWST locomotor training?

Answer: The primary activity for retraining to walk occurs in the treadmill environment. In manual-assisted BWST locomotor training, trained therapists and therapy technicians manually manipulate the muscles in the legs to help the patient move their legs as they walk on the treadmill. Patients are placed on the treadmill in an upright position and suspended in a harness by a cable at the maximum load at which knee buckling and trunk collapse can be avoided. A trainer is positioned behind the subject to aid in pelvis and trunk stabilization, as well appropriate weight shifting and hip rotation during the step cycle. Trainers are also positioned at each limb to provide manual assistance using a customized technique that facilitates knee extension during stance and knee flexion and toe clearance during swing. Trainers promote knee extension by applying posterior directed gentle pressure at the patellar tendon during stance. Knee flexion and toe clearance is promoted by applying a gentle anterior directed force at the medial hamstring tendon during swing.

Question: Describe robotic-assisted BWST locomotor training?

Answer: The robotic version of locomotor training provides a system of external orthoses that straps onto the patient. The robotic orthoses have motors in the hip and knee joints to move the patient's legs. The ankle is fixed and limits heel strike and toe flexion. It can provide feedback as to how much the patient is working with the machine. The Robotic-assist system does provide consistent steps every time and allows the patient to achieve a good walking pattern without needing to stop to rest.

Question: Which patients are candidates for manual vs. robotic BWST locomotor training?

Answer A: Manual-assisted locomotor training: This therapy is for patients who already have movement or new movement in their legs (ASIA C or D), they can be ambulatory or non-ambulatory, they must be medically stable, and there should be an absence of leg joint pain and/or fractures. Patients with strong spasticity or very loose joints will likely not be eligible for this therapy due to risk of injury to the patient or trainers. Patient weight limits are established by the programs own criteria and through specific product patient weight limitations. Program criteria have been established for manual-assist at 180-240 lbs, depending on the abilities of the patient. TheraStride accommodates patients up to 300 lbs.

Answer B: Robotic-assisted locomotor training: This therapy is for patients with little movement in their legs (ASIA C), with strong spasticity, or with very loose joints, ambulatory or non-ambulatory, medically stable with no leg joint pain or fractures present. The weight limit is 300 lbs, and the system must be able to accommodate the size of the patient.

Question: What types of diagnoses benefit from BWST locomotor training?

Answer: Generally, BWST locomotor training is suitable for all gait-impaired patients. The TheraStride BWST system utilizes a closed-looped algorithm feedback technology that assists in simulating standard gait patterns, and provides patient feedback throughout the course of the treatment. Currently, patients undergoing manual-assisted BWST locomotor training have the following neurologic injury or disease:

- SCI – AIS C or D incomplete
- Stroke
- Traumatic Brain Injury
- Cerebral Palsy
- Multiple Sclerosis
- Parkinson's Disease
- Other Neuromuscular Impairments

Question: When should BWST locomotor training therapy begin?

Answer: Patients can start anytime depending on the clinical assessment carried out by their doctors and therapists. In principle, it is recommended that the training begin as early as possible after a traumatic event in order to achieve the best possible results from the LT program. BWST locomotor training has been used on patients that are a few weeks, to over 20 years post injury with good results. Before any training begins though, the patient's doctor and therapist have to decide whether TheraStride therapy will be useful and feasible for the individual patient.

Question: How long does the typical locomotor therapy plan last?

Answer: The average person receives the therapy for three to four months, and will undergo about 40 to 60 sessions. Each patient is re-evaluated every 20 sessions.

Question: How much time is each locomotor training session?

Answer: Generally, each session is about 1.5 hours, and in the beginning phase of the program, 5 times per week. As the patient progresses the sessions are reduced to 4 times per week and then 3 times per week.

Question: Are there contraindications for BWST locomotor training?

Answer: Yes. Certain contraindications should be observed, including advanced osteoporosis and skin or tissue problems. Also, the body weight of the patient should not exceed 300 lbs. Patient body size is also a factor as this can limit the therapist's ability to manually assist the patient in hip rotation, knee extension, and flexion and toe clearance which will limit the overall effectiveness of the therapy.

Question: Is there an age requirement or limitation?

Answer: The range in age is from toddlers, as young as 4-5 like Chase Ford (see video of Chase at the following web address: <http://www.youtube.com/watch?v=d8FvgkRdgHE&feature=related>), to seniors in their 70's and 80's. The time period between injury and the onset of TheraStride training can range from just a few weeks to more than 20 years post injury.

Question: How many training sessions are required before results start to become noticeable?

Answer: No two patients will respond in exactly the same way. It is not possible to specify a timeframe at which results become noticeable as the success of the rehabilitation process depends on various individual factors, including age, general state of health, injury or disease state, etc. However, research findings and past patient outcomes indicate that the first positive changes in gait profile can present after only a few training sessions.

Question: Is BWST locomotor training financially feasible?

Answer: The simple answer is yes. On an inpatient basis the cost of locomotor training is included in the per diem payment – no separate charges. You need to use an interdisciplinary plan of care in working with your patient on an inpatient schedule for locomotor training to be effective. It is highly suggested that you incorporate LT into the patient treatment plan while an in-patient if the patient is able to tolerate the activity.

As an outpatient, you should use standard outpatient billing procedures. Locomotor training is the same as other physical therapy. Differences are related to frequency and duration of intervention, plus resource utilization. You should go through the same standardized appeal process plus add to this by providing an educational support packet to accompany documentation, i.e. literature evidence and patient specific video.

CPT coding to use:

- 97001 = evaluation (untimed)
- 97002 = reevaluation (untimed)
- 97110 = Therapeutic Procedures
- 97112 = Neuromuscular reeducation
- 97116 = Gait Training
- 97530 = Therapeutic Activities
- 97542 = Wheelchair Management
- 97750 = Physical Performance Tests

Question: How is TheraStride different than other BWST systems?

Answer: TheraStride technology is based upon years of research conducted at UCLA, University of Louisville and many other leading rehabilitation facilities around the country. **TheraStride offers unequalled technology for natural gait emulation by incorporating a patented algorithm and closed-loop feedback system.**

TheraStride is a manual-assisted BWST system that continuously regulates the amount of body weight exerted to the patient's legs, accurately and quickly adjusting body weight support levels in response to ground reaction forces through the step cycle. This is achieved through a computerized control system that continuously monitors a load cell. As trained therapists facilitate movement in the client's ankles, legs and hips, TheraStride's dynamic feedback system modulates ground reaction forces and the patient's center of gravity movement. The feedback system adjusts 20 times per second which provides for controlled vertical displacement with each step.

TheraStride offers an **ergonomically designed seating system** that enables therapists a comfortable access to the patient's legs that minimizes stress on their body, and limits the possibility of muscle strains and injury.

Question: What are the benefits of computerized reports?

Answer: System feedback is critical to managing patient locomotor training therapy in terms of weight-bearing ability, balance, motor control and natural gait replication. Clinicians can also use the recorded information to validate reimbursement with their payor.

TheraStride’s computer software continuously monitors, tracks and generates important clinical information during each session, such as body weight support percentage, treadmill speed, and session duration. These summary reports enable the therapist to evaluate and adjust stand and step cycles based upon each patient’s performance and need.

Question: What is the typical price for BWST systems and maintenance?

Answer: It is important to always ask the manufacturer what is covered in the cost of the equipment to make sure there are no hidden costs. Some manufacturers do not include the treadmill as part of the standard system and will quote a standard system without the treadmill. Always be sure you are comparing similar equipment and features.

Extended service contracts for manual-assisted systems are in the range of \$7,000 per year, and \$15,000 per year for robotic-assisted equipment.

Body Weight Support Treadmill Systems Quick Comparison	Price	Sizes		Computer Adjustability		Computer Controlled Dynamic Movement	Ergonomic Therapist Seating	Synchronized Robotic Motors for Hips/Knees	Treadmill Included	Mobile for Over Ground Training	Complete Therapy Reports
		Adult	Peds	Treadmill Speed	Body Weight Support						
Robotic-Assist:											
LocoMat by Hocoma	250K	X	X	X	X	X		X	X		X
AutoAmbulator	180K	X		X	X	X		X	X		
Dynamic Manual-Assist:											
TheraStride by Innoventor	80K	X		X	X	X	X		X		X
Andago by Hocoma	70K	X	X	X	X	X			X		X
Robomedica	72K	X		X	X	X					X
Static Manual-Assist:											
Lite Gait	10K	X	X							X	
Biodex Unweighing System	12K	X								X	
Spinoflex	5K	X	X							X	