

Therapy Information

Lokomat® Training for Stroke Patients

(Also known as cerebral insult, apoplectic insult, apoplexy, and cerebral apoplexy)

The term “stroke” refers to a sudden disturbance of brain function caused by the loss of brain tissue. Approximately 15 million people in the world suffer from stroke every year, of which 5.5 million die, while another 5 million are left with varying degrees of disability.

(Source: www.who.int/cardiovascular_diseases/resources/atlas/en, as of February 21st, 2007.)

The most common complaints that result from stroke are as follows:

- Hemiplegia (paralysis on one side)
- Balance problems
- Vision problems
- Speech disorders
- Perception problems

How can Lokomat training help stroke patients?

To regain walking ability after a stroke is one of the main aims of neurorehabilitation. The ability to walk is often the deciding factor in whether or not a patient must remain at home or can return to work without having to rely on assistance from another person. Our nervous system has the ability to change its structure and function, an ability known as neuroplasticity. It is known that repetitive exercise encourages such structural and functional changes in the nervous system, which greatly improve the patient’s ability to handle the tasks presented to him or her.⁽¹⁾ As a result, modern neurophysiological concepts of walking now focus on repetitive, task-specific exercises.^(2, 3) In other words, “If you want to learn to walk, you have to walk”. Training with the Lokomat system is based on this concept, and enables repetitive training in complex walking cycles to take place as early as possible.

What’s more, the Lokomat system enables patients to follow another therapeutic procedure, one that has proved to be highly effective in the rehabilitation of stroke patients: constraint-induced movement therapy (CIMT).⁽⁴⁾ This form of therapy involves intensive training of the affected part of the body in order to regain motor function more quickly in a targeted way.

What are the expected effects of training with the Lokomat system on stroke patients?

Beyond the already known positive effects of treadmill therapy with partial body weight support such as improved balance⁽⁵⁾, better motor control of the lower extremities^(2,5), faster walking^(5,6) and greater endurance⁽⁷⁾, Lokomat training is especially beneficial to hemiparetic patients in the area of an essential unchangeable component of movement – standing on one leg. Patients who train with the Lokomat system are thus able to stand on a hemiparetic leg for longer. Furthermore, a significant decrease in body fat mass and corresponding increase in muscle mass compared with conventional forms of therapy has been proven.⁽⁸⁾

Note: At this point, we would like to expressly state that these improvements are not due exclusively to training with the Lokomat system. They must always be regarded as a result of Lokomat training in combination with other physiotherapeutic interventions.

How often should training take place?

In the early phase of rehabilitation, training should take place every day if possible (depending on the patient's stamina and the therapy plan). In the later rehabilitation phase, we recommend that the patient train three times a week. For more information, please see the "Recommendations for clinical practice" in the Products/Lokomat/Interest Groups section of our website.

Who should not use the Lokomat system for training?

As with any form of therapy, there are known contraindications for the Lokomat system. For a list of these contraindications, please see "Purpose and contraindications of the Lokomat System" in the Products/Lokomat/Interest Groups section of our website.

Which clinics have experience with the Lokomat system?

If you have any questions about therapy with the Lokomat system, please contact your local clinic directly. For a list of reference clinics, see the Lokomat / References section on our website.

⁽¹⁾ Schmidt RA, Lee TD. Motor Control and Learning: A Behavioral Emphasis. 3rd. Human Kinetics; Champaign, IL: 1999.

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⁽³⁾ Barbeau H. Locomotor training in neurorehabilitation: emerging rehabilitation concepts. *Neurorehabil Neural Repair* 2003, 17:3–11.

⁽⁴⁾ Taub E, Uswatt G. Constraint-Induced Movement therapy: answers and questions after two decades of research. *NeuroRehabilitation*, 2006, 21: 93-95.

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⁽⁶⁾ Laufer Y, Dickstein R, Chefez Y, Marcovitz E. The effect of treadmill training on the ambulation of stroke survivors in the early stages of rehabilitation. *J. Rehabil. Res. Dev* 2001; 38: 69–78.

⁽⁷⁾ Da Cunha IT, Lim PA, Qureshy H, Hensen H, Monga T, Protas E. A comparison of regular rehabilitation and regular rehabilitation with supported treadmill ambulation training for acute stroke subjects. *J. Rehabil. Res. Dev.* 2001, 38: 245–255.

⁽⁸⁾ Husemann B, Muller F, Krewer C, Heller S, Koenig E. Effects of locomotion training with assistance of a robot-driven gait orthosis in hemiparetic patients after stroke: a randomized controlled pilot study. *Stroke*. 2007; 38(2):349-54.