Avoiding falls through balance training

Balance disorders and associated involuntary mobility impairments are among the leading symptoms of neurological and geriatric patients. They lead to a reduction in the quality of life and to falls with a subsequent increase in morbidity and mortality. Achieving sufficient standing and walking stability is therefore one of the central challenges of rehabilitation medicine. The significance results from the high incidence rate of falls and the mostly severe consequences [1]: A fall as a result of a loss of balance is one of the most common causes of injury in older people. Under the conditions of demographic change, health policy is faced with the task of making appropriate use of increasingly scarce resources in order to prevent the often serious restrictions on health and the threat of a need for long-term care. As a result, fall prevention concepts and measures have become increasingly important in recent years. National and international guidelines recommend a wide range of individual and combined fall prevention measures.

In this context, it is important that task-oriented training always takes place, focusing on the patient's existing activity restrictions. This ensures that the activity that is to be improved is trained. There is no such thing as THE balance exercise in postural control therapy. This is due to the fact that balance cannot be separated from the action performed, nor from the environment. The following figure illustrates the connection:

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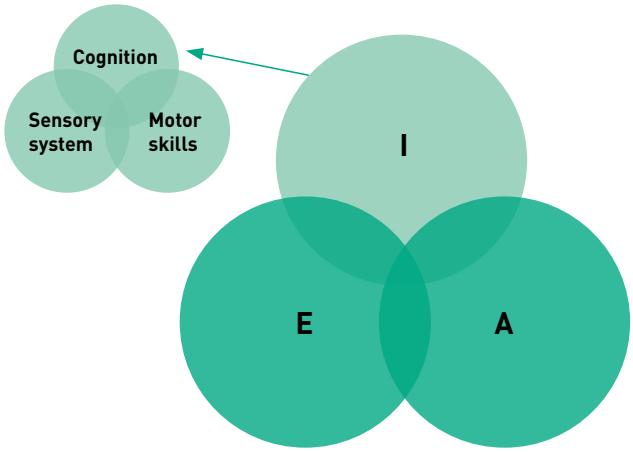

Figure 1: The interaction model (source: own representation according to Shumway-Cook A, Woolacott M (2017))

Postural control (PC) is therefore the result of the environmental conditions (E), the activity performed (A) and the physiological conditions of the individual patient (I). Accordingly, the therapy must be designed in a multi-layered way: For example, the therapist has to decide between different surfaces or consciously choose certain balance mechanisms: is the balance training static, anticipative or reactive?

Task-oriented training with the aim of restoring walking ability should therefore always take place while standing and walking. There is a close correlation between these two starting positions. This goes so far that the ability to balance while standing marks an important predictive factor for the ability to walk after a stroke [6]. In summary, balance training is an indispensable part of daily therapy and represents an initial starting point for severely affected patients to restore their ability to walk and thus their independence at an early stage [5]. Furthermore, the ability to walk becomes much more probable if free standing is possible [7]. In order to improve walking ability, balance training must therefore also be part of the therapy, which is confirmed by several internationally recognised guidelines: Accordingly, the additional use of a balance trainer alone is superior to conventional therapy. This is especially true for patients in chronic stages to improve walking speed [11]. The Dutch guideline adds that balance training can also be carried out in a standing frame [12]. Therapy in a standing frame is not as one-sided as it seems. A recommended therapy option for standing frames, for example, is visual feedback. It helps to improve the postural control of standing patients [13].

With the dynamic standing frames from THERA-Trainer, balance training can be carried out safely and flexibly. Several studies have shown that this has a positive effect on postural control during walking [4, 8, 9]. The use of the devices is so intuitive and safe that therapy with the dynamic balance trainers can also be taken over by trained helpers. A therapist is therefore not absolutely necessary [2, 10]. The dynamic standing trainers are therefore a complementary measure in physiotherapy in order to increase the patients' therapy time and thus improve the therapy outcome [4]. In addition, therapy with the THERA-Trainer balo can also be continued at home. Here, too, safety and effectiveness are guaranteed [3]. In addition, dynamic standing training with THERA trainers stabilises the cardiovascular system and improves parameters such as muscle strength, mobility and endurance. Body awareness is improved.

In view of decreasing budgets in the healthcare system and at the same time increasing scarcity of resources, dynamic standing training with THERA trainers represents a good alternative to other conventional methods for improving balance and postural control. Recommendations of international guidelines can thus be integrated into day-to-day therapy and can also be incorporated into the patient's everyday life after inpatient or outpatient treatment. This not only increases the patient's ability to walk, but also their quality of life.

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