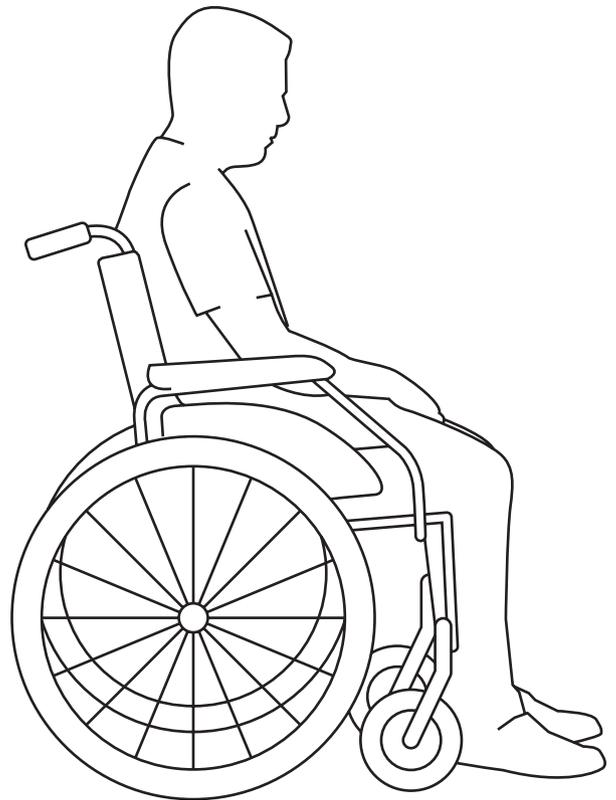
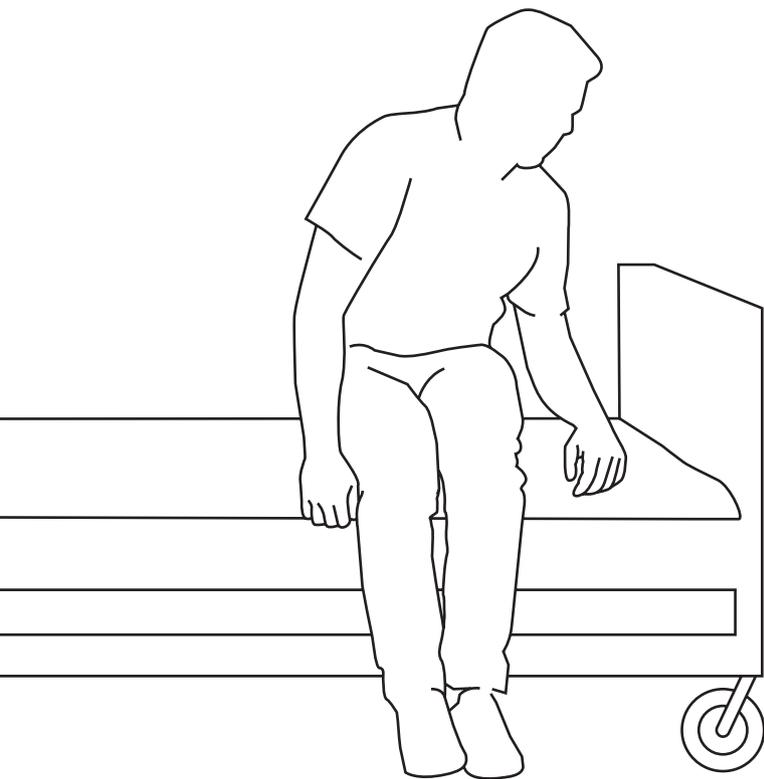
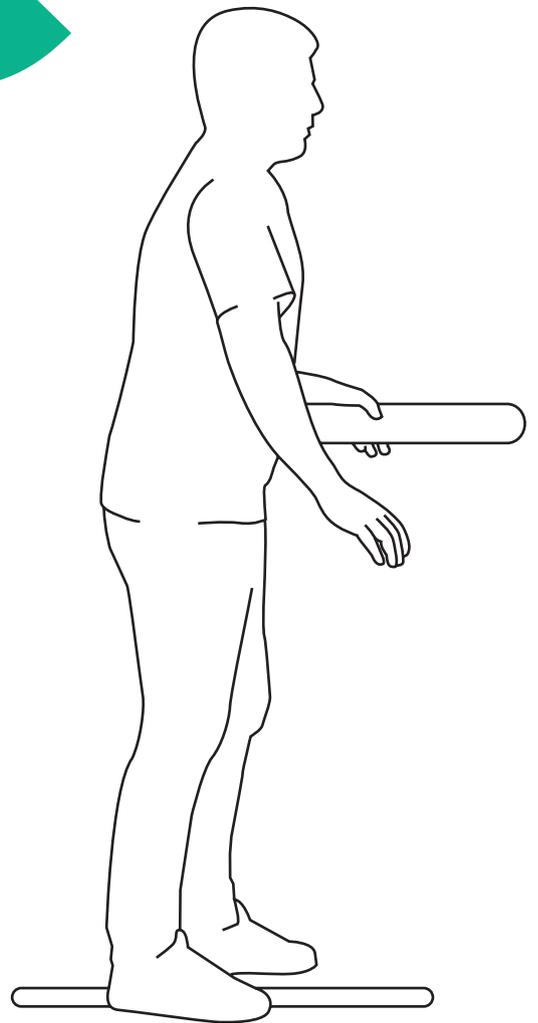
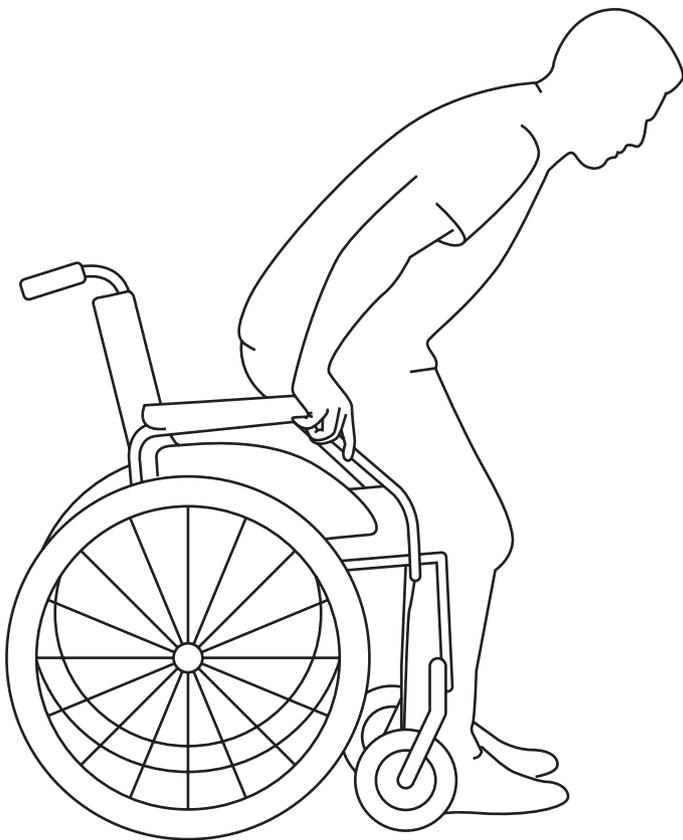


COVER STORY

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Part 2
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COVER STORY

From evidence to clinical practice

The THERA concept offers extensive expertise to all facilities involved with active rehabilitation and patient care on the basis of the latest evidence. At the heart of the concept are practice-oriented guidelines for action that facilitate goal-oriented use of THERA-Trainer products across all phases of rehabilitation. This is based on the latest scientific findings taking account of all adjoining areas.

By Jakob Tiebel

Nowadays, in physiotherapy, it is crucial to have up-to-date knowledge. Treatments must be increasingly efficient and economical. The effectiveness of therapeutic measures is tested in studies to ensure that the best possible quality of care is given. This evidence-based practice approach is becoming increasingly popular. Despite the fact that physiotherapeutic research is still new in comparison with other branches of research, evidence-based practice has been in demand and actively encouraged for several years.

Evidence-based practice should bring the individual experiences of the therapists and the wishes and needs of the patients in line with current scientific and research findings (see THERAPY 1-2017). A critical examination of the effectiveness of the measures implemented is crucial to improve

the quality of treatment and generate the best possible results. This is carried out on the basis of scientific studies. The results can determine which measures and procedures can be deemed as therapeutically effective and superior. The quality of the studies is crucial here. Randomised controlled trials (RCT) are generally used along with meta-analyses. Meta-analyses are procedures that quantitatively combine the findings from several studies with the same research question.

Guidelines have been developed to translate current findings from clinical research into practice. The knowledge gained from the wide variety of studies is summarised and recommendations are made to ensure best practice. Field and Lohr define clinical treatment guidelines as “systematically developed statements to assist practitioner and

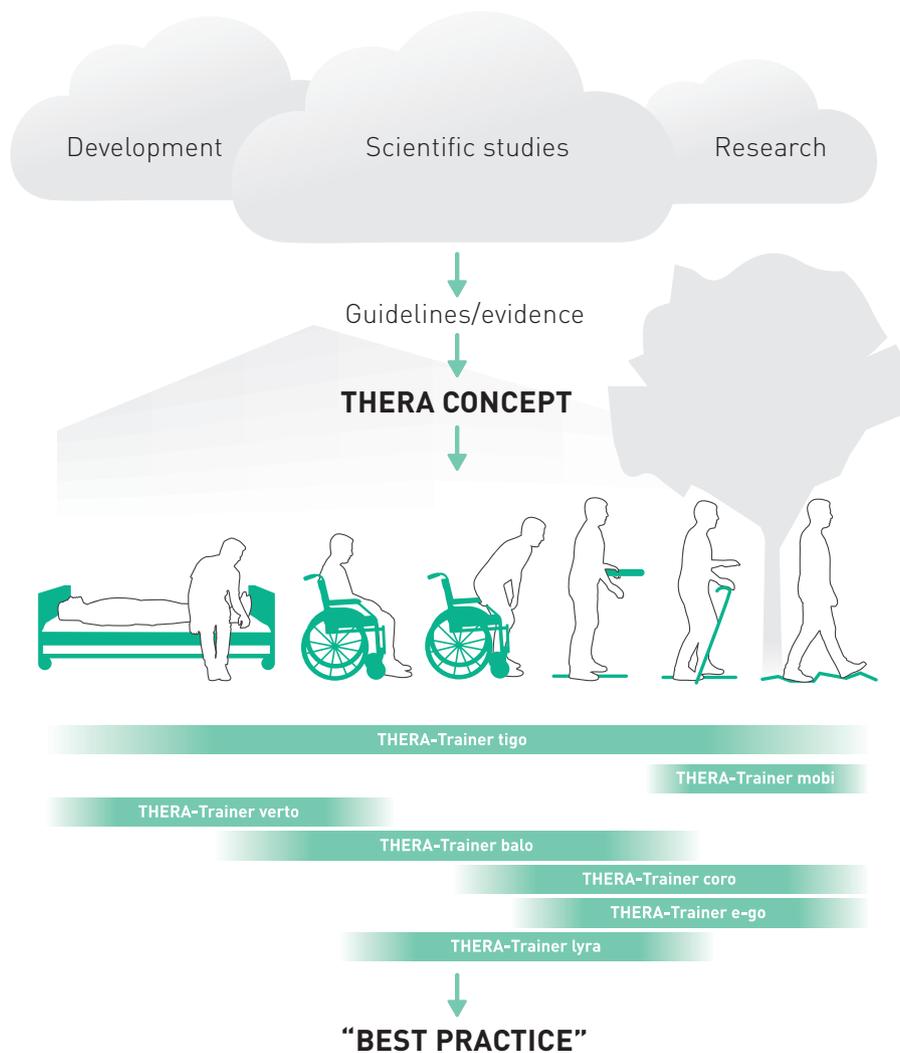
patient decisions about appropriate health care for specific clinical circumstances” (Field, Lohr 1992). The first guidelines for rehabilitation of neurological patients were published around 10 years ago and have since been constantly expanded and adapted with new findings.

The THERA concept is mainly based on the recommendations of the Royal Dutch Society for Physical Therapy (KNGF) and the German Society of Neurorehabilitation (DGNR) [1-2]. Both organisations recently published high-quality clinical practice guidelines for the rehabilitation

of stroke patients that reflect current scientific knowledge and have impressed due to their practicability.

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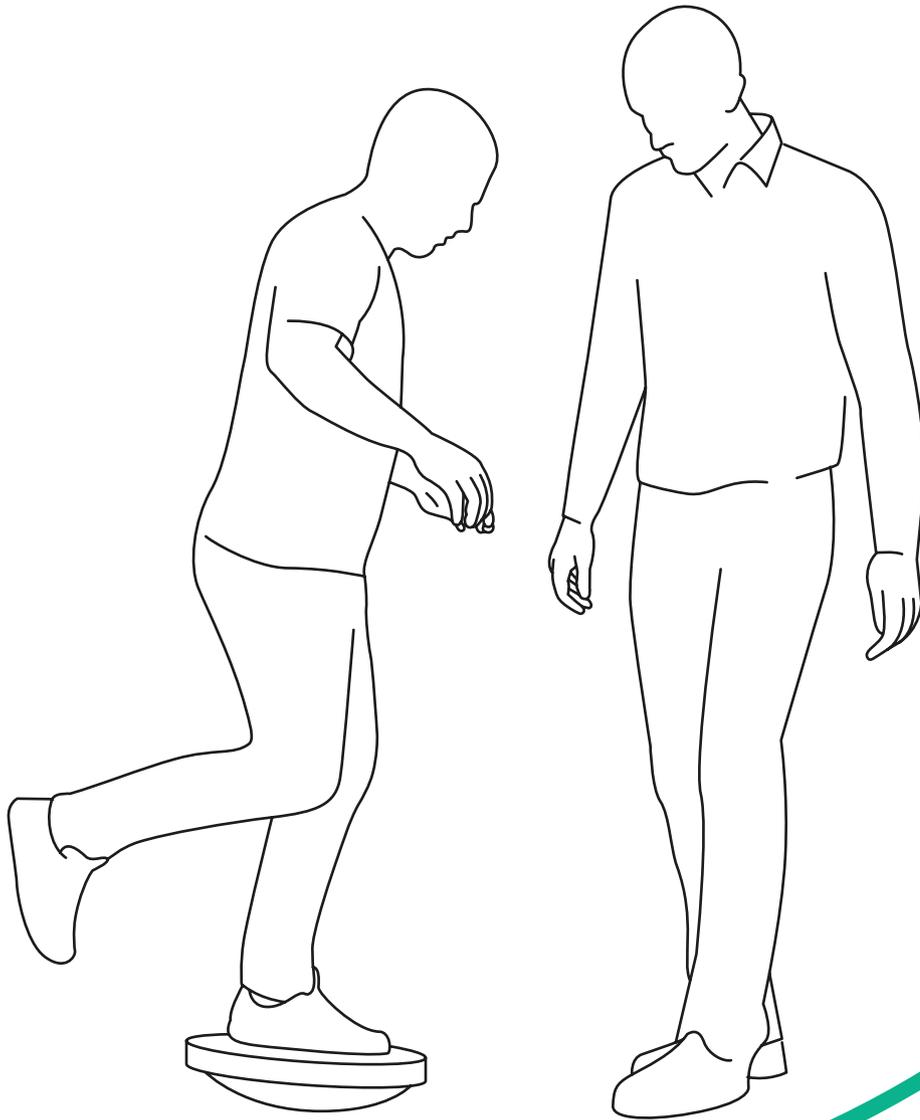


COVER STORY

Patients undergoing rapid testing

A procedure has been developed for THERA concept that is set to assist therapists in their clinical decision-making. Patients are assigned to sub-groups of specific interventions according to their capabilities. This makes it possible to use THERA-Trainer effectively in day-to-day clinical treatment and sensibly structure the device-based treatment measures.

By Jakob Tiebel



Assessments are made to determine a patient's cognitive abilities in a targeted manner. According to Platz and van Kaick, systematic and standardised recording of functional abilities and impairments is one of the fundamental tasks of modern therapy processes for enabling targets and appropriate measures to be determined together with the patients on the basis of results [1].

Modern rehabilitation concepts should always be based on careful evaluation of patient capabilities and a precise definition of targets. These are two significant elements of rationalised and conclusive rehabilitation management [2, 4].

Assessment instruments are currently largely based on the classification levels of the International

Classification of Functioning, Disability and Health (ICF) of the World Health Organization (WHO) [1, 5]. The major benefit of the ICF is an underlying biopsychosocial approach, which facilitates an integrated and resource-oriented view of the patients [2]. According to the ICF, health problems are seen as the result of complex relationships between people, people-related factors and the environment [6].

A patient's abilities are determined in terms of bodily functions and structures (e.g. postural control), activities (e.g. standing and walking) and participation (e.g. involvement in everyday life). The measurements required for this should always be taken at the start of the rehabilitation

process and at regular intervals over the course of it. In this way, the effects of the treatment can be checked and the measures taken can be adjusted to the changing level of performance of a patient. In the long term, recommendations for improving the effectiveness of therapy can also be devised on the basis of documented results [7].

In practice, however, it is not always easy to select a suitable procedure for a specific application from the many assessments available worldwide [1]. Most rehabilitation facilities routinely use a selection of standardised survey procedures to determine the patient's capabilities in conjunction with the ICF and formulate objectives with the patient. However, in many cases the relevant instruments are deployed only sporadically and often non-specifically. As a result of this, the motor abilities of patients are recorded inadequately in day-to-day treatment. Many of the detailed assessments include measurement procedures that, while useful, are often lengthy and require a great deal of time and routine work to be applied to obtain meaningful results. Data can often be used only to a limited extent in interdisciplinary exchanges, as other professional groups are not familiar with the procedures.

In a bid to structure the treatment measures in the context of the THERA concept, there was a pressing need to establish a simple yet valid instrument for assessing motor skills, which could be implemented and interpreted by all the professional groups involved in the rehabilitation process and make it possible to assign patients to treatment modules based on their capabilities.

The THERA concept assessment is derived from assessments that have been thoroughly clinically analysed and are tried-and-tested, such as the Functional Ambulation Categories (FAC) and the Static Balance Test (SBT), which in turn is based on elements of the Berg Balance Scale [8][9]. It records patient capabilities in terms of activity and must therefore be implemented in a task-oriented way and enable a quick and reliable assessment of postural control, the ability to stand and (in combination with the FAC) ability to walk.

LITERATURE

1. **Platz T, van Kaick S** (2007). Motorisches Assessment bei Patienten mit Schlaganfall [Motor assessment of patients after stroke]. In: Dettmers C, Bülow P, Weiller C (ed.): Schlaganfall Rehabilitation [Stroke rehabilitation]. Bad Honnef: Hippocampus Verlag.
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The THERA-concept assessment

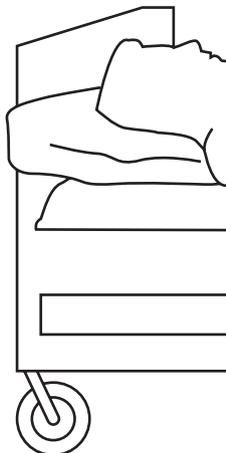
Various ability levels based on postural control, ability to stand and ability to walk can be determined with the help of the THERA-concept assessment in combination with the FAC. The ease of implementation is particularly compelling.

By Jakob Tiebel

Module 1

The patient cannot sit up, even with a lot of assistance

The patient mainly lies in bed and is mobile only for brief moments, if at all. The period of mobility is significantly less than three minutes. At least two assistants are required and the patient must be given maximum support. The patient does not have sufficient control over his or her head and body; active cooperation by the patient is not discernible at any time.



Module 3

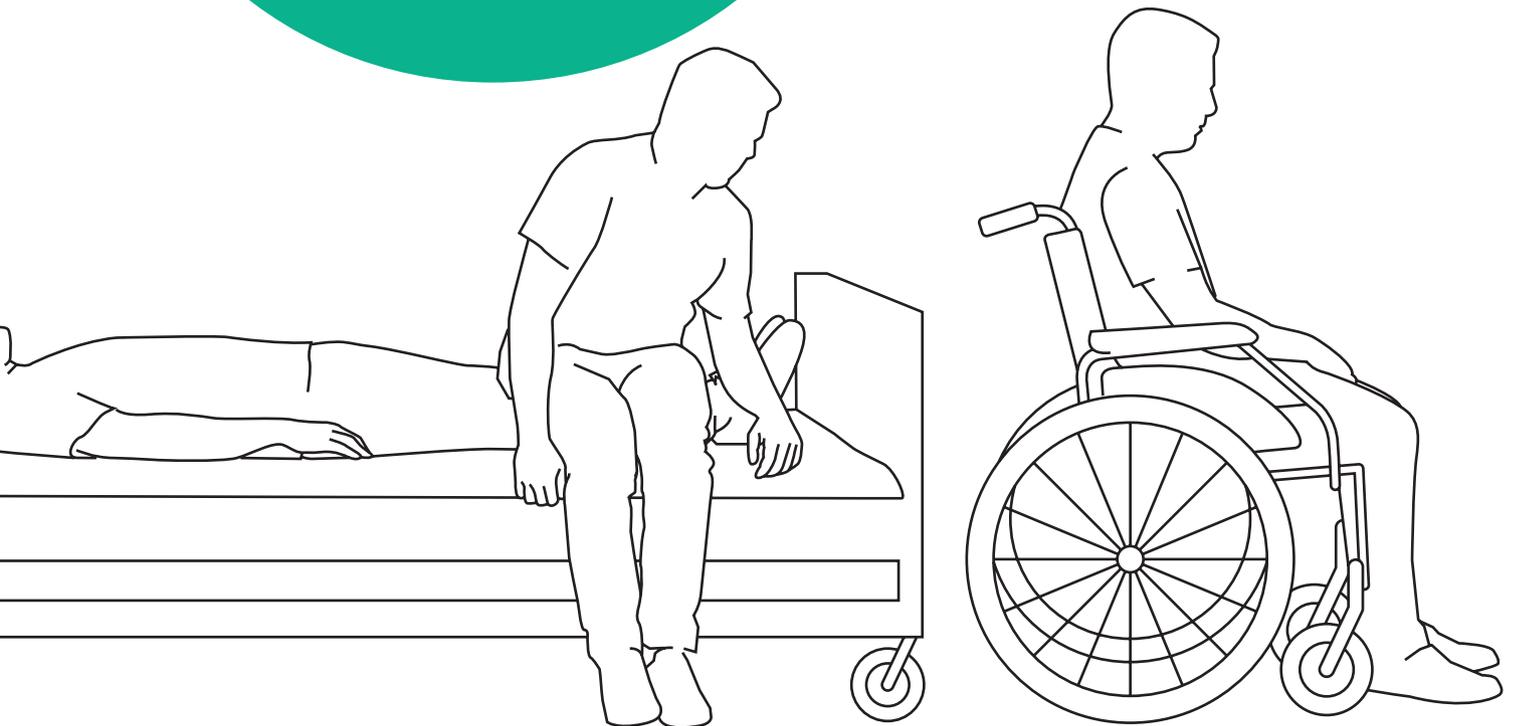
The patient can sit up with a little assistance

The patient relies on little to no direct physical support from an assistant. The assistant only uses hand contact for added safety. The therapist mainly uses verbal instructions to improve postural control. During the day, the patient is mainly mobile using a wheelchair, can keep his or her body upright against gravity for a sustained period of time, and can shift his or her centre of gravity when sitting.

Module 2

The patient can sit up with a lot of assistance

The patient is mobile with the support of at least one assistant, e.g. on the edge of the bed during therapy. Physical contact and stabilisation of the patient's body are required at all times and prevent the patient from losing his or her balance. A stable sitting position can be maintained for a brief moment under certain circumstances. There is no discernible shifting of bodyweight at any time.



Module 5 (FAC 1-2)

The patient can stand still

The patient can remain standing upright against gravity and can shift his or her centre of gravity over a flat area of support. Active shifting of balance is only possible with the help of an assistant. The patient risks falling over in the event of a distraction or disruption of equilibrium.

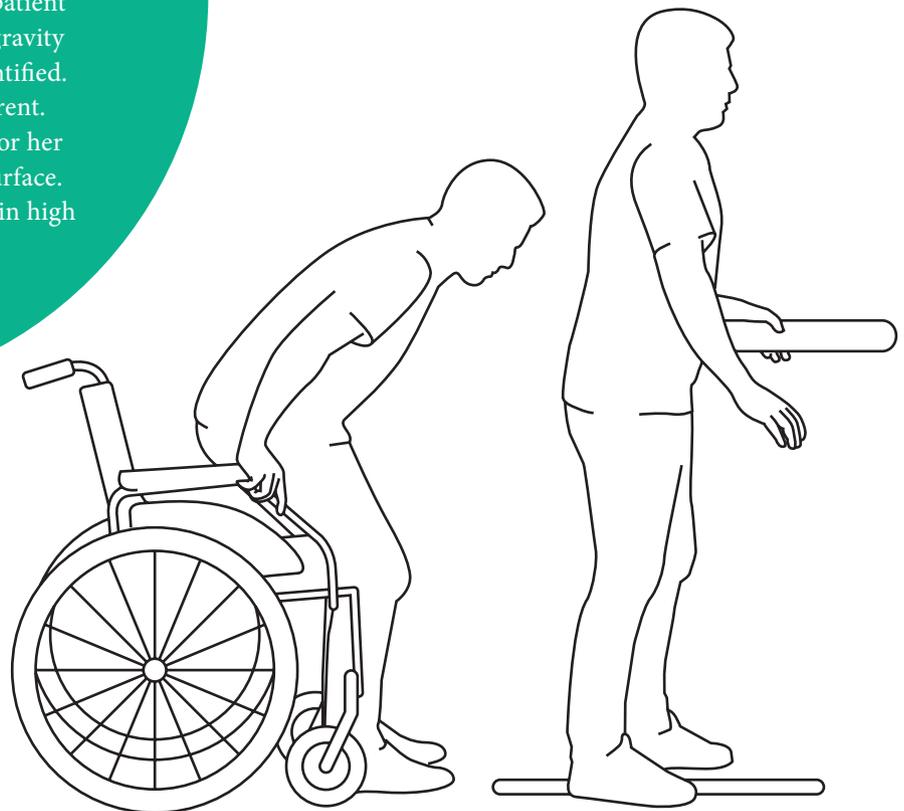
Module 4 (FAC 0-1)

The patient can stand with a lot of assistance

The patient can move his or her legs, pelvis and, where appropriate, body when standing with the support of at least one assistant. The patient cannot yet maintain his or her centre of gravity unassisted but initial attempts can be identified.

The patient's active cooperation is apparent.

The patient cannot yet safely balance his or her body's centre of gravity on the support surface. The patient is at a very high risk of falling in high starting positions.



Module 6 (FAC 2-4)

The patient has anticipatory balance control while standing

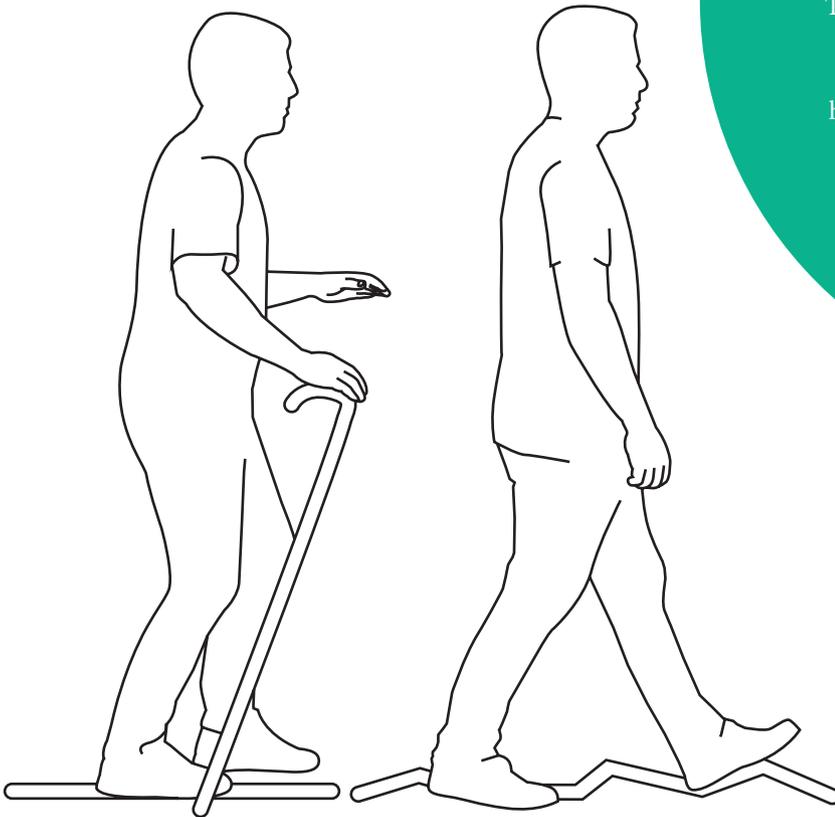
The patient is capable of shifting his or her centre of balance without contact from an assistant.

Tasks can be performed safely while standing without disturbances. Contact with an assistant is still required on uneven and unstable ground to prevent the patient from losing his or her balance. Unpredictable and sudden disturbances to balance increase the risk of falling.

Module 7 (FAC 3-5)

The patient has reactive balance control while standing

The patient is capable of standing safely on uneven and unstable ground and can compensate for unpredictable and sudden disturbances to his or her balance. Endurance is still reduced depending on the patient's physical capacity and regular breaks are still necessary.



Objectives & interventions

The question remains unanswered as to which interventions are most suitable depending on the ability level and goals of the patient at a particular time over the course of rehabilitation, and which THERA-Trainers can be used to support his or her therapy.

THERA concept	Objectives according to ICF		
	Function and structure	Activity	Participation
Module 1 Patient cannot stand/sit	<ul style="list-style-type: none"> > Muscle activation session, body > Prophylaxes > Sensory input > Attention 	<ul style="list-style-type: none"> > Sitting with assistance > Standing still with assistance > Transfers 	<ul style="list-style-type: none"> > Own ADL activities (if possible)
Module 2 Patient can sit up with a lot of assistance	<ul style="list-style-type: none"> > Muscle activation session, body > Strength > Cardiovascular fitness > Prophylaxis 	<ul style="list-style-type: none"> > Sitting up with a little assistance > Standing still with assistance > Walking with assistance > Transfers 	<ul style="list-style-type: none"> > Own ADL activities > Increase of out-of-bed time > Participation in everyday life on the ward > Individual therapy in the group
Module 3 Patient can sit with a little assistance	<ul style="list-style-type: none"> > Strength > Strength-endurance > Cardiovascular fitness 	<ul style="list-style-type: none"> > Sitting freely > Standing still with assistance > Walking with assistance > Independent transfers 	<ul style="list-style-type: none"> > Own ADL activities > Broader participation in everyday life on the ward > Broader action radius > Participation in everyday life at the clinic (within the clinic) > Individual therapy in the group > Group therapy
Module 4 Patient can stand still with a lot of assistance (FAC 0-1)	<ul style="list-style-type: none"> > Strength > Strength-endurance > Cardiovascular fitness 	<ul style="list-style-type: none"> > Standing still without assistance > Walking with assistance > Independent transfers 	<ul style="list-style-type: none"> > Own ADL activities > Broader action radius > Participation in everyday life at the clinic within the clinic > Increased social interaction > Group therapy > Self-training
Module 5 Patient can stand still with a little assistance (FAC 1-2)	<ul style="list-style-type: none"> > Strength > Strength-endurance > Cardiovascular fitness 	<ul style="list-style-type: none"> > Dynamic standing with assistance > Walking with assistance > Increasing the walking distance > Independent transfers 	<ul style="list-style-type: none"> > Own ADL activities > Broader action radius > Participation in everyday life at the clinic including outside the clinic > Increased social interaction > Group therapy > Self-training
Module 6 Patient has anticipatory balance control while standing (FAC 2-4)	<ul style="list-style-type: none"> > Strength > Strength-endurance > Cardiovascular fitness 	<ul style="list-style-type: none"> > Dynamic standing without assistance > Walking with assistance > Increasing the walking distance > Increasing walking speed > Walking outdoors on uneven ground 	<ul style="list-style-type: none"> > Own ADL activities > Broader action radius > Participation in everyday life at the clinic including outside the clinic > Increased social interaction > Group therapy > Self-training
Module 7 Patient has reactive balance control while standing (FAC 3-5)	<ul style="list-style-type: none"> > Strength > Strength-endurance > Cardiovascular fitness 	<ul style="list-style-type: none"> > Dynamic standing without assistance > Walking with and without assistance > Increasing the walking distance > Increasing walking speed > Walking outdoors on uneven ground 	<ul style="list-style-type: none"> > Own ADL activities > Broader action radius > Participation in everyday life at the clinic including outside the clinic > Increased social interaction > Group therapy > Self-training

As mentioned in the previous article, the classification of modularisation is important given that patients show different motor deficits depending on their impairments, making personalised measures necessary when it comes to therapy [1][2]. The patient is therefore ideally assigned to one of seven treatment modules depending on his or her capabilities, for which target criteria for treatment can be defined.

In addition, knowing that the patient's limitations caused by damage must be viewed as limiting factors, the patient's capabilities and the activities for formulating objectives are the focus of the THERA concept. The definition of objectives forms the basis for subsequent intervention and

treatment planning.

The following table provides an overview of the objectives and interventions for recovering the ability to stand and walk. The structure is also based on the ICF levels.

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2. **Pollock CL et al.** (2014). Use of the Challenge Point Framework to guide motor learning of stepping reactions for improved balance control in people with stroke: a case series. *Phys Ther. 94*:562-570.



Intervention		THERA-Trainer	Supporting measures
Contents of the therapy > Verticalisation > Mobilisation > Activation		> THERA-Trainer bemo with FES > THERA-Trainer verto > THERA-Trainer lyra	> FES
> Verticalisation > Mobilisation > Activation > Gait training > Orthotics		> THERA-Trainer bemo with FES > THERA-Trainer tigo > THERA-Trainer verto > THERA-Trainer lyra	> FES > Walking frames
> Postural control while sitting > Postural stability while standing > Activation > Strength training > Strength-endurance-training	> Cardiovascular training > Gait training > Transfer training > Orthotics	> THERA-Trainer tigo > THERA-Trainer verto > THERA-Trainer balo > THERA-Trainer lyra	> FES > Treadmill with safety belt > Walking frames
> Postural control while standing > Gait training > Transfer training (independent) > Activation > Strength training	> Strength-endurance-training > Cardiovascular training > Orthotics	> THERA-Trainer tigo > THERA-Trainer balo > THERA-Trainer coro > THERA-Trainer lyra	> FES > Treadmill with safety belt > MTT > Walking frames
> Postural control while standing > Gait training > Transfer training (independent) > Activation > Strength training	> Strength-endurance-training > Cardiovascular training > Provision of medical equipment	> THERA-Trainer tigo > THERA-Trainer balo > THERA-Trainer coro > THERA-Trainer lyra	> FES > Treadmill with safety belt > MTT
> Postural control while standing and walking (reactive components) > Gait training > Activation > Strength training	> Strength-endurance-training > Cardiovascular training > Provision of medical equipment	> THERA-Trainer tigo > THERA-Trainer coro > THERA-Trainer lyra > THERA-Trainer e-go	> FES > Treadmill with and without safety belt > MTT
> Postural control while standing and walking under difficult conditions > Dual-task, sensory weighting > Practising everyday situations	> Strength training > Strength-endurance training > Cardiovascular training	> THERA-Trainer tigo > THERA-Trainer coro > THERA-Trainer lyra > THERA-Trainer e-go	> FES > Treadmill > MTT