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LIFE IN MOTION

Between evidence and clinical practice

Dear readers,

How do scientific findings become good care? This question is a common theme throughout this issue. The full value of guidelines, studies, technical innovations and interdisciplinary concepts is only realised when they can be integrated into everyday care – where therapeutic decisions are made under time pressure, resource constraints and different institutional conditions. The path from evidence to clinical practice is therefore not a linear transfer, but a translational process.

This is particularly evident in the articles on guideline-based and evidence-based rehabilitation. The new NICE guideline on rehabilitation for chronic neurological disorders shows how international recommendations can provide orientation in an increasingly complex field. In this issue, we also focus on the concrete implementation of professional recommendations in daily therapeutic practice. This perspective is complemented by articles on robotics in gait rehabilitation, which not only address the effectiveness of robotic methods, but also the conditions of their actual use. For example, the article on early end-effector-based gait training in severely affected stroke patients with neglect shows that the evidence needs to be validated in specific patient groups and real-world healthcare practice.

This issue makes it particularly clear that healthcare can be seen less and less as a service provided by individual disciplines, but rather as a collective task. The article on interdisciplinary collaboration addresses the associated change in therapeutic role concepts. Reviews of the THERA-Trainer Masterclass 2025 and the DGNR Congress 2025 also illustrate how training, exchange and scientific discussion bring new knowledge into patient care.

This issue invites you to take a closer look at the evidence-based perspective. Evidence is essential. However, its value is only unleashed in interaction with clinical practice, team structures, technological possibilities and the real-world conditions of therapeutic action. Between guideline and living environment, innovation and implementation, a space emerges in which good care succeeds.

I wish you an inspiring read and new ideas for your daily work.

With best regards,

Jakob Tiebel

Exercise training among haemodialysis patients

From lone warrior to team player

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SCIENCE

Robotics in gait rehabilitation: efficiency, evidence and system pressure

What current healthcare research shows about the strategic use of robotic-assisted rehabilitation in the healthcare system

Jakob Tiebel

Robotics is effective in gait rehabilitation – with the right service delivery model.

While traditional rehabilitation models are increasingly hitting their personnel and economic limits, gait rehabilitation is a field of care in which robotic systems can have measurable effects – both clinically and structurally. However, it is not the technology itself that is crucial here, but the way in which it is used. It is precisely at this interface between evidence, organisation and responsibility that the real debate begins. In a recent paper, a working group led by Waldemar A. Marcinski discusses these questions against the background of the structural burdens on the healthcare system.

Background

The study addresses the increasing demographic, economic and staffing pressures on the UK healthcare system (NHS), particularly in the area of neurorehabilitative care. Against the backdrop of an ageing population, rising incidences of neurological disorders and significant gaps in the skilled labour force, the potential contribution that robotic-assisted rehabilitation can make to ensuring the quality and efficiency of care is being investigated.

Objective

The aim of the paper is to summarise the clinical, economic and structural evidence on robotic-assisted therapy and to outline its strategic relevance for rehabilitation pathways in the NHS, with a particular focus on gait rehabilitation and scaling effects.

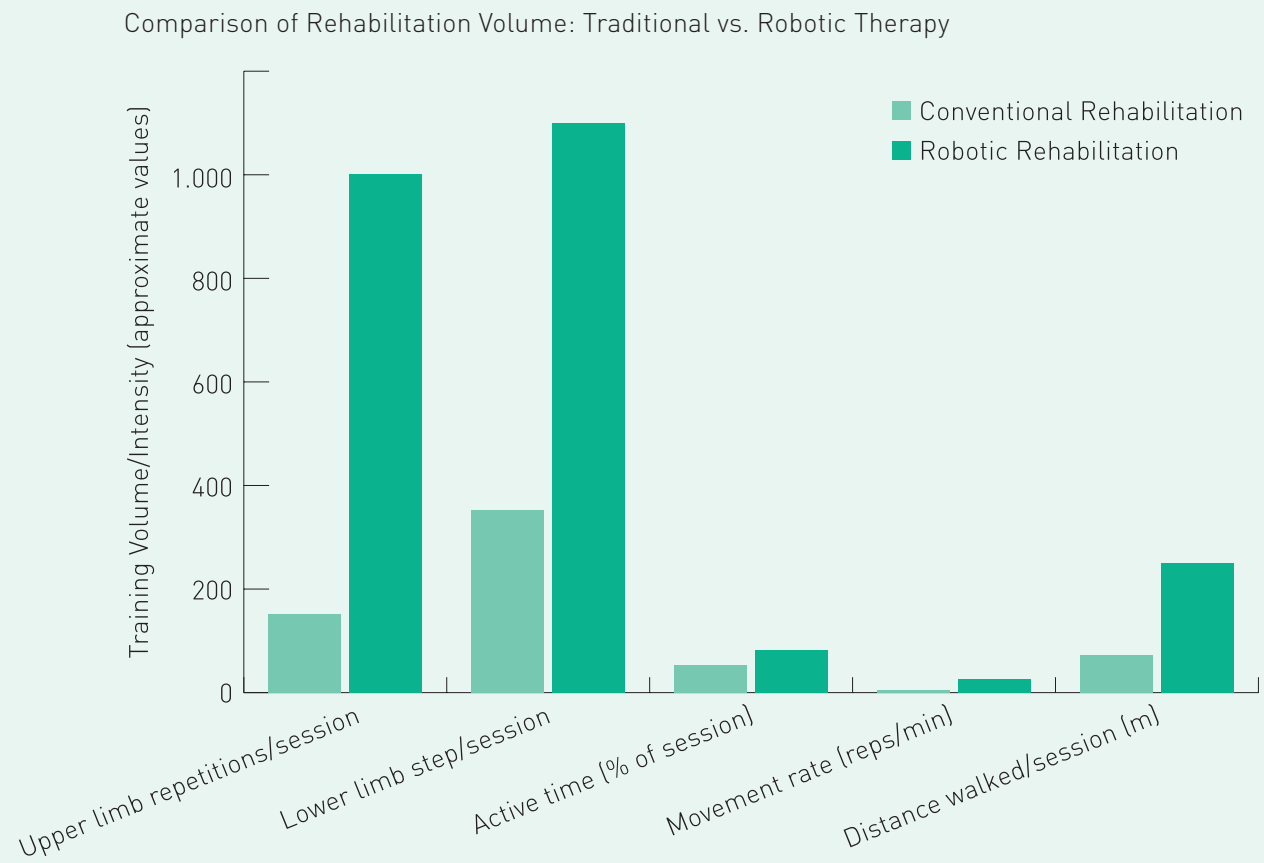
Methodology

It is a narrative, evidence-based perspective work. The authors integrate demographic data, health economic analyses, results of randomised trials, systematic reviews and meta-analyses as well as regulatory and organisational frameworks. No separate primary data is collected.

Results

The study shows that robotic-assisted therapy enables a significantly higher therapy intensity than conventional rehabilitation. Consistent improvements in walking speed, walking ability, step parameters, balance and functional mobility are reported, particularly in gait rehabilitation. Economic analyses indicate that robotic-assisted gait therapy can be cost-effective or cost-neutral with high utilisation and suitable care models, sometimes with negative incremental cost effectiveness ratios. For upper limb rehabilitation, the clinical and economic results are more heterogeneous; large studies such as RATULS do not show any cost effectiveness under one-to-one care conditions. Overall, a correlation is described between economic efficiency and organisational form (e.g. multi-patient supervision, long service life).

Gait is the field in which robotics shows convincing results, not only clinically but also economically.



Discussion

The authors discuss how robotic-assisted rehabilitation primarily delivers its benefits through a high number of repetitions, standardised movement quality and reduced physical demands on staff. The inconsistent evidence for the upper limb is attributed to methodological differences, device characteristics and service delivery models. In addition, regulatory requirements, staff qualification requirements and integration with digital technologies (e.g. AI, sensor technology, data analysis) are named as key influencing factors for implementation.

Conclusion

Robotic-assisted rehabilitation is described as a potentially effective building block for overcoming structural challenges. Consistent clinical and economic evidence is available for gait rehabilitation in particular, provided that the technology is integrated into suitable service delivery models. The authors emphasise the need for further systematic evaluations, but recognise the strategic relevance of robotic systems for sustainable and scalable rehabilitation care.

It is not the technology that is the lever, but how it is used in the system.

Original work

Marcinski, W. A., Martínez-Soler, P., & Martínez-Canca, J. F. (2026). Robotics in rehabilitation: A strategic necessity for the NHS in the face of demographic and economic pressures. Journal of Neurology & Stroke, 16(1), 39–42. https://medcraveonline.com/JNSK/JNSK-16-00650.pdf

l.ead.me/therapy-26-01-06

Comments

This perspective work by Marcinski et al. (2026) impressively demonstrates why robotic-assisted rehabilitation – especially in gait rehabilitation – is not just a technological option, but a structural response to the increasing challenges placed on modern healthcare systems. Against the backdrop of the demographic shift, rising stroke figures and chronic staff shortages, the study argues that the lower limb and gait in particular represent a field of application in which clinical benefits and economic efficiency can be combined with particular consistency.

In the area of gait rehabilitation, the evidence base is much more homogeneous than for the upper limb. Robotic-assisted gait training enables a high number of repetitions, consistent movement quality and early mobilisation, even in severely affected patients. Studies summarised in the paper show improvements in walking speed, step parameters, balance and functional walking ability. The critical factor here is less the "robotics per se" than the possibility of practically implementing evidence-based principles of neurorehabilitation – intensity, task orientation and repetition – even under real care conditions with limited staffing resources.

The health economic outcomes for the lower limb are particularly relevant. For "operational machines", which involve the mechanical coupling of human and end effector, not only favourable incremental cost-benefit ratios but even net savings are described in high-frequency settings. With high capacity utilisation, for example for several hours a day, six days a week, the cost argument is reversed: robotics goes from cost factor to efficiency driver. This clearly distinguishes gait rehabilitation from upper limb rehabilitation, where early studies such as RATULS primarily depicted inefficient service delivery models.

This has clear implications for providers. Firstly, the work confirms the strategic focus on the lower limb and walking as a clinically and economically robust field of application. Device-based mobility and gait therapy address precisely the patient group for whom conventional therapy is often met with physical, time or safety-related limits. Secondly, the study emphasises that the added value lies not in the device alone, but also in the service delivery model: high utilisation rates, group settings, therapeutic supervision instead of one-to-one care and clear embedding in the rehabilitation pathway are crucial for success.

Thirdly, the analysis points to another, often underestimated advantage: robotic systems deliver objective, continuous movement and performance data. This data foundation opens up prospects for adaptive training control, progress monitoring and, in the future, AI-assisted prognoses. For providers, this means that the combination of mechanical therapy, digital evaluation and motivational interfaces is not only therapeutically attractive, but also compatible with future regulatory and data-driven service delivery models.

In summary, the study shows that robotic-assisted gait rehabilitation is not a luxury, but a rational response to structural problems in service delivery. For providers, it confirms a strategic focus on technology-based, scalable and evidence-based solutions for lower limb therapy. The critical lever here lies less in technological progress alone, but much more in the consistent focus on clinical effectiveness, process integration and sustainable use in everyday care.

Dead end in product development

A critical look at a new in-bed prototype – and why in-bed cycling remains a complex challenge in practice, use and regulation

Jakob Tiebel

Early mobilisation is considered one of the most important factors in limiting loss of function, complications and dependency on care among bed-resting patients. At the same time, it is generally difficult to implement in everyday clinical practice. Time pressure, staff shortages and serious clinical pictures mean that early mobilisation is often a goal that does not easily become routine practice. Against this background, it is not surprising that new devices are constantly being developed to enable exercise therapy in bed. One current example is provided by an article in Actuators (2025) on the technical development of a prototype for an in-bed lower-limb therapy device.

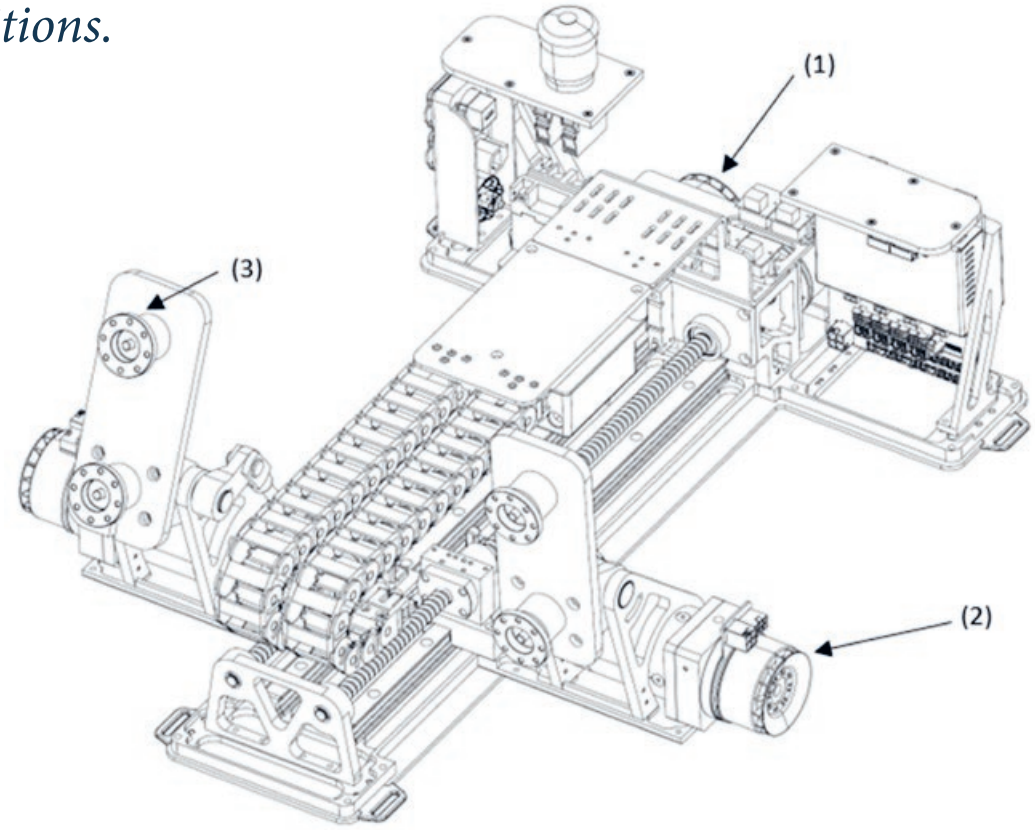
The item is technically ambitious, but it raises a crucial question: Is a solution being built here that will really advance healthcare – or is a problem merely being translated into an elegant machine without considering the benefits, safety and feasibility in a real-life setting?

What was developed?

The team of authors describe a compact therapy device that is used directly on a hospital bed. It consists of two motorised foot plates with integrated force sensors. Four electric motors control linear movements of the foot plates and rotation in the ankle joint. The intention here is to enable several forms of training: passive plantar flexion/dorsiflexion, passive linear leg movement with synchronised ankle joint movement and active leg press training with adjustable resistance loads. The system is controlled via a touchscreen; exergames have also been implemented to accompany movements and provide feedback.

The core technical service lies in controlling movement and force. The article reports control accuracies, for example average position deviations in the millimetre range and low force control deviations in active mode. In addition, usability is assessed using questionnaires – on healthy test subjects.

Technical sophistication does not bypass the logic of care: a device is not good if it can do something, but if it can be used reliably under real clinical conditions.



CAD of the lower-limb therapy device. The system housing, the foot plates, and the cases for the foot platforms were removed so as to show the drives and mechanical components. (1) Motor for linear movement, (2) motor for ankle dorsiflexion/plantarflexion, and (3) force sensor. – Source: Fang et al. (2025); original image taken from Open Access Publication without changes

What does the study say?

The authors state their goal clearly: they want to demonstrate the technical feasibility and usability of a prototype. And that's exactly what they deliver. The device was tested in a laboratory setting with twelve healthy adults, who completed short test sequences in the passive and active modes. They then evaluated the device using a modified usability questionnaire. The feedback was generally positive, but there were also indications of problems that are in no way trivial in practice. At around 18 kg, the device is not really "lightweight" and therefore presents transport limitations. A delay was also perceived between real movement and exergame feedback, and basic set-up and workflow frictions were observed.

What the authors explain in their publication as "technically feasible" is often intuitively equated with "relevant for early mobilisation". This is precisely where it is worth taking a critical look.

The comparison with in-bed cycling

The article places the developed device in the early mobilisation market and draws parallels with established in-bed cycling systems such as the THERA-Trainer bemo. It is exactly here that the comparison becomes relevant: In-bed cycling has been a clinically established and effective procedure in early rehabilitation and acute care for years because it is a practicable principle for applying activity under real care conditions and has been proven to be safe and reliable.

In-bed therapy rarely fails because of motors or sensors – but because of complexity, regulation and a lack of process robustness in everyday life.

In-bed cycling generates a cyclical movement, allows for adequate dosing via assistive drive control and is easy to operate and implement. As a clearly defined medical device, a THERA-Trainer bemo can be integrated reliably, safely and quickly into existing clinical routines, for example. The critical factor here is less the degree of "high tech" than the fact that the process has been tried and tested many times, and actually works under everyday conditions. In early mobilisation, this ease of implementation weighs heavily in its favour.

In contrast, the newly developed prototype device utilises complex mechatronic axes and force sensors. While this may theoretically open up other therapeutic options, in practice it also increases the likelihood of sources of error, training requirements, maintenance needs, failure risks and process interruptions. Clinical added value and benefits would first have to be established.

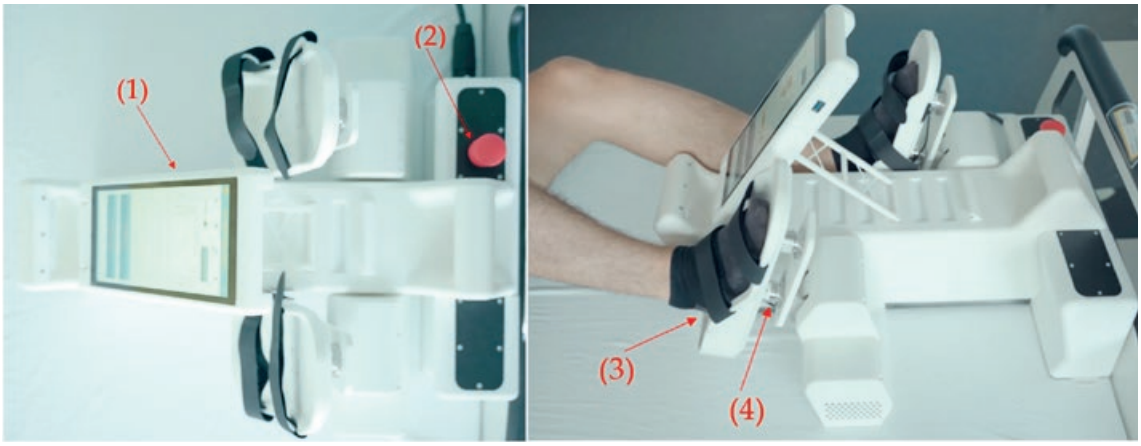
Technical control and clinical safety are not one and the same

The device presented works with motorised foot plates that generate linear movement and ankle joint rotation. This actively initiates forces and paths while the patient is fixed in the supine position. This is one thing for healthy subjects in the laboratory. But it immediately poses additional safety issues for real bed-resting patients: What does this mean for spasticity, contractures, osteoporosis, painful joints, impaired communication, delirium and fluctuations in vigilance? How robust are emergency stop concepts under stress? What is done to ensure that a set-up error does not lead to shear forces, skin stress or unfavourable joint loads? The article does not address these questions because it cannot yet address them methodologically. However, they are central to later translation.

At this point, in-bed cycling is still the gold standard: The movement logic is extremely gentle, the forces are typically easy to control, the clinical experience is broad, and the devices are already integrated into risk processes, hygiene and training in many hospitals.

Regulation and the coupling of two medical devices

However, the most critical aspect is not the motor or the control system – but the regulation and the system definition that is relevant to liability. The developers seem to have overlooked something very important here.



The prototype of the lower-limb therapy device on a medical bed and with a test person: (1) touch screen, (2) emergency stop, (3) foot plate, and (4) force sensor. – Source: Fang et al. (2025); original image taken from Open Access Publication without changes

The prototype is placed in the bed and used there as a de facto bed-integrated solution. A hospital bed is usually a medical device itself. As soon as another medical device is used mechanically and functionally in such a way that it is dependent on the bed as a supporting structure or is operated in conjunction with it, a constellation quickly arises that for regulatory purposes can no longer be treated as "two independent devices". This gives rise to issues such as system compatibility, safe combination, intended use when combined, interface risks, stability in different bed geometries, risks of misuse when changing beds and chains of responsibility between manufacturers.

This is not a theoretical problem. In practice, it determines whether a device can be approved and rolled out in clinics in a scalable manner. In-bed cycling is typically more cleverly designed in this respect: It remains recognisable as an independent medical device, is positioned at the bed instead of being "married" to it and as a result, avoids many issues relating to combination, integration and liability. This self-sufficiency is precisely one key reason why the design concepts of well-known manufacturers stand out accordingly.

By contrast, if a new device implicitly requires fixation or support in the bed, or functional coordination with bed mechanisms, the regulatory complexity increases considerably. While this does not make such concepts impossible, the development and authorisation process becomes longer, more expensive and riskier.

Original work

Fang, J., Cerrito, A., Gamero Schertenleib, S., von Raumer, P., & Schmitt, K.-U. (2025). The Technical Development of a Prototype Lower-Limb Therapy Device for Bed-Resting Users. Actuators, 14(2), 60. https://doi.org/10.3390/act14020060

l.ead.me/therapy-26-01-10

Critical assessment

The article in Actuators presents a technically well-developed idea that generally works in a laboratory setting and is perceived as operable by healthy subjects. This is a legitimate step in any early development phase. However, it falls short of demonstrating clinical benefits or competing with established in-bed cycling solutions.

When assessing the project from a strictly care-oriented perspective, three central touchstones remain open. Firstly, the clinical relevance, i.e. whether the training modes actually contribute to outcomes that measurably promote early mobilisation. Secondly, safety in the target group, i.e. in vulnerable patient populations with high variability. Thirdly, the regulatory and practical feasibility of implementation, particularly with regard to coupling with the hospital bed as a medical device.

Until these points are clarified, the device is more of an example of how easy it is to confuse "technically feasible" with "clinically useful". This is a dangerous shortcut for healthcare provision. Early mobilisation needs devices that not only generate movement, but also simplify processes, reduce risks and fit neatly into real-world care from a regulatory perspective. In-bed cycling is therefore not old school, but often simply the more robust design when it comes to service delivery.

If one key insight can be derived from this development, then perhaps it is precisely this lesson: In early mobilisation, it is not the device with the most axes that wins, but the system that works safely, quickly, reliably and legally correctly under staff shortages – and supports the journey out of bed instead of being perfected in bed.

TECHNOLOGY & DEVELOPMENT

Connected assistance systems in outpatient fall prevention

Evidence from CARE REGIO and the role of the THERA-Trainer

Matthias Gaßner, Andreas Hechtl, Jakob Tiebel

What happens when digital fall prevention doesn't stop at data collection? The CARE REGIO study indicates that the actual added value of care does not lie in individual sensors, but in the intelligent combination of monitoring, suitability for everyday use and exercise-based intervention. This brings a central question into focus: Under what conditions can digital assistance systems be embedded in outpatient care in such a way that they not only promise safety, but actually counteract functional decline – and transform fall prevention from a technical add-on into an effective care mandate?

Fall prevention as a care mandate

Outpatient care for elderly people in German-speaking countries is under twofold pressure to transform. On the one hand, the demographic change is leading to an increasing proportion of very elderly people with multimorbidity and functional limitations; on the other hand, the shortage of skilled labour in care and therapy is worsening. Falls are a key risk event in this setting, as they often mark the threshold from fragile independence to acute hospitalisation, functional decline and permanent need for care. Preventive strategies that can be integrated into the everyday lives of those affected and at the same time support care and therapeutic processes are therefore highly relevant.

Digital assistance systems have been discussed for years as a potential lever for strengthening prevention, monitoring and care coordination in home contexts. Nevertheless, translation into routine care remains limited. One key cause of this is not so much the availability of individual devices as their lack of integration into work processes, insufficient

user-friendliness and a lack of support with implementation and operation. Against this background, the study "Digital assistants for outpatient care: benefits of intelligent connected assistive systems for caregivers and elderly people" (Gaßner et al., 2025) conducted in the CARE REGIO context addresses the question of whether a holistic, connected combination of assistance technologies in outpatient fall prevention generates a measurable and subjectively perceptible additional benefit – and under what conditions this benefit can be realised.

Mixed-methods study in a real-world home setting

The study follows a mixed-methods design that combines qualitative interviews with quantitative questionnaire surveys. The approach is explorative and clearly focussed on real-world care practice: care recipients used the systems in their own homes for five weeks; caregivers accessed the resulting data via a data integration platform. The central idea was to create a connected assistive system: vital parameter and activity data is collected via various devices, collated interoperably and made available for use by caregivers.

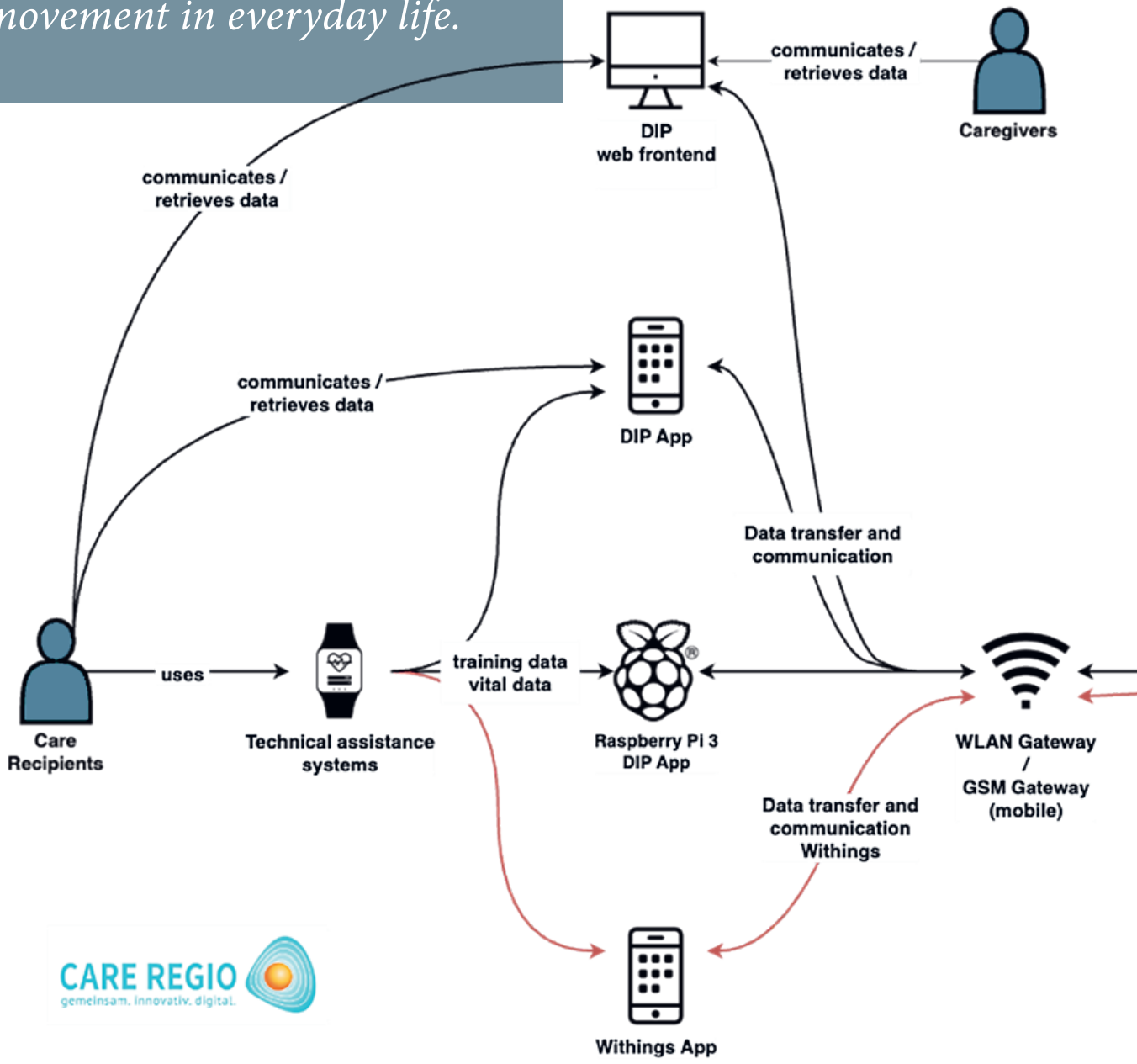
Participants

A total of 33 people took part: 11 caregivers and 22 care recipients. The average age of the care recipients was 80.7 years (range 54–95 years). The caregivers were on average 45.6 years old, with an average of around 19 years of work experience. Inclusion criteria for care recipients included the ability to use the systems independently; people with considerable difficulties in handling technology or with a transition to inpatient care were excluded.

Assistive systems

The selection was needs-based: care recipients were able to choose up to five systems together with the caregivers. These included a smartwatch (Withings ScanWatch 2), a sleep mat (Withings Sleep Analyzer), a blood pressure monitor and scales (A&D), as well as a leg trainer, the THERA-Trainer tigo, as an exercise-related intervention.

Fall prevention does not start with the fall – but with daily movement in everyday life.



Data integration

The data integration platform (DIP) was based on the COMES® telemedicine system and was further developed with additional middleware and a new web front end for caregivers. The study explicitly emphasises that deficits in interoperability and transmission stability had been identified in earlier field tests and were specifically addressed before the start of the study – a relevant step, as technical reliability is a prerequisite for any implementation of care.

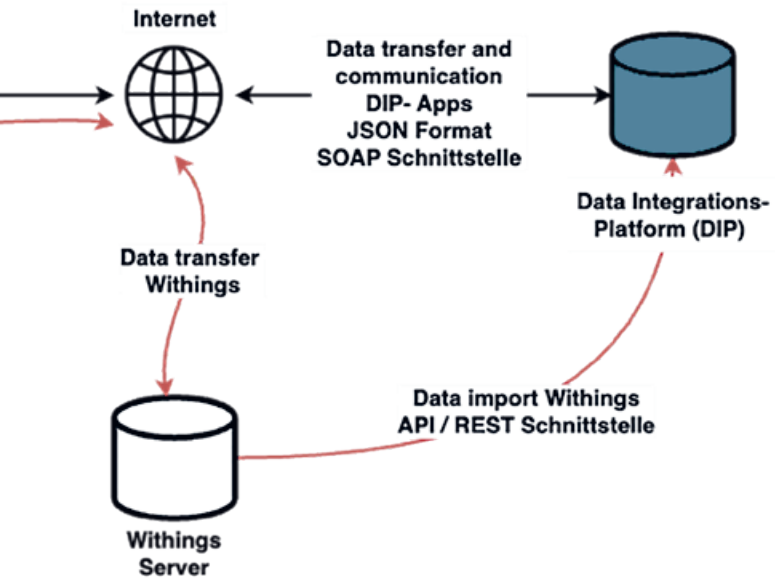
Survey instruments

Qualitative interviews were conducted before and after the intervention and analysed using Mayring's structured content analysis. Quantitatively, the system usability scale (SUS) was used for care recipients; for carers, a specially developed questionnaire about integration into routine and perceived usefulness was used. In addition, technical stability was assessed indirectly via documented service interventions.

Key findings: High acceptance – benefits dependent on integration

Usability and acceptance among care recipients

The SUS evaluation resulted in a mean value of 78.6 (SD 9.8; n=20), which typically corresponds to a good to very good usability level. Item analyses indicate low perceived complexity and a high level of satisfaction overall. At the same time, there is a weak negative correlation between age and SUS score, which is consistent with qualitative statements: very elderly people were more likely to express uncertainty when using digital devices. In the interviews, a number of care recipients reported an increased sense of safety after five weeks, particularly due to the regular recording of vital data. Systems requiring little interaction (e.g. scales, sleeping mat) were described as



particularly suitable for everyday use. Criticism was mainly levelled at devices requiring independent handling (smartwatch operation, unassisted blood pressure measurement). The need for more intensive support and a longer test duration was mentioned repeatedly.

Caregiver perspective: documentation gain vs concern about additional workload

At the beginning of the study, caregivers showed a positive attitude towards digital assistance, but were concerned that technology would add time and complexity to already complex processes. After the intervention, the benefits of the systematic collection and documentation of health data were emphasised in particular. However, the expectation of a noticeable reduction in the daily workload was relativised: the perceived effect depended heavily on how well the systems could be integrated into existing processes. The quantitative values reflect this: high levels of openness and positive attitudes contrast with relatively low approval ratings regarding physical, psychological and time relief. In free text responses, the benefits are explicitly linked to "saving time" and "reduction of administrative burden". These findings underpin the study's principal recommendation for implementation: technology is only useful if it actually supports rather than adds to routine processes.

Technical reliability as a real-world factor

Over the study period, 23 service interventions were documented, 10 of which involved an on-site visit. The intervention rate is described as low and decreased over time – an indication that the system could be operated in a fundamentally stable manner under real-world conditions and that accompanying support processes were effective.

The crucial point in fall prevention: monitoring alone is not enough

The study addresses fall prevention as a multidimensional process. Fall risk is not only the result of individual vital parameters, but also a reflection of functional performance, everyday activity, balance, strength and responsiveness – factors that can only be influenced to a limited extent by measurement, but can potentially be influenced by targeted intervention. This is precisely where the role of movement-based assistance becomes visible.

Many digital systems in home care primarily supply data. Data can convey security, improve progress monitoring and enable early warning signals. However, the therapeutically relevant "leap" only occurs when data is translated into actions: adaptation of measures, motivation to get active and targeted training. Against this background, the integration of an exercise machine

such as the THERA-Trainer is not just another component, but a conceptual addition: it closes the gap between risk detection and risk modification.

The benefits of the THERA-Trainer in the CARE REGIO concept: interventional, open to integration, data-capable

Even if the study is not designed as an effectiveness test for a single device, a technically robust line of argumentation on the role of the THERA-Trainer can be derived from the structure, objectives and result patterns.

Movement as a primary logic of prevention

The group of authors explicitly situates the intervention in the prevention paradigm. Especially in the home setting, where external training programmes are often unavailable, low-threshold, guided forms of training are becoming increasingly important. The THERA-Trainer addresses precisely this care barrier: it enables structured training in the home and can therefore – in the logic of the study – contribute to the prevention of loss of function and the need for care.

Practicality and user-friendliness as central determinants of acceptance

The results show a clear preference for systems that can be integrated into everyday life without major operating requirements. Compared to complex wearables or measuring devices, a movement exerciser is often less cognitively demanding: training can be established as a routine, without menu guidance, app navigation or frequent interaction steps. This aspect is important in the very elderly collective, as usability problems lead to users dropping out particularly quickly.

Training becomes visible and manageable within care

The DIP not only enables the display of vital data, but also of training data. This creates additional benefits for care teams: activity is not only recommended, but it can be documented. This enables changes in training adherence, possible declines in activity or even positive developments to be recognised at an early stage and translated into discussions, adjustments or motivational interventions. In an outpatient system that is heavily characterised by time constraints, this transparency can help to set priorities and make preventative measures more focused.

Multiplier effect via relatives and professional support

The study describes how acceptance and long-term use depend heavily on social and professional support. For a training system, this means that the THERA-Trainer unleashes its potential in particular when guidance, motivation and, if necessary, support (from caregivers, therapists or relatives) are guaranteed.

Feedback on the THERA-Trainer tigo

Many participants rated the movement exerciser positively overall, as shown by the qualitative analysis of the interviews. They found it easy to use and described the device as useful. Some of them even considered acquiring their own trainer. This is reflected in statements from the interviews such as: "Positive – the trainer. I'll see about getting one. It really has a good story to tell. Prophylaxis. It just made me feel a bit stronger."

Feedback on the THERA-Trainer tigo

The evaluation of the training in particular seemed to have a motivating effect. "Yes, the cycling is great. And I can see how far I've travelled." Of course, regular movement training is particularly useful, which is why it is an advantage if this can be carried out at home at any time: "But I usually do the five kilometres or 15 minutes twice a day. That feels really good."

Discussion: Implementation conditions as the actual effect factor

The study delivers a typical but important result in healthcare research: the perceived benefits of digital systems depend less on their technological performance than on the quality of their implementation. These include:

- Needs-based selection of systems together with those affected
- Training and continuous support
- Integration into routines and documentation processes
- Reliable interoperability and low maintenance requirements

These factors are not "add-ons", but core elements of the intervention. From the perspective of a movement-orientated system such as the THERA-Trainer, this leads to a clear conclusion. What matters is not just that training is possible, but that it is guided, motivating, safe and embedded in the service delivery process. In a connected setting, the THERA-Trainer can be seen not only as a training device, but also as a component of an integrated prevention programme.

Limitations and categorisation

The group of authors rightly points out the limited generalisability: small sample, non-representative setting, limited subgroup analyses. Furthermore, the study was not designed to evaluate clinical endpoints such as fall frequency, mobility measures or functional scores. The evidence therefore primarily relates to implementation and acceptance: it shows that networked systems can be used under everyday conditions and which conditions determine their acceptance and perceived usefulness. However, this is particularly important for the introduction in healthcare contexts, because a lack of acceptance and process interruptions are often the main reasons why digital innovations fail.

Conclusion: Networking is the means – movement is the goal

CARE REGIO provides compelling evidence that digital assistance systems in outpatient care do not fail due to the fundamental willingness of those involved, but due to practical issues: usability, support, process integration. At the same time, it is clear that fall prevention requires more than just vital data monitoring. Preventive added value arises where systems not only observe, but also enable action. Within this framework, the THERA-Trainer fulfils a specific, clinically justifiable role: it represents the transition from data to intervention, and thereby encapsulates the fundamental objectives of fall prevention in daily practice – preserving mobility, facilitating activity and decelerating functional deterioration. In a connected setting, training also becomes visible and can therefore be integrated into decision-making processes relating to nursing and therapy. Under the implementation conditions identified in the study, the THERA-Trainer can therefore be considered a central component of a prevention system with real-world integration capability.

Original work

Gaßner, M., Hechtl, A., Nigg, U., Schmid, S., Yagci, S., & Friedrich, P. (2025). Digital assistants for outpatient care: benefits of intelligent connected assistive systems for caregivers and elderly people. Procedia Computer Science, 270, 4686–4695. https://doi.org/10.1016/j.procs.2025.09.594

Feedback on the THERA-Trainer tigo

The qualitative evaluation also shows that several subjects reported that using the trainer had a positive impact on their well-being. Better mobility, a feeling of safety, increased activity and better sleep were mentioned. This was illustrated by statements such as: "I felt much more confident, especially with walking. I walked more (...) and then I cycled and then I felt much better and also slept much better."

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TECHNOLOGY & DEVELOPMENT

From practitioner to development companion

The new role of therapists in the digital age. A future psychological perspective for modern rehabilitation

Linda Kaiser

A silent but profound change

The digitalisation of the healthcare system is often described as technical progress. Teletherapy, apps, wearables, digital training programmes and artificial intelligence are changing processes, approaches and structures. But a closer look reveals that the actual change is not a technical one, but a professional and psychological one.

For some years now, therapists have been experiencing a subtle shift in their professional identity. Patients come to the practice more informed, but not necessarily more orientated. They bring with them data, apps, training plans and contradictory recommendations – and at the same time uncertainty, excessive demands or unrealistic expectations. The question is therefore not whether therapy is becoming digital. It is rather what role therapists have to play in a digital health world.

From the perspective of future psychology, this development does not mark a loss of significance for therapeutic professions, but rather a clarification of their core purpose. Therapy is defined less by knowledge and more by the ability to shape development processes. This is exactly where this article comes in.

Digitalisation is not changing therapy – it is exposing its core

Digital technologies have made knowledge available. Movement analyses, training suggestions and health information can be accessed at any time. What they cannot deliver is meaning. They can measure, but not categorise. They can compare, but not evaluate what makes sense for a specific person in a specific life situation.

From a psychological perspective, this creates tension: the more information available, the greater the need for orientation. Patients often know what they could do – but not what the right thing to do is at that particular moment. This is exactly where modern therapeutic expertise begins.

In the digital age, therapy is becoming less about imparting knowledge and more about providing orientation. The therapist is no longer primarily the one who explains, but the one who helps to reduce complexity, sort out expectations and structure development. This is not a loss of professionalism – it is its intensification.

Therapy as a learning process – not repair work

Rehabilitation has long been understood as functional restoration: improving mobility, building strength, reducing pain. These goals remain relevant, but fall

For some years now, therapists have been experiencing a subtle shift in their professional identity.

short. Modern neuropsychological models show that the body is not a passive object that is repaired, but a learning system.

Movement is not created by willpower or instruction alone. Even before a muscle is activated, the nervous system has assessed whether a movement is safe, sensible and energetically justifiable. This assessment is based on experience, emotion and expectation – not solely on objective findings.

This is why therapists encounter situations every day in which patients are functionally "ready" but feel insecure, are evasive or stagnant. It is not a lack of motivation, but a reflection of a system that has learnt to be cautious.

Under these conditions, therapy becomes a learning process: patients learn to trust their bodies again, to realistically categorise stress and to be open to new experiences. This perspective shifts the focus from purely performing exercises to shaping experience.

In the digital age, therapy is becoming less about imparting knowledge and more about providing orientation.

Future-oriented pedagogy as a frame of reference for therapeutic action

This is where the concept of future-oriented pedagogy can be categorised in a meaningful way. Future-oriented pedagogy is not a pedagogical approach to methodology or an educational concept in the traditional sense. It describes an interdisciplinary framework that deals with the question of how people remain capable of learning and acting under conditions of uncertainty, change and complexity.

When applied to therapy, this means that rehabilitation is a transitional process. Patients are caught between old and new resilience, between certainty and uncertainty, and between control and trust. Therapy accompanies this transition.

In therapy, future-oriented pedagogical action is not characterised by instruction, but by the creation of experiential spaces. Therapists structure learning processes, dose challenges, provide orientation and enable self-efficacy. They help patients to deal with uncertainty without avoiding it.

In this way, therapy becomes a form of applied future-oriented pedagogy in the health context – not theoretical, but highly practical.

Teletherapy and digital formats: what really counts

The discussion about teletherapy is often polarised: either as an inferior substitute or as a solution to all healthcare problems. The scientific evidence paints a more differentiated picture, in the sense that digital therapy formats can be effective – if they are well structured.

The critical factor is not the medium, but the quality of the relationship, the clarity of the guidance and the ability to organise transfer into everyday life. Teletherapy makes visible what therapy has always been: success does not happen during appointments, but between them.

Therapists who work effectively in digital settings are not characterised by technical sophistication, but by psychological intuition. They can motivate, structure, dose and provide feedback – even without being physically present. Digitalisation strengthens these skills, but it does not replace them.

Digital applications, data and the new translational capacity

Apps, wearables and digital health applications generate data. Step counts, movement volumes, load durations and progress curves can be helpful – or overwhelming. Data alone does not change behaviour. It needs categorisation.

A new therapeutic core competence emerges here: the translation of data into experience. Therapists help patients to understand what readings mean – and what they do not mean. They prevent overinterpretation, relativise fluctuations and draw attention to correlations rather than individual values.

This is a challenging task. It requires clinical judgement, psychological understanding and experience. It cannot be automated because it is always context-dependent.

Artificial intelligence and the question of the human being

Artificial intelligence is increasingly being used in rehabilitation. It can analyse movements, recognise patterns and provide feedback. What it cannot do is take responsibility or shape relationships.

Therapy is caught between stress and protection, and between progress and retreat at all times. These decisions are rarely unambiguous. They require experience, intuition and the ability to read non-verbal signals. This is precisely where humans remain indispensable. The future does not lie in replacing the therapist, but using technological

Artificial intelligence is increasingly being used in rehabilitation.

Modern therapy teaches far more than just movement exercises.

assistance in a sensible way. AI can provide support – accountability remains with the practitioner.

Relationships as a key factor in the digital age

A common misconception is that relationships lose importance in digital settings. In actual fact, the opposite happens. The less context there is, the more important the quality of the relationship becomes.

A therapeutic relationship creates security. It facilitates learning, change and regulation. It is not a soft factor, but a neurobiological mechanism of action. Patients do not open up because an app demands it, but because they feel understood.

In the digital age, this expertise is growing in visibility – and value.

The skills conveyed by therapy today

Modern therapy teaches far more than just movement exercises. It teaches skills that patients need in the long term:

- Self-regulation
- Realistic load appraisal
- Dealing with uncertainty
- Body awareness
- Confidence in one's own ability to act

These skills extend beyond therapy. They are of central importance in a dynamic working and living environment.

Conclusion: The future of therapy is human

The digital era is not changing therapy at its core. It is making visible what therapy has always been: a companion to development. Therapists are not needed less, but more clearly.

They are development companions, translators, regulators and sources of orientation. Future-oriented pedagogy provides a framework for understanding this role – not as an add-on, but as a precise description of professional practice.

The future of therapy is not digital or analogue. It is human, reflective and professional.

The digital era is making visible what therapy has always been.

For me, future-oriented pedagogy does not mean preparing people for a very specific future, but accompanying them in such a way that they remain capable of dealing with uncertainty, change and physical transitions. Therapy is not a repair shop, but a learning space. Where people develop a renewed sense of trust in their bodies, future capability is created – quietly, through experience and for the long term.

Linda Kaiser learned the healthcare profession from the ground up. As a physiotherapist, she worked in neurorehabilitation for over a decade and experienced first-hand the challenges and opportunities involved in caring for patients. In doing so, she recognised that physiotherapy can not only heal, but also sustainably shape the entire healthcare system – provided it has the right framework to do so. To play an active role in shaping this framework, she expanded her knowledge about the healthcare system and, alongside her practical work, completed a bachelor's degree in Health and Social Management followed by a Master of Science in Public Health. This pathway enabled her to link theory with practice even more strongly, and to engage with the structural, political and economic challenges of physiotherapy. She now brings her professional expertise to her role as scientific director, overseeing academic management and future workshops at the opta data Zukunfts-Stiftung foundation. Here she analyses scientific studies, develops future strategies for healthcare and works with interdisciplinary teams to strengthen the future viability of the healthcare professions. In doing so, she employs the future compass, a tool developed by future psychologist Professor Thomas Druyen, that enables systematic navigation through the challenges of the coming years.

TECHNOLOGY AND DEVELOPMENT

Game-based balance training in rehabilitation

Development and clinical evaluation of a sensor-based game application for device-based balance training for the rehabilitation of balance disorders as part of a clinical feasibility study

Jakob Tiebel

Balance training is an integral part of rehabilitative care. This study by Simsek and Kutlu investigates how an existing training system can be supplemented with sensor-based game applications to influence patients' training perception.

Publication context and objective

The paper by Simsek and Kutlu was published in October 2025 in the journal Medical Engineering & Physics. It describes the development and clinical trial of a sensor-supported, game-based training system for the rehabilitation of balance disorders. The starting point of the work is the established role of balance training in orthopaedic and neurological rehabilitation and the assumption that visual feedback and gaming elements can support patients' therapy adherence and motivation level. At the same time, the authors point out the high costs of many existing feedback systems and formulate the goal of investigating a technically simple and economically practicable solution.

THERA-Trainer balo as an established balance training system

The THERA-Trainer balo was used as a therapy device. It is a medical device established in clinical practice for static and dynamic balance training. The mechanical structure of the device was not changed in the study. The balo served as a physical training base on which the subjects performed balance exercises while standing.

Sensors and game application

The actual development involved a game application based on the additional sensor module. The patient's movements and weight shifts were recorded via the microcontroller-operated sensor system. This data was transferred in real time to a game environment developed in Unity, where it controlled the movement of an avatar. The aim was to translate balance movements directly into visual feedback and to combine the training with clearly defined target tasks.

Clinical application and study design

The clinical application was carried out with a total of 36 patients with orthopaedic and neurological balance disorders. The training protocols comprised several sessions of standardised duration. The difficulty of the exercises and the resistance of the platform were individually adapted to the age, state of health and performance ability of the patients. The focus of the study was not on objective changes in balance performance, but rather on subjective aspects of training perception.

Therapeutic effect is not achieved through game mechanics alone – it is achieved through the precise coordination of movement, feedback and clinical objectives.

Motivation as the primary endpoint

The Intrinsic Motivation Inventory was used for the evaluation. The results show that a large proportion of participants perceived the training as enjoyable and motivating. Over 90 per cent of patients stated that they found the system appealing, and almost all respondents saw a potential benefit for their rehabilitation process. The authors interpret these findings as an indication that game-based, goal-orientated feedback can support acceptance and willingness to participate in balance training.

Categorisation of the results

In the discussion, the authors emphasise that the system was developed at a comparatively low cost compared to many existing feedback solutions. At the same time, they refer to clear inter-individual differences in the training values, which are related to age, clinical picture, severity of restriction and physical performance, among other things. This variability is expected and typical for clinical populations with impairments in postural control.

Limitations and outlook

The short observation period and the lack of long-term functional outcome parameters are cited as limitations of the study. Based on the available data, it is not possible to draw any conclusions about the long-term improvement in balance or the reduction in the risk of falling. The authors therefore view the work as an investigation into the feasibility of such goal-orientated, game-based extensions.

Comments

The paper presents a feasibility study in which a THERA-Trainer balo, an established balance training device, was enhanced to include visual play feedback via the external sensor module. The results indicate a high level of acceptance and increased motivation among patients with balance disorders, but do not enable any conclusions to be drawn about clinical efficacy in the narrower sense. The article therefore fits in well with the growing literature on game-based feedback systems in rehabilitation and provides an example of how existing training platforms can be technically extended and systematically analysed.

However, it should be critically noted that the technological entry barrier for the development of game-based systems is comparatively low today. Modern game engines such as Unity or Unreal facilitate the development of interactive, visually appealing applications with a manageable use of resources. The mere implementation of a game or game-like interface is therefore not the main challenge. There is a danger of underestimating the development effort for therapeutic games with a one-sided focus on motivation, acceptance and technical feasibility.

In a rehabilitative context in particular, game mechanics not only need to be entertaining, but also need to be tailored to therapeutic objectives and specific movement patterns. Motivation alone is not a sufficient criterion for therapeutic benefit. Rather, the focus is on targeted movement control, the quality of movement execution and the support of motor learning – requirements that cannot be derived directly from classic game design principles. They require a close intermeshing of therapeutic expertise, motor learning research and technical implementation.

Adaptive elements such as the sensitive adaptation of level of difficulty to the individual performance level or the integration of reward and progression mechanisms are particularly demanding. Such systems must avoid over- and underchallenging users in order to support effective learning processes without creating frustration or undue stress. These requirements go far beyond conventional game design and explain why the development of high-quality therapeutic games remains complex, time-consuming and resource-intensive despite the availability of technical frameworks.

Against this background, the chosen focus on feasibility and acceptance makes sense, but falls short if it is not clearly distinguished from questions of therapeutic effectiveness and the quality of movement control. The study provides valuable information on technical feasibility and user acceptance, but should not be misunderstood as evidence that game-based rehabilitation is primarily a technological or motivational problem. The central challenge lies in the demanding task of translating between game mechanics and therapy – and this is precisely where the clinical and economic value of such systems is ultimately decided.

Original work

Simsek, O. S., & Kutlu, M. (2025). Goal-oriented balance rehabilitation system for balance disorder. Medical Engineering & Physics, 144, Article 104386. https://doi.org/10.1016/j.medengphy.2025.104386

l.ead.me/therapy-26-01-26

SCIENCE

New NICE guideline on rehabilitation for chronic neurological disorders

An evidence-based frame of reference for coordinated, real-world and person-centred care

Jakob Tiebel

In October 2025, the National Institute for Health and Care Excellence (NICE) published a comprehensive guideline on the rehabilitation of children, young people and adults with chronic neurological disorders and acquired neurological impairments. This guideline covers rehabilitative care in all settings – from acute care and outpatient rehabilitation to community and long-term care – and aims to create an evidence-based, coordinated and person-centred framework for neurorehabilitation.

The guideline is aimed at healthcare professionals, clinical teams, social and care structures, decision-makers, and those affected and their relatives. It complements and links with existing NICE guidelines on specific neurological conditions such as motor neurone disease, multiple sclerosis and Parkinson's disease, as well as guidelines on acute care for head and spinal injuries. It does not include guidelines on rehabilitation for stroke in adults, dementia, epilepsy or cerebral palsy – these are covered by separate NICE recommendations.

Basic principles of the guideline

The guideline sets out a new paradigm for neurological rehabilitation that emphasises the following core principles:

- Holistic and person-centred rehabilitation that addresses physical, cognitive, psychosocial and participatory aspects in equal measure.
- Lifelong care, i.e. lifelong rehabilitative support that is geared towards individual needs and objectives.
- Coordination and continuity of care, underpinned by a single point of contact (e.g. key contact or case manager) for navigating the healthcare system.
- Multidisciplinary cooperation between health, social and community services, including voluntary and charitable sectors.

The aim is to reduce inequalities in care, smooth transitions between care sectors and establish consistently high standards for all those affected.

Physical activity and exercise

A central chapter of the guideline deals with physical activity and targeted exercise therapy – key elements of any neurological rehabilitation programme.

Individual programmes and target agreement

The guideline recommends the joint development of a physical activity and exercise programme between the practitioner and the person affected in order to optimise muscle power, endurance and physical function. Factors such as fatigue, pain, cognitive

impairment and the risk of possible damage should be taken into account. Supervision, self-exercise and local programmes should be combined as required, and the dose of exercise (frequency, duration, intensity) should be agreed on a clinically relevant basis.

Functionally orientated promotion of movement

For individuals with functional neurological disorders, activities that encourage goal-oriented, planned movement while recognising symptom awareness, but focus attention on achieving functional goals, are recommended.

Specialist support

Physical activity programmes should be developed and supervised by professionals with expertise in exercise programmes, such as physiotherapists or occupational therapists with a neurological focus.

Rehabilitation is an ongoing process – the new NICE guideline sets a new evidence-based, lifelong standard for this.

Promotion of long-term behavioural change

The guideline recommends the use of behavioural strategies, including cognitive behavioural therapy, motivational interviewing techniques or intervention-based approaches in order to support lifelong activity and exercise participation. Barriers such as social, cultural or structural obstacles should be jointly identified and addressed.

Stability, mobility and limb function

Another core chapter deals with functional aspects of physical rehabilitation.

Targeted training programmes

For problems with stability, mobility or limb function, the guideline recommends specific, targeted training approaches, including:

- Function-orientated training and task-based training (e.g. gait training, balance exercises, sensorimotor tasks).
- Treadmill- and robotic-assisted gait training to promote both mobility and endurance.
- Use of robotics and game modes to improve motivation and training quality where available.

The guideline emphasises the integration of these exercises into everyday life – at home and in the community – and recommends agreeing clear training programmes that can also be carried out independently or with the support of family and caregivers.

Context and significance for practice and care

The new NICE guideline represents a paradigm shift in neurorehabilitative care in that it no longer calls for selective therapies, but for coordinated, lifelong and person-centred case management that integrates physical, psychosocial and functional goals. It calls for clear assessments, common objectives, multidisciplinary collaboration and the provision of a single point of contact to navigate the healthcare system.

The guideline also emphasises that successful implementation does not happen by itself: It requires well-resourced, coordinated healthcare systems, political commitment, training and expansion of the rehabilitative workforce, and sufficient funding in order to realise the recommended personcentred, integrated and lifelong service delivery models.

Conclusion

The new NICE guideline provides a comprehensive, evidence-based framework for the rehabilitation of chronic neurological diseases and sets new standards for the organisation of rehabilitative care. With its recommendations on physical activity, functional training, integration of robotics/VR, holistic care and long-term care coordination, it provides a broad basis for clinical practice, care planning and health policy decisions in neurorehabilitation.

Original work

www.nice.org.uk/guidance/ng252

Jakob Tiebel studied Applied Psychology with a focus on Healthcare Management and has clinical expertise through previous therapeutic work in neurorehabilitation. He researches and publishes on theory-practice transfer in neurorehabilitation and is the owner of hestrix, an agency for digitalisation and communication in the healthcare sector.

Exercise training among haemodialysis patients

An underestimated component of care provision

Jakob Tiebel

Haemodialysis saves lives – but for many patients it also means a gradual loss of physical performance, independence and quality of life. What was long regarded as an unavoidable side effect is increasingly being seen in a different light: targeted exercise is key to reducing hospitalisation and halting functional decline. A recently published specialist article demonstrates why exercise therapy for dialysis patients is far more than a nice-to-have – and why it has yet to become standard practice in clinical management.

Patients with chronic renal failure on haemodialysis are among the most vulnerable patient groups. They have an increased risk of complicated and protracted disease progression and often present a geriatric appearance in the sense of frailty at a comparatively young age. Functional limitations, reduced resilience and an increased hospitalisation rate are the result.

Against this background, exercise therapy becomes increasingly important. As the DiaTT study, among others, shows, structured physical training can achieve clinically relevant effects in dialysis

patients. In particular, a significant reduction in the hospitalisation duration was demonstrated. Exercise training not only has an effect on physical performance, but also helps to stabilise general state of health and preserve independence.

The article, which was recently published in Nieren- und Hochdruckkrankheiten, a specialist journal focusing on renal and hypertensive diseases, takes a comprehensive look at this topic. Author Kerstin Anding-Rost, who was also significantly involved in the DiaTT study, discusses exercise therapy interventions both during dialysis treatment and as home training programmes. Suitable training concepts, their individual adaptation and options for structured progress monitoring are presented.

The article places particular emphasis on the need for qualified guidance and support from appropriately trained staff in order to ensure the safety and effectiveness of the measures. Despite the well-documented positive effects, the issue of remuneration remains unresolved and represents a key barrier to widespread implementation. Regardless of this, the article makes it clear that exercise therapy should be seen as an integral part of the care provided to haemodialysis patients in order to sustainably improve prognosis, functional capacity and quality of life.

Dialysis prolongs life – exercise decides what this life looks like.

Original work

K. Anding-Rost, C. Grupp (2025). Exercise therapy in hemodialysis patients. Nieren- und Hochdruckkrankheiten 54: 261–267. https://www.dustri.com/nc/de/article-response-page.html?artId=192212&doi=10.5414%2FNHX02471&abstractLang=en

l.ead.me/therapy-26-01-34

SCIENCE

Early end-effector-based gait training in severely affected stroke patients with neglect

What the study shows – and what this means for the use of the lyra end-effector gait trainer

Jakob Tiebel

Guidelines consider early, intensive gait rehabilitation to be a central component of stroke rehabilitation, especially for patients who are not yet able to walk in the subacute phase. At the same time, there is one patient group that has traditionally been underrepresented or explicitly excluded in robotic-assisted studies: people with visuospatial neglect (VSN), typically after a right-hemispheric stroke. VSN is a negative predictor of functional outcomes and makes the process of recovering mobility more difficult, among other things due to attention and perception deficits, and a lack of insight into one's own impairments. The randomised study by Gorsler et al. addresses this evidence gap. (Frontiers in Neurology, 2025).

Question and hypothesis

The authors investigated whether early end-effector-based gait training as an addition to standard therapy in severely affected, non-ambulatory subacute stroke patients with VSN is more effective than an active control intervention (early verticalisation in a standing frame) – in each case in

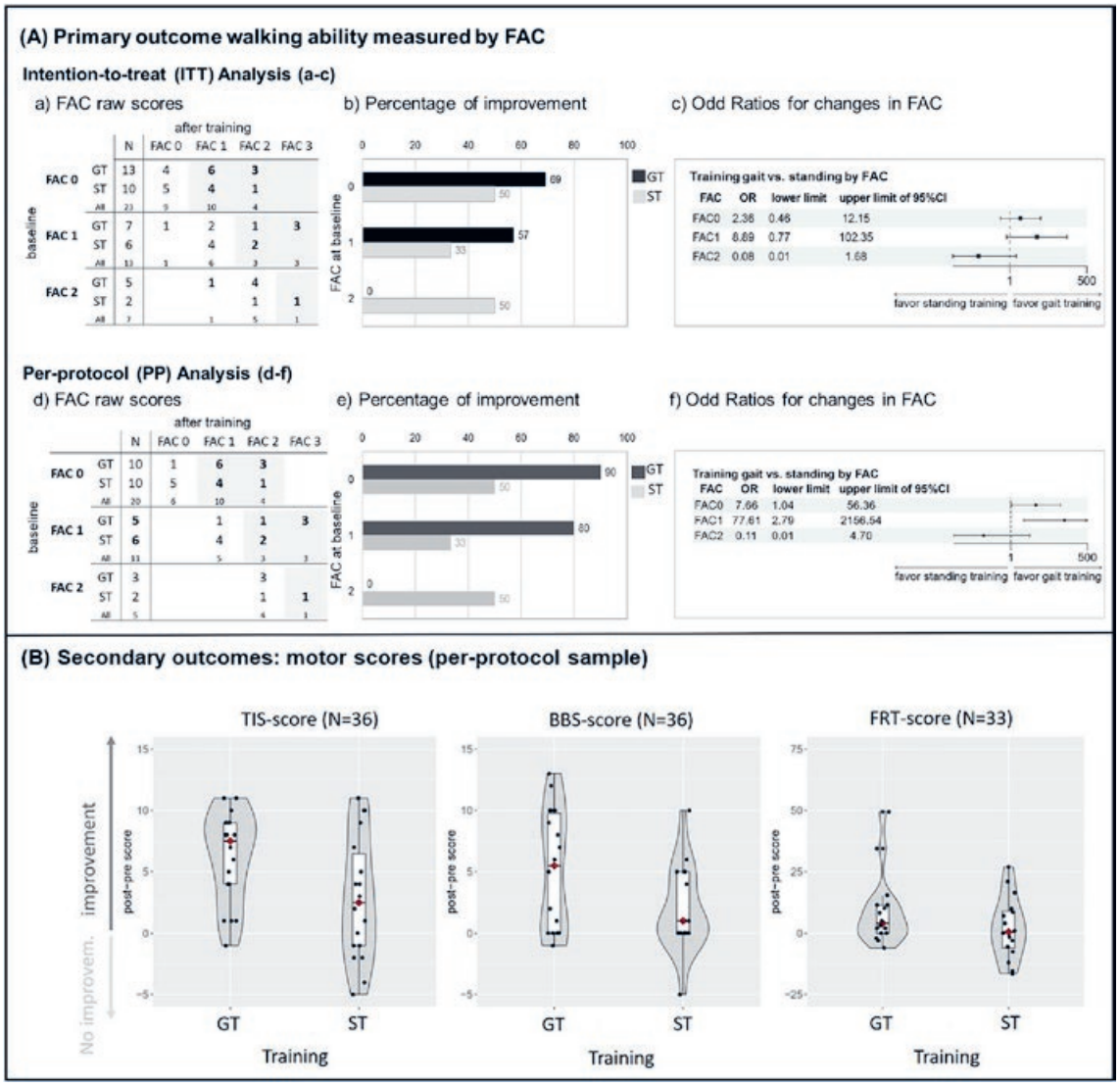
addition to the usual physiotherapy and neglect therapy. The primary endpoint was walking ability, while trunk stability and balance were considered secondarily.

Study design, population and interventions

This is a prospective, randomised, assessor-blinded controlled study (proof-of-concept). The study included 43 patients in the early subacute phase (7–80 days post-stroke) with a first right-hemispheric stroke and left-sided VSN. All of them were non-ambulatory (FAC ≤ 2) and had to be haemodynamically stable when standing. The cohort was severely affected from a clinical standpoint (including high functional dependence, impaired trunk function).

The additional intervention consisted of nine sessions, each lasting 30 minutes, and took place over approximately two to three weeks. In the control group, patients were verticalised early in the standing frame, while in the intervention group they received end-effector-based gait training. Both groups used devices from the same manufacturer: the THERA-Trainer balo as a standing frame and

Neglect is not a reason to postpone gait training – but a reason to make it possible in a targeted manner.



Source: https://www.frontiersin.org/journals/neurology/articles/10.3389/fneur.2025.1639659/full

the THERA-Trainer lyra for gait training. A walking speed of at least 1.5 km/h was planned for the gait training. The body weight support (BWS) was a maximum of 30% at the beginning. If patients were clinically observed to be overwhelmed, the BWS could be temporarily increased to 60%; thereafter, the speed was reduced. This makes the study very practical: the parameters were consistently adapted to the resilience of the severely affected patients (feasibility first).

Outcomes and evaluation

The primary outcome was the Functional Ambulation Category (FAC), analysed using ordinal logistic regression. An intention-to-treat (ITT) analysis with multiple imputation and additionally a per-protocol (PP) sensitivity analysis was performed (PP: at least 6 of 9 sessions and post-measurement).

During the intention-to-treat (ITT) analysis, all participants were analysed as they were originally assigned to the group – even if someone did not complete all the training sessions or dropped out prematurely. Missing measured values (e.g. because the final measurement is missing) were not simply omitted, but rather plausibly supplemented using a statistical method (multiple imputation). This can be pictured as follows: The programme generates multiple realistic "substitute values" based on the available data, performs calculations using these values and consolidates the results. This means that the result is less distorted than if only the "finished" cases are considered. In addition, the per-protocol (PP) analysis was carried out as a control calculation. Only those who received the treatment largely as planned were included here – in this study: at least 6 out of 9 sessions and a final measurement. This indicates whether the results are also similar when only looking at those who actually completed the programme to a sufficient extent. ITT thus marks the effect under "clinically realistic" conditions (including failures), while PP checks whether the result remains stable compared to "optimal participation".

Those most severely affected in particular benefit not only from standing, but also from early, task-oriented walking.

Secondary outcomes included the Trunk Impairment Scale (TIS) and a short form of the Berg Balance Scale (BBS).

Primary results: Comparison of gait training vs standing training at the main endpoint (walking ability/FAC)

The ITT analysis showed no statistically significant superiority of the end-effector-based gait training over the standing frame control measure (OR 1.20; 95% CI 0.30–4.78). The overall superiority was also not significant in the PP analysis (OR 4.08; 95% CI 0.80–20.87), but with a significantly larger effect size and broad uncertainty (confidence interval), as is typical for small proof-of-concept studies.

The critical factor is the interaction effect identified by the authors. The PP analysis showed a pattern by which patients with very low initial walking ability (FAC 0–1, i.e. completely unable to walk or only able to walk with substantial manual assistance) were more likely to benefit from gait training than from standing training. Patients with FAC 2 did not display this pattern, which the authors also attribute to having very small subgroups. In practical terms, this means that the results speak less in favour of a one-size-fits-all effect and more in favour of a subgroup effect in very severely affected people, who have often not been considered in research to date.

Another finding pertinent to dosage and implementation was the positive correlation between the number of completed training sessions and FAC improvement. This supports the clinical intuition that adherence and sustained exposure are central in this population – and explains why PP analyses may be more informative here than pure ITT estimates.

Secondary results: Accompanying secondary endpoints (trunk, balance) and neglect/SVV

While the primary endpoint was not formally significant, the secondary outcomes showed a much clearer picture: greater improvements in trunk function (TIS; mean difference 3.4 points

If walking ability is not yet achievable, trunk and balance become the critical lever in rehabilitation.

[95% CI 0.8–6.1], partial η^2 = 0.18) and balance (BBS; 5.7 points [0.5–6.7], partial η^2 = 0.15) were reported after gait training than after standing training. In contrast, the ability to lean forward while sitting (FRT sitting) differed only slightly between the groups (4.0 cm [-0.2–17.3], partial η^2 = 0.12).

The MCID-related findings (Minimal Clinically Important Difference) are particularly convincing because they translate the statistical effects into clinically relevant improvements. For TIS (MCID = 3 points), 78% of patients in the gait training group achieved a clinically relevant improvement, compared to 33% in the standing training group. For the BBS (MCID = 6-7 points), this figure was 50% after gait training versus 11% after standing training. Clinically relevant changes occurred with similar frequency during FRT in a sitting position (MCID = 6 cm) (gait training 41%, standing training 38%). Functionally, this pattern is plausible because end-effector-based training not only generates verticalisation and orthostatic activation, but also repetitive, task-oriented weight shifting, rhythmic leg movement and coordinative demands that specifically address trunk control and balance in the direction of standing/walking.

It is important to mention that the neglect symptoms themselves and the subjective visual vertical (SVV) improved similarly in both groups; gait training therefore had no negative influence on neglect recovery, but also showed no specific additional benefit for this.

Safety and compatibility

The study reports isolated training dropouts in the gait training group in connection with pain (in the case of pre-existing knee pain) or cardiac exercise intolerance in the case of pre-existing illnesses. No other adverse events were reported; affected patients were always able to continue routine therapy. In practice, the message is clear: in this multimorbid, severely affected cohort, systematic screening, close monitoring (e.g. oxygenation, pain, orthostasis) and adaptive parameter management are essential. This fits with the real-world observation of the study that the originally planned minimum speed was initially not achievable in many cases and the average BWS was above the recorded target limit – important information for protocol design and clinical pathways.

Benefit argumentation with a focus on the end-effector gait trainer

Neglect is not a reason for exclusion from early gait training

The study's key scientific achievement is that it examines a patient group that has been excluded from many robotic/device-assisted gait training studies. In doing so, it provides proof of feasibility and initial evidence of the effectiveness of end-effector-based training in VSN. For clinics, this means that in principle, early device-assisted, task-specific gait training can also be implemented in neglect, provided that the right general conditions (vigilance, orthostasis stability, contraindications) are in place.

Trunk control and balance as enablers

Especially in early rehabilitation and the severe subacute phase, walking ability is often a late outcome. Improvements in trunk stability and balance, meanwhile, are often earlier, highly relevant intermediate goals in therapy because they influence transfers, sitting/standing tolerance, preparation for standing and walking, and ultimately the intensity of rehabilitation. The stronger secondary effects on TIS and BBS suggest that gait training in this cohort can act as functional priming – and is therefore clinically valuable even if a global FAC difference does not (yet) become significant in the short term.

Added value, especially for very severely affected patients (FAC 0–1)

The PP pattern suggests that patients with very low baseline FAC in particular benefit from end-effector-based training. This is clinically significant because this group is often most at risk of getting "stuck" in passive verticalisation or preparatory formats. Electromechanical gait training offers a structured way of training repetitive, task-related gait components at a very early stage – with adaptive BWS and customised dosing. The study does not provide definitive confirmation of effectiveness, but it does provide a plausible signal.

Progressive protocol instead of rigid target parameters

The fact that the target speed was often not achieved initially and that BWS had to be increased more frequently is not a failure, but a realistic implementation finding. A stringent conclusion can be drawn from this for the clinical use of the lyra end-effector trainer: protocols should be planned progressively (e.g. start with higher BWS/lower speed, clear progression criteria, close symptom monitoring) instead of starting with bestpractice parameters from less severely affected cohorts.

Limitations

The authors emphasise the small sample size, dropouts (exclusively in the gait training group) and lack of long-term follow-up. Accordingly, the study should primarily be read as a proof of concept with hypothesis generation. It demonstrates feasibility and provides evidence of potential subgroup effects and secondary functional gains, but does not provide a conclusive efficacy assessment for all VSN patients.

Conclusion

The study suggests that early end-effector-based gait training with the THERA-Trainer lyra is feasible in severely affected, non-ambulatory subacute stroke patients with visuospatial neglect and can offer clinically relevant advantages over pure verticalisation, especially in very severely affected patients and with regard to trunk stability and balance – provided that an adaptive, safety-conscious training and monitoring setting is used.

Original work

Gorsler A, Ernst D, Grittner U, Harnack D, Koßmehl P, Mehrholz J, Mueske C, Schneider P and Kuelzow N (2025) Early end-effector-based gait training in non-ambulatory patients with visuospatial neglect after subacute stroke. Front. Neurol. 16:1639659. doi: 10.3389/fneur.2025.1639659
https://www.frontiersin.org/journals/neurology/articles/10.3389/fneur.2025.1639659/full

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LIFE IN MOTION

Improving balance with the THERA-Trainer balo

Review of a webinar on postural control, motor learning and technology-assisted therapy

Jakob Tiebel

In the webinar, Alisa Barthel, physiotherapist and specialist therapist for neurorehabilitation and founder of Therapeuticum Gehrden, presented her practical approach to using the THERA-Trainer balo in neurological rehabilitation. The starting point was a brief insight into the interdisciplinary, evidence-based practice concept, which combines technology-assisted therapy with high repetition, feedback mechanisms and motivational elements. It became clear that modern devices are not seen as a substitute for therapeutic expertise, but rather as a targeted addition.

Motor learning and neuroplasticity as a therapeutic framework

In the theoretical part, Alisa categorised the balo into central principles of motor learning. Neuroplasticity, a high number of repetitions, sufficiently high training intensity, customisable dosage, and continuous visual and acoustic feedback were identified as key therapeutic factors. The benefits of gamification for increasing adherence and self-motivation were particularly emphasised, without relinquishing therapeutic control in the process. The technology enables objectifiable progress documentation and makes progress transparent for patients, relatives and caregivers.

Classification of the THERA-Trainer balo in the device range

The THERA-Trainer balo was then presented in terms of its function, structure and application logic. The balo closes the gap between passive standing frames and complex gait robotics systems. It allows dynamic standing and balance training in various degrees of freedom (lateral and anteroposterior weight shifts) and provides real-time feedback of the body's centre of gravity through sensor technology.

WEBINAR

More stability, more quality of life - with the THERA-Trainer balo

Alisa Barthel
Certified Specialist in Neurorehabilitation

Safety mechanisms such as the upright and support system also enable use with severely restricted patients who are unable to stand. The possibility of using the balo both statically and dynamically with variable degrees of freedom was emphasised as a significant advantage for gradual therapy progression.

Postural control: anticipatory and reactive training

One focus was on postural control as the basis of functional mobility. Alisa differentiated between anticipatory balance reactions, which are specifically trained via visually controlled weight shifts, and reactive balance responses, which are provoked by unexpected perturbations. The balo is particularly suitable for training anticipatory control; reactive parts were deliberately supplemented by therapeutically initiated disturbances. This made it possible to demonstrate a functionally relevant training of fall reactions, protective steps and trunk stability in a safe setting.

Practical examples and objectifiable therapy effects

The practical examples impressively demonstrated how the balo can be used in different clinical constellations, including multiple sclerosis, post-stroke, Parkinson's disease and incomplete tetraplegia. Video clips and progress data showed how anteroposterior weight displacement, lateral stability and standing tolerance improved measurably within a few weeks. Supplementary therapeutic strategies such as forced-use approaches, dual tasking, additional cognitive tasks or the deliberate prevention of support strategies were shown as examples of the necessary active therapeutic control. The objective progression graphs emphasised the added value of quantifiable outcomes for therapy planning, motivation and interprofessional communication.

Postural control begins while standing – balance is not a by-product, but a central focus of therapy.

Integration into care concepts and everyday life

The discussion focussed on the integration of balo into individual, parallel and group settings, for example as part of circuit training or combined forms of therapy. Use in the home setting was also addressed. The ability to prescribe training as an aid, supported by standardised application templates, enables training to be continued outside the practice

in suitable cases. The balo was thus categorised not only as a therapeutic instrument, but also as a bridge between outpatient care, training in everyday life and long-term self-efficacy.

Conclusion: Technology as an amplifier of therapeutic efficacy

The conclusion of the webinar was clear: the THERA-Trainer balo is a functional, evidence-based addition for balance and standing training in neurorehabilitation. Its added value lies in the combination of a safe setting, high training intensity, objectifiable feedback and broad therapeutic applicability. The critical factor remains the competent therapeutic embedding that integrates the balo into an individual, goal-oriented treatment concept.

Objectifiable progress creates motivation – visible for patients, relatives and caregivers.

Image source: Therapeuticum Gehrden

robOTion Barriers

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- Online, anonymous and voluntary questionnaire
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Epidural spinal cord stimulation and robotic-assisted mobilisation in complete spinal cord injury

How a multimodal rehabilitation concept with spinal stimulation and intensive training can restore functional mobility even in cases of chronic complete spinal cord injury

Jakob Tiebel

People with complete paraplegia have been regarded for decades in rehabilitation as a patient group with very limited chances of functional recovery. In the case of complete sensorimotor lesions in particular, regaining the ability to stand or walk is often considered barely realistic. All the more remarkable are the latest results from one clinical proof-of-concept study, which shows that under certain conditions, functional mobility can be relearned years after a spinal cord injury. The study focuses on an intensive, multimodal rehabilitation programme that combines epidural spinal cord stimulation (SCS) with targeted movement therapy, mental training, robotic-assisted gait training and structured trunk rehabilitation. The THERA-Trainer plays a key role in this, as it was used both in the preparation phase and during the post-operative rehabilitation.

Supported standing and trunk control training with the THERA-Trainer balo.

A new approach to an old challenge

Only around five to eight per cent of people with a complete sensorimotor spinal cord injury regain a certain ability to walk. Traditional rehabilitation approaches quickly reach their limits here. The study now presented therefore takes a different approach: it relies on the interplay of several therapeutic levers to make existing but functionally "dormant" neuronal connections below the lesion usable again.

Three people with chronic complete thoracic spinal cord injury took part in the programme. All of them had been completely dependent on a wheelchair for several years. Following a preparatory training phase (prehabilitation), they were implanted with an epidural spinal cord stimulator. This was followed by a seven-month, highly intensive rehabilitation phase with daily training.

Prehabilitation: preparation for re-uprighting

Even before spinal cord stimulation was implanted, the THERA-Trainer balo played a central role. The aim of this phase was to prepare the participants physically and mentally for the subsequent intensive gait and standing training.

The following aspects were specifically trained with the standing frame:

- Verticalisation and weight bearing to get the circulation used to the upright position
- Active trunk control, which is essential for later transfers and walking
- Dynamic weight shifts, supported by interactive training programmes

This phase is particularly crucial for people who have not stood for years. The THERA-Trainer enabled safe, controlled standing with a high level of therapeutic activation at the same time – without excessive demands and with a clear structure.

After implantation: movement made possible again

After implantation of the spinal cord stimulator, the actual core phase of the programme began. The electrical stimulation made it possible for the

participants to voluntarily control individual muscle groups in their legs for the first time – but only in combination with active training.

This showed the great advantage of structured device use: THERA-Trainer-based therapy was not used here in isolation, but was combined with other elements in a targeted manner:

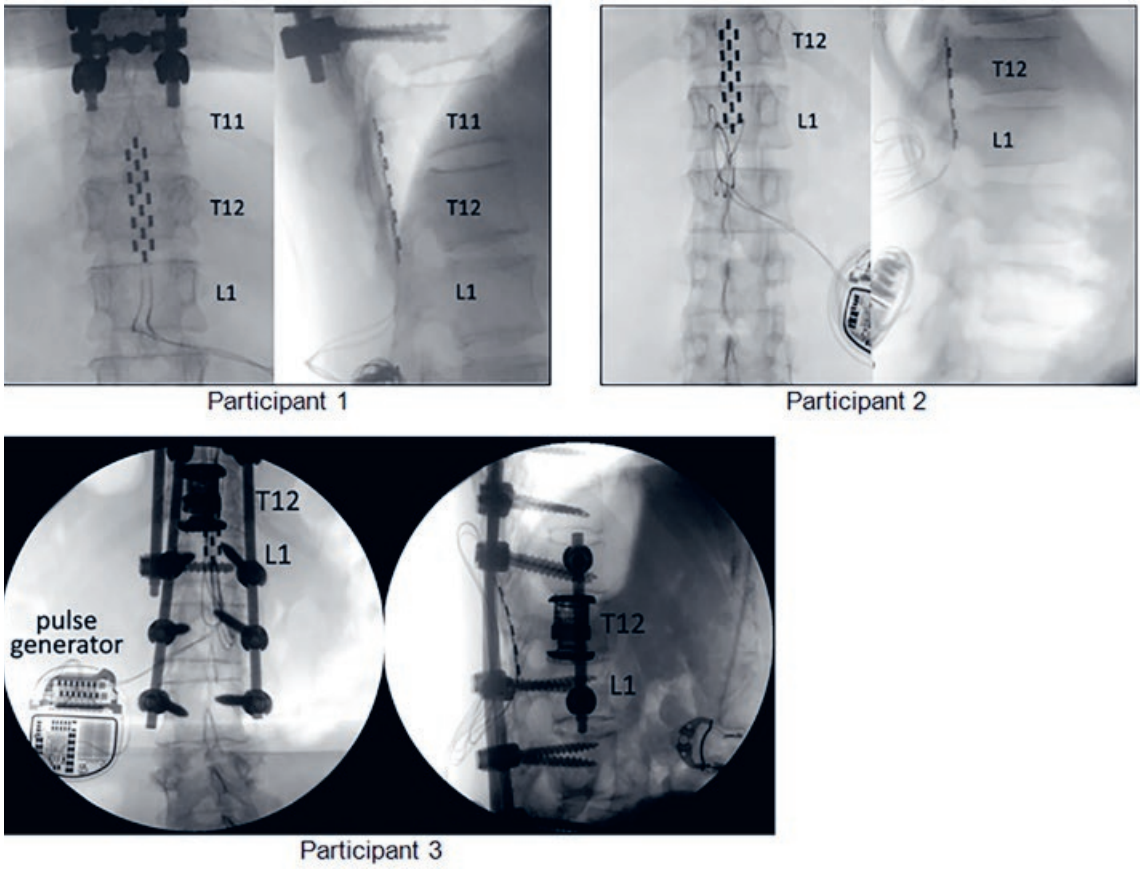
- Trunk rehabilitation to create the basis for balance and standing stability
- Task-specific training, such as sit-to-stand exercises
- Robotic-assisted gait training and later free walking with aids

The THERA-Trainer acted as a link between stabilisation and mobilisation. In particular, repeated, safe standing and controlled weight-bearing proved to be a critical intermediate step on the way to walking.

Measurable progress – with high clinical relevance

The results after seven months of intensive rehabilitation: all three participants experienced significant improvements in their functional mobility. They were able to switch from sitting to standing independently and walk with a rollator under supervision – skills that they did not have before starting the programme.

Structured standing and trunk training with the THERA-Trainer formed the necessary basis for later sit-to-stand and gait training.



Intraoperative X-ray of the final placement of the spinal cord stimulation (SCS) implants in the three participants.

The improvements are particularly relevant in practice:

- Trunk stability, a central predictor of functional walking
- Sit-to-stand performance, a key movement in everyday life
- Walking ability, measured with established clinical scales

This progress was not achieved through technique alone, but through consistent, high-dose exercise therapy – made possible and structured by the targeted use of training devices such as the THERA-Trainer balo.

Implications

The study makes it clear: in complex neurorehabilitative programmes, technology is particularly effective when it is functionally embedded. The THERA-Trainer fulfilled several key tasks:

- It enabled early, safe verticalisation
- It created the basis for active trunk and balance control
- It provided specific preparation for dynamic gait loads

It was therefore not just an "aid", but an integral part of a learning-oriented rehabilitation pathway. This approach offers an important message for therapy: functional training can be useful even for the most severe neurological impairments – if it is implemented in a structured, progressive and patient-centred manner.

Limitations and outlook

The authors of the study rightly emphasise the limitations: three participants, no control arm, high expenditure of resources. Nevertheless, the work provides valuable evidence that functional progress is possible even in cases of complete paraplegia – provided that rehabilitation is understood as an active, long-term learning process.

In practice, this means that devices such as the THERA-Trainer can achieve their full effect if they are not used in isolation but as part of a holistic concept.

In complex neurorehabilitative programmes, technology is particularly effective when it is functionally embedded.

Original work

Wee SK, Valerie ZYN, Phua MW, et al. Synergistic integration of epidural spinal cord stimulation with robotic therapy and neurorehabilitation to facilitate functional recovery in chronic sensorimotor complete spinal cord injury: A case series. Advances in Rehabilitation Science and Practice. 2025;14. doi:10.1177/27536351251343738

l.ead.me/therapy-26-01-46

THERAPY & PRACTICE

From lone warrior to team player

How interdisciplinary collaboration improves patient care

Katharina Zierold

In the past, therapy was often a solitary, isolated skill set: the doctor prescribes, the therapist treats and in between there is radio silence. But modern medicine is dispelling the myth of the lone warrior. The meta-analysis by Struck et al. provides impressive evidence: patients reach their destination faster when the team works in a network. Find out how a simple therapy diary can become a data protection-compliant miracle weapon.

The myth of the lone wolf

Hand on heart: we are all familiar with that moment that we feel like we're on a desert island in the treatment room. We do our best, mobilise and motivate – but what the colleague from occupational therapy on the other side of town did yesterday or why the neurologist adjusted the medication often remains a mystery. "Silo thinking" used to be the standard. Everyone was an expert in their own little

garden, but the fence between them was high and the only source of information was an often overwhelmed patient.

But the days of one-on-one therapeutic battles are over. Why? Because our patients do not have static problems, but complex lives. A stroke patient does not need an "isolation specialist", but an orchestra that plays the symphony of recovery. If the speech therapist knows that the physiotherapist is currently working on trunk stability, this can be used as the basis for swallowing training. This is not a luxury, but highly efficient medicine in everyday practice.

What the science says

Current data shows that collaboration is not only good for the working atmosphere, but also brings tangible clinical benefits. A groundbreaking meta-analysis by Struck et al. (2024) has investigated the effectiveness of interdisciplinary interventions. The result is clear: interdisciplinary team care (ITC) is clearly superior to conventional, purely multidisciplinary treatment, in which disciplines tend to work side by side.

According to the study, not only does the fall rate decrease, but patients also achieve a significantly higher level of independence in everyday life (activities of daily living, ADL). The common ground acts as a catalyst. When everyone is working on the same parameters, patients often reach their goals weeks earlier than with sequential treatment. This saves resources and provides valuable quality of life.

Communication over data protection drama

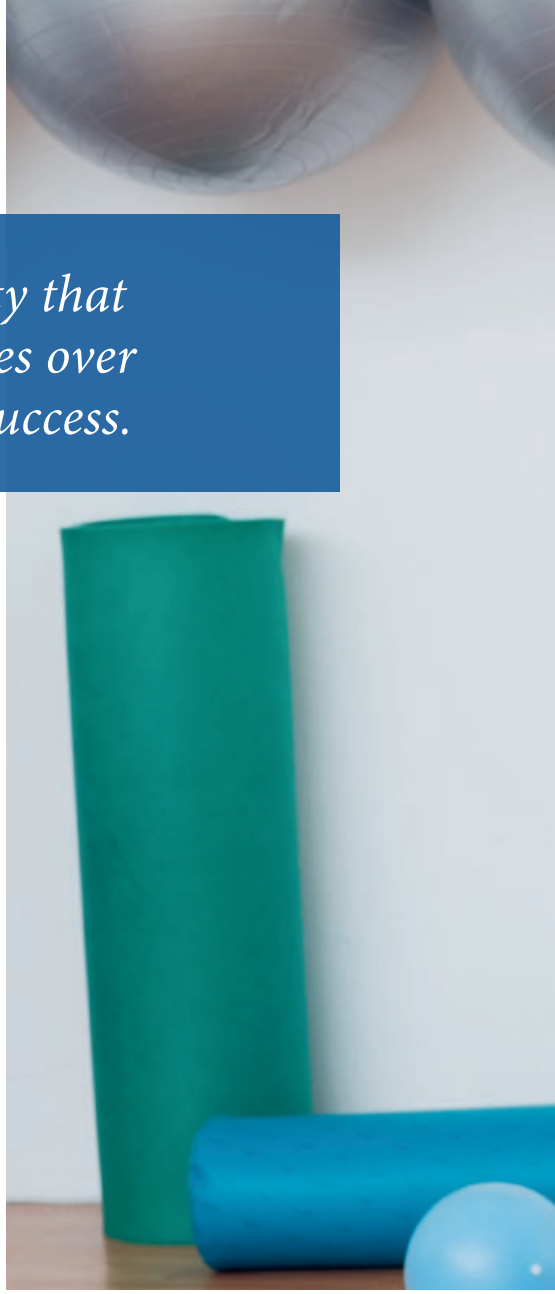
In theory, networking sounds great, but in practice, data protection often suffers when reports are sent back and forth by email. The solution is as simple as it is ingenious: the analogue therapy diary.

Instead of laboriously searching for fax numbers or typing unsecure emails, we use the patient as an active information carrier. No novels are written in the diary, but goals are briefly outlined according to the ICF model (International Classification of Functioning, Disability and Health).

An entry such as "Physio: Focus on transfer training today – Ergo: Please pay attention to hand support" immediately links the disciplines. As the book remains in the patient's possession, data sovereignty is maintained and the exchange takes place directly at the point of treatment.

Patients who understand why they are doing something are more motivated.

It is an investment in quality that pays off twice and three times over through faster therapeutic success.



The haptic anchor in the digital age

Why paper? In a world full of apps and digital overload, a physical diary offers an invaluable advantage: it is present. It sits on the patients' kitchen tables, and is in their pocket when they come to the practice. It serves as a reminder of progress that is often overlooked in everyday life. For patients, it becomes a record of their own achievements. When they look back and see which goals seemed unattainable three months ago, it strengthens their self-efficacy more than any verbal encouragement.

For us as therapists, it means: 60 seconds at the end of the session for an entry saves us hours of clarification and phone calls. It is an investment in quality that pays off twice and three times over through faster therapeutic success.

Making the "invisible" practice visible

In many cases, we do not even know who else is looking after the patient. The therapy diary serves as a business card for colleagues. It makes the "invisible" allies tangible.

As a physiotherapist, when I see that occupational therapy is already successfully working on fine motor skills for doing up buttons, I can integrate this sense of achievement into my gait training: "If you walk to the baker's, maybe we can manage to do up the jacket on our own today?" This networking not only motivates us therapists, but also creates a quality of care that patients can feel, in the sense that an entire network is pulling in the same direction here.

The patient in the driving seat

We must not forget the most important player: the patient themselves. In a networked setting, they no longer play passive roles, but are the drivers of their recovery. They see in black and white how the gears mesh. When they realise that their exercises in speech therapy perfectly complement the goals of physiotherapy, adherence – i.e. compliance with therapy – increases massively. Patients who understand why they are doing something are more motivated. And all of us know that a motivated patient is half the battle.

Working together for a greater impact

The switch from lone warrior to team player requires perhaps five minutes more time for an entry in the

diary at the beginning. But the rewards are great: less frustration from miscommunication, better results and a mutually supportive working environment. Interdisciplinary cooperation is not a trend for large centres, but the answer to the challenges of every modern practice. Let's tackle it together – with the diary under our arm, for our patients and for our own enjoyment of the profession.

Sources:

Meta-analysis by Struck et al. (2024) "Interdisciplinary Team Care" (ITC)

Katharina Zierold is an author and physiotherapist with an interdisciplinary view of the body, mind and social dynamics. In her work, she combines medical expertise with clear, accessible language. Professionally, she has many years of experience in the treatment of chronic pain and psychosomatic contexts. As an author, she deals with topics such as physical self-perception, healing processes and identity. Her work contributes to removing taboos from physical processes and promotes a differentiated view of the human whole.

SCIENCE

Walk more, train more intensively, exercise together

What the new ESO guideline on motor rehabilitation after stroke means for mobility and balance

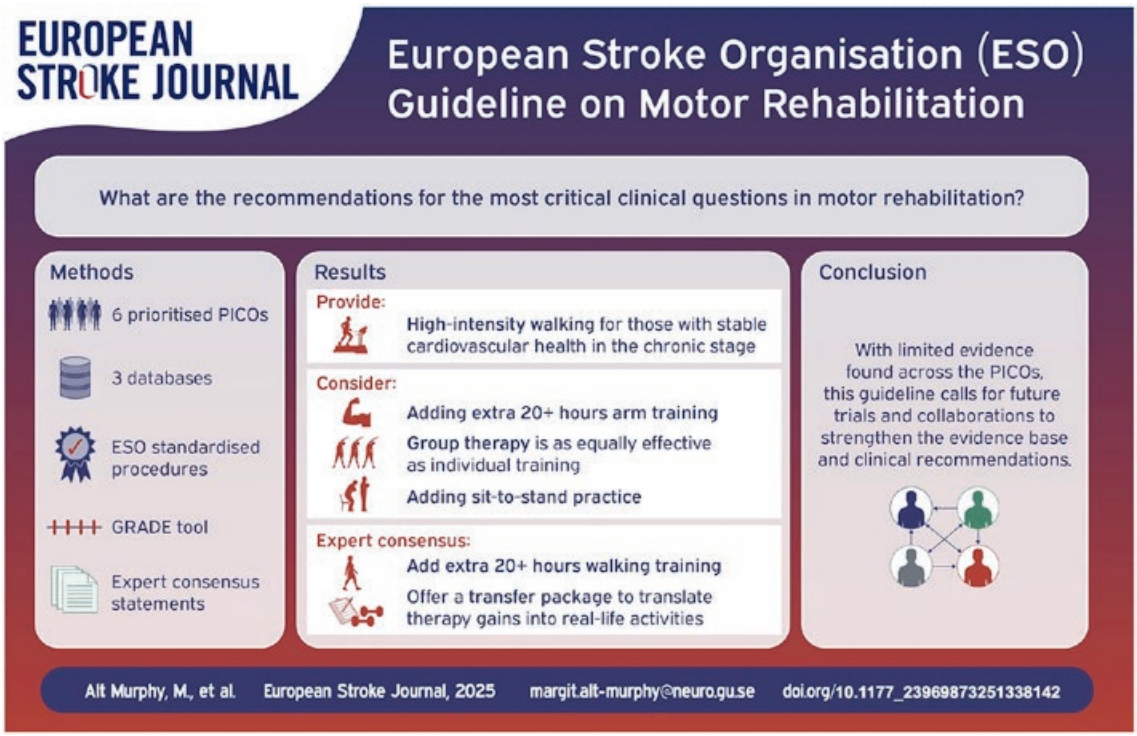
Jakob Tiebel

When people are asked what they most want back after a stroke, the answer is often not "more strength in my arm", but to be able to walk safely again. Walking signifies independence, participation, dignity – and determines whether someone leaves their home or not. It is therefore all the more remarkable that until recently there was no independent European guideline explicitly dedicated to motor rehabilitation after stroke. This has changed with the European Stroke Organisation (ESO) guideline published in December 2025. The guideline on motor rehabilitation after stroke is the first of its kind and starts where everyday clinical practice has been calling for orientation for years: in terms of dosage, intensity, forms of organisation and motor functions relevant to everyday life. One message that is central to walking ability becomes particularly clear: More helps – but only if it is done properly.

Why this guideline is important

The new ESO guideline differs from many previous recommendations in that it does not attempt to cover "everything". Instead, it concentrates on particularly relevant questions in clinical practice, known as PICO questions, including specifically walking, exercise intensity, group therapy and getting up from a sitting position. It was developed using standardised ESO procedures and the GRADE system, which transparently assesses the quality of the evidence. Where reliable studies are lacking, expert assessments are clearly labelled as such.

At least 20 hours of additional gait training to improve walking ability.



This is an important step, especially for the rehabilitation of walking ability and balance: away from implicit assumptions and towards explicit, well-founded recommendations.

Anyone who wants to learn to walk again has to walk – at least 20 hours more

One of the key statements in the guideline concerns the dosage of gait training. Despite a heterogeneous study situation, the expert group came to a clear consensus: additional walking time improves walking ability after a stroke. Specifically, it is recommended that at least 20 additional hours of targeted gait training be planned in addition to the usual rehabilitation, typically spread over three to five sessions per week over four to six weeks.

This recommendation is noteworthy because it reveals an implicit deficiency in current practice: in many rehabilitation settings, there is simply not enough walking. Walking is often trained on a secondary basis, but not systematically, not repetitively and not to a sufficient extent. The guideline emphasises once again that walking ability is not a by-product, but must be trained in a targeted manner and for a sufficient period of time in order to achieve relevant improvements in walking distance, speed and endurance.

Use transfer packages so that therapy successes become effective in everyday life.

Intensity counts – especially in the chronic phase

The guideline is even clearer when it comes to training intensity. For people in the chronic phase after a stroke who are cardiovascularly stable, it strongly recommends high-intensity gait training, at least with regard to walking endurance. There are also advantages for walking speed, albeit with a lower level of evidence.

What does "high-intensity" mean? It does not mean a leisurely walk in the corridor, but training at or close to one's individual performance limit – for example on the treadmill, with speed targets or heart rate goals. The guideline sends a clear signal to

practitioners: rest is not a therapeutic principle, at least not in the chronic phase. If the goal is to walk securely, the patient needs to be challenged.

This statement is particularly relevant because it contradicts the still widespread reluctance to engage in intensive exercise after a stroke. The ESO guideline makes it clear that with the right medical conditions, intensive gait training is not only safe but also effective.

Supplement sit-to-stand training to specifically improve postural balance.

Balance can be trained – through functional transitions and targeted exercise formats

In addition to walking, the guideline also focuses on postural balance as a key prerequisite for safe mobility. In particular, it emphasises the additional integration of sit-to-stand exercises. Repeatedly standing up and sitting down is highly relevant in functional terms, applicable to everyday life and can be used in various therapeutic contexts – from simple exercise settings to structured, device-based forms of training.

The guideline recommends including sit-to-stand training in addition to the usual therapy in order to specifically promote balance ability. Even if the duration, frequency and number of repetitions have not yet been clearly defined, the results emphasise that balance training is particularly effective when functional transitions are practised systematically, repetitively and progressively. This explicitly includes both manual and technically supported training approaches.

Sit-to-stand training can offer an easily manageable introduction to developing balance, strength and functional safety in parallel, especially for people with limited mobility. In practice, this principle can be flexibly extended – for example with device-based balance and standing training, which makes the number of repetitions, load and safety aspects precisely controllable, thereby enabling individualised progression.

Training together – group therapy is not a compromise

Another practical aspect of the guideline concerns how therapy is organised. Contrary to the often implicit assumption that individual therapy is more effective per se, the available evidence shows that individual therapy is more effective: task-oriented group training for the lower limbs is at least as effective as individual therapy with a comparable duration – especially for balance, walking speed and walking endurance. The guideline makes a cautious but clear recommendation here. It is not the setting itself that is critical, but the quality of the training, the specific nature of the task and appropriate therapeutic supervision. This is an important message for clinical practice, as group therapy can not only be effective, but also resource-efficient and motivating for patients.

Transfer to everyday life – so that training remains effective

In addition to content-related and structural aspects of training, the guideline emphasises the importance of transfer packages. These are accompanying behaviour-oriented measures aimed at sustainably transferring therapeutic progress into everyday life. Even if the current evidence base is still limited, there is a broad consensus among experts that such transfer strategies can usefully support the effectiveness of motor rehabilitation.

A transfer package may include, for example, regular self-monitoring of activities, short reflection sessions, problem-oriented discussions, agreed exercise goals, home exercises that are relevant to everyday life and structured feedback loops. Especially when it comes to promoting mobility and balance, this approach can help to ensure that the skills developed during training are not limited to the therapy situation, but are actually used in the home and social environment.

In combination with task-oriented, repetitive and – where appropriate – technology-assisted training, this creates a framework that not only enables performance gains, but also systematically supports their implementation, stabilisation and further development in everyday life.

What remains – and what should be changed

The ESO guideline does not conceal the fact that many recommendations are based on moderate to very low evidence. This is not a shortcoming of the guideline, but a reflection of the current state of research. At the same time, it formulates a clear mandate for research and practice: dosage, intensity and training organisation need to be investigated in a more targeted, comparable and internationally coordinated manner in future.

For clinical practice, however, the message is already clear:

If wanting to improve mobility and balance after a stroke, there is a need to walk more, train more intensively, practise functional transitions and question organisational barriers. The new ESO guideline does not provide simple recipes for this, but it does provide a clear compass.

Key recommendations for rehabilitation of the lower limbs
European Stroke Organisation (ESO) Guideline Motor Rehabilitation (2025)

1. Increase dosage and volume
In order to improve walking speed and walking endurance in the long term, the guideline recommends increasing the volume of gait training in a targeted manner. As a guide, at least 20 additional hours of specific gait training, spread over several weeks and supplementing the existing rehabilitation programme.

2. Use intensity in a targeted manner
High-intensity gait training is recommended for people in the chronic phase after a stroke who have a stable cardiovascular situation. This can significantly improve walking speed and, in particular, walking endurance, provided it is delivered safely, in a structured manner and with individualised adaptation.

3. Integrate sit-to-stand systematically
Additional repetitive sit-to-stand training is recommended to promote postural balance. Functional transitions such as standing up and sitting down play a central role in mobility, transfer safety and everyday skills, and can be implemented in different training settings.

4. Use targeted group therapy
Task-oriented group training for the lower limbs is at least as effective as individual therapy with a comparable duration, particularly with regard to walking speed, walking endurance and balance. Group settings can also positively support motivation, activity and therapy density – with appropriate supervision.

5. Promote activity beyond the therapy room
The guideline emphasises the importance of a high level of activity throughout the day. People who have had a stroke should be supported with being active for up to six hours a day through a combination of therapy, guided self-exercise and activities of daily living (ADL).

6. Train in an individual, goal-oriented manner
Rehabilitation should be consistently oriented towards the patient's goals. Functional, repetitive and progressively designed training content that can be flexibly adapted to the level of performance, motivation and everyday requirements is crucial.

Use high-intensity gait training to additionally improve walking ability.

Original work

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https://academic.oup.com/esj/article/10/4/1160/8377197
l.ead.me/therapy-26-01-54

THERAPY & PRACTICE

Review of the THERA-Trainer Masterclass 2025

Unleashing therapeutic potential – ten years of the Neurorehabilitation Technology Masterclass: evidence, robotics and practice in interdisciplinary and international dialogue

Jakob Tiebel

Last year's THERA-Trainer Masterclass once again showed why it has been a firm fixture in the neurorehabilitation training calendar for almost ten years. Under the headline slogan "Unleashing therapeutic potential", specialists from the fields of therapy, science and practice came together to gain in-depth information about robotics in the rehabilitation of mobility after stroke and to learn about specific concepts and implementation strategies. The combination of evidence-based lectures and practical expert workshops once again confirmed the Masterclass's aspiration to combine theory and clinical reality in a meaningful way.

Special thanks are extended to our hosts at Diana-Klinik Bad Bevensen, who created the ideal environment for intensive professional exchange through their open-door policy, insights into their therapeutic departments and excellently organised infrastructure.

The clinic tours and practical colloquium provided direct insight into existing care concepts and prompted numerous discussions regarding their transferability and further development.

The programme covered a wide range of topics: from practical examples of device-supported circuit training in neurorehabilitation to the development of multimodal neglect therapy concepts and strategic insights into mobility-oriented rehabilitation models such as "Mo.Ritz". This was complemented by perspectives from both outpatient and inpatient care settings, as well as a current

Unleashing therapeutic potential – 10 years of dialogue.

update on research and development initiatives. The lectures emphasised the therapeutic potential of evidence-based technologies – provided they are sensibly integrated into existing structures and supported by an interdisciplinary approach.

The intensive dialogue between the participants was particularly valuable. This year, for the first time, it extended far beyond national borders: colleagues from the Netherlands enriched the discussions and opened up additional perspectives on different healthcare systems, logics of care and implementation strategies. This international perspective was perceived by many as a clear added value.

We extend our sincere thanks to all speakers for their clinical expertise, transparency, and willingness to share evidence-based insights, as well as to all delegates who enriched the Masterclass through their questions, discussions and networking. Last but not least, the continuing interest in the Neurorehabilitation Technology Masterclass underlines the relevance of this format within the THERA-Trainer community.

We are already looking ahead: in 2026, the symposium will be held at the Moritz Klinik Bad Klosterlausnitz. Once again, a challenging and practical programme is planned over two days, focusing on the latest developments in robotics, evidence-based therapy concepts and specific implementation issues. The Masterclass will remain a central platform for actively shaping the future of neurorehabilitation and unleashing therapeutic potential in a targeted manner.

Less show, more substance: quality, exchange and evidence-based practice.

Comments

Ten years of existence in a field that is developing as dynamically as neurorehabilitation is no coincidence. It is the result of a conscious, content-based approach. The THERA-Trainer Masterclass has experienced periods of significant growth, enhanced visibility and rapid expansion throughout its history. However, it has also consciously taken a step back, becoming smaller, more focussed and more specific – not for lack of demand, but out of a clear desire to ensure quality and deepen professional discourse. Looking back, this decision is a key success factor.

The basic concept has remained stable over the years: evidence-based content, practical relevance, openness to discussion and critical reflection. At the same time, the Masterclass has continued to evolve. New topics have been added, perspectives expanded and formats adapted. This reflects a central reality of rehabilitation: change is not a disruption, but a constant. Anyone who takes rehabilitation seriously not only has to accept change, but actively shape it.

The Masterclass offers a rare space for this. A space in which complex developments can be synthesised and condensed. A space in which technology is not viewed in isolation, but always in the context of therapeutic action, the reality of care and evidence-based criteria. And above all, a space that thrives on exchange – on encounters, shared experiences, practical testing and questioning.

Last year's THERA-Trainer Masterclass once again demonstrated this in an impressive way. It was not merely a lecture format, but rather a forum for dialogue between therapy, science and clinical practice. Robotics in mobility rehabilitation after stroke was not only presented, but also categorised, discussed and linked to concrete implementation strategies. The combination of evidence-based specialist presentations and practical workshops demonstrated how closely theory and clinical reality must align for innovation to be effectively implemented.

The fact that this exchange is now also taking place across national borders is a logical next step. The participation of colleagues from the Netherlands showed how valuable it is to look at other healthcare systems, organisational logics and approaches to solutions – not as a comparison in the sense of "better or worse", but as a learning field.

After ten years, the Masterclass is neither routine nor nostalgic. It is a living format that is constantly readjusting itself without losing its core. Especially at a time when technological developments, economic pressure and professional requirements continue to increase, it remains a place of concentration: on quality, on exchange and on the shared task of shaping rehabilitation for the future.

Gait therapy with added impact

How the THERA-Trainer lyra at Passauer Wolf Bad Gögging supports neurological rehabilitation

Nina Ruppert

At Passauer Wolf Bad Gögging, gait therapy with the THERA-Trainer lyra is setting new standards in neurological rehabilitation. The device has established itself as an effective tool, particularly in acute Parkinson's treatment and stroke therapy. Following the recent expansion of inpatient acute neurology capacity to 55 beds, an increased number of patients will benefit from this innovative therapeutic intervention.

In order for the body to relearn how to walk, the brain needs precise movement signals that are clear, rhythmic and repeatable.

Motor learning in neurological diseases

At Passauer Wolf Bad Gögging, patients with neurological disorders are treated as part of neurological rehabilitation following a stay in hospital, after an operation or for chronic complaints – at the Neurological Centre for Movement Disorders at the Passauer Wolf specialist clinic in Bad Gögging, with complex Parkinson's treatment starting as early as the acute phase. Stroke treatment is also one of the location's core competences.

After a stroke or with neurological diseases such as Parkinson's, the ability to walk is often limited – control, rhythm and safety are lacking. In order for the body to relearn how to walk, the brain needs precise movement signals that are clear, rhythmic and repeatable so that new neuronal connections are created. The central nervous system can only overwrite old patterns and establish new ones through the repetition of regular, correctly performed steps. This is exactly where lyra comes in: the device reproduces a physiological

The Neurological Centre for Movement Disorders is located in the Passauer Wolf specialist clinic in Bad Gögging. © Berliberlinski

gait pattern that can be adapted to each patient within a few seconds. The high step frequency of up to 100 steps per minute, precise repetition accuracy and dynamic weight relief enable intensive training that would be almost impossible to achieve with conventional therapy alone.

The lyra is a valuable contribution to our therapists' occupational health in daily clinical practice.

For patients with Parkinson's, the lyra offers an ideal combination of safety, freedom of movement and a steady gait rhythm. Imbalances and freezing moments can be specifically addressed, while the fluid, reproducible movement gives the body orientation. For people who have suffered a stroke – often accompanied by paralysis or increased tone – the lyra also provides the basis for the first safe steps and thus for a new body awareness.

Professor Tobias Wächter, Medical Director and Head of Neurology at Passauer Wolf Bad Gögging, witnesses the positive effects of the gait trainer on a daily basis: "In acute Parkinson's treatment, we see impressive progress time and again with the lyra. Parkinson's patients with unphysiologically small steps and freezing benefit greatly from gait training," says the doctor. "And the lyra also shows how valuable it is in stroke therapy. It creates a sense of achievement that motivates patients and advances the rehab process in a meaningful way."

Pelvic stabilisers and a dynamic body weight support system provide the necessary support even for severely affected patients. © Berliberlinski

Technology with added value

The lyra has also significantly changed the treatment of patients from a therapeutic perspective. The ease of use, quick transfer and ability to train patients at different functional levels create real efficiency – and, above all, noticeable success. "We see every day how much encouragement and motivation the lyra gives to patients. Patients who barely tolerate standing can suddenly walk for several minutes continuously or regain a fluid gait pattern. For us as a team of therapists, it is impressive to see how quickly the body reacts to the physiological movement stimuli," says Stefan Ipfelkofer, Head of Physiotherapy and Occupational Therapy at Passauer Wolf Bad Gögging. The therapists also benefit from the modern trainer in their day-to-day work: "The suspension allows us to guide movements precisely without having to constantly hold or lift with force. This minimises musculoskeletal loading on the spine and joints, promotes ergonomic working and provides therapeutic flexibility. The lyra is a valuable contribution to our therapists' occupational health in daily clinical practice.

We see every day how much encouragement and motivation the lyra gives to patients.

The lyra combines technical precision with a high therapeutic benefit – creating ideal conditions for real progress in gait therapy. In addition to neuropsychological sessions, occupational therapy, physiotherapy, speech and language therapy, physical therapy and sports therapy, the lyra at Passauer Wolf Bad Gögging contributes to a holistic

The lyra combines technical precision with a high therapeutic benefit.

therapeutic approach that is individually tailored to each patient's needs and effectively supports the rehabilitation process.

More capacity, more opportunities, more mobility

With the expansion to 55 inpatient beds in acute neurology, Passauer Wolf Bad Gögging is strengthening its role as a competent centre for neurological rehabilitation. Modern robotic therapy systems such as the lyra, combined with medical expertise and therapeutic experience, form a strong foundation for sustainable therapeutic success. The lyra is far more than just a device: it is a motivator, a tool for motor learning and a beacon of hope for people who are looking for a way back to walking.

Nina Ruppert has been an editor in the Corporate Communications department at Passauer Wolf since 2024. She studied journalism at the Catholic University of Eichstätt-Ingolstadt and Comparative Cultural Studies at the University of Regensburg.

In addition to the lyra, patients at Passauer Wolf Bad Gögging are supported on their journey to greater mobility with a variety of state-of-the-art therapy devices. © Berliberlinski

Between movement and memory

How two facilities are opening up new paths for activity, participation and joie de vivre with the THERA-Trainer tigo

Leoni Schulz

For many residents, cycling is a familiar part of their life story – a feeling of freedom, independence and being on the move. The fact that this feeling can be experienced once again is due to a special combination: the THERA-Trainer tigo movement exerciser and the bike labyrinth with its virtual video routes. This form of training is now part of everyday life at both the care home in the Thomaszentrum in Freiburg and at Haus Siloah in Bad Krozingen.

In Bad Krozingen, Mr Cech, Facility Manager of Haus Siloah, has been involved in the project from the outset. He recalls clearly that some residents initially approached the new therapeutic intervention with caution. He acknowledges that a sense of scepticism was evident. But after the first few introductions, reluctance gave way to curiosity – and ultimately genuine enthusiasm. The tigo is freely accessible there, without registration or appointment. This intuitive design principle has proven highly effective and facilitated daily use of the movement exerciser over several hours.

For some it is a piece of home, for others a memory of holidays – or a place they never managed to visit in the past.

While the legs or arms are moving, a window to the world opens at the same time. The screens show bustling towns, small villages, riverside paths, forests or distant landscapes. Some residents cycle through Freiburg, others choose Lake Titisee, while others head for Las Vegas or Norwegian fjords. For some it is a piece of home, for others a memory of holidays – or a place they never managed to visit in the past.

Both facilities demonstrate movement and memory are mutually reinforcing. Virtual pathways establish novel communication opportunities and bring back memories from earlier phases of life. At Haus Siloah, Mr Cech regularly observes childhood stories being told during or after the trips. The familiar feeling of cycling and the images on the screen trigger memories that have not been expressed for a long time. This creates small, personal moments that are otherwise easily lost in everyday life.

Some residents express their joy directly. One 97-year-old user from Bad Krozingen joked that he felt it was "almost like the Tour de France" and never thought he would ever be able to cycle again at this age. The Thomaszentrum also reports how "the visual field suddenly expands from the wheelchair" – an experience shared by many users when they position themselves in front of the tigo and actively control the movement.

"Almost like the Tour de France."

In addition to the emotional impressions, there is also a physical effect. Relatives and employees notice that regular training improves mobility and makes everyday life easier. And even if a therapy session is cancelled, the time can be bridged sensibly with a ride on the tigo.

The compelling nature of the intervention has not gone unnoticed outside the facilities. The neighbouring clinic in Bad Krozingen is now interested in a similar concept – inspired by the positive experiences at Haus Siloah.

Relatives and employees notice that regular training improves mobility and makes everyday life easier.

The purchases were made possible thanks to the support of numerous donors. For the residents, however, one thing counts above all: that cycling – whether through Freiburg, Las Vegas or along a fjord – can once again become part of their everyday lives. Between movement and memory, a space is created in which activity, joie de vivre and self-efficacy blossom anew.

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Image source: Schrader/Stadtmission Freiburg

l.ead.me/therapy-26-01-66-1

l.ead.me/therapy-26-01-66-2

Leoni Schulz has been part of the THERAPY Magazine editorial team since mid-2024. As a creative all-rounder, she combines design know-how with editorial expertise. Thanks to her many years of experience in medical technology, she provides practical insights and exciting perspectives – both in the layout and between the lines of her articles.

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Guideline-based therapy

How the lyra is redefining gait rehabilitation at SRH Gesundheitszentrum Waldbronn

Anja Röck and Pascal Benz

After a stroke, regaining the ability to walk is the central goal of rehabilitation for many patients. There is clear scientific evidence of what is needed for this: the ReMoS guideline recommends 500 to 1,000 steps per therapy session in order to initiate an effective motor learning process. For patients, this means intensive repetition, confidence in training and noticeable progress. This is precisely where the gait lab at SRH Gesundheitszentrum Waldbronn (SRH Health Centre Waldbronn) comes in – with the clear aim of making evidence-based therapy a real experience for patients.

Before the introduction of the gait lab, however, this evidence could only be implemented to a limited extent in everyday rehabilitation. Manual patient stabilisation imposed a substantial physical burden on therapists and required considerable resources, as two to three practitioners were frequently needed to provide adequate weight-bearing support, facilitate lower limb advancement and simultaneously maintain continuous fall risk monitoring. Training intensity remained limited. For patients, this had specific consequences: too few steps, slower progress, lower self-efficacy. From the patient's point of view, there was a gap between what would help and what was possible.

With the lyra, we can support patients who previously were barely able to exercise actively. They achieve movement goals that seemed unattainable just a short time ago.

SRH Gesundheitszentrum Waldbronn: a gait laboratory for modern rehabilitation

The SRH Gesundheitszentrum Nordschwarzwald has set itself the task of promoting the walking ability of rehabilitants – for more independence and active participation in life. A gait laboratory was set up, closely orientated to the principles of motor learning: it is equipped with special treadmills in its own therapy room and enables targeted, modern gait rehabilitation.

A central component is the THERA-Trainer lyra, an end-effector gait trainer that complements traditional individual and group physiotherapy. It enables intensive, efficient and safe gait training, especially for patients who are unable to walk.

The effect is measurable and immediately noticeable for patients. The evaluation of previous treatments shows: as early as the first training session, an average of 562 steps is achieved with the lyra, in the seventh session over 1,000 steps. This means that patients not only fulfil the guideline – they surpass it.

Before the introduction of the gait lab, these values were around 40 steps in the first session and around 60 steps in the seventh session.

This difference is crucial for patients. The high number of steps facilitates the motor learning process, increases walking economy and boosts the patient's confidence in their own body. Visible progress has a motivating effect and increases active participation in therapy, a key factor for sustainable recovery.

Thanks to the lyra, the team requires significantly less physical effort. No more tedious supporting or guiding is necessary. Patients can be positioned quickly and safely in the device and the device settings can be applied easily and intuitively. This creates valuable room for manoeuvre for targeted patient motivation, immediate positive feedback on the number of steps they have achieved and the promotion of motor learning – with noticeably greater therapeutic meaningfulness and motivation.

Patients not only walk on the lyra; rather, therapists intelligently and individually adjust parameters such as weight relief, stride length and frequency. Sessions are designed to be highly effective through progressive control in the sense of shaping: every adjustment avoids over- or under-exertion and optimises the training benefit.

From stroke to paraplegia – lyra expands the boundaries of neurorehabilitation

The lyra demonstrates its therapeutic potential far beyond its use in stroke rehabilitation. At our clinic, we have observed significant therapeutic successes in various neurological diseases and the associated functional impairments – including multiple sclerosis, Parkinson's disease, brain tumours and paraplegia. The measurable functional improvements in strength, endurance and mobility in particular emphasise the central importance of robotic-assisted gait therapy with the lyra. By focussing on the targeted improvement of walking ability, intensive cardiopulmonary training also strengthens general resilience and contributes to the prevention of contractures, pneumonia and thrombosis. As a result, the lyra is establishing itself as a holistic therapy tool that significantly supports rehabilitation while sustainably improving the quality of life of patients.

Lyra integration establishes sustainable gait rehabilitation in the gait lab

By integrating the THERA-Trainer lyra into the gait lab, its full potential can be optimally utilised. It is not a single device, but a sophisticated, robotic-assisted therapy concept that combines three systems in a targeted manner. All devices are firmly integrated into a joint treatment concept – tailored to the respective functional condition and the patient's recovery process. The result is a modern, holistic form of gait rehabilitation that enables sustainable progress.

"Since I started training with the lyra, I finally feel like I'm really moving again. The constant tension and pain caused by sitting so much has decreased significantly. And the best thing of all: I can now walk for much longer with my forearm rollator than before – I'm finally making progress again."

Quote from an MS patient

Anja Röck is a physiotherapist (B.Sc.) at SRH Gesundheitszentrum Waldbronn and specialises in neurorehabilitation. She supervises physiotherapy students and is a member of the "Innovation and Research in Therapy" team at the SRH health centres in the Northern Black Forest.

Pascal Benz is a sports scientist (Mag.) with over ten years of experience in neurorehabilitation. Together with Anja Röck, he set up the gait laboratory and successfully integrated it into everyday clinical practice. He is also a member of the "Innovation and Research in Therapy" team, which specifically transfers scientific findings into practice. In this way, he combines research and everyday clinical practice to promote innovative therapeutic approaches in neurorehabilitation.

Source:
Deutsche Gesellschaft für Neurorehabilitation. (2015). S2e-Leitlinie: Rehabilitation der Mobilität nach Schlaganfall (ReMoS). Retrieved from https://remos.dgnr.de

SCIENCE

Review of the DGNR Congress 2025

All under one roof: evidence, practice and innovation

Jakob Tiebel

The joint annual conference of the German Society for Neurorehabilitation (DGNR), the Swiss Society for Neurorehabilitation (SGNR) and the Austrian Society for Neurorehabilitation (ÖGNR) took place in Freiburg from 4 to 6 December 2025. Under the headline slogan "All under one roof: evidence, practice and innovation", the congress brought together specialists from Germany, Switzerland and Austria, as well as all professional groups involved in neurorehabilitation – clinicians, researchers and healthcare experts – for an interprofessional and transnational exchange.

In view of the growing global significance of neurological diseases as the principal cause of disability in activities of daily living, the need for coordinated, evidence-based and forward-looking neurorehabilitation was emphatically underscored. Plenary lectures, scientific abstracts, seminars and practice-oriented workshops provided a comprehensive overview of the current state of science and innovative approaches in diagnostics, therapy and care.

The conference focused on key topics in modern neurorehabilitation, including advanced brain imaging, rehabilitation technology, digitalisation and artificial intelligence, as well as the implementation of major study results in clinical practice. Other focal points included evidence-based guidelines, long-term perspectives of neurological diseases, new therapeutic approaches for cognitive disorders and fatigue, as well as personalised rehabilitation strategies.

Particular attention was paid to the translation of care, i.e. the transfer of scientific findings into everyday clinical practice. Practical solutions were discussed in numerous contributions – from the development of adaptive therapy technologies and neuromodulative procedures to the integration of psychological comorbidities and functional communication therapy.

The joint conference provided compelling evidence of the innovative capacity and interdisciplinary approach characterising neurorehabilitation in German-speaking regions. What became clear was that progress in neurorehabilitation is inextricably linked to a cooperative approach that brings together medical knowledge, technological development and framework conditions regarding health economy and policy.

The DGNR, SGNR and ÖGNR conference management team would like to thank all participants for their committed contributions, scientific expertise and the constructive exchange. The 2025 conference not only provided key impetus for the further development of neurorehabilitation, but also made it clear that more can be achieved together all under one roof – based on evidence, practice and innovation.

Congress highlights

The joint annual conference of the DGNR, SGNR and ÖGNR 2025 in Freiburg was held under the forward-looking headline slogan "All under one roof: evidence, practice and innovation". The interprofessional and transnational exchange provided substantial impetus for the further development of neurorehabilitation – from clinical practice to healthcare research and technology integration.

What really counts in rehabilitation? Professor Derick T. Wade at the opening of the congress

The opening keynote address by Professor Derick T. Wade (Oxford, UK), which focused on the core principles of effective rehabilitation, provided an impressive start to the conference. Based on historical observations, he showed that the transformative effect of rehabilitation is not due to technological or medical breakthroughs, but to people's ability to adapt – supported by a systematic, person-centred clinical approach. In his view, rehabilitation therefore needs to be consistently biopsychosocial, goal-oriented

Effective rehabilitation is not achieved through technology, but through systematic, person-centred clinical thinking.

The future of neurorehabilitation lies in combining global evidence with local, practicable care.

and adaptive. His concept of a "cognitive clinical approach" emphasises the need for holistic problem analysis and individual goal planning as the key to successful neurorehabilitation.

Setting the global course: the Lancet Commission on Neurorehabilitation

With the introduction of the new Lancet Neurology Commission on Neurorehabilitation, Professor Thomas Platz (Greifswald) presented a global lighthouse project. The aim of the commission is to develop pragmatic and practicable recommendations for improving neurorehabilitative care on the basis of global epidemiological data, health economic analyses and systematic evidence assessments. The transdisciplinary initiative includes an international care survey, implementation analyses and the development of prioritised intervention roadmaps – supported by the WHO, WFNR, WSO and other international stakeholders. The results will serve as a basis for decisions on investments in neurorehabilitation worldwide.

Technological platforms for personalised rehabilitation

Dr Chris Easthope Awai (Vitznau) and his team presented an innovative "i-health" system that implements personalised neurorehabilitation through high-density, multimodal data collection and AI-supported analysis processes in the clinic. The

architecture includes digital assessments, wearable sensor technology, real-time data processing and seamless integration into clinical information systems. Initial results from >2,500 patient days show a high level of clinical acceptance, reduced documentation times and a growing interest in data-based decision-making – strong evidence of the feasibility of digitalised neurorehabilitation.

Criticism of trunk training: evidence-based reassessment

In the highly acclaimed seminar "The trunk myth", Sabine Lamprecht and Simon Schlick scrutinised the traditional importance of trunk training in neurorehabilitation. Based on current evidence – including a Cochrane review (Thijs et al., 2023) – it was shown that the therapeutic benefits of trunk training for stroke, ataxia and arm rehabilitation have been systematically overestimated. The discussion marked a paradigm shift towards more specific, functionally oriented therapeutic approaches and emphasised the importance of differentiated, evidence-based indications.

New S3 TheMoS guideline on mobility rehabilitation after stroke

Another milestone was set with the presentation of the upcoming S3 TheMoS (Therapy of Mobility after Stroke) guideline by PD Dr Christian Dohle. Based on the ReMoS guideline and developed in accordance with the AWMF guidelines, the new guideline systematically focuses on therapeutic care in outpatient and (semi-)inpatient settings for the first time. The recommendations are based on GRADE methodology and are accompanied by a structured implementation concept for professionals and those affected. Publication is planned for the end of Q1/2026.

Digitalisation only delivers its benefits when data is translated into clinically meaningful decisions.

Conclusion:

The DGNR Congress 2025 clearly demonstrated how closely evidence, practice and innovation need to be interlinked in modern neurorehabilitation. The initiatives, guidelines and technological developments presented point the way to highly specialised, interdisciplinary and future-oriented care – both nationally and internationally.

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