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THERAPY

THE MAGAZINE FROM THERA-TRAINER



Global perspectives on rehabilitation

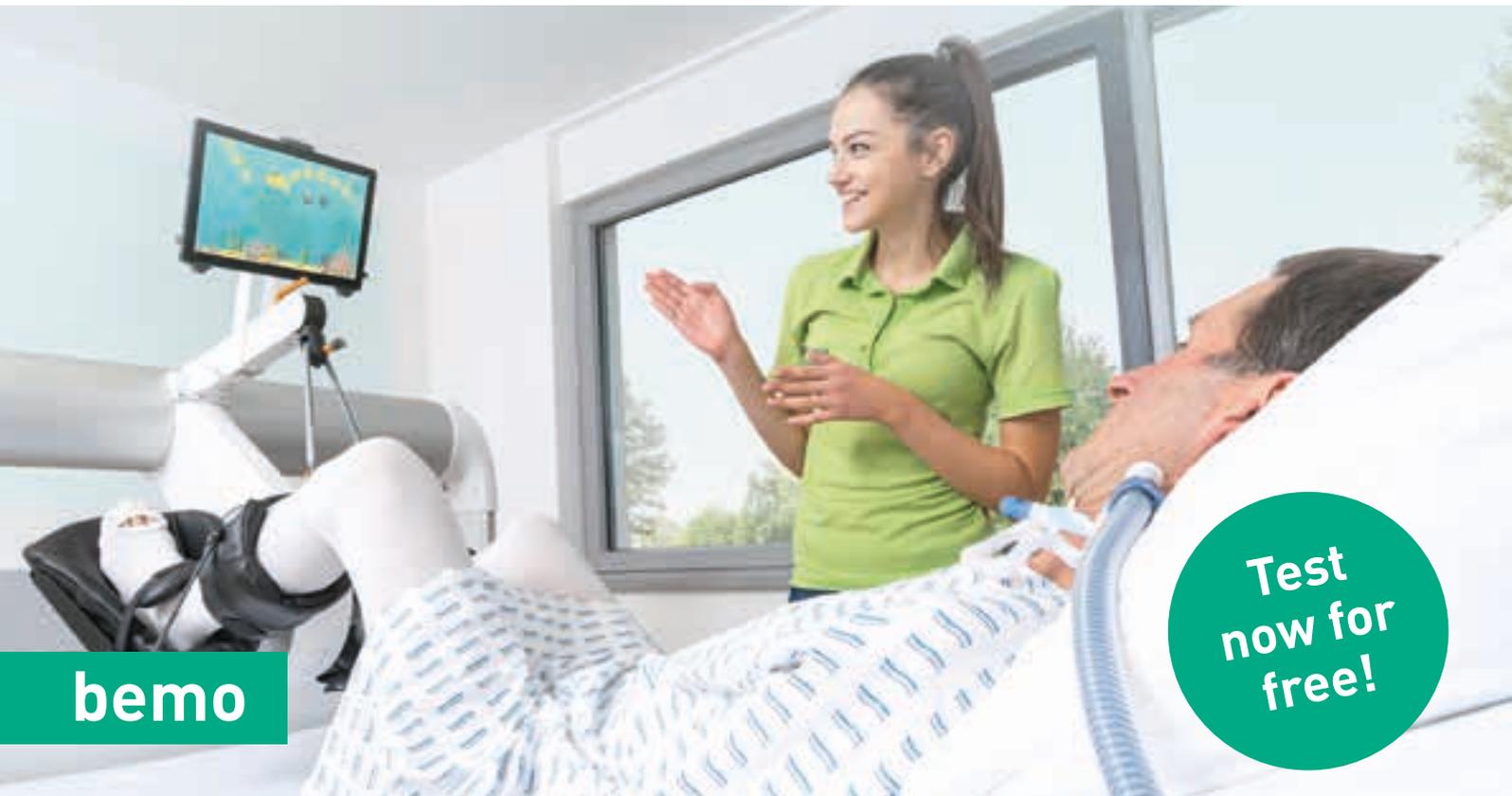
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L I F E I N M O T I O N

FOREWORD

New perspectives

Dear readers,

I would like to welcome you to the latest issue of our THERAPY magazine. This time, we would like to address the topic of “A different perspective” – a look at rehabilitation from a variety of angles, inviting us to look beyond our usual boundaries and gain new insights.

Rehabilitation is a specialised field that offers challenges and opportunities on an international level. In a global context, we recognise the many differences in rehabilitation between different countries. While some countries have sufficient resources and expertise, people in other regions face considerable challenges when it comes to care. These differences emphasise the need to find sustainable solutions that are accessible to everyone. Research, knowledge and technology all play a role here.

An important part of “A different perspective” is the patient’s point of view. As professionals, we look at healthcare from an expert’s perspective, but what

about those who are directly affected? An interview gives us a unique insight into personal experiences, challenges and individual perspectives on rehabilitation. Bernd Tittel’s story reminds us that behind every medical diagnosis is a person – with their own hopes, fears and dreams.

In addition to insights into science and research, we also focus on practical implementation. The interdisciplinary exchange between colleagues offers an inspiring opportunity to see how others deal with similar challenges and develop innovative solutions for modern, evidence-based practice.

I would like to invite you on an inspiring journey through the different perspectives of rehabilitation. I hope this issue of THERAPY Magazine brings you new insights and broadens your perspective.

With best regards,

Jakob Tiebel



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Based on scientific evidence



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THERA-Trainer
Founder
Peter Kopf
says goodbye



We are erGO konzept



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Based on scientific evidence

The development of the senso is based on scientific evidence – thanks to Dividat’s international research activities.

Editorial

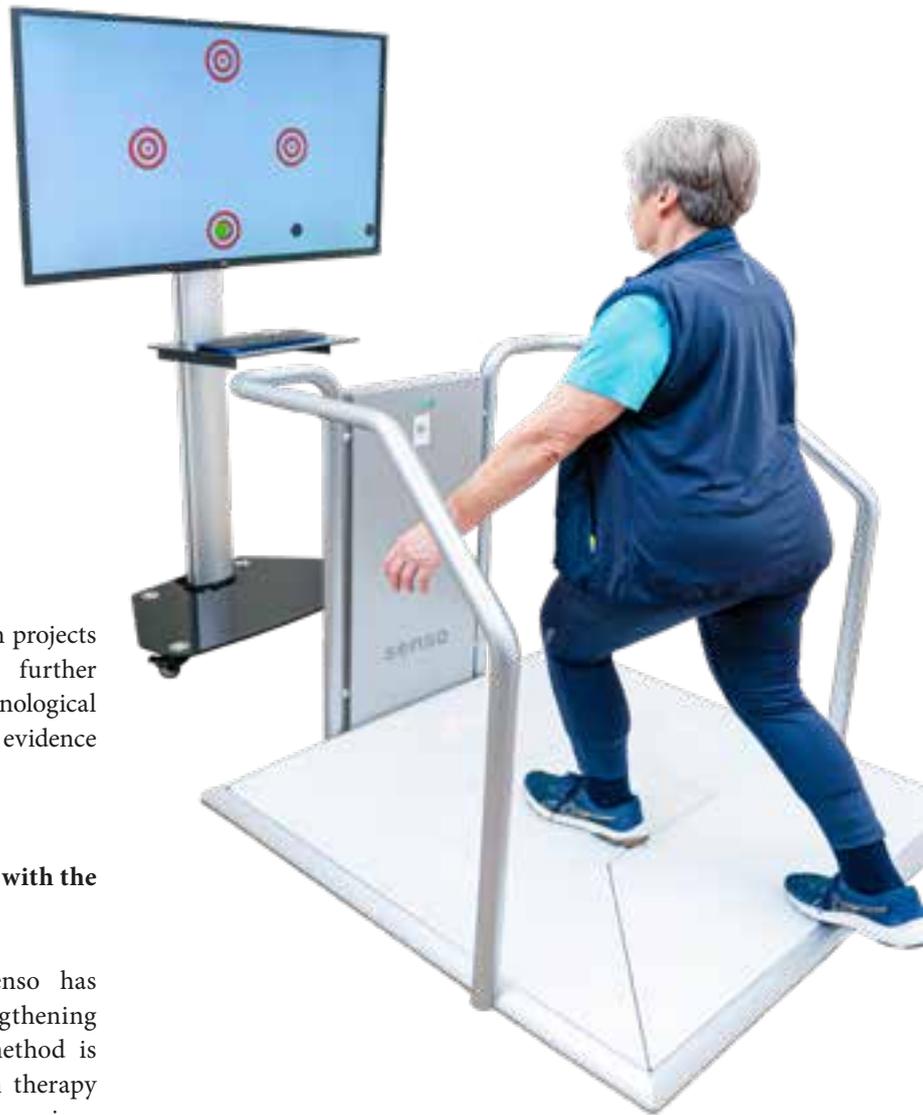
In 2011, researcher Dr Eva van het Reve laid the foundations for the innovative senso training and testing device, which was successfully launched in 2013 by Dividat, the Swiss spin-off company she founded. THERA-Trainer added the senso to its portfolio in 2023 and has been selling it worldwide ever since. The scientific basis of the senso and its evidence-based use in training and therapy interventions are highly recognised in research and clinical practice. Under the leadership of Dr Eva van het Reve and Dr Manuela Adcock, Dividat’s product is continuously being integrated into numerous research projects to further investigate the applicability and benefits of the senso. The article provides insight into the current projects.

The founding of Dividat by ETH Zurich researcher Dr Eva van het Reve marked a milestone in the development of the innovative senso training and testing device. Since its successful market launch in 2013, the senso has become well established in the fields of prevention and rehabilitation. THERA-Trainer, a global provider of training and therapy

concepts for neurological and geriatric rehabilitation, added the senso to its product portfolio last year and has been marketing the scientifically validated training system for cognitive-motor training under its own brand ever since.

The senso success story is based on a strong scientific foundation that is closely linked to the research work of Dividat’s founder, Dr Eva van het Reve. The training and therapy interventions that the innovative training system enables are undergoing extensive research and attracting a great deal of attention, both in the academic world and in everyday clinical practice.

The research collaborations between Dividat and various partners from national and international projects are a central component for success. Under the leadership of Dr Eva van het Reve and Dr Manuela Adcock, highly qualified research teams are working closely with partners from various disciplines to investigate the applicability and benefits of senso and its ongoing development.



The knowledge gained from these research projects is continuously incorporated into the further development of senso. This ensures that technological innovations are based on sound scientific evidence and meet the highest scientific standards.

Key results of cognitive-motor training with the senso

Cognitive-motor training with the senso has proven to be extremely effective in strengthening brain-body interaction. This training method is widely used in prevention, as well as in therapy and rehabilitation. Studies conducted with various patient groups and healthy older adults show consistently positive results:

- Ease and safety of use.
- Motivating training experience for users.
- Improved reaction time.
- Increase in cognitive functions.
- Improved balance.
- Optimisation of gait parameters, such as walking speed.
- Significant reduction in fall risk.

These impressive results not only emphasise the versatility of the senso device, but also demonstrate the enormous potential of cognitive-motor training approaches for promoting health and quality of life.

Research collaborations

Under the leadership of Dr Eva van het Reve and Dr Manuela Adcock from Dividat, highly qualified research teams are working closely with partners from various disciplines to investigate the applicability and benefits of senso and its ongoing development.



Dr Eva van het Reve, Founder of Dividat AG

Eva van het Reve began her doctoral studies in movement sciences at ETH Zurich in 2011 and founded the spin-off company Dividat in 2013. In recent years, she has initiated and followed many research projects and supported numerous institutions in the implementation of cognitive-motor training concepts.



Dr Manuela Adcock, Head of Research at Dividat AG

Manuela Adcock is a neuropsychologist with many years of clinical experience at the Zurich University Hospital. She completed her doctorate in neuroscience at ETH Zurich and leads scientific projects as Head of Research.



The Dividat research team

Current research projects

Dividat is currently driving several pioneering research projects through close cooperation with renowned institutions such as ETH Zurich and the Eastern Switzerland University of Applied Sciences (OST). These projects address not only the expansion of training platforms, but also preventive and therapeutic approaches for different patient groups. The current projects and their objectives are briefly presented below:

SWING IT project

The SWING IT project is funded by Innosuisse, the Swiss Agency for Innovation Promotion. As part of this project, the hardware of the Dividat Senso training platform is being expanded in collaboration with ETH Zurich and the Eastern Switzerland University of Applied Sciences (OST). The aim of this expansion is to make the training platform mobile (Senso Swing). This significantly increases the neuromuscular resources required



for training. Training on the Senso Swing therefore provides adequate stimulation for people with higher balance resources. In addition, the Senso Swing is an excellent aid for proprioception training, which could benefit various patient groups (e.g. orthopaedic and certain neurological patients). Usability tests and a clinical pilot study are being carried out as part of this research and development project.

The ongoing studies and developments not only promise a continuous improvement of existing products, but will also help open up new fields of application in health and education.

COCARE project

COCARE is a project funded by the European Commission as part of the Active and Assisted Living Programme (AAL). An international team is developing a comprehensive training system that can be used across the entire continuum of care (rehabilitation clinic, outpatient therapy, at home).

An ecosystem is being developed with technological and digital solutions that enable efficient, personalised and effective treatment in inpatient facilities with continuity and transfer to the home environment. One key aim of this research and development project is to develop a mobile version (a “little brother”) of the Dividat Senso for use at home. This product – the Dividat SensoFlex – is a roll-up mat fitted with sensors. The training device can be connected via cable to a screen in the comfort of the user’s home. A large-scale, randomised clinical trial with the aim of testing the feasibility and effectiveness of the training system for use by older adults started in January 2023.



lead.me/therapy-24-01-6





It has already been shown that Brain-IT training is well received by those affected, has a high level of acceptance and is perceived as beneficial. The data to date on the effectiveness of the training is also promising. For this reason, a study is currently being conducted to analyse the effectiveness of the training in more detail. Cognitive performance, gait, well-being and cardiac activity are measured. In addition, brain structure and function are measured using magnetic resonance imaging in order to investigate the possible underlying neuronal changes.

The project is funded by the Synopsis Foundation – Dementia Research Switzerland, the Gebauer Foundation and the Dalle Molle Foundation.

Brain-IT project

This project (a PhD project by Patrick Manser under the direction of Prof Eling de Bruin at ETH Zurich) aims to investigate innovative approaches to the prevention of cognitive impairment. The focus is on three important – but often neglected – modifiable risk factors for cognitive impairment, which are known to play an important role in disease progression. These three risk factors are: (1) physical inactivity, (2) cognitive inactivity and (3) symptoms of depression.

Between August 2020 and May 2022, a training guide (called the Brain-IT training concept) was developed specifically for older adults with mild cognitive impairment, in collaboration with those affected and experts from various fields. Brain-IT training includes physical and neurocognitive tasks as well as breathing training, and is individually adapted to the study participants. It is carried out using so-called exergames (video games that are controlled by physical movements) and takes place at the study participants' homes under individual supervision. The Dividat SensoFlex is currently used for the training.

Senso@School project

In this project, cognitive-motor training on the senso is applied to primary school children. Scientific studies have shown that this cognitive-motor training approach can improve executive functions in a global way. Core components of executive functions (such as cognitive flexibility, working memory, divided attention) are important for success at school and later at work. Executive functions develop during childhood and are not fully developed until around 20 years of age. Children are likely to benefit from supportive training of executive functions, particularly in order to be able to concentrate better in class. In collaboration with the municipality of Feusisberg and Feusisberg primary school, a study is therefore being carried out with schoolchildren using the Dividat Senso as an active break and support aid.



Chronic Stroke project

As part of this project (a PhD project by Simone Huber under the direction of Prof Eling de Bruin) at ETH Zurich (Motor Control & Learning Group) and University Hospital Zurich (Physiotherapy and Occupational Therapy research teams), a training concept is being developed that enables personalised progression and variability for motor-cognitive training in people with chronic stroke over several weeks/months. Progressive and variable means that the training challenge is constantly adapted to the current abilities and preferences of the person training in order to achieve an optimal training load. Following the successful completion of a feasibility study (see publication), a randomised controlled clinical trial is currently being conducted in which the training concept will be used in addition to standard treatment. The aim of this study is to determine the effects of additional training on health-related quality of life, cognitive abilities and gait in people with chronic stroke.

SOURCES:

<https://dividat.com/forschung>

Conclusion and outlook

The continuous involvement of senso in scientific research demonstrates a strong commitment to innovative developments in the healthcare sector. Dividat's research projects cover a wide range of applications, from improving the training platform to preventive and therapeutic approaches for various patient groups. The ongoing studies and developments not only promise a continuous improvement of existing products, but will also help open up new fields of application in health and education. The research activities contribute to creating evidence-based solutions that can have a lasting impact on people's lives and well-being.



SCIENCE

TheMoS

TheMoS project partners want to develop an S3 guideline for the treatment of mobility disorders after a stroke, and thereby promote the standardisation of treatment in neurorehabilitation. The therapy recommendations should follow specific target criteria, such as the ability to learn to walk independently or a reduction in falls.

In Germany alone, around 1.6% of adults suffer a stroke every year, which can lead to significant mobility impairments. In a pioneering project called TheMoS, a medical S3 guideline is currently being developed to improve the treatment of mobility disorders after a stroke.

The TheMoS project aims to develop an S3 guideline for the treatment of mobility disorders following a stroke.



An S3 guideline is a medical guideline categorised as having the highest level of evidence in the German healthcare system.

Background: Stroke and mobility impairments

Strokes have a considerable impact on the mobility of those affected. Around two-thirds of patients are in need of care or assistance in everyday life after a stroke. This makes stroke the most common cause of acquired disability in adulthood. The resulting mobility impairments are often decisive for the need for care levels or even full residential accommodation.

The importance of prompt and consistent therapy in overcoming these limitations should not be underestimated. Effective interventions can significantly reduce the impact of the disorders and enable patients to regain their independence.

The TheMoS project: Goals and approach

The TheMoS project aims to develop an S3 guideline for the treatment of mobility disorders following a stroke. The focus is on improving the standardisation of therapeutic approaches. The new guideline will replace the existing S2k guideline “Rehabilitation of mobility after stroke” (ReMoS).

A key aspect of the project is the systematic development of target group-specific versions of the guideline. This is made possible by the involvement of various professional groups and disciplines such as neurology, general medicine and geriatric medicine. The perspective of those affected is also taken into account by actively involving patient representatives.

Methodological background of guidelines: S classification

S3	Evidence- and consensus-based guideline	Representative body, systematic research, selection, evaluation of the literature, structured consensus process
S2e	Evidence-based guideline	Systematic research, selection, evaluation of the literature
S2k	Consensus-based guideline	Representative body, structured consensus process
S1	Recommendations for action from expert groups	Informal consensus process

Systematic approach

Funding and duration of the project

TheMoS is being funded for two and a half years with around €449,000. This will enable the project partners to carry out comprehensive research and development in order to produce an evidence-based and practice-orientated guideline.

Research logic and recommendation development

TheMoS's research logic is based on established recommendations for the development of guidelines by the German Association of Scientific Medical Societies (AWMF). This includes joint recommendations from the Cochrane Germany Foundation, the Institute for Evidence in Medicine,

the Institute for Medical Biometry and Statistics in Freiburg, the AWMF Institute for Medical Knowledge Management, and the Medical Centre for Quality in Medicine (ÄZQ) on systematic research for evidence syntheses and guidelines. Furthermore, the recommendations on the Grading of Recommendations Assessment, Development and Evaluation (GRADE) are taken into account.

Once the recommendations have been agreed, target group-specific dissemination and implementation aids for various professional groups will be developed based on the results of a literature review and topic-based interviews.

Jakob Tiebel

Outlook and potential

If successful, the new S3 guideline will not only contribute to better care for patients with mobility disorders after a stroke, but will also focus on continuous quality control of the recommended therapies. This could make a significant contribution to improving the quality of life of stroke survivors and minimising the long-term complications of the disease. TheMoS thus demonstrates how innovative approaches in guideline development can help to optimise patient care and create a broad basis for the treatment of mobility disorders after a stroke.



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SOURCES:

- [1] <https://innovationsfonds.g-ba.de/projekte/versorgungsforschung/themos-entwicklung-der-medizinischen-s3-leitlinie-zur-therapie-der-mobilitaet-nach-schlaganfall.580>
- [2] <https://www.eah-jena.de/forschung/projekt/themos>



What is an S3 guideline?

An S3 guideline is a medical guideline categorised as having the highest level of evidence in the German healthcare system. The number S3 stands for the level of evidence, with S3 representing the highest level. Guidelines serve as systematically developed recommendations to assist physicians, other healthcare providers and patients in making choices about appropriate care in specific clinical situations.

Here are some characteristics of an S3 guideline:

- 1. Highest level of evidence (S3):** S3 guidelines are based on comprehensive, systematic research and evaluation of the available scientific literature. The recommendations are designed to represent the highest level of evidence and consensus in the medical community.
- 2. Interdisciplinary development:** The creation of S3 guidelines requires the collaboration of experts from various medical specialities. This ensures that the guidelines have a broad and comprehensive consensus within the specialist community.
- 3. Practical orientation:** S3 guidelines are designed to provide practical recommendations. They are intended to support everyday clinical practice and provide specific instructions for doctors and other healthcare providers.
- 4. Regular updates:** Medical knowledge is constantly evolving, so guidelines should be regularly reviewed and updated to reflect the latest findings and research.
- 5. Clear area of application:** S3 guidelines are tailored to specific clinical issues or clinical pictures. Their area of application is clearly defined in order to ensure practicability in clinical use.

S3 guidelines are often developed by medical societies, institutions or organisations that specialise in the respective field. In Germany, for example, the Association of the Scientific Medical Societies (AWMF) is responsible for the coordination and quality assurance of medical guidelines.

If successful, the new S3 guideline will not only contribute to better care for patients with mobility disorders after a stroke, but will also focus on continuous quality control of the recommended therapies.

We are erGO konzept

Best practice with evidence-based group therapy concept
and state-of-the-art technology for maximum chances
of success with neurological diseases

Interview with Kathrin Neißendorfer by Jakob Tiebel

The erGO konzept practice, located in Straubing in southern Germany, is an innovative and modern outpatient occupational therapy facility. The focus is on evidence-based, device-assisted and computer-assisted therapy approaches, particularly for people with stroke or other neurological diseases. In this interview, we talk to founder and owner Kathrin Neißendorfer, an experienced therapist who uses best practice methods.

A prominent feature of erGO konzept is the cross-phase (group) therapy concept, which integrates state-of-the-art robotic and computer technology.

A prominent feature of erGO konzept is the cross-phase (group) therapy concept, which integrates state-of-the-art robotic and computer technology. This enables patients to train strength, endurance, mobility, balance, standing and walking in a task-orientated manner.

The use of high-quality rehabilitation equipment opens up promising therapeutic options for patients. With this unique overall solution, the erGO konzept maximises the chances of success, helping patients achieve the best possible rehabilitation. The combination of state-of-the-art technology and classic therapy methods offers a comprehensive and effective approach to improving the quality of life and independence of people with neurological conditions.

Interviewer: Kathrin, let's talk about the name erGO konzept. How did it come about, and what does it stand for?





Kathrin Neißendorfer: The name erGO konzept has evolved from the key elements of our philosophy. When I was looking for a suitable name for the practice, it was important to me to incorporate 'GO' – representing walking – as gait therapy is a central component of our concept. After a bit of pondering, it was a surprisingly obvious choice, as 'ergo' already contains 'go' (laughs). That's where the name came from, and that's what we're all about. I feel that it's a creative name that emphasises the connection to gait, balance and postural control therapy as important therapeutic approaches, while at the same time symbolising the clear focus on modern occupational therapy.

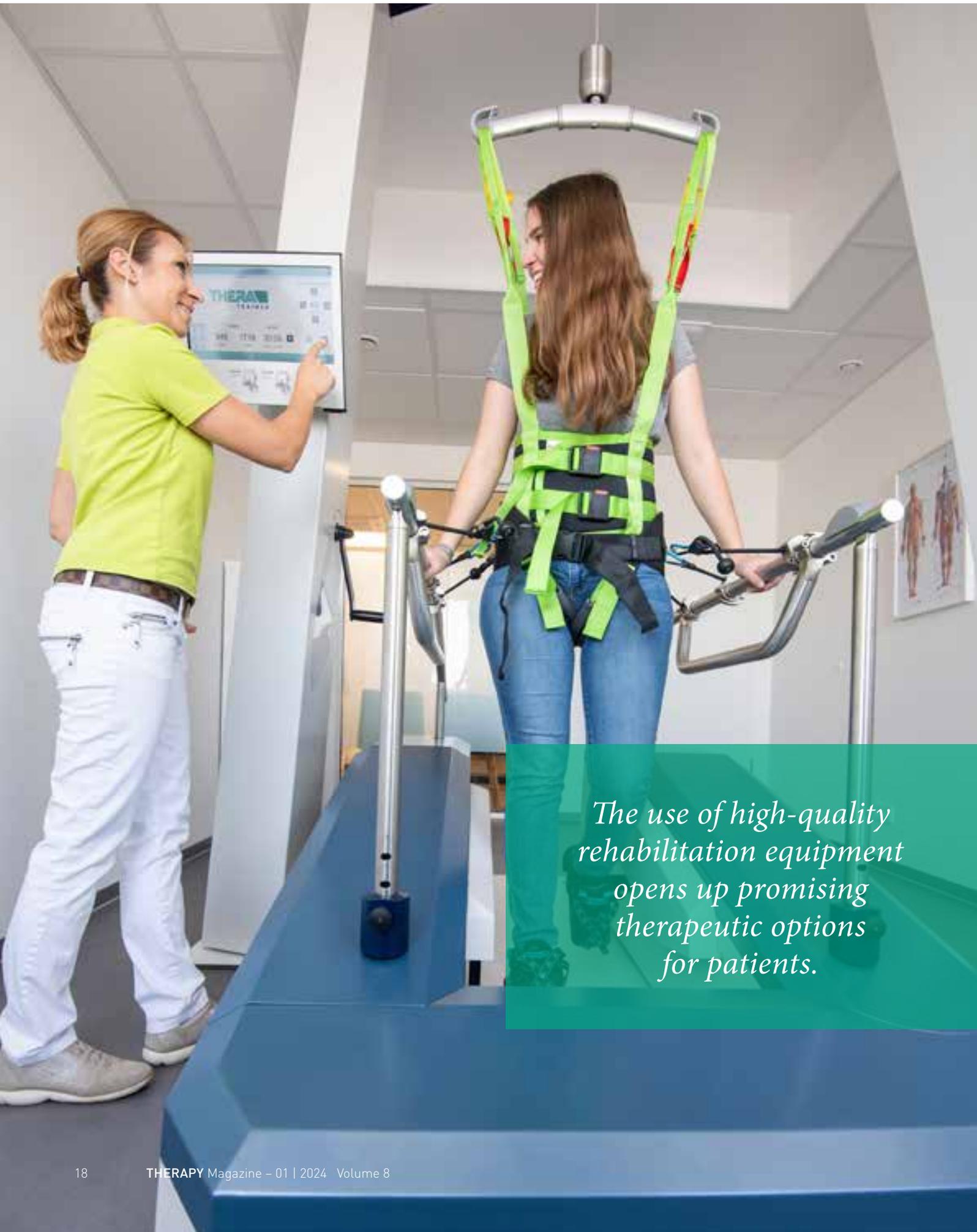
Interviewer: What is the overriding objective of erGO konzept?

Kathrin Neißendorfer: Our aim is to help patients re-learn lost skills and maintain existing ones so they can be as independent as possible and participate in social life. The plasticity of the brain means that nerve connections can be rebuilt even after severe damage. This is precisely where

our occupational therapy treatment comes in, to compensate for functional deficits. We use state-of-the-art methods to maximise the chances of success for patients for the best possible rehabilitation. The external focus of computer-assisted therapy is not just an important aspect in terms of motor learning, but also ensures a high level of motivation and enjoyment during therapy.

Interviewer: Which specialities do you cover, in addition to neurology?

Kathrin Neißendorfer: We are a specialist practice for neurology and orthopaedics. Patients of all ages are at the heart of orthopaedics. We treat congenital disorders of the musculoskeletal system, as well as disorders caused by accidents or chronic illnesses. Our aim is to strengthen muscles, maximise mobility and reduce pain. One major area is hand rehabilitation. In the paediatrics department, specially trained therapists treat children and adolescents on a different floor. We treat children and adolescents with delayed or limited development of perception or motor skills, as well as attention problems or unclear handedness.



The use of high-quality rehabilitation equipment opens up promising therapeutic options for patients.

Interviewer: Another focus is on vestibular rehabilitation and neurofeedback. What characterises vestibular rehabilitation?

Kathrin Neißendorfer: We offer specific therapy for patients with symptoms of dizziness and vestibular migraines. As dizziness and vestibular therapists certified by the Institute for Vestibular Rehabilitation Therapy (IVRT), we achieve amazing and – most importantly – rapid results through individualised exercises in vestibular rehabilitation. Patients who previously had little professional support have been able to reduce their dizziness symptoms in our practice, as well as through personalised exercises at home, enabling them to participate in social life again without balance problems and gait insecurity.

Interviewer: And how does neurofeedback work?

Kathrin Neißendorfer: Neurofeedback aims to improve processing in the brain. EEG measurements are used to analyse individual brain waves, compare them with standard databases and transmit the brain activity to a screen in real time (feedback). The training is based on operant conditioning. In our practice, patients are offered a video of their choice. If successful, i.e. if the brainwaves approach the norm or increase or decrease in intensity, the patient receives a reward in the form of a sharp, bright image. If the brain waves deviate too much or if certain waves dominate (which could be the cause of the relevant symptoms), the patient experiences a “reprimand” in the form

of a dark screen. This stimulates the brain to adjust its activity so that the film can be watched without any disturbing factors. Neurofeedback therapy is suitable for ADHD, epilepsy, autism, depression, sleep disorders, anxiety, burnout, migraines, memory disorders and long COVID.

Interviewer: Going back to neurology, which clinical pictures do you typically treat?

Kathrin Neißendorfer: We offer intensive treatment for stroke patients, focusing on gait therapy and the upper extremities. Patients with multiple sclerosis, Parkinson’s disease, rare neurological diseases, and dizziness and gait abnormalities in old age also attend our practice. The focus is on maintaining and regaining motor skills after central lesions.

Interviewer: Which devices are used in therapy?

Kathrin Neißendorfer: The lyra end-effector gait trainer from THERA-Trainer is at the heart of our approach. We also use the 3D Spacecurl, Posturomed and the THERA-Trainer balo to train postural control and coordination. The THERA-Trainer tigo is used for strength, endurance and mobility, while the Hand-Arm and 3D Tutor are used for upper limb training. The training usually takes place in individual and group settings and is supplemented by conventional therapy methods as required.

Interviewer: Which factors are most important for the success of the therapy?

Kathrin Neißendorfer: In our practice setting, we create therapy situations that promote learning, particularly as part of group training. The modern therapy devices, some with biofeedback and therapy games, motivate patients and provide feedback on their successes. The equipment enables a high training intensity and number of repetitions, which is crucial for the motor learning process. The requirements are determined individually and increased over the course of the programme. The therapy has significant practical relevance, as the majority of patients are highly motivated to carry out the exercises on their own at home, leading to faster improvements such as increased independence in their daily lives.

Kathrin Neißendorfer

- State-recognised occupational therapist
- Founder and owner of erGO konzept
- Specialist Neurorehabilitation® therapist
- Dizziness and vestibular therapist (IVRT)
- Certified neurofeedback therapist (IFEN)
- Specialist occupational therapist for Florian Hockenholz® pain therapy (in training)

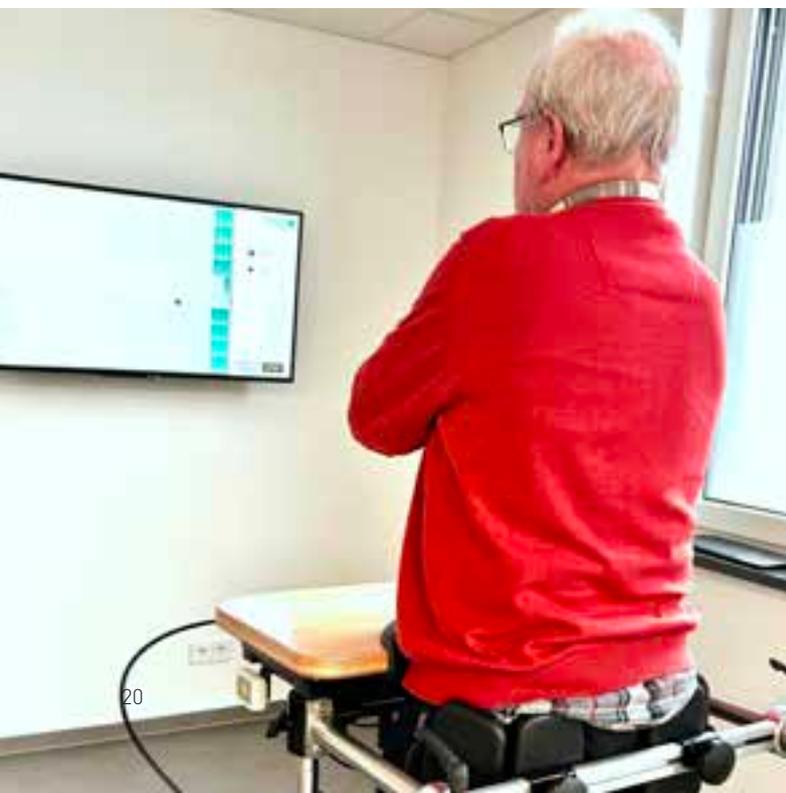


Interviewer: What conclusions have you drawn from the successes of the erGO konzept?

Kathrin Neißendorfer: The computer and device-assisted therapies represent added value for patients and therapists. We achieve more effective treatment progress and success in less time. Our practice is not only clinically effective but also an economic success. This clearly shows that with a well-conceived plan and the right level of investment, you can achieve success and inspire patients even in outpatient rehabilitation. We started with 120 square metres

and gradually built up. We now have around 400 square metres of therapy space, currently spread over 3 floors. We offer services across specialised fields. There's a practice for neurofeedback and brain performance training, the original practice for neurological and orthopaedic patients, and the Kirchroth site with paediatrics also recently moved to Straubing.

Interviewer: Thank you, Kathrin, for an exciting insight into this modern form of occupational therapy. And good luck for the future!



The combination of state-of-the-art technology and classic therapy methods offers a comprehensive and effective approach to improving the quality of life of people with neurological conditions.



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With this unique overall solution, the erGO konzept maximises the chances of success, helping patients achieve the best possible rehabilitation.



THERAPY & PRACTICE

Vestibular rehabilitation

A promising method for improving balance
and gait in stroke survivors

Jakob Tiebel

See interview
with Kathrin
Neißendorfer –
We are erGO
konzept



Vestibular rehabilitation therapy (VRT) has emerged as a potential intervention for managing balance problems after a stroke.

New evidence suggests that vestibular rehabilitation therapy (VRT) contributes significantly to improving balance and walking function in stroke survivors. The results of a systematic review show that VRT, particularly when used within the first six months after a stroke, effectively improves balance and significantly benefits walking function.

Introduction

Stroke survivors often face challenges in regaining their balance and improving their gait, leading to a significant impact on their quality of life. Vestibular rehabilitation therapy (VRT) has emerged as a potential intervention to overcome these problems. A systematic review by Lijiao Meng and colleagues from the Department of Rehabilitation Medicine

and Institute of Rehabilitation Medicine in West China aimed to investigate the effectiveness of VRT in improving balance and gait in post-stroke patients.

Methods

Conducted according to the guidelines of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA), fifteen randomised controlled studies with a total of 769 participants were examined. The researchers assessed the risk of bias using the PEDro scale with an average value of 5.9, which indicates an overall moderate quality of the included studies. In addition, the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) method was used to assess the certainty of evidence.



Results

The results of the review suggest that VRT is effective in improving balance in stroke survivors (standardised mean difference [SMD] = 0.59, 95% confidence interval [CI] 0.40, 0.78, $p < 0.00001$). The positive effects in patients who received VRT within the first six months after a stroke (SMD = 0.56, 95% CI 0.33, 0.79, $p < 0.00001$) are notable, with moderate certainty of evidence.

Subgroup analyses showed that VRT significantly improved balance, particularly when balance exercises were performed in combination with swivel chair training (SMD = 0.85, 95% CI 0.48, 1.22, $p < 0.00001$) and head movements (SMD = 0.75, 95% CI 0.43, 1.07, $p < 0.00001$). In addition, four weeks of VRT showed a stronger positive effect on improving balance (SMD = 0.64, 95% CI 0.40, 0.89, $p < 0.00001$) compared to VRT lasting less than four weeks.

With regard to walking function, VRT was found to significantly improve the results of the timed up-and-go test (mean difference [MD] = -4.32,

95% CI -6.65, -1.99, $p = 0.0003$). Similar to the improvements in balance, the positive effects on gait were more pronounced in patients who received VRT within the first six months after the stroke with moderate certainty of evidence (MD = -3.92, 95% CI -6.83, -1.00, $p = 0.008$).

Conclusions

In summary, there is moderate certainty of evidence for the positive effects of vestibular rehabilitation therapy on improving balance and gait in post-stroke patients. The results suggest that the integration of VRT into the rehabilitation process, particularly in the first six months after a stroke, can contribute significantly to improving the overall mobility and functional capacity of stroke survivors. Further research and clinical studies are needed to validate and refine the specific components of VRT that offer the greatest benefit to this patient group.

The results suggest that the integration of VRT into the rehabilitation process, particularly in the first six months after a stroke, can contribute significantly to improving the overall mobility and functional capacity of stroke survivors.

SOURCES:

Meng L, Liang Q, Yuan J, Li S, Ge Y, Yang J, Tsang RCC, Wei Q. Vestibular rehabilitation therapy on balance and gait in patients after stroke: a systematic review and meta-analysis. BMC Med. 2023 Aug 25;21(1):322. doi: 10.1186/s12916-023-03029-9. PMID: 37626339; PMCID: PMC10464347.



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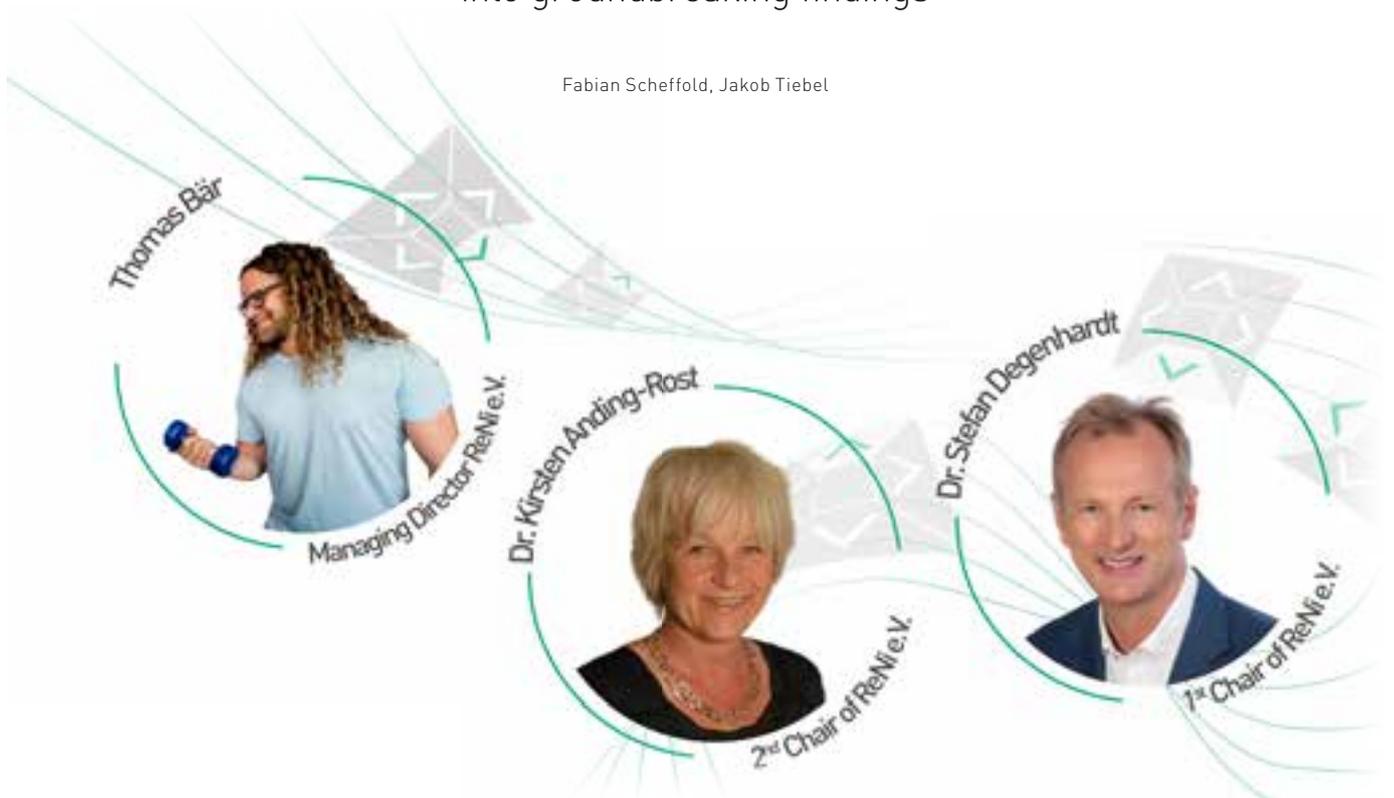


THErapy & PRACTICE

Webinar: Exercise therapy during dialysis

Joint online event provides insights into groundbreaking findings

Fabian Scheffold, Jakob Tiebel



Exercise during dialysis means more than just physical activity – it promotes patients' enjoyment of life and sense of community.

A webinar held in December, organised by THERA-Trainer in cooperation with ReNi Deutsche Gesellschaft Rehabilitationssport für chronisch Nierenkranke e.V., takes a fascinating look at the integration of exercise therapy into the treatment of dialysis patients. The event not only provided practical insights, but also presented important study results that illustrate the positive effect of training during haemodialysis.

Background

The ReNi e.V. expert panel, consisting of Stefan Degenhardt (1st Chair), Kirsten Anding-Rost (2nd Chair) and Thomas Bär (Managing Director), gave insightful presentations during the webinar. Stefan Degenhardt emphasised the importance of exercise and sport during haemodialysis, before handing over to Kirsten Anding-Rost, who presented the results of the DiATT study.

*The DiATT study shows:
Structured training
during haemodialysis
leads to lasting
improvements in the
patient's state of health.*

DiATT study: a milestone in dialysis research

The Dialysis Training Therapy Study (DiATT) is a pioneering study in which around 1,000 patients from 21 German dialysis centres took part. The results, published in the New England Journal of Medicine – Evidence, show a clear improvement in the health of the participants after one year of structured training, despite the difficult conditions caused by the COVID-19 pandemic.



Watch the video here



[Lead.me/therapy-24-01-2601](https://lead.me/therapy-24-01-2601)





Practical implementation and training sessions

In his presentation, Thomas Bär, an expert in dialysis training therapy, talked about the practical implementation of this therapy. He emphasised the importance of a long-term training structure, divided into adaptation, build-up and stabilisation phases. He structured the training sessions themselves into warm-up, main and wind-down phases, with the selection of exercises being individually adapted to the needs of the patients.

Training during dialysis: FAQs

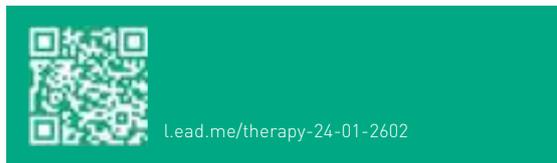
Following the presentations, the panel of experts answered numerous questions from the audience. Topics such as the optimal time for training, the dosage of exercise, options for increasing the intensity

and medical requirements were discussed in detail. The topic of financing was also addressed.

On-demand access to the webinar

For those who missed the live event, the webinar is now available as an on-demand video. The recording provides a comprehensive insight into the information presented and the interactive discussion that took place during the webinar.

The webinar not only provides insights into clinical practice, but also encourages clinicians to start exercise therapy with dialysis patients immediately – having the courage to get started is key.



[Lead.me/therapy-24-01-2602](https://lead.me/therapy-24-01-2602)



[Lead.me/therapy-tt-website-dialysis](https://lead.me/therapy-tt-website-dialysis)



Conclusion and outlook

The conclusion of the webinar emphasises the challenges but also the rewards of exercise therapy for dialysis patients. Creating active and satisfied patients who can do something for their own health lifts their spirits and promotes community. Despite the difficulties in organising such programmes on a permanent basis, it is encouraged to start immediately and not shy away from implementing them. The initiative to secure comprehensive reimbursement from health insurance companies

highlights the commitment to expanding the establishment of such programmes and making them accessible to a broader audience. Watch the on-demand webinar to gain valuable insights and recommendations from the experts. The recording is available to anyone who would like to gain deeper insight into the world of exercise therapy for dialysis patients. Start today and be inspired by the positive effects of structured training during haemodialysis.



Fabian Scheffold has been in charge of dialysis exercise therapy at THERA-Trainer for several years as a project manager in the New Business Development department. Through his experience in the project, he has built up broad expertise and an exciting network. Thanks to his MBA studies, he also understands the business challenges of dialysis centres.



Jakob Tiebel studied Applied Psychology with a focus on Health-care 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 Native.Health, a digital health marketing agency.

Exercise therapy in the dialysis centre – a rewarding task

This article takes an in-depth look at the implementation of sports therapy in dialysis centres. From the establishment of therapeutic exercise clubs to the integration of training programmes during dialysis – find out more about the significant advances and hurdles in this area.

Dr Stefan Degenhardt, Chair of Nierensport Nettetal e. V., 1st Chair of ReNi e. V.

Organising exercise therapy with dialysis patients at the centre, on a broad and permanent basis, is not easy. But it rewards us with more active, more mobile patients who are happy to be able to do something for their own health. It lifts the spirits – it's not just about holding out your arm for the puncture, but about actively practising and training together with others, competing and having fun.

The dialysis centre shows that it goes above and beyond what is necessary for its patients. But how can you organise all that? Just get started! That means finding qualified, motivated exercise instructors (sometimes the local disabled sports association, cardiac sports groups, physiotherapists or similar can provide or arrange contacts). Get a bed ergometer and small equipment (dumbbells, resistance bands, balls, etc.), start a training programme and let people know about it.

If the patients take to it and want to train even more – start a dialysis sports club! Invite them to the inaugural meeting (preferably in the centre itself, a Wednesday between the morning and midday shifts would be ideal, so that most patients can attend). Clarify beforehand who can take on administrative roles – chair, treasurer, secretary, deputy chair, two auditors. Prepare draft articles of association so that they can be discussed and, if possible, adopted at the general meeting. Comply with association law. Register the association, apply for charitable status after registration (tax office) – the association is only authorised to issue donation receipts once charitable status has been established. Apply for membership of the German Disabled Sports Association, and an institute indicator (prerequisite for support from funding bodies).





For further information, visit the ReNi e.V.
website: www.reni-online.de

Gain clarity about funding beforehand: start-up funding, e.g. from the dialysis centre, membership fees; support from health insurance companies as part of the rehabilitation sports agreement in accordance with Section 44 (1) No. 3 of Book 9 of the German Social Code (SGB IX) (see application for cost coverage for rehabilitation sports and functional training) is only possible after the institute indicator has been issued. The prescription is then issued on form 56 – limited to 120 exercise units within three years.

Unfortunately, according to the current interpretation, this prescription only applies to training outside dialysis. Subsequent prescriptions are possible, they must again be justified on form 56 (page 1, last line): Rehabilitation through structured training is a therapy that accompanies treatment for the entire duration of the dialysis requirement.

Sports therapy in dialysis centres is more than just physical exercise – it makes a significant contribution to improving patients' quality of life and social integration.

The establishment of sports clubs and the integration of training programmes for patients undergoing dialysis are challenging but worthwhile initiatives that have a positive impact on the well-being of the individuals concerned.

Training without the support and guidance of qualified trainers is practically impossible during dialysis treatment – most dialysis patients also need external motivation from trainers, doctors and the training group.

Finding a sponsor

Various models can be followed here. Income from study funds from the dialysis practice can, for example, go in whole or in part to dialysis exercise programmes. Time frame: even with persistent commitment, it will take at least six months – realistically even a year – to overcome all the organisational hurdles. The reward should be a functioning, structured training programme and organisational concept.

The dialysis sports club belongs to the patients, and wherever possible the chairperson and treasurer should be selected from among the patients themselves. Often, however, no patient will be found who is able to take on these tasks, in which case they can be handled by a dedicated doctor at the centre. Even a well-functioning association, under current conditions, relies on donations for more than half of its funding. Experience has shown that at most the other half can be covered by membership fees and health insurance subsidies.

The non-profit status of the organisation ensures that donors can at least deduct their commitment from their taxes. Joining an existing disabled sports club is easier. However, there are various obstacles to this:

- In many sports clubs, indoor or outdoor exercise sessions for many disabled people at a time contribute to the financing of the club as a whole – but exercise programmes during dialysis require considerable supervision and equipment while only serving smaller groups of patients, making it difficult to cover the costs. Willingness to support dialysis sports groups is therefore unfortunately very low among both non-disabled and disabled sports clubs.
- These problems restrict the availability of exercise opportunities, as the altruism of sports clubs is limited. And what happens if an external association decides to no longer support the training programme during dialysis?

Need help?

It is often helpful to take a look at functioning exercise programmes in other dialysis centres – sitting in on exercise instructors' sessions is a good way to exchange experiences and boost motivation. You can find out about suitable centres via ReNi e. V.



Dr Stefan Degenhardt: After working as an internist at the University of Cologne, the specialist in internal medicine and nephrology worked for several years as a nephrologist at Heinrich Heine University Düsseldorf and later in private practice at MVZ DaVita Viersen. He has worked for the German Society for Rehabilitation Sport for Chronic Kidney Disease (ReNi for short) since 2005 and has been its chairman since 2014.

End-effector gait training as the key to mobility

Multi-centre study confirms promising results compared to conventional training and investigates the influence of different robotic devices on gait rehabilitation after stroke.

Jakob Tiebel

Robot-assisted gait training is proving to be the key to regaining mobility. A new study carried out in eight Italian rehabilitation centres confirms its promising effects compared to conventional therapy. In particular, therapy with end-effector systems has been shown to be superior in significantly improving walking speed in patients in the subacute stage. There is still a lot of potential for this scientifically established and proven technology to revolutionise stroke rehabilitation.

Walking disorders are a serious complication of a stroke – more than 75% of those affected lose the ability to walk. This has far-reaching effects on quality of life, autonomy and social participation. One of the main goals of neurological rehabilitation after a stroke is therefore restoring walking ability through targeted gait training. Intensive, repetitive

and task-orientated training approaches have proven to be effective. Robot-assisted training plays a key role here, and research to increase the effectiveness of treatment and reduce the workload for therapists is ongoing.

Robot-assisted training

The available robot-assisted devices can be divided into end-effector systems and exoskeletons. End-effector systems have limited contact with the body, while exoskeletons are orthotic systems that electromechanically simulate human walking movements. There is still interest in investigating the specific effects of different robot-assisted therapy devices on gait rehabilitation after a stroke. Some studies have already demonstrated the advantages of end-effector systems over exoskeletons.



The study once again underscores the potential of robot-assisted gait training as an effective rehabilitation strategy after a stroke and confirms the advantages of the end-effector system over exoskeletons.

Study design and objectives

This study, conducted across eight Italian rehabilitation centres, compared the clinical effects of robot-assisted gait training with conventional training in patients in the subacute stage after a stroke. The main focus was on improvement in walking speed as measured by the 10-metre walk test. The study compared the effects of end-effector systems versus exoskeletons in a subgroup comparison.

Results

The results showed significant improvements in walking speed, endurance, balance and daily living activities in the group that received robot-assisted training compared to the conventional group. End-effector systems in particular proved to be more promising in terms of walking speed. Although

further research is needed, the results suggest that people in the subacute stage after a stroke benefit significantly from robotic end-effector gait training.

Conclusions

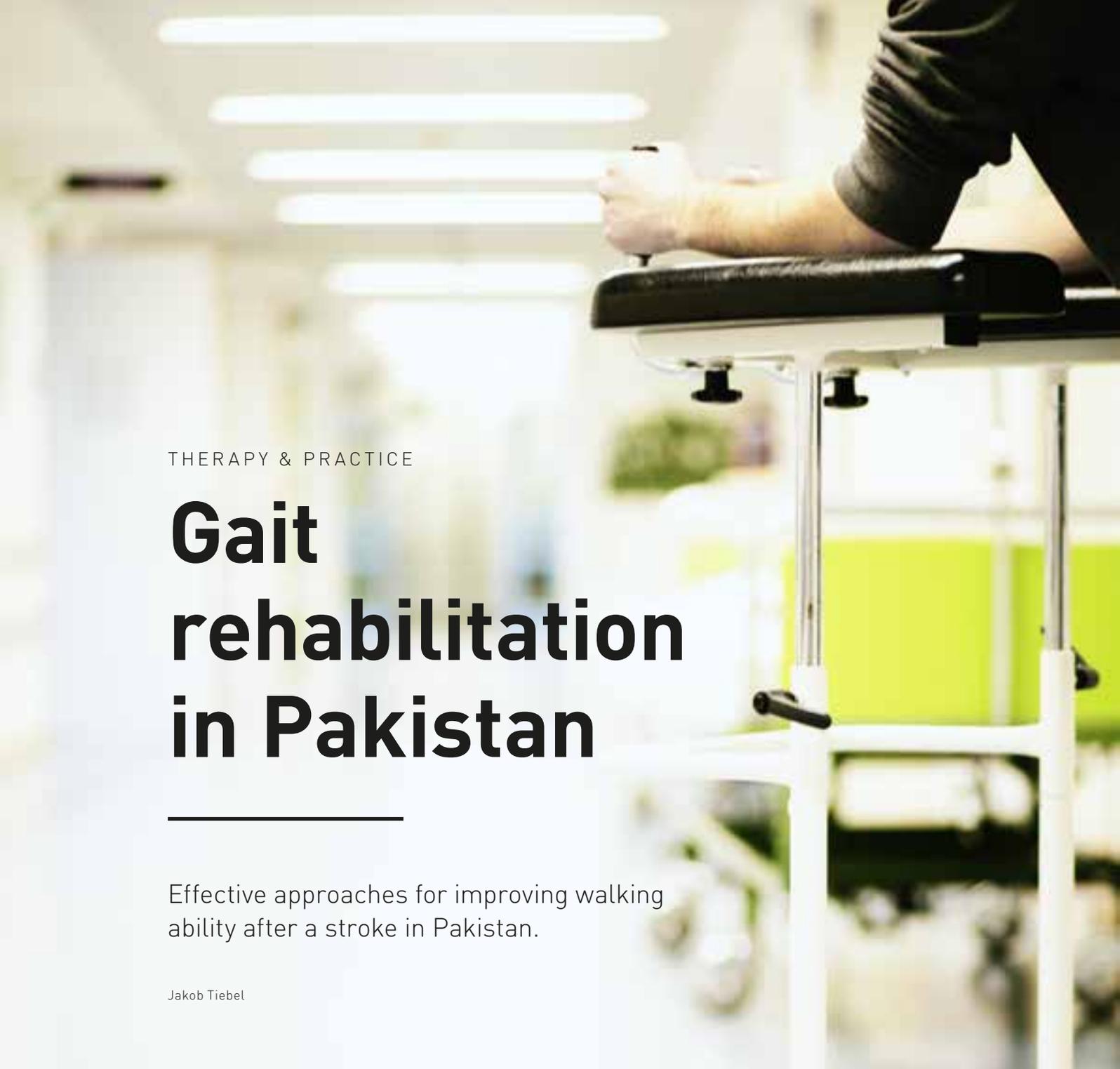
The study once again underscores the potential of robot-assisted gait training as an effective rehabilitation strategy after a stroke and confirms the advantages of the end-effector system over exoskeletons. Future research should focus on larger, controlled studies to clarify optimal training protocols for maximum efficiency.



Original work
[Lead.me/therapy-24-01-34](https://lead.me/therapy-24-01-34)

SOURCES:

Pournajaf S, Calabrò RS, Naro A, Goffredo M, Aprile I, Tamburella F, Filoni S, Waldner A, Mazzoleni S, Focacci A, Ferraro F, Bonaiuti D, Franceschini M, TreadStroke Group. Robotic versus Conventional Overground Gait Training in Subacute Stroke Survivors: A Multicenter Controlled Clinical Trial. *J Clin Med*. 2023 Jan 5;12(2):439. doi: 10.3390/jcm12020439. PMID: 36675371; PMCID: PMC9861649.



THERAPY & PRACTICE

Gait rehabilitation in Pakistan

Effective approaches for improving walking ability after a stroke in Pakistan.

Jakob Tiebel

Strokes are a growing health challenge in Pakistan, with an estimated incidence of 250 per 100,000 inhabitants and 350,000 new cases every year. Loss of mobility after a stroke affects around 80% of stroke survivors, and the limited availability of advanced gait rehabilitation methods complicates the situation. One article highlights the need for multidisciplinary rehabilitation supported by innovative techniques,

and discusses the advantages and disadvantages of conventional versus advanced training methods. Recommendations include the provision of budgets for training and equipment, as well as the establishment of specialised stroke rehabilitation centres in cooperation with industries.

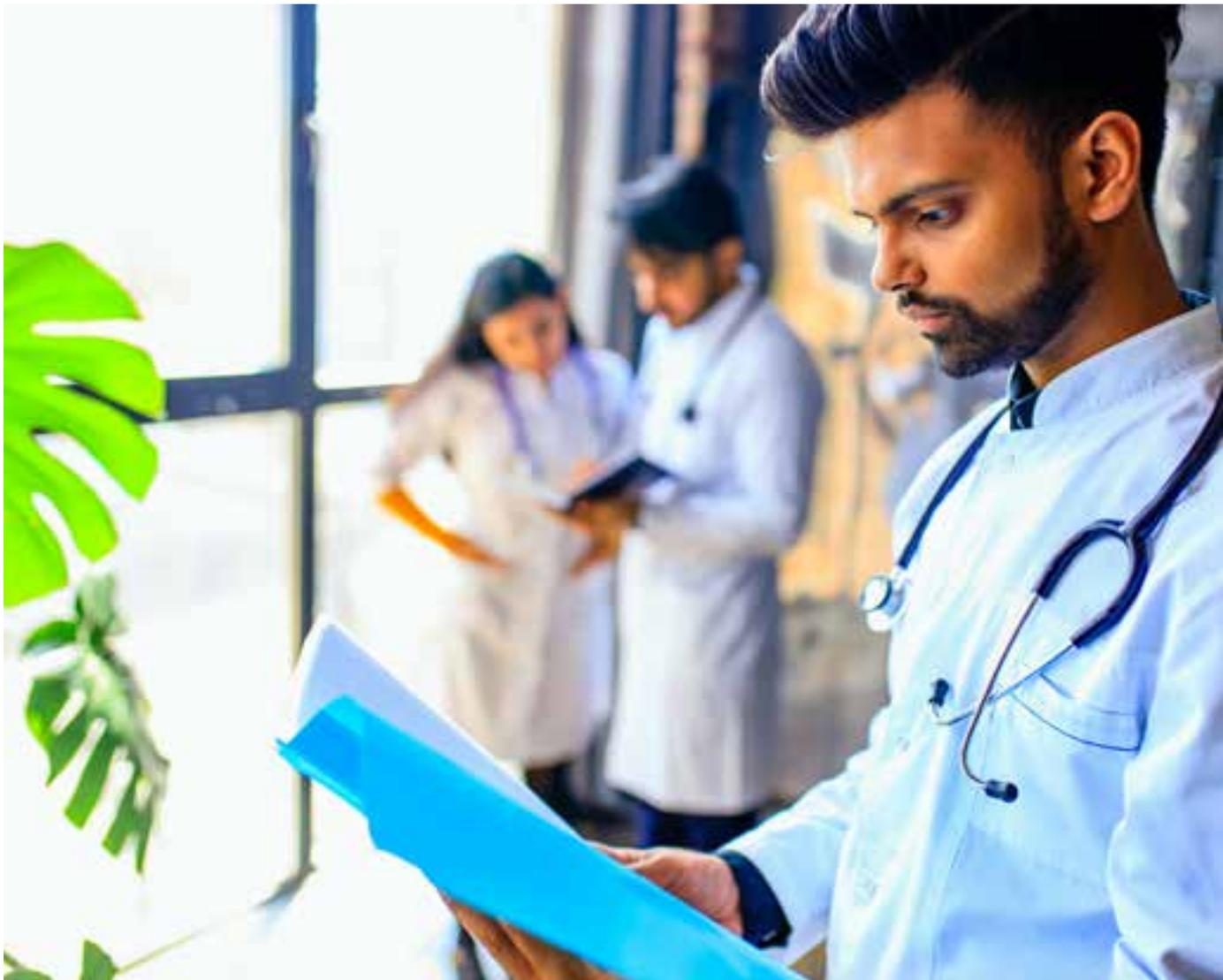
The World Health Organisation considers stroke to be the second most common cause of death

worldwide after ischaemic heart disease, and experts predict a further increase by 2030. In developing countries, demographic change has made stroke a pressing public health concern. In Pakistan, where comprehensive stroke statistics are lacking, the incidence is estimated at 250 cases per 100,000 inhabitants, resulting in around 350,000 new cases annually. The resulting loss of mobility poses considerable challenges for the healthcare system.

According to current evidence, post-stroke gait rehabilitation requires differentiated approaches.

Multidisciplinary coordinated rehabilitation is crucial to reduce the health burden and increase independence rates. Current research shows that durable medical equipment such as electro-mechanical gait trainers can improve walking

In Pakistan, gait rehabilitation after a stroke faces major challenges.



ability. Conventional therapies can be supplemented by innovative technologies such as virtual reality to increase their effectiveness.

When weighing up conventional versus advanced gait training methods, it is clear that conventional approaches are cost-effective and widely used. Advanced methods, on the other hand, require

expensive equipment and specialised training, but offer more intensive rehabilitation and accurately controlled levels of intensity or support.

In Pakistan, gait rehabilitation after a stroke faces major challenges. Access to advanced methods is limited, mainly due to the high cost of equipment and a lack of trained staff.



The establishment of dedicated stroke rehabilitation centres with advanced equipment is recommended.



Scientists who have recently studied the topic as part of this research recommend greater integration of evidence-based concepts into clinical practice. The government in Pakistan should provide budgets

for training and equipment, while collaboration with industries could promote innovative solutions. The establishment of dedicated stroke rehabilitation centres with advanced equipment is recommended.



Original work
[Lead.me/therapy-24-01-36](https://lead.me/therapy-24-01-36)

SOURCES:

Khalid S, Malik AN, Siddiqi FA, Rathore FA. Overview of gait rehabilitation in stroke. J Pak Med Assoc. 2023 May;73(5):1142-1145. doi: 10.47391/JPMA.23-39. PMID: 37218257.

TECHNOLOGY & DEVELOPMENT

Global perspectives on rehabilitation

A critical journey through the world of therapies that aims to shed light on cultural diversity and innovative approaches.

Lars Timm

In the next issues of our THERAPY magazine, you'll be taken on an exciting journey to institutions that are driving innovation and changing people's lives around the world. Get to know inspiring people overcoming challenges with determination and courage, and giving others hope. Get ready for a journey of discovery through the varied world of rehabilitation! Read this article for a taster of what to expect.

In our increasingly interconnected world, the importance of rehabilitation for the health and well-being of people worldwide is becoming ever clearer. From the rural communities of Africa to the urban centres of Asia – the challenges and opportunities in the field of rehabilitation are both diverse and fascinating. This series of articles invites you on a journey of discovery through various countries and continents to explore the



**2.4 billion people need
rehabilitation**

BUT

in low- and middle-income
countries, **more than 50%**
of people do not receive the
rehabilitation services they need

multi-faceted landscape of rehabilitation. We will look at innovative approaches, cultural differences, challenges and successes in rehabilitation world-wide. Immerse yourself in the world of therapies with us, and be inspired by stories and progress from around the globe.

“The World Health Organisation (WHO) defines rehabilitation as an appropriate measure to enable people with disabilities or physical impairments to achieve maximum independence. With full inclusion and participation in all aspects of life, be it physically, mentally, socially or professionally.” (4)

The rehabilitation situation

Global rehabilitation is at a critical turning point. In many parts of the world, there is a growing realisation that promoting rehabilitation is an essential part of healthcare systems, and can bring economic benefits. Nevertheless, many countries face significant challenges such as limited resources, unequal access to rehabilitation and a shortage of skilled labour. The development and implementation of effective rehabilitation programmes varies greatly from region to region and from country to country. While some are making progress towards holistic rehabilitation, others are still lagging far behind. Nevertheless, a growing global movement is emerging in favour of comprehensive and inclusive rehabilitation to improve the quality of life and participation of people with disabilities or health conditions (WHO Rehabilitation 2030 Initiative). It is time to take a closer look at the developments and challenges of global rehabilitation and to look for ways in which it can be further advanced.

Despite numerous efforts, the number of people who do not have access to rehabilitation is constantly increasing. This is largely due to the general ageing

of the population and the associated increase in non-infectious diseases in society. The steadily increasing demand for therapists cannot currently be offset by training new staff (2). There are many reasons for this. There is a particularly high shortage of skilled labour in low-income countries. One reason for this could be the migration of skilled labour to countries with higher incomes. (1)

As the already difficult situation is likely to worsen significantly in the coming years, solutions must be found to ensure access to rehabilitation. One possible solution, particularly in middle- and high-income regions, is the use of new technologies that relieve the burden on therapists and at the same time enable optimal therapy.

“Global health and functional capability promote inclusion and support participation, **allowing children to learn and adults to earn**, escape from poverty and the basis for long-term and sustainable economic development.” (3)



Lars Timm studied Sports Science with a focus on rehabilitation in Freiburg i.Br. and M.Sc. Sports Engineering at KIT Karlsruhe.

*Rehabilitation worldwide
is at a turning point.
Despite a shortage of
resources and skilled labour,
innovative approaches for
comprehensive rehabilitation
are gaining ground.*



Rehabilitation is becoming increasingly important worldwide in a networked world. From Africa's rural communities to Asia's urban centres, we are facing many challenges and opportunities.

SOURCES:

[1] Blacklock, C., Ward, A. M., Heneghan, C., & Thompson, M. (2014). Exploring the migration decisions of health workers and trainees from Africa: A meta-ethnographic synthesis. *Social Science & Medicine*, 100, 99–106. <https://doi.org/10.1016/j.socscimed.2013.10.032>

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TECHNOLOGY & DEVELOPMENT

CARE REGIO

Together for innovative care solutions

Jakob Tiesel

CARE REGIO, the joint project in the administrative district of Schwaben, is making strides towards sustainably improving care through the targeted use of technical and digital systems. In coordination with the Kempten, Neu-Ulm and Augsburg universities of applied sciences, Augsburg University and Augsburg University Hospital, the project analyses existing care structures and develops sustainable concepts for technology and digitally-assisted care. The focus is on helping patients stay in their own home for longer, establishing a fast-acting network of experts for improved care, and promoting

self-determined work in the care sector. The CARE REGIO consortium identified four fields of action for digitalisation in a transfer study: Assistive systems, digitalisation of the care transfer report, care data lake, and care wiki. The results will be tested in Schwaben and discussed at the CARE REGIO Network Day. In addition, a CARE REGIO study on technology-assisted fall prevention in the home was launched in 2024, with initial practical tests in Ottobeuren, using THERA-Trainer among other methods. The 6-month study promises instructive findings for the future of care.



Their primary aim is to noticeably relieve the burden on carers and those in need of care with a focus on technical and digital systems.

Collaboration for digital care innovations

The CARE REGIO joint project, funded by the Bavarian State Ministry of Health and Care, is made up of five partners in the administrative district of Schwaben who are jointly pursuing innovative approaches in the digitalisation of care. The project is coordinated by Kempten University of Applied Sciences, supported by the Neu-Ulm and Augsburg

universities of applied sciences, as well as the University of Augsburg and Augsburg University Hospital. Their primary aim is to use technical and digital systems to significantly relieve the burden on carers and those in need of care. The first step is to develop sustainable concepts for technology and digitally-assisted care.

Innovative approaches to care

In the analysis process, existing care structures are analysed and possibilities for technology-assisted care are collected and evaluated. The insights gained lead to specific fields of action for which suitable solutions are developed. CARE REGIO strives to improve the care landscape sustainably through innovative approaches. The targeted use of technical and digital systems should enable people to stay in their own homes for longer, help to establish a fast-acting network of experts for improved care, and promote self-determined work in the care sector. CARE REGIO acts as a link between technical assistance systems, support in home care, geriatric care and nurse training, schools and teaching.



Fields of action for digitalisation

In a transfer study, the CARE REGIO consortium has identified four fields of action in which digitalisation can offer considerable added value: Assistive systems, digitalisation of the care transfer report, care data lake, and care wiki. Solutions are being developed for these areas and tested in Schwaben.

A care technology milestone

The 4th CARE REGIO Network Day took place on 9 November 2023, marking another milestone for the project. Experts and interested parties gathered online to discuss the future of care technology. Prof Petra Friedrich, the project coordinator for CARE REGIO, a collaborative initiative in the administrative district of Schwaben at Kempten

University of Applied Sciences, opened the event. One highlight was the presentation on the DiCo platform by Dr Frank Eierdanz. The project facilitates the digitalisation of care facilities, taking into account ergonomic standards. Bernd Hoffmann from LAQA presented the SmartCup LAQA, an innovative solution in hydration management, and Otto Höbel from medica Medizintechnik GmbH presented products for neurological and geriatric rehabilitation, in particular the robotics-assisted solutions from THERA-Trainer.

Technology for greater mobility and safety

“These devices are designed to help people with mobility impairments regain their mobility,” explains Otto Höbel. “There is now a particular focus on cognitive-motor interaction. With this approach, the THERA-Trainer senso integrates the



*In this context,
THERA-Trainers are
designed to help people
with mobility impairments
regain their mobility.*



Bringing together experts and practitioners promotes the development of forward-looking solutions to make the care sector more efficient, effective and humane.

latest scientific findings into everyday therapeutic practice. This is particularly promising for training older people and patients at risk of falling.”

Study on technology-assisted fall prevention

The CARE REGIO Network Day once again emphasised the relevance of digitalisation and technological innovations in care. Bringing together experts and practitioners promotes the development of forward-looking solutions to make the care sector more efficient, effective and humane.

At the beginning of this year, CARE REGIO initiated a study on technology-assisted fall prevention in the home environment. Interviews have already taken place and the participants are currently receiving the devices. In addition to other devices and software solutions, THERA-Trainers are used in this study to evaluate their applicability in outpatient care. The study is expected to last several months, and results are not yet available.



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SOURCES:
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Jakob Tiesel 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 Native Health, a digital health marketing agency.

A different perspective

Interview with Bernd Tittel:
Insights into the world of a critically ill ICU patient

Tobias Giebler

In an exclusive interview, Bernd Tittel, who contracted COVID-19 in autumn 2021, provides insights into the course of his illness and his impressive journey back to normal life. The interview was conducted by Tobias Giebler, our clinical specialist for early mobilisation in the intensive care unit, and provides a unique perspective on the challenges and successes during treatment.

I remember getting into the ambulance at home. In the emergency department, I must have sent a few organisational text messages somehow – after that, I don't remember anything.

Tobias Giebler: Thank you, Bernd, for taking the time to allow us to shift our perspective and see through the eyes of a critically ill ICU patient. Let's recap what you went through. In autumn 2021, you caught COVID between your first and second vaccinations – is that right?

Bernd Tittel: I'd already been COVID-positive once in spring 2021. I had my first vaccination in August 2021 and was just about to have my second vaccination. Then I got infected with the Delta variant. I think it was 17th November. I became increasingly unwell and was taken to the hospital in Überlingen by ambulance. The situation there got so bad that I was transferred to Tübingen on a ventilator.

Tobias Giebler: What do you know about that time? What did you notice? How was it?

Bernd Tittel: I remember getting into the ambulance at home. In the emergency department, I must have sent a few organisational text messages somehow – after that, I don't remember anything.



You just have to grit your teeth and make the best of it. You can't just sit down and give up.

Tobias Giebler: Nothing? No sights, no sounds?

Bernd Tittel: No, nothing at all. I can tell you today that I was apparently transferred to Tübingen by road. It wasn't possible to have me flown in. From what I hear, it was touch and go. I got to Tübingen not just at the eleventh hour, but pretty close to the twelfth!

Tobias Giebler: When I first contacted you, you were already connected to the ECMO (extracorporeal membrane oxygenation) machine, taking over from your lungs. Then you were regularly placed in the prone position for at least 16 hours, following the recommendations. You woke up in the meantime. What were the first things you noticed? What happened next?

Bernd Tittel: During this time I had near-death experiences, and very confused dreams. I kept dreaming I'd been flown to the army hospital in a military helicopter. So I woke up thinking that I was lying in the army hospital in Ulm, for some reason. Then I was told where I actually was and what had happened to me.

Tobias Giebler: Do you remember who explained it to you, and how that went?

Bernd Tittel: No, they all looked the same – blue gowns, masks, visors.

Tobias Giebler: Did it bother you that you couldn't see who you were talking to?

Bernd Tittel: No, that didn't worry me. I was just grateful that someone was talking to me, taking the time to tell me where I was, and being there for me. It felt like I was drunk. I couldn't communicate properly.

Tobias Giebler: Because of the breathing tube? It must have been comforting to wake up and feel like someone was taking care of you. Did you feel understood despite not being able to speak?

Bernd Tittel: Communication was a big problem. All the technical terms, and I couldn't ask questions, couldn't make myself understood. It felt as if I couldn't be heard.

Tobias Giebler: For us, you were a patient who quickly regained consciousness and was able to communicate. The ventilation tube was manageable because we could read your lips, and we were also able to use an alphabet board and a writing pad to assist you. I rarely had the feeling that I didn't understand what you were trying to say. Did making yourself understood get any easier with time?

Bernd Tittel: It was very much dependent on the person I was interacting with, and their willingness to engage. Particularly when boards and writing were involved. It was made even more difficult when I experienced bleeding into my arm. Then I couldn't even point and write any more. That was a barrier for me, but it was good to know that someone was always there.

Tobias Giebler: Were you in pain during this time?

Bernd Tittel: No, I can't remember any pain.

Tobias Giebler: What did you notice about the technical equipment, alarms and so on?

Bernd Tittel: There were constant alarms and signals that were to do with me, yes!

Tobias Giebler: Can you describe that in more detail?

Bernd Tittel: You've got time, in that situation. At some point you try to make sense of the sounds. Each sound means something different. Something is empty – the food or a medicine. You try to find out what it all means. Not all of it is obvious, but some things got clearer over time. The really tough thing was that the noises were there all the time. You never really got to rest, so you never had a proper night's sleep. That was something I found quite hard.

Tobias Giebler: I remember that you mostly slept during the periods when you were lying in prone position. That set a certain rhythm. Do you remember anything about this time?

Bernd Tittel: No, nothing at all.

Tobias Giebler: What do you remember from the periods when you were awake?

Bernd Tittel: I was always tired, right through this whole phase. I always wanted to sleep, but sometimes it just wasn't possible because it was either too bright or too loud. So tiredness was my constant companion.

Tobias Giebler: You also underwent therapy during the times when you were awake. We had speech therapy, occupational therapy and physiotherapy 1–2 times a week. I assume that was exhausting for you?



Bernd Tittel: For the physiotherapy, I was supposed to wiggle my toes. But after such an effort, I was usually happy to go back to sleep. You try your best, but you can hardly do anything when you're so tired.

Tobias Giebler: I found you to be a very positive person who was incredibly committed during these therapy sessions. You always asked the speech therapist to practise with you a little longer. Why was that?

Bernd Tittel: Well, on the one hand it was the need for movement and normality. On the other hand, at the beginning I actually found it motivating that I could divide my day into two halves. Then there was time for me again.

Tobias Giebler: The psychiatrist started seeing you very early on. So you had psychological counselling during this time. How did you feel about that?

Bernd Tittel: That was very important. Sometimes I missed those conversations. Particularly on days that were tough.

Tobias Giebler: How did you feel about the helpfulness and dedication of the nursing staff?

Bernd Tittel: The nurses were all very dedicated and looked after me, but that's their job after all. I was particularly pleased with the student nurses. Some of them were my age and simply took a bit more time with me.

Tobias Giebler: What was it like when you were able to stand up for the first time?

Bernd Tittel: That was a huge step forward. I remember the first time I was able to stand up after 3–4 weeks. My legs still felt weak, though. It was a huge step, but it was very shaky. Standing just didn't feel all that safe.

Tobias Giebler: Were you able to walk straight away?

I was just grateful that someone was talking to me, taking the time to tell me where I was, and being there for me.

Bernd Tittel: No, I couldn't walk yet. I made my first outings in a wheelchair. I was then offered a kind of rollator, but I didn't feel that confident with it.

Tobias Giebler: In the last few days before your discharge, plans for your rehabilitation were arranged. You were then transferred to Kempten. What was that like for you?

Bernd Tittel: Kempten was a chance for me to recuperate at first. I was able to calm down a bit and gather my strength. It was quite a change to go from the intensive care unit to a rehabilitation centre like this. I also had occupational therapy, physiotherapy and speech therapy there.

Tobias Giebler: How did you find your time in rehabilitation?

Bernd Tittel: Overall, my time in rehabilitation was good. You could learn a lot. You could take a lot away with you. I also took advantage of the group programmes. You met a lot of people there who had been through the same thing.

Tobias Giebler: What were the most important successes for you in rehabilitation?

Bernd Tittel: I was able to get up on my own again, get dressed and walk a bit. These were all steps that helped me progress. In hindsight, the progress I made was huge.

Tobias Giebler: You were then discharged from rehabilitation. What's next for you?

Bernd Tittel: I'm now continuing with outpatient rehab. I have occupational therapy, physiotherapy and speech therapy there as well. And I've now got an assistance dog to help me in everyday life.

Tobias Giebler: Do you feel like you're back to your old self now, or has anything changed?

Bernd Tittel: No, I'm definitely not the old me. A lot has changed. Both physically and mentally. I've had a lot of time to think about myself. After all, I've spent a lot of time in bed.

Tobias Giebler: How do you deal with these changes?

Bernd Tittel: Some are difficult, others not so much. You just have to grit your teeth and make the best of it. You can't just sit down and give up.

Tobias Giebler: Do you have any plans for the future?

Bernd Tittel: I haven't got any definite plans for the future yet. I'm just taking things day by day and seeing what happens. There are a lot of things you can't predict.

Tobias Giebler: Is there anything else you'd like to pass on to our readers?

Bernd Tittel: Yes, most importantly: Get vaccinated! That is the most important thing. This disease is not to be underestimated.

Tobias Giebler: Thank you, Bernd, for telling us so openly about your experiences. We wish you all the best on your road to recovery.

Bernd Tittel's experiences with the bed bike in the intensive care unit

Tobias Giebler: Bernd, you also trained on the bed bike in the intensive care unit. Do you remember anything about that, what was it like for you?

Bernd Tittel: It was very motivating. To be able to move while lying down was a step forwards for me. I know this activity. It's a popular sport. I found it amazing that you could do that in the intensive care unit. The great thing was that it was all explained to me clearly, and the training was adjusted to suit my performance. The therapists always took care of me. So I found the training to be very useful!

Tobias Giebler: Were you aware what the training with the bed bike was meant to achieve?

Bernd Tittel: For me, it was a kind of mobilisation. When I pedalled, my legs were bent and stretched – with some electronic support of course. And with resistance added, it became a workout for my muscles. It was clear that I wasn't going to be standing and walking without leg muscles! The training helped get everything – my muscles, my circulation – back in shape.

Tobias Giebler: A nice summary, and it's great that you realised the significance of all this as a patient. It's always important to me to explain why and for what purpose the individual therapeutic measures are used. The bed bike has the potential to accelerate strength gain and demonstrably improve walking ability.



The bed bike has the potential to accelerate strength gain and demonstrably improve walking ability.



Tobias Giebler graduated as a physiotherapist at the University Hospital of Freiburg in 2013. Due to his several years of working as a paramedic in the emergency services, he already brought knowledge in dealing with patients in the intensive care unit into his physiotherapeutic training. He has been working intensively on the topic of early mobilisation for 9 years. He works at the Tübingen University Hospital in the Therapy Centre and has been the deputy area expert for intensive care medicine and neurosurgery since 2023.

THErapy & PRACTICE

ThERA-Trainer Symposium 2023

State-of-the-art approaches and pioneering ideas
for the future of gait rehabilitation

Jakob Tiebel



The THERA-Trainer Symposium 2023 offered in-depth expertise and practical insights into modern approaches to gait rehabilitation, from international guidelines to robotics-assisted therapy concepts.

The THERA-Trainer Symposium 2023 brought together experts and specialists at the Medeclin clinic in Essen to present innovative approaches, practical insights and inspiring discussions on modern gait rehabilitation. From international guidelines and practice-based gait labs to modern device-assisted therapy concepts.

In the late summer of 2023, experts and specialists from the field of gait rehabilitation gathered for a pioneering symposium at the Medeclin rehabilitation clinic in Essen. The clinic, which specialises in neurological, orthopaedic and geriatric rehabilitation, was the perfect setting for the THERA-Trainer Symposium, which left a strong impression with its innovative approaches and practical insights.

Expertise and practical relevance

Dr Meves, head physician at Medeclin Essen, opened the symposium with an impressive presentation on early mobilisation and post-intensive care syndrome. In her speech, she combined professional eloquence with a high degree of practical relevance, which delighted the participants.

Dr Meves used case studies to illustrate the importance of early mobilisation for patients, placing a clear focus on the practical implementation of the theoretical concepts. Her interactive style enabled a direct professional discourse with the audience, giving the event a dynamic atmosphere from the very beginning.

The presentation not only focused on the technical aspects of early mobilisation, but also emphasised the challenges and opportunities that arise in rehabilitation following intensive care. The intensive discussion and the large number of questions asked reflect the participants' keen interest in this forward-looking topic. Dr Meves was instrumental in raising awareness of the importance of early mobilisation and providing participants with practical insights into post-intensive care rehabilitation.

A look into the future of rehabilitation

The patron of the symposium, Prof Siebler, former head physician of the clinic and head of the Medeclin Research Centre, followed up the opening speech with an inspiring question: Will the use of technology in rehabilitation lead to new job profiles such as rehab technician? His presentation set the tone for two days of intensive dialogue on developments in rehabilitation.

Prof Siebler shed light on the research work at the Medeclin Research Centre and asked critical questions about the future development of rehabilitation. In particular, he addressed the challenges and opportunities presented by the increasing use of technology in rehabilitation. With his refreshing style and many years of experience in rehabilitation, he got the participants thinking about the future role of therapists and the integration of technology into therapeutic practice.

The gait laboratory at Medclin Essen

Lena Flöter, a physiotherapist specialising in neurology and an expert in gait rehabilitation at Medclin in Essen, showcased the gait laboratory concept by way of case studies and practical examples. In addition to organisational aspects such as planning, organisation and patient allocation, she also addressed the individual objectives of therapy. Her presentation led to a lively discussion in which many questions were asked, and the discussions continued into the subsequent coffee break.

International guidelines and motor learning – Sabine Lamprecht

The second series of lectures started with Sabine Lamprecht, an MSc. in neurorehabilitation. Her comprehensive overview of international guideline recommendations for gait rehabilitation emphasised the importance of a task-specific, highly repetitive training approach. Lamprecht, renowned for her uncompromising advocacy of evidence-based practice, critically examined traditional concepts and presented well-defined perspectives.



The symposium was praised for its clear commitment to professional content and networking.

She emphasised that modern neurorehabilitation must follow scientific evidence and that therapeutic action should be based on the recommendations of international guidelines. In her experience, hybrid approaches that attempt to combine traditional concepts with evidence-based practice are doomed to failure, the expert said.

Practical insights from Sara Ruppert

Sara Ruppert from the Diana Klinik Bad Bevensen presented a practical insight into the organisation and implementation of a gait laboratory in a clinic setting. Ruppert went into detail about the planning and development process of the gait lab, including the current status quo at the clinic. Specifically, she pointed out that subgroups tailored to the varying ability levels of neurological patients could be created for a coordinated circuit training programme in the gait lab. Her presentation illustrated how patients can train at individual stations with the therapy and robotic devices from THERA-Trainer.

Kathrin Neissendorfer focuses on modern device-assisted gait rehabilitation

Kathrin Neissendorfer, occupational therapist and owner of erGO Konzept, rounded off the series of lectures. She used concepts and examples to illustrate

that modern device-assisted gait rehabilitation is relevant in not just the inpatient but also the outpatient sector. Her contribution provided valuable insights into the possibilities and potential of device-assisted gait rehabilitation (“End-effector gait training as the key to mobility”, page 34).

Joint conclusion and networking

The first day of the event ended with a joint church party, which created an informal atmosphere for further professional and social dialogue.

Practical insights and personal experiences

The second day of the symposium gave participants the opportunity to gain personal insights into practical applications. While one group of participants was guided through Mediclin Essen by Prof Siebler and given exclusive insights into the Mediclin Research Centre, Lena Flöter gave the other group an insight into the gait laboratory. Participants also had the opportunity to test the lyra end-effector gait trainer from THERA-Trainer for themselves.

Closing workshop – Shaping the future of gait rehabilitation together

The programme concluded with a practical colloquium in which the participants themselves developed important aspects and criteria for the design of modern gait rehabilitation. The enthusiasm of all participants was reflected in an intensive exchange on specialised topics and experiences. This interactive workshop helped to bring together the diverse perspectives of the participants and jointly identify important findings for modern gait rehabilitation.

Focus on enthusiasm, dialogue and professionalism

The THERA-Trainer Symposium 2023 at the Mediclin Essen was not just a success in professional terms; it also inspired the participants with a variety of opportunities for exchange and exciting content.



The positive feedback from participants testifies to the successful combination of practical relevance, scientific input and interdisciplinary exchange.

Special emphasis was placed on the opportunity to exchange ideas with colleagues from different areas of rehabilitation. The event's interdisciplinary approach enabled participants to gain insights beyond their own specialty and promoted professional dialogue. The extensive questions, lively discussions, and exchange of insights during the presentations and workshops emphasised the high level of interest and the relevance of the topics discussed.

Another decisive factor for the success of the symposium was the clear focus on technical content. Despite the support of industry partners, the focus was not on promotional aspects but on knowledge exchange and networking. The participants appreciated this focused approach, which helped to turn the event into a platform for high-quality exchange and innovative ideas.

Overall, the positive feedback from participants indicates that the THERA-Trainer Symposium not only offered informative insights into modern rehabilitation technologies, but also created an inspiring atmosphere for joint learning, discussion and networking.



The event facilitated intensive dialogue and networking between experts from different areas of rehabilitation.



Jakob Tiesel 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 Native Health, a digital health marketing agency.

Webinar review: The power of virtual cycling

A look back at an inspiring webinar on the transformative power of virtual cycling and how it can inspire people to keep up regular exercise even in old age.

Jakob Tiebel

The graphic features two green bicycle icons at the top left. Below them, the text reads: "Webinar Engaging Elderly People in Physical Activity The Power of Virtual Route Cycling". On the right, the "THERA TRAINER" logo is displayed. Two circular portraits of speakers are shown: "Jan Inge Ebbesvik, President RWS" and "Ella Keijzer, CEO BikeLabyrinth". A green bar at the bottom left contains a QR code, the text "Watch the video here", and a play button icon. Below the QR code is the URL "Lead.me/therapy-24-01-60".



Immerse yourself in the world of virtual cycling, as showcased by experts during the THERA-Trainer webinar at the end of 2023. Find out how this innovative technology not only promotes physical activity for older people, but also offers social networking, cognitive stimulation and customisability. A recording of the webinar is now available on the THERA-Trainer Education Channel.

At the end of 2023, THERA-Trainer held a groundbreaking webinar that impressively highlighted the transformative effect of virtual cycling on the physical activity of older people. Ella Keijzer, founder of Bike Labyrinth, and Jan Inge Ebbesvik, founder of Motitech, discussed their extensive experience in using virtual cycling platforms to activate and motivate older people.

The event highlighted a number of key aspects of virtual cycling. Firstly, the improved accessibility was emphasised, as older people are able to take part in virtual cycling activities regardless of the weather or location. The possibility of overcoming physical and geographical limitations offers an innovative approach to encouraging physical activity among the elderly.

Another focus was on the interactive and immersive nature of virtual cycling. The simulation of real environments allows older people to cycle through picturesque landscapes or explore familiar cityscapes, enhancing their enjoyment of the exercise.

Special attention was also paid to the customisable intensity and duration of virtual cycling. The use of THERA-Trainer movement exercisers for route cycling enables older people of varying fitness levels to adapt the activity to their individual needs. The training is not only simple, but can also be carried out safely by most older people – without any adverse effects.

Virtual cycling provides older people with motivating physical activity regardless of the weather and location.

One outstanding aspect is the social interaction made possible by virtual cycling. Thanks to the integrated social functions, older people can connect with other participants, share their successes and feel a sense of community. This was demonstrated in particular by Jan Inge Ebbesvik's presentation on the World Cycling Championships for older adults, which are organised annually – an impressive event that vividly illustrates the intervention's ability to inspire and encourage (see also article 10 issue 3-23).

In addition, cognitive stimulation was emphasised as a valuable aspect of participating in virtual cycling. The activity offers not only physical exercise, but also the opportunity for a cognitive challenge.

Another important point is the tracking and monitoring of progress. Progress tracking functions allow older people to set fitness goals, monitor their progress and receive feedback, leading to increased motivation.

In addition to social interaction, virtual cycling offers individual customisability, cognitive stimulation and the opportunity to track progress, resulting in increased motivation.

Would you like to delve deeper into the world of virtual cycling? The full webinar with Ella Keijzer and Jan Inge Ebbesvik is available on demand. The recording of the webinar can now be accessed via the THERA-Trainer Education Channel. For those who were unable to attend the live event, this is a great opportunity to catch up and benefit from the experts' insights and tips.





The immersive nature of virtual cycling experiences encourages the joy of movement through picturesque landscapes and familiar cityscapes.



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 Native Health, a digital health marketing agency.

SCIENCE

Amazing possibilities

Conference review: Joint annual conference of the German Society for Neurorehabilitation (DGNR) e. V., the Austrian Society for Neurorehabilitation (OeGNR) and the Swiss Society for Neurorehabilitation (SGNR) with the theme of Amazing Possibilities.

Jakob Tiebel

From 14 to 16 December 2023, the joint annual conference of the German Society for Neurorehabilitation (DGNR) e. V., the Austrian Society for Neurorehabilitation (OeGNR) and the Swiss Society for Neurorehabilitation (SGNR) took place in Augsburg, with the theme of Amazing Possibilities. The conference, held in the city centre at Kongress am Park Augsburg, presented a wide-ranging programme in which leading experts from various specialist areas of neurology and rehabilitation presented the latest findings and perspectives.

The conference presidents, Prof Andreas Bender, Prof Susanne Asenbaum-Nan and Prof Adrian Guggisberg, conveyed the multifaceted nature of the conference theme Amazing Possibilities during the joint annual conference of the German Society for Neurorehabilitation (DGNR) e. V., the Austrian Society for Neurorehabilitation (OeGNR) and the Swiss Society for Neurorehabilitation (SGNR). Prof Bender highlighted the impressive therapeutic potential of the innovative field, which ranges from traditional therapeutic experience to robotics, virtual reality and AI-based applications. The effectiveness

The event marked a historic premiere as the first joint annual conference of the three national associations.



of evidence-based neurorehabilitation, which offers many patients surprisingly good recovery prospects, was particularly highlighted.

A primary goal of the conference presidents was not only to highlight the therapeutic possibilities, but also to present the outstanding training and further education opportunities, working conditions and career opportunities in neurorehabilitation. The conference therefore not only offered insights into the latest developments in the respective fields, but

also into the extensive opportunities that this field of activity offers for specialists.

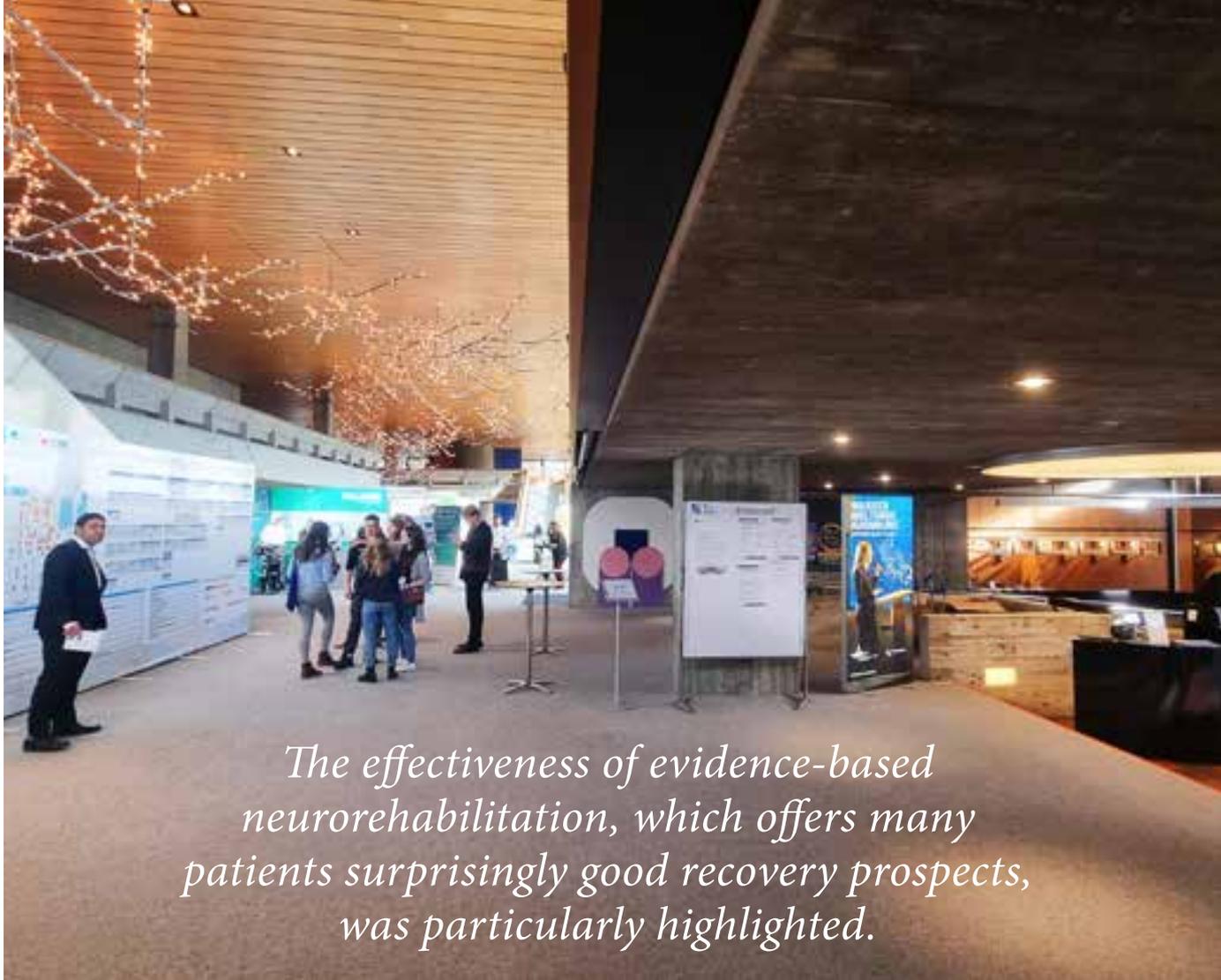
The event marked a historic premiere as the first joint annual conference of the three national associations. Augsburg, being only a short distance from the Austrian and Swiss borders, was an ideal setting for professional exchange and the strengthening of interdisciplinary cooperation between the DGNR, OeGNR and SGNR.



The accompanying specialised industry exhibition not only provided insights into the latest technologies and products in the field of neurorehabilitation, but also featured the THERA-Trainer stand as a returning highlight.

Selecting Augsburg as the venue for the conference was a well-considered and appropriate choice. Although neurorehabilitation is a relatively young field, Augsburg, one of the oldest cities in Germany, seemed to be the ideal location for the conference. Augsburg, which is easily accessible from all three countries, presented itself as a small and pleasant city with a rich tradition, particularly during the pre-Christmas season. The atmosphere in Augsburg and its reputation as a city of peace helped make the conference an inspiring and enjoyable event.

The accompanying specialised industry exhibition not only provided insights into the latest technologies and products in the field of neurorehabilitation, but also featured the THERA-Trainer stand as a returning highlight. This year, the important topic of postural control and balance took centre stage. The new THERA-Trainer senso, an interactive training device for evidence-based cognitive-motor training, made a strong impression. Its intelligent software analyses the patient's activity level in real time and adapts the level of difficulty of the exercises to their individual performance level.



The effectiveness of evidence-based neurorehabilitation, which offers many patients surprisingly good recovery prospects, was particularly highlighted.

The fundraising campaign at the THERA-Trainer stand was particularly eye-catching. Every point scored by the conference participants when trying out the THERA-Trainer senso went towards a generous donation totalling €2,000 for the P.A.N. Centre Berlin. The impressive sum was donated to the neurological rehabilitation centre in support of its charitable goals. The joy of discovering new technologies thus went hand in hand with a contribution to a good cause.



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High-frequency interval therapy in neurorehabilitation

High-frequency therapy programmes are a promising (new) therapeutic approach in neurological rehabilitation. The P.A.N. Centre for Post-Acute Neurorehabilitation of the Fürst Donnersmarck Foundation has already achieved therapeutic successes with the use of high-frequency interval therapy, and is now working on the project “Intensive phases with modules”.

Nico Stockheim, Head of Public Relations, Fürst Donnersmarck Foundation

A therapy programme is always successful when it is individually tailored to the needs of the patients and when goals are regularly discussed, reviewed and adapted. High-quality methods and services also play a decisive role, which is why the P.A.N. Centre always incorporates the latest research findings into its daily therapy work. New processes are established, evaluated and systematically improved in-house.

As part of this improvement process, high-frequency interval therapy has already been implemented and selectively applied. For this reason, the institution is currently working on a project entitled “Intensive phases with modules”, which incorporates the approach of frequent,

intensive intervals into a comprehensive framework.

The “Intensive phases with modules” project at the P.A.N. Centre

The intensive phases are a modern therapeutic approach. Instead of integrating the various disciplines more or less simultaneously into the therapy plan, patients undergoing rehabilitation alternate between the different disciplines in phases of high and low-intensity exercise. In this way, patients undergo highly intensive, goal-directed therapeutic activities for a limited period of time, followed by a regeneration phase. The intervals are then evaluated and follow-up offers are developed.





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The P.A.N. CENTRE for Post-Acute Neurorehabilitation is a facility of the Fürst Donnersmarck Foundation in Berlin-Frohnau.

For the intensive phases, the P.A.N. Center is developing a modular therapy programme with various modules that combine exercises, for example

- Overall targets across all modules
- Arm initiation/expansion
- Mobility inside/outside
- Communication: aphasia
- Neglect
- Basal ADLs

Targets

The appropriate modules are selected based on the agreed targets, which are continuously updated together with the patients during the rehabilitation

process. Reflecting on the results is also an important part of the discussions. This is because if the evaluation of a module shows that little progress can be made here, work is continued with a module that has a better chance of success, thus creating greater benefits for those affected.

One possible goal could be, for example, that a patient wants to relearn how to unscrew a tube of toothpaste independently with both hands. A therapy plan is then drawn up with the primary aim of initiating arm function. For four to five weeks, this module therefore mainly involves working with different components, such as mirror therapy, the motor arm studio, positioning or MindMotion Go.



Rehabilitation patients before a training session with the THERA-Trainer tigo, visible on the left and right in the picture

If the interval in the module is successful, the successes can then be transferred to other everyday life skills, and new goals can be formulated. If there is no immediate success, compensation options can be identified.

Digital aids in everyday therapy like MindMotion Go

Digital tools and methods also play a special role in the project, as many of them are designed so that patients can continue to work with them independently. This is also the case with the MindMotion Go (MMGo) software.

MMGo provides people undergoing rehabilitation with a gamified, structured and independent self-training programme. This is preceded by a detailed briefing by the therapists. Only then can the patients

use the MMGo, either together with the therapy assistants or entirely independently. The advantage of self-training is that it can significantly increase the potential therapy times, leading to improved rehabilitation results.

Learning to live again: About the P.A.N. Centre

The P.A.N. Centre for Post-Acute Neuro-rehabilitation in Berlin-Frohnau has been supporting people who have suffered severe brain damage as a result of accidents or strokes since 2015. Specifically, individuals aged 18 to 60 who might otherwise be placed in care homes due to insufficient rehabilitation options, despite having potential for recovery, are assisted on their journey towards regaining as much independence as possible in their lives. The P.A.N. Centre thus fills



A therapist explains to a patient how to use MindMotion GO. She can then carry out the discussed therapy exercises independently on the terminal at any time and as often as she likes.

a gap in neurological rehabilitation in Germany (Phase E). A total of 66 places are available. The average length of stay for patients is around 18 months.

The P.A.N. Centre particularly focuses on promoting mobility, communication, independence and social integration. Neurologists, neuro-psychologists, neuro-educators, occupational therapists, physiotherapists and speech therapists work together on an interdisciplinary basis. Special emphasis is placed on the neuro-pedagogical support of the patients in the residential groups. Here, individuals undergoing rehabilitation find a temporary home where they can develop their rehabilitation potential in a safe place and interact with each other, while maintaining their personal privacy.



Contact:

For technical questions on the subject of high-frequency interval therapy, please contact Dr Christian Dohle, M.Phil., Medical Director of the P.A.N. Centre for Post-Acute Neurorehabilitation, an institution of the Fürst Donnersmarck Foundation, Berlin-Frohnau.

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[Lead.me/therapy-24-01-68](https://lead.me/therapy-24-01-68)

Development of a technical assistance system to improve nutrition and mobility in old age

Mareike Förster, Vincent Quinten, Dr Lisa Happe, Dr Rebecca Diekmann

Older adults often experience deficiencies in nutrition and physical activity, two key factors that are essential for maintaining health. Technical assistance systems that enable individuals to independently conduct health measurements and training to monitor/improve health could preserve autonomy and reduce adverse health outcomes (Zager Kocjan et al. 2023).

In the AS-Tra project (assistance system for the sustainable improvement of the nutritional and mobility status of older people taking into account the transtheoretical model of behaviour change), we are developing and evaluating an innovative technical assistance system aimed at improving the nutrition and mobility of older adults aged 70 and older. In order to achieve a high level of usability and to align

the station with the needs of the target group, older adults are involved in the development in the form of focus group discussions and iterative user studies.

The two main components of the assistance system are a tablet-based app and a measuring and training station. The underlying concept is for the app to be used independently by older adults in their everyday lives. The measuring and training station enables independent training and assessments of physical functioning, and provides user feedback. Carrying out nutrition and exercise tests can contribute to the early detection of possible risks and deficits. The information obtained in the measuring and training station is transferred directly to the app, allowing the results to be displayed and used for features such as reminder functions.

Tablet-based app

The app interface offers four different areas: Mobility, nutrition, measuring and training station, and contact. In the areas of mobility and nutrition, informative elements such as texts, videos and quizzes are integrated, e.g. on exercise recommendations, specific nutrients or nutrition myths. There are also interactive elements, such as the exercise and food diary, in which the users can directly document their exercises and what they have eaten during the day.

Fig. 1a shows the mobility page and Fig. 1b the nutrition page, with the sub-topics presented in colour-coded tiles with corresponding symbols. Navigation cues for the four different areas of the app are displayed at the top of each screen.



Fig. 1a: App screen on mobility with the corresponding sub-topics



Fig. 1b: App screen on nutrition with the corresponding sub-topics

Measuring and training station

The measurement and training section of the app integrates various devices that are used in the station. These include a heart rate monitor, a hand strength measuring device, an automated Timed Up & Go test and an interactive training device for testing and training cognitive-motor skills – the Senso. The app runs on a stationary computer and is operated via a 55-inch touchscreen. Users are guided through the tests and training sessions by means of integrated explanations and explanatory videos. The results achieved can be viewed at the end of these tests.

The Withings Scan Watch (Withings, model HWA09, Fig. 2a) is used for heart rate measurement. Hand force is measured with the K-Force Grip Kinvent (SAS Kinvent Biomechanique, KFORCE Grip) (Fig. 2b). This device connects to the computer via Bluetooth and measures hand strength in kilograms when the user presses it, as though making a fist. This test is helpful in drawing conclusions about general muscle status and is considered a predictor of functional deterioration.

The third measurement is the automated Timed Up & Go test (aTUG), which is used to determine walking speed, among other things (Fudickar et al. 2020; Fudickar et al. 2022, Fig. 2c). With four force sensors and an infrared light barrier, the aTUG chair automatically recognises whether a person is sitting on it with their back leaning against the backrest. The test starts with an acoustic signal. The test subject stands up, walks three metres straight ahead, turns behind a marker, returns to the chair and sits down again. The crossing of the marker, as well as the action of sitting down again, are detected using light barriers, and the walking speed is calculated (Hellmers et al. 2018). The results of this test can be used to draw conclusions about general mobility and the risk of falling (Podsiadlo and Richardson 1991).

The Senso (THERA-Trainer) is used as the training device (Fig. 2d). This device has five force plates, which are used to operate it. On the Senso, users can select different exergames to train cognitive-motor skills such as reaction speed, balance and coordination. The movements can be recorded via the force plates. For people with balance problems, for example, there is the option of holding on to the metal bars.

The results of the measurements and training sessions are displayed graphically and in text form in the app. If people use the station regularly over a certain period of time, they can easily track their progress and are incentivised to improve.



Fig. 2a:
Withings Scan Watch



Fig. 2b:
K-Force Grip Kinvent



Fig. 2c:
aTUG chair



Fig. 2d:
THERA-Trainer senso



Fig. 3: Junior research group Nutrition and Functionality in Old Age.
From left to right: Vincent Quinten, Lisa Happe, Rebecca Diekmann, Mareike Förster, Julia Dannemann

The junior research group **Nutrition and Functionality in Old Age** (led by Dr Rebecca Diekmann), focuses its research on analysing the relationships between nutritional parameters and mobility status in older people. The needs of older adults with regard to technical support are identified, taking into account their lower affinity for technology and the structural and individual barriers. In this context, technology to monitor nutritional status, physical functionality and mobility is being developed and evaluated in a user-centred process on an ongoing basis.

Results of initial studies

Five focus groups, comprising a total of $n = 21$ older adults and an average age of 78.5 years, were used to identify the basic willingness and interest in the independent use of technical-digital systems to record and improve nutrition and mobility. The focus group participants were shown various training devices (exercise stairs, Posturomed, Senso, recumbent bicycle, digital exercise instructions and feedback) by means of pictures and videos.

Owing to its ludic and motivating character, along with the ability to adjust the intensity, the THERA-Trainer senso was favoured by the users as a training device.

In addition, the first two iterative study cycles have already been carried out, in which the usability of the developed prototypes was tested across an entire station, including the app.

The next round of iterative testing deals with the scenario of independent use without testers in the same room. Instructions are provided through the playback of voice recordings, and the performance of each test is monitored and evaluated using camera footage and eye-tracking data. A pilot study will then be carried out to test the independent application in long-term use. The assistance system is used independently by the participants over a period of three weeks and its implementation in everyday life and feasibility are tested, taking into account the phases of the transtheoretical model for behavioural change (TTM) (Lippke and Renneberg 2006).

Finally, a two-arm randomised controlled study with a control and an intervention group will be conducted to assess the long-term effects on nutritional and mobility status.

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Exercise culture in care facilities: The tigo is designed to encourage more movement

Prevention and health promotion also play an important role in care facilities; despite physical, mental or cognitive impairments, residents have health potential that can be promoted. The tigo has the potential to foster a culture of physical activity in the residential care setting.

Berit K. Labott, Vera Belkin

Physical changes in old age are accompanied by a loss of strength, endurance, flexibility and mobility, as well as cognitive abilities. However, physical activity can help to maintain physical and cognitive performance, enabling the continuation of daily

living activities [1]. Maintaining physical activity is therefore particularly important for people requiring care, as it ensures the ongoing development and support of their physical skills, cognitive abilities and psychosocial well-being [2].



Inactivity is widespread

National and international studies show that residents of care facilities spend most of their time in their rooms, walk only a few steps per day and spend the majority of their waking hours lying down or sitting [3]. This puts their behaviour well below the national exercise recommendations for people with multimorbidity [4]. People with multimorbidity should exercise as much as their current health situation allows. It is important to emphasise that even short periods of physical activity are beneficial to health, as any physical activity is advantageous [4]. There are many reasons for physical inactivity, including among residents of care facilities [5]. In addition to physical conditions and attitudes towards exercise, the spatial environment and philosophy of the care facility can significantly influence the (in)activity of care facility residents.

Feasibility study on the use of tigo in the care setting

The THERA-Trainer tigo is a motorised movement exerciser (bicycle and hand crank ergometer) for the lower and upper extremities and can be operated from a chair or wheelchair. This makes it easier to use for people who are dependent on a wheelchair, as there is no need to transfer to the training device. The device can be used for active (muscle-powered) or passive (motor-powered) training. The positive health effects of ergometer training are also well researched and have been proven numerous times in past studies [6, 7]. The feasibility of placement, application, user behaviour, independent use and acceptance of the tigo in the residential care setting have now been evaluated in a pilot project.

For this project, the THERA-Trainer tigo was placed in a fixed, freely accessible location in the

care facilities for a period of 16 weeks. In this way, a highly stimulating exercise programme was created, which residents could use at any time. At the start of the testing phase, several orientation sessions were offered at each facility to train the staff on how to use the tigo. In addition, a poster with 6-step instructions on how to use the device was put up next to the recumbent bike (see Figure 1). All additional materials, such as various handles, safety belts and the operating instructions, were stored in an adjacent cabinet and were freely accessible. Depending on the participating care facility (sortition), the use of the THERA-Trainer tigo was supervised either by trained external staff in addition to the internal employees or exclusively by the facility's own staff.



Figure 1. Placement of the THERA-Trainer tigo with instructions in a care facility.

Evaluation and conclusion

The applicability of tigo in care facilities was evaluated in a workshop. Residents and employees of the care facilities took part in this workshop. Within this framework, usage behaviour as well as experiences and feedback from the perspectives of staff and residents were gathered.

Feasibility, application and user behaviour: The training programme on the THERA-Trainer tigo was very well received by the residents. It was always possible to position the device appropriately, and training was also easy to carry out. The user behaviour of the movement exerciser requires active control and coordination.

Independent use and acceptance: Interested residents specifically sought out the exercise programme and were particularly keen to take part in supervised individual training. Independent use of the motorised movement exerciser by residents was possible in individual cases if they were confident enough to do so themselves or if the care

staff encouraged them (because they had confidence in the residents' ability). As a rule, however, some support was required in using the machine. The support included hooking the safety belts onto a chair or wheelchair, fastening and securing the lower extremities, releasing and attaching the handles, and starting and ending the programme. The residents also generally needed assistance with unbuckling and leaving the tigo. A training session of 15–20 minutes was recommended, and was considered suitable and appropriate by the residents.

In summary, the residents' interest in the THERA-Trainer tigo was very high, it was always feasible to accommodate the device in the participating facilities, and the implementation of brief training sessions with the movement exerciser was straightforward. The promotion of physical activity could be effectively implemented when responsibilities were clearly defined and agreed. However, it is still uncertain how to facilitate the adoption for residents without extra assistance.



Berit K. Labott is a research assistant in the Neuromotor Skills and Training working group (headed by Prof Claudia Voelcker-Rehage) at the University of Münster. She is a sports scientist and completed her Master of Science in Sport and Exercise Gerontology at the German Sport University Cologne in 2020. She has worked as a research assistant in various projects on the effects of exercise interventions on the health of older people. Currently a doctoral candidate in exercise science, she has given presentations at international conferences on the effects of exercise on older people and has published articles in international journals.



Vera Belkin is a research assistant in the Neuromotor Skills and Training working group (lead by Prof Claudia Voelcker-Rehage) at the University of Münster. She is a physiotherapist and sports scientist. She obtained a Master of Science in Biomechanics-Motor Movement Analysis at the University of Giessen in 2021. She is now working as a research assistant in a health promotion project and is pursuing her doctorate in the field of neuromotor skills and training, with a focus on promoting movement in residents in the residential care setting. She is also part of the COST Action PhysAgeNet, which aims to promote the health of the ageing population and reduce the stresses caused by inactivity.

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TECHNOLOGY & DEVELOPMENT

THERA-Trainer Founder Peter Kopf says goodbye

Press release



For further information:
[Lead.me/
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The current THERA-Trainer management with Peter Kopf (founder and CEO until the end of 2023), Dr Jonathan Kopf (CEO) and Otto Höbel (CTO) (from left to right)

Peter Kopf founded medica Medizintechnik GmbH 33 years ago and led the company's fortunes as CEO ever since. Together with Otto Höbel, the CTO (Chief Technical Officer), he developed the family company under the THERA-Trainer brand into one of the world's leading manufacturers of robotics-assisted therapy devices and software solutions for all phases of neurological and geriatric rehabilitation.

Today, THERA-Trainer is present in over 70 countries with around 150 employees at 5 locations. "Based in Hochdorf, at home in the world," is how Peter Kopf describes the journey from the German roots to becoming a global hidden champion.

On 31 December 2023, Peter Kopf retired as CEO of medica Medizintechnik and went into his planned retirement. The family company will be continued by his son, Dr Jonathan Kopf, who moved from strategy consulting to the management of THERA-Trainer already in 2020. The baton has thus been successfully passed on within the family.

THERA-Trainer remains an innovative, value-driven, self-financing family company. With over 100,000 systems installed worldwide, THERA-Trainer brings mobility back to millions of patients, true to the vision of LIFE IN MOTION - and the number is growing every day.



The family company will be continued by his son, Dr Jonathan Kopf, who moved from strategy consulting to the management of THERA-Trainer already in 2020.

Innovative research, evidence-based results

The THERA-Trainer senso in scientific focus

Editorial

The research results not only illustrate the evolution of the device, but also show interesting correlations and lay the foundation for future scientific questions.

The THERA-Trainer senso, as an innovative and pioneering training and testing device, has not only gained worldwide recognition for its practical applicability and benefits, but has also been the subject of intensive scientific research. In this article, we take a look at completed and published studies that have placed the senso at the centre of research. These evidence-based findings not only emphasise the versatility of the device, but also its positive effects on the health and well-being of users.

The research on the THERA-Trainer senso spans the period from 2016 to 2023 and offers fascinating insights into the development of this innovative training and testing device. In close co-operation with renowned universities and institutions worldwide, studies have been carried out that not only reflect the technological evolution of the device, but also open up new perspectives in rehabilitation and healthcare (see section “Based on scientific evidence”).

The publications from this period form a scientific mosaic whose parts not only build on each other, but also lay the foundation for future research questions. The main areas of research focus on fall prevention, healthy ageing, dementia, stroke and multiple sclerosis.



[Lead.me/therapy-24-01-6](https://lead.me/therapy-24-01-6)

Insights into selected studies

2016 Schaettin et al. – Frontiers in Aging Neuroscience

Adaptations of Prefrontal Brain Activity, Executive Functions, and Gait in Healthy Elderly Following Exergame and Balance Training: A Randomized-Controlled Study



The study by Schaettin et al. from 2016 focused on the adaptations of brain activity, executive functions and gait in healthy older adults after exergame training with the senso. The results showed significant improvements in brain activity, cognitive function and gait.

The aim of this study was to investigate the effectiveness of exergame training with the senso in healthy older adults, focusing on the effects on brain activity (in the prefrontal cortex), on cognitive functions (particularly executive functions) and on gait. The study participants were randomly assigned to either the training group or the control group. The intervention group carried out a training session on the senso three times a week for eight weeks. Each training session lasted 30 minutes and included four training games (Balloon, Step, Space and Season). The control group underwent conventional balance training during this time. Twenty-seven older adults took part in the study. The results showed improvements in brain activity in prefrontal brain areas (measured by EEG) as well as in cognitive functions (divided attention, working memory, cognitive flexibility) and gait pattern (walking speed, stride length, cadence) after training with the senso. Conventional balance training also led to improvements, but in fewer functions.



[Lead.me/
therapy-24-01-8201](https://lead.me/therapy-24-01-8201)

2018 Swanenburg et al. – Frontiers in Physiology

Exergaming in a Moving Virtual World to Train Vestibular Functions and Gait



In 2018, Swanenburg et al. investigated the effectiveness of exergame training with the senso on vestibular functions and the gait pattern of older adults. The study showed positive effects on vestibular functions and various aspects of walking.

The aim of this study was to investigate the effectiveness of exergame training with the senso on vestibular functions and the gait pattern of older adults. Ten older adults were included in the study. The study participants carried out eight training sessions (twice a week for four weeks) with the senso. Each training session lasted 20 minutes and included four training games: Simple, Targets, Flexi and Snake. The games were projected onto a white wall using a projector. A special aspect of this training was that this projection moved during the training session (up/down or to the right/left). The study participants were forced to turn their heads while maintaining their body position. In addition, some of the study participants (for one game per training session) did not stand facing the wall with the game projection, but turned 90°, which meant that they had to turn their heads while maintaining a stable body position. The results showed an improvement in vestibular functions (gaze stability during head turns). There was also an improvement in several aspects of walking (gait initiation, walking backwards, walking on a narrow base). Walking with additional head turns also improved.



[Lead.me/
therapy-24-01-8201](https://lead.me/therapy-24-01-8201)

2019 Morat et al – Experimental Gerontology

Effects of stepping exergames under stable versus unstable conditions on balance and strength in healthy community-dwelling older adults: a three-armed randomized controlled trial



In 2019, Morat et al. presented the results of a study that investigated the effects of stepping exergames on stable and unstable surfaces. Training with the senso led to improvements in balance and calf muscle strength.

The aim of this study was to investigate the effects of training with the senso on a stable surface (normal senso) and on an unstable surface (senso on a Posturomed moving platform). Study participants were healthy older adults who were randomly assigned either to one of the training groups (senso stable, senso unstable) or to the control group (inactive). The participants in the two training groups trained with the senso three times a week for eight weeks, each training session lasting 45 minutes. Fifty-one participants were included in the study. The results showed an improvement in balance and calf muscle strength in both training groups with the senso. However, there are superior effects for training on the unstable, moving senso for reactive balance and functional mobility. No adverse events such as falls occurred in either group. It appears that training on unstable surfaces requires motor skills that are relevant to fall prevention.



[Lead.me/
therapy-24-01-8203](https://lead.me/therapy-24-01-8203)

2019 de Bruin – Frontiers in Aging Neuroscience

Playing Exergames Facilitates Central Drive to the Ankle Dorsiflexors During Gait in Older Adults; a Quasi-Experimental Investigation



The 2019 study by de Bruin investigated the effects of exergame training with the senso on neuronal drive during walking in older adults. The results showed an improvement in the neuronal drive of the lower extremities.

The aim of this study was to investigate whether exergame training with the senso has an effect on neuronal drive, measured here using EMG-EMG coherence in the tibialis anterior muscle during walking. Neuronal drive essentially means that “the brain talks to the body” or the connection between brain and body. Twenty older adults were included in the study. The study participants completed 18 training sessions on the senso, each lasting 20 minutes (three times a week over six weeks). The following training games were used for the training: Simple, Targets, Divided, Simon, Flexi, Snake, Seasons and Tetris. The results showed an improvement in the neuronal drive of the lower extremities after training with the senso. There was also an improvement in gait pattern (minimal toe clearance).



[Lead.me/
therapy-24-01-8204](https://lead.me/therapy-24-01-8204)

2019 Rebsamen et al. – Frontiers in Physiology

Exergame-Driven High-Intensity Interval Training in Untrained Community Dwelling Older Adults: A Formative One Group Quasi-Experimental Feasibility Trial



In 2019, Rebsamen et al. conducted a study on exergame-driven high-intensity interval training (HIIT) with the senso. The results showed excellent usability, high training participation and improvements in maximum performance.

The aim of this study was to investigate the feasibility and effectiveness of high-intensity interval training (HIIT) on the senso in untrained older adults. Twelve study participants performed HIIT on the senso three times a week for four weeks, with each training session lasting around 30 minutes on average. The training game Rocket was used for the HIIT, which was carried out in 2-minute units (with a heart rate of 70–90% HRmax) with 1-minute breaks in between. Less intensive training games were played during the breaks (e.g. Simple, Flexi, Simon, Snake etc.). The results showed excellent usability, very high training participation (91%) as well as high satisfaction and acceptance of this training by the older adults. No undesirable events occurred. There was also an improvement in maximum performance in a cardiovascular exercise test.



[Lead.me/
therapy-24-01-8205](https://lead.me/therapy-24-01-8205)

2020 Bakker et al – Experimental Gerontology

Balance training monitoring and individual response during unstable vs. stable balance Exergaming in elderly adults: Findings from a randomized controlled trial



In 2020, Bakker et al. analysed balance during exergaming on stable and unstable surfaces. The study showed that the perceived exertion was higher when exercising on unstable surfaces.

The aim of this study was to investigate individual effort during exergame training with the senso, as this is relevant for training success. This is a secondary analysis of a study that investigated the training effects of training with the senso (on stable and unstable surfaces, see Morat et al. 2019). The aim of this secondary analysis was to investigate the internal and external load during training with the senso (on stable and unstable surfaces). The study participants were healthy older adults who were randomly assigned to one of the training groups (senso stable, senso unstable) or the control group (inactive). The participants in the two training groups trained with the senso three times a week for eight weeks, each training session lasting 45 minutes. The performance in the training games was regarded as external stress, and the subjectively perceived effort (recorded by means of an assessment procedure) was regarded as “internal stress”. Fifty-one participants were included in the study. Interestingly, the results showed that the performance in the training games was not significantly different between the two training groups (on the stable or unstable senso). However, it was found that the subjectively perceived exertion was higher for those who exercised on the unstable senso.



[Lead.me/
therapy-24-01-8206](https://lead.me/therapy-24-01-8206)

2020 Swanenburg et al. – Frontiers in Neurology

Exergaming with integrated head turn task improves compensatory saccade pattern in some patients with chronic peripheral unilateral vestibular hypofunction



In 2020, Swanenburg et al. investigated the effects of exergame training with an integrated head rotation task on patients with peripheral vestibular hypofunction. The training showed an improvement in compensation in the vestibular system.

The aim of this study was to test the use of exergame training with the senso in vestibular rehabilitation. The effectiveness of training with the senso on vestibular functions and gait pattern of patients with chronic peripheral vestibular hypofunction (cPVH) was investigated. Twelve patients were included in the study. The study participants carried out eight training sessions (twice a week for four weeks) with the senso. Each training session lasted 22 minutes and included four training games: Simple, Targets, Flexi and Snake. The games were projected onto a white wall using a projector. A special aspect of this training was that this projection moved during the training session (up/down or to the right/left). The study participants were forced to turn their heads while maintaining their body position. In addition, some of the study participants (for one game per training session) did not stand facing the wall with the game projection, but turned 90°, which meant that they had to turn their heads while maintaining a stable body position. The results showed an improvement in vestibular functions (vestibular compensation in terms of smaller saccade amplitude) in patients with cPVH. There was also an improvement in walking (e.g. walking with additional head rotation).



[Lead.me/
therapy-24-01-8207](https://lead.me/therapy-24-01-8207)

2021 Huber et al. – Frontiers in Aging Neuroscience

Personalized Motor-Cognitive Exergame Training in Chronic Stroke Patients – A Feasibility Study



The 2021 study by Huber et al. focused on personalised motor-cognitive exergame training for chronic stroke patients. The results showed a high level of training participation and improvements in balance, gait pattern and psychomotor speed.

The aim of this study was to investigate the feasibility and effectiveness of a training programme with the senso for chronic stroke patients in an initial pilot study. The training programme was developed based on theory and includes personalised, progressive training for each patient. The training took place twice a week for eight weeks. The duration of the individual training sessions was 15–20 minutes at the beginning and was increased over time (in 3-minute increments per week) to 30–45 minutes. Ten patients completed the study. The results showed a high level of training participation (95%). The study also found an improvement in balance and gait pattern as well as psychomotor speed. These results motivated us to continue working on the training programme and to conduct another larger study.



[Lead.me/
therapy-24-01-8208](https://lead.me/therapy-24-01-8208)

2021 A. Schättin et al. – JMIR Serious Games

Design and Evaluation of User-Centered Exergames for Patients With Multiple Sclerosis: Multilevel Usability and Feasibility Studies



The development of specific exergames for patients with multiple sclerosis was the focus of the study by A. Schättin et al. The usability and feasibility of the games were rated positively.

As part of an Innosuisse project by Dividat together with ETH Zurich (Motor Control & Learning) and the Zurich University of the Arts (ZHdK), exergames/training games were developed specifically for the needs of multiple sclerosis (MS) patients. An interdisciplinary team (movement scientists, neuropsychologists, game designers) was put together for this purpose. Focus groups were held with MS patients and therapists. The newly developed games (Ladybug, Scooper/Sam's Garden and Cloudy) were tested in two studies, which investigated the usability and feasibility of the games with MS patients. The games were revised based on the results. The results showed that the newly developed training games are usable and applicable for patients with MS and that they find this type of training very motivating.



lead.me/therapy-24-01-8209

2021 Swinnen et al. – Alzheimer's Research & Therapy

The efficacy of exergaming in people with major neurocognitive disorder residing in long-term care facilities: A pilot randomized controlled trial



In 2021, Swinnen et al. presented the results of a pilot study on the effectiveness of exergaming with the senso in people with Alzheimer's disease. The training showed positive effects on cognitive performance.

The aim of this study was to investigate the effectiveness of cognitive-motor training on the senso for people with severe cognitive impairments (in long-term care facilities). The study participants were randomly assigned to either the training group or the control group. The intervention group trained with the senso for at least 15 minutes three times a week for eight weeks. The training programme focused on the games Simple, Birds and Targets, and Habitats was also added depending on the restrictions. The control group watched music videos during this time. Forty-five patients completed the study. The results showed improvements in walking speed, balance, reaction speed, general cognitive status and mental well-being in patients who trained with the senso. Training with the senso is a practical and effective approach for patients with severe cognitive impairments (e.g. in the context of dementia) and can help to improve physical and cognitive functions.



lead.me/therapy-24-01-8210

2023 Jäggi et al. – European Journal of Medical Research

Feasibility and effects of cognitive-motor exergames on fall risk factors in typical and atypical Parkinson's inpatients



The study investigated the feasibility and effectiveness of a senso training programme for Parkinson's patients in a rehabilitation clinic, showing a high training participation rate (97%) and an improvement in physical and cognitive functions such as balance and reaction time. Senso training proved to be a practicable, safe and effective approach for inpatient Parkinson's rehabilitation.

The aim of this study was to investigate the feasibility and effectiveness of a senso training programme for patients with Parkinson's disease in a rehabilitation clinic. The study participants were randomly assigned to either the training group or the control group. The control group received the standard treatment offered at the clinic. The intervention group also carried out training with the senso five days a week. Each training session lasted at least 15 minutes and included around five to seven training games. Depending on how long a patient was at the clinic, the intervention period lasted eight to 28 days with daily training. Forty patients took part in the study. The results showed good usability/operability and a very high training participation rate (97%). There were no adverse events such as falls. The study also found an improvement in physical and cognitive functions such as balance, responsiveness and attention in patients who trained with the senso. Training with the senso is a practical, safe and effective approach for Parkinson's patients in inpatient rehabilitation.



[Lead.me/
therapy-24-01-8211](https://lead.me/therapy-24-01-8211)

2023 Seinsche et al. – Frontiers in Public Health

Older adults' needs and requirements for a comprehensive exergame-based telerehabilitation system



The study analysed the needs for telerehabilitation among older people and healthcare professionals. Results show great interest, provided that the technologies are user-friendly and training and a contact person are available. Based on this, Dividat is developing the SensoFlex system for cognitive-motor training at home.

The aim of this study was to investigate the needs and requirements that older individuals/patients and healthcare professionals have with regard to telerehabilitation. Telerehabilitation means that information and communication technologies (ICT) can be used to provide training or therapy without physical contact, sometimes over long distances (e.g. at home). Six focus groups were conducted with a total of 34 participants. The results showed that both older people/patients and healthcare professionals are very interested in such approaches to telerehabilitation and would like to try them out. Important requirements are that the technologies used are easy to use, that appropriate training is provided and that a contact person is always available. Based on these results, Dividat is developing a telerehabilitation system with a product (SensoFlex) for cognitive-motor training at the patient's home.



[Lead.me/
therapy-24-01-8212](https://lead.me/therapy-24-01-8212)

2023 Altorfer et al. – Frontiers in Aging Neuroscience

Feasibility of Cognitive-Motor Exergames in Geriatric Inpatient Rehabilitation: A Pilot Randomized Controlled Study



The study investigated the feasibility and effectiveness of senso training for geriatric patients in a rehabilitation clinic. The results showed high usability, 99% training participation and improvements in walking speed, step reaction time and attention, confirming the training as safe, effective and suitable for geriatric patients.

The aim of this study was to investigate the feasibility and effectiveness of a senso training programme for geriatric patients in a rehabilitation clinic. The study participants were randomly assigned to either the training group or the control group. The control group received the standard treatment offered at the clinic. The intervention group also carried out training with the senso five days a week. Each training session lasted at least 10–15 minutes and included six or seven training games. Depending on how long a patient was at the clinic, the intervention period lasted two to three weeks with daily training.

39 patients took part in the study. The results showed excellent usability/operability and a very high training participation rate (99%) with no dropouts or adverse events. The study also found an improvement in walking speed, step reaction time and attention in patients who trained with the senso. This has reduced the risk factors for falls. The study was able to show that training with the senso is a practicable, safe and effective approach for geriatric patients in inpatient rehabilitation.



lead.me/therapy-24-01-8213

Conclusion

The wide range of scientific studies on the THERA-Trainer senso not only underscores the high relevance of this device in various areas of rehabilitation and health promotion, but also provides valuable findings for the further development and optimisation of training methods. The evidence-based results form a solid basis for the integration of senso into therapeutic approaches and show that innovative technologies such as the THERA-Trainer senso can make a significant contribution to improving quality of life and functional ability.

The senso was developed and scientifically validated by Dividat, a spin-off company of ETH Zurich specialising in the research and development of interactive training systems for prevention and rehabilitation. More information about Dividat and its senso research activities can be found at dividat.com

The research landscape surrounding the THERA-Trainer senso extends from 2016 to 2023 and offers a fascinating insight into the development of this innovative training and testing device.

SOURCES:

<https://dividat.com/forschung>



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