THE CLEVER THERAPY
**THIS IS TYROMOTION**

TYROMOTION GMBH is a world-leading producer of robotics- and computer-assisted therapy devices. The company’s focus is on providing a complete solution which enables doctors and therapists to treat their patients more intensively and make the rehabilitation process more motivating. With over 1,500 devices all over the world, reha-centers and therapy practices, TYROMOTION GMBH is globally represented.

The company, with headquarters in Graz, Austria, has additional sites in Germany and the USA. The distribution network stretches across the entire world.

**see also** TYRO’S WORLD – THE NETWORK

**OVER 1,500 DEVICES ALL OVER THE WORLD**

**MEDICLIN REHA-ZENTRUM RÖTER HÜGEL** – the modernly furnished interdisciplinary rehabilitation center in Bayreuth, Germany, comprises the departments of neurology, conservative orthopedics and geriatrics.

“We are extremely impressed by the devices. Personally, I particularly appreciate the nearly unlimited therapy options they offer. Thus, I can really tailor the rehabilitation to each individual patient.”
– Iris Ranft, Head of Department Occupational Therapy, Roter Hügel, Germany

**PRIVATE CLINIC LASSENZHOHE** – the private clinic Laßnitzhöhe has a custom-made TYROSOLUTION arm-studio, in which impaired and lost function of the arm and hand can be trained and regained.

“With the TYROSOLUTION we can provide diverse support for all phases of rehabilitative therapy. At our clinic, we particularly appreciate the flexible range of applications for the upper extremity.”
– Prim. Dr. Walter Kreuzig, Private Clinic Laßnitzhohe, Austria

**MOSS REHAB** has repeatedly been voted among the top ten rehabilitation clinics in the USA and is considered a world-leading institution. Moss Rehab was the first US-American rehabilitation clinic to be equipped with TYROSOLUTION devices.

“The engineers that work for TYROMOTION are pretty smart; they seem to understand what the needs of clinicians and their patients are. Patients – for the very first time – tell you "Doc, I actually like therapy. I want to be in therapy." Because not only are they using the TYROSOLUTION as an interactive, therapeutic approach but they are getting feedback and that feedback seems to be something they enjoy and appreciate.”
– Dr. Alberto Esquenazi, MD, Chair of the Department of Physical Medicine and Rehabilitation, Moss Rehab Einstein Healthcare Network, USA

Further reference clinics and practices, as well as more detailed information can be found here.
The TyROSOlUTION is a complete concept for the application of robotics- and computer-assisted therapy devices for the upper extremity. Adjusted to the needs of the individual, the TyROSOlUTION is suited for a broad patient spectrum throughout all phases of rehabilitation. The TyRO Software provides a gapless documentation and evaluation of the therapy progress and offers a huge range of therapy applications. For more motivation, efficiency and variety.

THE PABLO® SYSTEM
HAND-ARM REHABILITATION

TYROSTATION
THE THERAPY STATION

TYMO®
BALANCE TRAINING AND POSTURAL CONTROL

MYRO®
INTERACTIVE AND TASK-SPECIFIC THERAPY

AMADEO®
FINGER-HAND REHABILITATION

DIEGO®
ARM-SHOULDER REHABILITATION

PLUS VIRTUAL REALITY

THE CLEVER THERAPY

Scan the code and experience the TyROSOlUTION.
The Clever Concept

One therapy concept for the entire upper extremity in all phases of rehabilitation

Perfectly compatible devices for maximum effect and flexibility in therapy

For a broad patient spectrum, individual adjustment to neurological, orthopedic and geriatric patients of all ages

The Clever Application

Easy and intuitive handling for therapist and patient alike

Efficiency during therapy: short training phase, easy to use, quick setup and all data always in view — entirely without paperwork

Greatest benefit in the shortest time for more motivation

“The TYROSOLUTION convinced me with the easy handling and the therapy options it provides.”

– Peter David Lloyd, stroke patient, Australia

The Clever Software

Server solution with TYRO software for wireless networking of all devices, easy saving and recall of interactive therapy programs and patient data (also possible via tablet)

Vast number of interactive therapy programs for the training of motor and cognitive abilities, for maximum effectivity

Sophisticated assessments, clear documentation and well-structured visualization of therapy progress

“AMADEO and the PABLO system provide me with the option to document and recall the patient’s success and progress any time. This makes it easier to draw up reports for physicians and public health funds.”

– Daniel Ramming, Management, Therapy practice Autonomie Ergotherapie, Deutschland

Why TyroMotion?

9
The TYRO SOLUTION in detail.
One therapy concept for all age groups.
In all phases of rehabilitation.

OUR PRODUCTS
AMADEO®
MOVE YOUR FINGERS.

FINGER-HAND REHABILITATION
AMADEO is a computer- and robotics-assisted therapy device for fingers and hand in all phases of neurorehabilitation. In everyday life at the clinic and the practice, AMADEO guarantees flexibility: suitable for adults and children, the device can be easily adjusted to individual requirements. Such a perfectly tuned therapy program rapidly helps the patient gain quality of life and motivation. Depending on the rehabilitation progress, the therapist has the option to choose between passive, assistive and active therapy modules.

THE CLEVER THERAPY DEVICE
The patented AMADEO mechanism imitates the natural grasping movement of the hand. Specific exercises with the AMADEO help in cases of limited range of motion, motor function, strength and sense of touch. The finger movements stimulate the brain, and thus the reformation of synapses. Intensive training with a high frequency of repetitions particularly boosts the learning process. In addition, AMADEO reduces spasticity.

As it can be adjusted to the individual needs, AMADEO supports the patient in an intensity that makes it possible to train at the personal limit of performance.

After attaching the fingertips to the fingers and thumb, the therapist selects a customizable therapy program. Perfectly adjusted to the patient’s hand, automated motion sequences are then executed. Depending on the degree of the impairment, the patient can train passively, with assistance from the device, or actively at the individual limit of performance. EMG-triggered training enables early active training, even without muscular strength.

THE ASSESSMENT
Via bio-feedback the patient can follow the motion sequences acoustically and optically in real-time. Built-in sensors allow a quantitative documentation and evaluation of the occurring finger forces and the range of motion. The therapy progress becomes assessable and visible for the patient. This increases the motivation.

– 3 ADVANTAGES AT A GLANCE –
1 For all phases of neurorehabilitation
2 Greatest flexibility for a broad patient spectrum
3 Numerous applications for a more varied therapy routine

THERAPY WITH AMADEO®
PASSIVE, ASSISTIVE AND ACTIVE TRAINING.

AMADEO in moving pictures »

TYRO LINKED
Diego®

TRAINING IN SPACE.

Arm-Shoulder Rehabilitation

Diego supports the often difficult training to regain lost arm-shoulder-function in the neurological and orthopedic fields. Arm slings enable an easy fixation of the patient to the device, uni- and bilaterally. The unique overhead construction makes movement in three-dimensional space possible. Passive, assistive and active therapy with Diego guides the patient back to naturally accustomed activities.

With Diego the rehabilitation process becomes more varied, motivating and target-oriented.

GaininG momentum for both arms

The intelligent gravity compensation (IGC) enables an optimal mobilization of the arms even at an early stage of the rehabilitation process. Thus, natural movements and task-oriented training at the individual limit of performance is also made possible for patients with very little function. In addition, Diego scores with its bimanual application option. Compared to other devices on the market, Diego allows the patient to use both arms simultaneously. This brings therapy much closer to the everyday movements of a human being. Diego is suitable for children and adults in all phases of rehabilitation.

Virtual Reality Therapy

Diego brings movement in the treatment of the upper extremity. The playful and interactive training is conducted by means of specially developed uni-, two and three dimensional therapy modules. In 3D Virtual Reality Therapy, the immediate motion of the arm is represented on the computer screen. In combination with the Intelligent Gravity Compensation (IGC), the patient has the unique sensation of being able to execute lost function from the very start. This is incredibly motivating.

As part of the Tyrosolution, Diego comes with the Tyros software, which offers not just a multitude of therapy modules but also tracks and documents the therapy progress.

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– 3 advantages at a glance –

1. Active, assistive and passive therapy modules for uni- and bilateral training
2. Enables ergonomic, three-dimensional movement – thanks to Intelligent Gravity Compensation also at an early stage of rehabilitation
3. For the best motivating possible immersive Virtual Reality experience
The PABLO® SYSTEM presents new perspectives and possibilities in motor rehabilitati-
on. The core components of the wireless PABLO system are the PABLO handsensor, the PABLO Motionsensor, the PABLO Multiball and the PABLO Multiboard.

The wireless PABLO handsensor enables measurement of grasp and release force and various finger grips as well as ROM assessments. The additionally positioning of the Motionsensor enables a variety of therapies.

The PABLO Multiball trains pronation and supination of the lower arm, as well as extension and flexion of the wrist. Even at an early stage of rehabilitation, such as flaccid hemiparesis, targeted applications with the PABLO Multiball are possible.

The PABLO Multiboard can be used for repetitive distal and proximal single- and multi-joint exercises.

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**Hands-arm Rehabilitation**

Designed to be extremely compact and handy, the PABLO SYSTEM provides well-founded therapeutic possibilities to intervene on a functional, as well as on an activity level. It is superbly suited for the treatment of children and adults with neurologically, orthopedically or geriatric induced motor impair-
ment of the hands, arms, trunk and legs.

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ment of the hands, arms, trunk and legs.
Efficiency in Therapy
The TyROSTATION is a workstation for the PABLO SYSTEM and TyMO, which has been optimized for the challenges of everyday therapy. The integrated storage space keeps all devices plus accessories within reach and instantly accessible. The surface is height-adjustable and can be perfectly adapted to all patients. Thus, the TyROSTATION is not just suited as a support for patients standing up but also for wheelchair users. With the TyROSTATION, sitting gets on the way of an efficient therapy.

A Well-Designed System
Special storage slots in the work surface create order for the PABLO System (consisting of the PABLO handsensor, the PABLO Motionsensors, the PABLO Multiball and the PABLO Multiboard). Additional storage compartments at the side provide room for TyMO and the 1- and 2-D rolling elements. Pads and Multipad also have plenty of space in the TyROSTATION. And the accompanying stool offers the perfect surface for sitting exercises with TyMO.

One for All
The all-in-one PC has been equipped with the TyRO software. Thus, all devices can be used with the TyROSTATION without any hassle: for gapless documentation and evaluation of the rehabilitation progress.

TyMO in Rehabilitation – Measuring & Therapeutic Applications.

TyMO can be used statically, with an elastic support and as a movement board with selective movement axes. These functions have been taken into account in the measuring programs and therapy modules. As a result, the respective deficits of a patient can be addressed in an extremely individualized manner.

Static evaluation and therapy: force and weight distributions can be measured and trained in a playful manner with the patient standing, sitting and supporting himself/herself.

Dynamic evaluation and therapy: when a rolling element is placed underneath it, TyMO is mobile and can be used to analyze and train the ability of patients to preserve their equilibrium and/or to keep their balance.

The individually adjustable software TyRO with its playful design enables training in the motor and sensory limit of performance of each individual patient and additionally enables complete follow-up and documentation.

For more information about that, refer to » TyRO S

TyMO in Moving Pictures

TyMO impresses because of its versatility and most diverse application opportunities, such as the improvement of balance and postural control, as well as active use of force and support activities of the upper extremities. TyMO is also suited for stabilization training of the lower extremities.

The therapist can freely extend the preset starting positions (support, sitting and standing) in addition. 1- and 2-D rolling elements offer the option to use TyMO not just statically but also dynamically.

Due to the thin and wireless design, TyMO is barrier-free and flexible in use. The individually adjustable TyRO software enables training at the motoric and sensory limit of performance.

Neurological, orthopedic and geriatric patients of all ages can be treated with TyMO.

3 Advantages at a Glance
1. All devices stowed away, space-saving and always within reach
2. Height-adjustable, also suited for wheelchair users
3. For greatest efficiency during therapy

Cost Saving Solution
for Small Therapy Centers

Rehabilitation for the Entire Body
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Neurological, orthopedic and geriatric patients of all ages can be treated with TyMO.
MyRO®
ACTIVE. INTERACTIVE.
IN ALL POSITIONS.

MyRO is an interactive therapy surface which can be used in a multitude of ways: the MyRO sensors allow everyday life motor training with real objects on a responsive surface. MyRO reacts not only to motion but also to pressure. Graphomotoric therapy approaches can be realized flexibly and independently of consumables. Spatially explorative elements create more options for cognitive therapy. MyRO adapts to the needs of each patient; horizontally and vertically: MyRO is height-adjustable and the work-surface can be tilted from 0 to 90 degrees. And even MyRO’s responsive area can be scaled to the patient’s ability, which allows training at the personal limit of performance.

Therapy with MyRO®
Varied and Versatile.

MyRO supports task-oriented rehabilitation with real objects, trains everyday movements and improves the patient’s motor abilities. MyRO also offers a multitude of neurocognitive modules, which can be completed either alone or in multiplayer mode. Therapy with MYRO never gets boring.

The Interactive Surface for a Far-reaching Therapy

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3 ADVANTAGES AT A GLANCE

1. Flexible application options, such as therapy with real objects, for a broad patient spectrum
2. Incl. MYRO® for documentation and evaluation of the therapy progress
3. Combination of pressure sensitivity, sensor precision and scalable area of motion
tyroS®
THE SOFTWARE

THE THREE CORE AREAS OF THE SOFTWARE

1 INTERACTIVE THERAPY – Motoric, sensory and cognitive deficits can be playfully counteracted by means of a large number of therapy modules. Thus, the patient’s attention is directed at an external focus, even repetitive training becomes more varied and simply makes more fun.

2 ASSESSMENTS – Each device of the TYROSOLUTION includes the option to conduct assessments. Objective evaluation measures enable a perfect therapy adjustment to the patient. Progress is recorded and the rehabilitation process is made visible. This facilitates the diagnosis and creates motivation.

3 REPORT AND DOCUMENTATION – The TYROS® documentation system creates a patient file and saves all results of the diagnosis and the therapy progress. Every new diagnosis is automatically saved and the system creates a therapy report, as well as a final report. These include all data and a diagram of the therapy progress. This saves time and avoids tedious paperwork.

– 3 ADVANTAGES AT A GLANCE –

1 Simple and consistent, very little time required for training
2 Well-conceived documentation and report system
3 A huge selection of interactive therapy games and modules

TYROS® is a therapy software specifically developed for the TYROSOLUTION. The individually adjustable and playfully designed modules enable motivating training of motor, sensory and cognitive deficits of each patient and allow a gapless progress tracking and documentation. The software, which is also used for controlling the therapy process, has been developed in close cooperation with patients, therapists and doctors – together with Verena Schweizer the software has been extended to include cognitive therapy games from her neurotraining.

With TYROS® the TYROSOLUTION gains numerous additional aspects which make it possible to meet every single patient’s needs.
After robotic finger-hand training using the AMADEO® activation appeared "normalized", including the ipsilateral primary sensorimotor cortex and supplementary motor area (Pinter 2013). The practicability, safety, and clinical effectiveness of the AMADEO® system in stroke rehabilitation for acute (Sale 2012, Sale 2014), subacute (Hwang 2012, Orhuella-Espina 2016), as well as chronic patients (Stein 2011) have been demonstrated. Moreover, children with hemiparesis showed significant improvements after AMADEO® therapy and a carry over into bimanual skills during play (Bishop 2017). The I/O interface is used worldwide in fundamental research, i.e. brain-computer interface (BCI) to control the AMADEO® (Kaiser 2011, Gharabaghi 2014/2), transcranial magnetic stimulation (TMS) of the motor cortex combined with haptic feedback provided by the hand robot (Gharabaghi 2014/1), or selective estimation of individual finger movements from high-density surface electromyography signals (Caladon 2016).

The therapeutic potential of neuronal plasticity in cases of neurologic impairments is undisputed. Theories of cortical reorganisation after brain lesion suggest early, intensive, repetitive and contextual training as an ideal strategy to facilitate relearning of motor function and to minimise motor deficit.

When compared with conventional therapies, advantages of robotics-assisted therapy lie in the increased repetitions during training and motivation to train, as well as the opportunity for independent exercise. The latest Cochrane review found that robot-assisted arm and hand training improved activities of daily living, and function, and muscle strength of the affected arm in stroke patients (Mehrholz 2015).

In this context, the therapy with robotic- and computer-assisted therapy devices can make an important contribution to the optimization of the rehabilitation process (Wagner 2011, Hesse 2014). Thus, clinical guidelines recommend the use of robotic-assisted therapy devices in the rehabilitation of the upper extremity after a stroke (VA/DoD 2010, DGNR 2011).

The TYROSOLUTION concept unites these principles and provides robotic- and sensor-based systems suited for patients from the acute to the chronic phase and for all severity levels of motor impairment. The robotic devices support distal, repeti- tive and selective finger training and proximal functional arm training. In addition, the sensor-based devices address the entire hand and selective finger training and proximal functional arm training. The assist-as-needed adjustment of the intelligent gravity compensation allows task-oriented training early and at the individual limit of performance.

Both arms are involved in most everyday tasks, and therefore, bila- teral and unilateral retraining is necessary after stroke. All levels of impairment can benefit from appropriate bilateral training approaches (McCombe Waller 2008). Antigravity support can effectively reduce synergy-dependent coupling, maximise joint excursion, and reach of the paretic arm (Kwakkel 2014). The assist-as-needed ad-

IEIMPAIRMENT SEVERITY / PATIENT ABILITIES

SÉRIEUX GAMING

Therapy games actively involve the patient – they will get better while having fun. Commercial videogames are engaging but lack the functionalities required for rehabilitation (Borgese 2013). The therapy cross-system software TYRO stands out for its versatility in subacute to chronic stroke: a prospective randomized clinical trial of efficacy. Clinical Rehabilitation 2013 Aug; 27(8):734-45.

In the chronic phase of stroke, the patient’s sensorimotor system still experiences changes, especially with regard to the affected hand (Huang et al. 2010; Hesse et al. 2011). Sensor-based interactive therapy for the whole BODY

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Sale P, Lombardi V, Franceschini M, Group. Clinical study: hand-robotic virtual reality for upper limb motor recovery in stroke patients (Villafaz-Dio 2016). The playful and motivating application approach benefits patients and therapists alike. Studies have shown that therapy games increased motivation to engage in rehabilitation activi-

AFTER ROBOTIC- AND COMPUTER-ASSISTED THERAPY

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TAILORED TO CHILDREN

Therapy with children is particularly close to our heart. Therefore, the TYROSOLUTION provides a choice of products which is ideally suited for the needs of younger patients. Thanks to a specially developed hand-finger-rest, AMADEO perfectly fits small hands and fingers. The AMADEO Fingerfix plasters are also available in child-size. In therapy with DIEGO, special arm slings provide perfect support. The greatest advantage of the TYROSOLUTION lies in the playful approach of the therapy modules.

REACHING YOUR GOAL WITH GAMES

The interactive therapy games of the TYROSOLUTION are particularly effective with pediatric patients, as the child's attention is directed at an external focus. Repetitive training is no longer perceived as such. Instead, it’s about putting out a fire, collecting apples, steering cars, maneuvering hot air balloons and much more! The large selection of programs ensures that therapy never gets boring. Various difficulty levels make an adjustment to the child’s limit of performance possible. This sparks ambition and motivation. And what's probably most important: therapy makes loads of fun and appetite for more.

MORE FEELING FOR YOUR FINGERTIPS

The app provides special finger- and hand-exercises on the iPad. You can choose between numerous different movement patterns for one or more fingers, which need to be traced. The user receives individual feedback about the precision and execution of the exercise after each training session.

ONE APP, MANY ADVANTAGES

The Finger Motion App allows clinics to be closer to their patients than ever: even after completion of the patients’ therapy program. Create your own in-app homepage and connect with your patients. The additional offer makes you as a clinic unique, attracts new target groups and increases revenue!

APP ADVANTAGES

- Free clinic ads on your in-app homepage – completely individual
- Additional offers and services for patients
- Motivating exercises for greater patient satisfaction

FINGER MOTION at the Apple iTunes Store >

FINGER MOTION at the Apple iTunes Store >
What makes a manufacturer of medical devices one of the leaders in the business? In addition to high-quality products and services, as well as constant further development of a solution concept, it is one thing in particular: being close to one’s customers.

TYROMOTION GmbH with headquarters in Graz has branch establishments in Germany and the USA. The innovative therapy units are used in rehabilitation centers and hospitals world-wide. The distribution network extends across the entire globe.
Our objective is to improve the independence and quality of life of people with disabilities and, therefore, improve the rehabilitation process holistically.

We aspire to become the global market and innovation leader for robotic and computer assisted therapy. Our focus is on providing a complete solution which supports doctors and therapists to offer their patients effective and reliable therapy concepts and to make rehabilitation more motivating and fun.

To achieve these goals, we commit to being a high performance, top quality and fast learning organization. We strive to create a fulfilling environment for all employees in which an individual’s abilities and ideas are connected with a sense of purpose and team achievement and where we can work, play and grow together.

AWARDS

Our dedication has been regularly acknowledged, both nationally and internationally. Naturally, we are particularly excited about that and feel encouraged for the future. Among our awards are such prestigious prices as the Design Management Europe Award and the Austrian State Award for Innovation. We see such distinctions as confirmation of our course and will continue our path; always with the needs of our target groups in mind.

For further information, you can go to www.tyromotion.com/en

CERTIFICATIONS

TYROMOTION GMBH is a certified manufacturer of medical devices and is subject to strict international guidelines. In order to always remain up-to-date with regards to product- and service quality, we regularly conduct internal and supplier audits.

- ISO 13485 (with extension for Canada – CMDCAS)
- 93/42 EWG Annex II (full quality assurance system)