DIEGO®

ARM ROBOTIC THERAPY

PART OF THE
TYROSOLUTION

FACTS AND EXERCISES FOR PHYSICIANS, THERAPISTS AND PATIENTS.

TYRO LINKED
DIEGO IN ACTION

tyromotion

DIEGO®
ARM-SHOULDER REHABILITATION

DIEGO® is a robotic arm and shoulder rehabilitation device for patients suffering from motoric dysfunctions. It offers ROM assessments as well as functional therapies for the upper extremity. The patient setup is quick and easy via arm slings that attach to the arm both unilaterally and bilaterally. The unique overhead construction of **DIEGO®** offers a three-dimensional range of movement. It is accessible for both mobile and wheelchair patients.

DIEGO® supports the training of lost arm-shoulder functionalities in neurological, pediatric, orthopedic and geriatric impairments. The active weight relief of the arms, IGC (Intelligent Gravity Compensation) promotes an optimal mobilization of the arms early on. This distal support allows for a proximal initiation of movement, which facilitates natural sequences of motion and task specific training at a low functional level and within the individual limits of performance.

Besides the active therapy, **DIEGO®** supports patients in assistive therapy only as much as needed, thus forcing severely impaired patients to exercise actively and independently. Furthermore, various assessments allow the therapist to check the patient's progress objectively and present the results in a comprehensive and motivating manner.

PART OF THE
TYROSOLUTION

NEW THERAPEUTIC APPROACH

The **DIEGO®** arm- and shoulder therapy system consists of two overhead arm units. Individually adjustable arm slings allow for a physiological connection of the patient's arm to the motor controlled ropes. Sensors in the device capture the arms' positions as well as the joint angle. Each arm unit contains two motors that allow for an independent intelligent gravity compensation (IGC) of the patient's elbow and wrist. The system can be operated with either one or two arm units. The use of two arm units allows for a cooperative, simultaneous training of both arms. By individually positioning the patient with the back to or facing the screen the therapist has a whole range of new therapeutic approaches to choose from. The end effector approach allows the therapist to directly support the patient during the therapy session.

DIEGO® FACTS

1. Robotic and sensor based rehabilitation device
2. Unilateral and bilateral therapy in one device – no configuration necessary
3. Assistive and interactive therapies for the whole arm
4. Applicable for adults and children in all rehabilitation phases
5. Short setup time of patient to device
6. End effector system (hands-on possible)
7. Assist-as-needed with intelligent gravity compensation (IGC)
8. Enables task oriented training

EVIDENCE BASED - Results "Cochrane Review"*

"Electromechanical and robot-assisted arm and hand training improved activities of daily living in people after stroke and function and muscle strength of the affected arm."

Mehrholz J, Pohl M, Platz T, Kugler J, Elsner B. Electromechanical and robot-assisted arm training for improving activities of daily living, arm function, and arm muscle strength after stroke. Cochrane Database of Systematic Reviews 2015, Issue 11.

DIEGO® VR

"Virtual Reality" conveys the feeling of being in different surroundings. The **DIEGO® VR** system offers promising therapy options for patients suffering from various neurological disorders. The integrated sensors recognize the different positions of the arms in a three-dimensional space and transfer them to virtual reality applications. During therapy, the patient wears VR glasses, which allows them to enter their virtual surroundings. This will support the cognitive rehabilitation and stimulate the neuroplastic changes in the brain. **DIEGO® VR** applications specifically developed by Tyromotion simulate surroundings in which patients master tasks that often can be too difficult in real life. Functional tasks can be trained more often and with a greater sense of security. **DIEGO® VR** leads to more confidence, increased motivation and an intense experience.

THERAPY APPLICATIONS

Adults	✓
Pediatrics	✓
Neurology	✓
Orthopedics	✓
Geriatrics	✓
Wheelchair suitable	✓
Intelligent Gravity Compensation (IGC)	✓
Measurement programs for shoulder and elbow	✓
1D Therapies (ROM)	✓
2D Therapies (ROM) sagittal- frontal/transversal planes	✓
Virtual reality	✓
Symmetric therapy	✓
Passive therapy	✓
Active therapy	✓
Assistive therapy	✓
Cognitive therapies according to Verena Schweitzer	✓
Uni- and bilateral training	✓
Robotic and computer supported therapy device	✓
End effector system	✓
Seating position facing/not facing the screen	✓
Task oriented training with objects	✓
"Hands-on" with the patient	✓
Class IIa medical device (CE and FDA proved)	✓
Evidence based	✓

Steve, a strong guy from the United States, fell off the roof in 2015 and has been a tetraplegic since. This form of paraplegia affects all four extremities – legs and arms. After 1.5 years of conventional therapy Steve tested our DIEGO. His reaction to the interactive therapeutic games, such as car racing, was enthusiastic.

"I experience a real wow-effect. A completely new dimension of hope...It does not feel like physiotherapy at all...rather like I am driving a racing car..."

"Virtual Reality" allows the therapy applications to become even more realistic and motivating. Steve puts on his VR glasses and almost feels the wind…

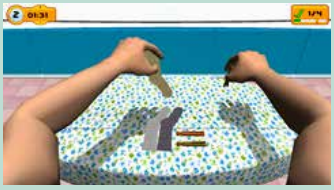
SOFTWARE TyroS

The therapy software **TyroS** has been developed in collaboration with patients, therapists and physicians and supports **DIEGO®** with various assessments and interactive therapeutic games. With its ease of use and comprehensive layout **TyroS** offers a gapless follow-up and rehabilitation documentation. The individually adjustable and intuitive software supports the patient's training of motoric, sensoric and cognitive deficits. Different levels of difficulty, mirroring of the display and the adjustability of visual und auditive feedback allow for a customized therapy, which stimulates the motoric learning process and renders the high amount of active repetition necessary for the neuroplasticity. The **TyroS** documentation system saves all individually chosen settings as well as the therapy progress in the respective patient file. A complete final report including therapy progress is generated at the end of the therapy, allowing physicians and therapists a reliable overview.

DIEGO® IN PRACTICE

INTERACTIVE THERAPEUTIC GAMES

Motoric, sensoric and cognitive deficits can be improved playfully with a number of therapy modules. The patient's attention is directed to an external focus; repetitive training becomes more varied, exciting, and fun.



ASSESSMENTS

DIEGO® offers objective evaluation measures in order to perfectly customize the therapy for each patient. Progress is shown and the rehabilitation progression are illustrated, which simplifies the diagnosis.

REPORTING AND DOCUMENTATION

TyroS saves all diagnosis and therapy results in an electronic patient file that is created by the therapist at the start of the rehabilitation process. Each new result is saved automatically and merged into a final report including progression charts and all data by the system.

DAILY USE

With the **DIEGO®** system, activities of daily living can be incorporated in each therapy session and repeated numerous times. This actively supports intensive task oriented training.

CHILDREN AND ADULTS

The optimized design of the device allows for a quick change between adults and children.

END EFFECTOR SYSTEM

The end effector approach quickly and safely connects the patient to the device. This leaves more time for the effective training which allows the therapist to intervene at any time. The therapist can facilitate desired movements and easily correct when necessary.

DIFFERENT THERAPY OPTIONS

With the **DIEGO®** system, patients can either sit with their back to the screen or facing it. In this way, **DIEGO®** supports both interactive therapies with **TyroS** and task oriented training with objects. A big number of **TyroS** therapeutic games facilitate symmetrical and asymmetrical movements as well as cyclical and cooperative sequences of movement.