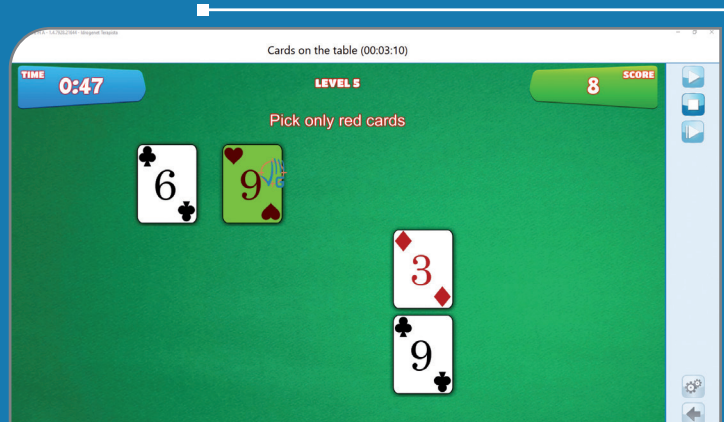GLOREHA
by BTL

**R-LEAD** offers cognitive exercises and interactive games focusing on free arm, wrist and hand movements.

The patient moves his upper limb in space, in absence of gravity.

The set-up is immediate: nothing to wear on the patient.



Motor recovery is never separate from **neurocognitive** recovery.

R-LEAD proposes exercises, inspired by tests and activities typical of neuropsychological treatment, to train selective attention, divided attention, shifting abilities, visual-spatial exploration skills, memory, etc.

Colours, numbers, images, playing cards: the software proposes interactive cognitive stimulation exercises, tailored to the patient. The playful aspect and the combination of motor tasks facilitate the compliance level of the patient with cognitive deficits.

Rehabilitate while having fun: the software offers several **challenging and recreational exercises** based on active upper limb movements detected by a specific sensor.

▪ The graphic interface involves the patient and enhances the playful aspect of the treatment.

▪ The motor exercise is carried out within an immersive context: the patient guides a character in the execution of tasks of varying complexity or controls a cursor in the solving of quizzes of increasing difficulty.

▪ The exercise **difficulty level** can be programmed by the therapist or can auto-adjust based on the patient's performance.

▪ Patients and therapists have immediate feedback on the performance trend.

▪ The level of compensation is calibrated according to the weight of the arm and the patient's residual capacity of control and movement.

**Range of movements** detected by R-LEAD:

▪ finger flexion-extension,

▪ wrist pronation-supination,

▪ radial-ulnar deviation,

▪ wrist flexion-extension,

▪ arm movements in vertical and horizontal planes (back-forth, right-left, up-down).

# R-LEAD

R-LEAD is the sensor-based system for therapeutic upper limb treatment and neurocognitive training.

## CLINICAL EFFICACY PROVEN BY SCIENTIFIC PUBLICATIONS

## ON THE MARKET SINCE 2011

## INTERNATIONAL NETWORK

## MORE THAN 10,000 PATIENTS TREATED EVERY YEAR
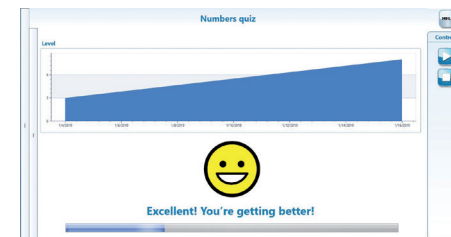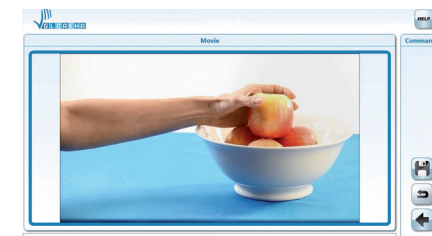
## MADE IN ITALY

# SOFTWARE

Involves the patient with audio and visual effects, 3D movement simulations, engaging, challenging, and fun serious games
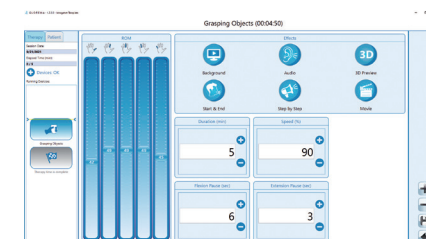
Provides feedback on the patient's performance and stores all therapies

Enables the therapist to upload new videos to be shown as preview and tutorial before the motor exercise

Allows customizing the exercises, adapting to the peculiarities of each patient from time to time

Guides the patient through customizable vocal messages

# CLINICAL REFERENCES

**Dr. Luciano Bissolotti**
**Domus Salutis Rehabilitation Center**
**Italy**

"I had the opportunity to realize how much the robotics, in particular Sinfonia, was able to quickly act to the mutual satisfaction of the clinician and the patient.
In particular, within a few sessions, it was immediately possible to record a reduction in focal spasticity with a significant reduction in the Ashworth scale values"

**Dr. Franco Molteni**
**Villa Beretta Rehabilitation Center**
**Italy**

"The movement is experienced, imagined and perceived by the patient, thanks to the execution of activities the glove makes possible"

**Ullrich Thiel**
**Hellmuth & Thiel Praxis**
**Germany**

"Gloreha glove offers the patient the possibility to feel the object, grasp it autonomously and to benefit of a high quality proprioception stimulation"

**Tatiana Jeglic**
**Center Fizioterapije Ljubljana**
**Slovenia**

"I chose Gloreha because it allows the patients to really feel and manipulate the objects, and also bimanual or bilateral activities. We can really improve their ability to perform their daily life activities in better quality of movement"

## MULTIDISCIPLINARY REHABILITATION PROJECT

## SOLUTIONS FOR ALL PHASES OF REHABILITATION

## AGELESS SOLUTIONS FOR CHILDREN AND ADULTS

## COMBINED FUNCTIONAL, COGNITIVE AND MOTOR REHABILITATION

Stay up-to-date on our news

www.gloreha.com

## Clinical indications

Gloreha devices are extensively used on neurologic patients with motor and/or cognitive deficits. They can be effectively applied in sub-acute as well as in chronic phase to support distal, proximal, functional and cognitive recovery.

The most frequent indications are: Stroke, Traumatic Brain Injury, Spinal Cord Injury, Cerebral Palsy, Parkinson's Disease, Peripheral Neuropathies, Neurodevelopmental Disorders.

Gloreha devices can also be useful supports in the treatment of patients with **musculoskeletal disorders** and in the post-operative stage.

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" *Robot-assisted training using the Gloreha device demonstrated beneficial effects on body structure and function, including upper extremity motor function, brachioradialis muscle recruitment, and coordination, in children with Cerebral Palsy. The beneficial effects were maintained 1 month after training termination.* "

Kuo FL, Lee HC, Hsiao HY, Lin JC. Robotic-assisted hand therapy for improvement of hand function in children with cerebral palsy: a case series study. Eur J Phys Rehabil Med. 2020 Apr;56(2):237-242. doi: 10.23736/S1973-9087.20.05926-2. Epub 2020 Jan 14. PMID: 31939267.

" *Gloreha glove is feasible and effective in recovering fine manual dexterity and strength and reducing arm disability in sub-acute hemiplegic patients. [...] Patients in the treatment group significantly improved the motor function of the paretic upper limb (Motricity Index), their coordination and mono-manual dexterity (Nine Hole Peg Test) and strength (Grip and Pinch) in contrast to controls, and the cost savings was considerable.* "

Vanoglio F, Bernocchi P, Mulè C, Garofali F, Mora C, Taveggia G, Scalvini S, Luisa A. Feasibility and efficacy of a robotic device for hand rehabilitation in hemiplegic stroke patients: a randomized pilot controlled study. Clin Rehabil. 2017 Mar;31(3):351-360. doi: 10.1177/0269215516642606. Epub 2016 Jul 10. PMID: 27056250.

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" *According to recent literature, the hand rehabilitation program with Gloreha provides an intensive, repetitive, functional, task oriented, specific, and customizable treatment. [...]*
*The exercises with devices work on plasticity in the central nervous system due to the neuromotor, audiovisual feedback: the multisensory action-observation system enables patients to re-learn impaired motor function through the activation of internal action-related representations. [...]*
*Our results showed a great improvement on the ADL and positively marked functional recovery of motor function. An important aspect of our study was the association of robotic therapy with the traditional rehabilitation-based approach of physiotherapy and OT to provide more full and intensive sessions to improve the outcome.* "

Milia P, Peccini MC, De Salvo F, Sfaldaroli A, Grelli C, Lucchesi G, et al. Rehabilitation with robotic glove (Gloreha) in poststroke patients. Digit Med 2019;5:62-7

## Clinical benefits

- Maintenance and improvement of the joint range
- Proprioceptive stimulation
- Improvement of visual-spatial and attentive skills
- Increase in functional independence
- Reduction of pain, oedema and hypertonia
- Prevention of adhesions, contractures, and immobilization damages
- Improvement of joint metabolism, lymphatic and blood circulation
- Maintenance of functional skills and body perception
- Increase in coordination and dexterity
- Increase in grip and pinch strength

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