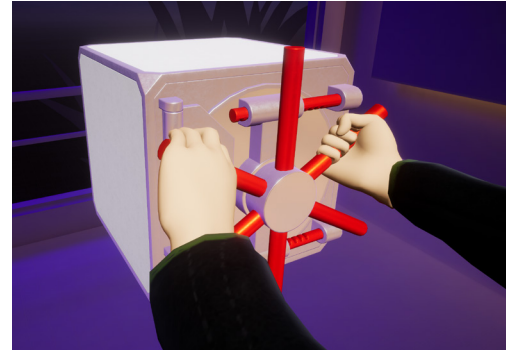


# CUREO<sup>®</sup> 3

Virtual Therapy – Real Success



# What is CUREO®?

Countless studies demonstrate the high potential of immersive therapy based on virtual reality (VR). But so far, the practical implementations have not yet met the clinical requirements.

With CUREO®, an innovative, sophisticated VR therapy system is finally available to you and your patients. Consisting of pre-installed software and hardware, CUREO® is immediately applicable and in use in leading, international clinics. Modular training units in a VR environment playfully support cognitive and sensorimotor rehabilitation. Motor skills of the upper extremities as well as the trunk are promoted. From the hospital bed in clinical rehabilitation, to outpatient therapy, e.g. in a wheelchair, to aftercare, CUREO® can be used transsectorally.

CUREO® motivates patients and thus promotes the success of therapy. Therapists can care for several patients at the same time - in this way, resources can be used optimally and high-frequency therapy can be guaranteed for patients.

The CUREO® software is CE certified as a medical device.

---

**Our innovative approach to therapy has received several awards:**



„Der Deutsche  
Innovationspreis“

Category:  
„Start-ups“



DIGI HEALTH AWARD WINNER



Digi Health Talk

2020



# CUREO® – one system, many advantages

CUREO® was developed in an iterative process together with therapists, medical professionals and patients.

The uniqueness of CUREO® consists  
is that by using virtual reality and  
gamification of digital content, the  
impact is multiplied and recovery time is  
**accelerated.**



Alexander Felsenberg, Chairman WSA-Germany,  
Member of the Board WSA-Global



## Immediate start of therapy

CUREO® is bedside compatible, brings therapy to the patient, and provides immediate, high-frequency training. There are no infrastructure requirements.



## High therapy frequency

CUREO® allows one therapist to take care of several patients at the same time – for personnel relief and, at the same time, qualitatively as well as quantitatively improved care.



## High Motivation

By immersing patients in virtual worlds, the frustration caused by the pathologizing, clinical environment is reduced. Thanks to gamification, patients experience a sense of achievement, which sustainably increases motivation and overall therapy success.



## Suitable for aftercare

CUREO® enables new aftercare concepts through mobile, outpatient use at the patient's home and sustainable quality of care.

# CURE<sup>®</sup> Update 3.0

## Longlasting motivation thanks to Gamification

Gamification has a positive influence on motivation and the success of therapy. This has been proven by studies and feedback from our patients. New competitive high score modes activate the reward system and sustainably promote fun, motivation and performance of patients even over longer therapy periods.



### Target archery

- Targets and switchable aiming aid
- More realistic environment for more immersion
- Training of concentration, perception, upright posture and for stress management



### Kite flying in Iceland

- Earn points by steering the kite through clouds
- Special challenges: Thunderclouds as disruptive elements
- Promotes selective attention

## Playful exercises for Fine motor skills of the fingers and hands

In CURE<sup>®</sup> 3, additional finger exercises are available that are targeted and can be used for fine motor skills. These allow an even wider range of motor challenges as well as better selection and therapy of individual fingers.



### ADL-Cube

- Interactive therapy cube with a variety of fine motor skills exercises, both one-handed and two-handed
- Activities of daily life are reflected
- E.g.: Operate a switch, press a lever or button, turn a wheel



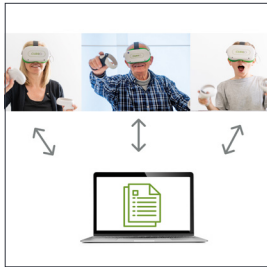
### Hand opening and closing

- Training of opening and closing the hand alternately
- Training in dealing with disruptive elements and selective perception
- Suitable for neurologically impaired patients or after hand surgery



## Data synchronization and Documentation of therapy use

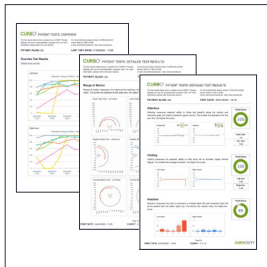
With our new Sync tool, you can manage your patient data in a clear and consolidated manner. When using multiple systems, patient settings can be transferred quickly and easily thanks to the Sync tool. This means that every patient can be treated with every system.



- Patient-independent use of the systems
- Flexible data exchange between systems with central back-up and storage facility
- Documentation of therapy minutes provided or the duration of use of the modules



## Increased data security

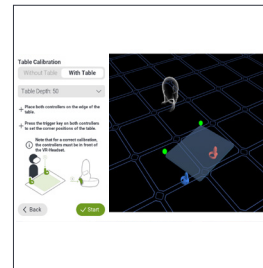


- Progress data and therapy progress are stored securely and reliably, are easily accessible for practitioners
- 256-Bit-Encryption of all data (AES-256\_CBC)



## Quick calibration and Operator facilitation

CURE<sup>®</sup> is used in many clinics on a daily basis with a wide variety of patients. We are pleased to be able to continuously optimize our system on the basis of feedback from our users. For example, we have adapted our usability to the most frequently mentioned wishes.



- Faster, easier to adjust, reliable calibration, even in the hospital bed
- With just a few clicks, e.g. determine the size of the therapy table; more time is left for therapy
- In mirror therapy: unused hand faded out to focus attention more on the mirrored hand



## Multilingual system

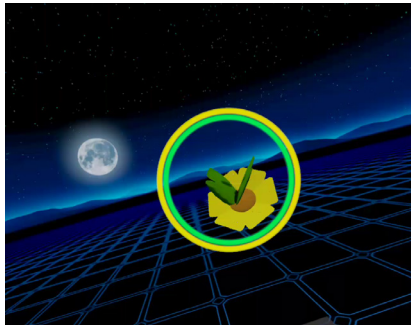


- New languages: Finnish, Swedish, Arabic, Slovenian, Spanish
- Operating language of the tablet and the language of the instructions for patients can be set independently of each other
- Enables therapy of people of different nationalities

## Targeted modules for successful therapy

**CUREO®** offers 6 modules that can be flexibly and continuously adjusted in terms of difficulty. Thus, depending on the patient's ability and need, it is possible to select which module is performed. For example, if the patient can only move his head, the "active" module offers suitable exercises in which objects are tracked only with the gaze. In the "Taiko" game, for example, the location of the drums can be adapted to the patient's range of motion as part of amplitude training.

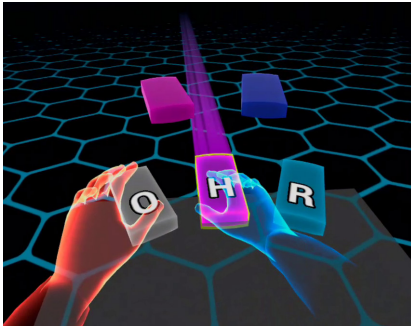
Furthermore, additional functions, such as the mirror mode, can be added to all **CUREO®** modules to create a further cognitive and motor stimulus. Between exercises, units of the "relax" module can be performed to both rest and maintain and increase therapy ability. In this way, different therapy goals can be addressed and realized.



The active module is suitable for severely affected patients. Already in early rehabilitation it stimulates and activates attention and supports the reduction of neglect. The therapy can be completed by means of gaze guidance.



The moto module includes bi- and unilateral motor training of the upper extremities and promotes active and goal-oriented mobility in motivating therapy games.



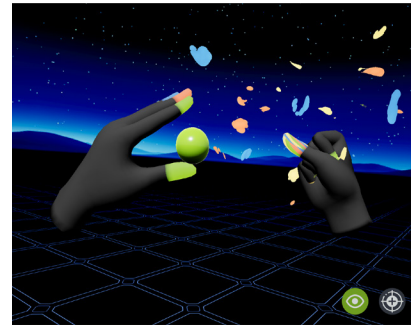
The cogni module offers cognitive and sensory training. It promotes color and shape recognition, word finding, spatial perception, coordination and memory.



The relax module promotes neuroregulation, stress reduction and pain relief and is suitable for all patients. It supports compliance and readiness for therapy thanks to explorative environments, interactive mini-games, breathing exercises and color therapy.



In the daily module, everyday situations are practiced in a virtual environment, e.g. a therapy kitchen, such as using tools or utensils.



In the finger module, fine motor skills as well as mobility and coordination of the hands and individual fingers are trained. By performing manual activities, the patient practices skills such as holding and grasping (e.g. power and tweezer grasp).

## Indications

**The therapy system was developed for use on patients for, among other things for following indications:**

- Stroke of ischemic or hemorrhagic etiology with residual hemiplegia/ paresis
- (Infantile) cerebral palsy
- Spinal cord injuries (Commotio, Contusio, Compressio Spinalis)
- Traumatic brain injury
- Musculoskeletal diseases
- Neuropathy (Guillain-Barré syndrome, PNP)
- Neurodegenerative diseases (e.g. multiple sclerosis, Parkinson's disease, ALS)
- Ataxia of the upper limbs and trunk

## Application areas

**CUREO® addresses cognitive, sensorimotor, perceptual, and upper body impairments as well as the upper body region:**

- Perception and attention disorders
- Memory and learning disorders
- Disturbances in planning and orientation
- Limitations in solving problems
- Impairments in the area of proprioception, shape and color recognition
- Neglect/restriction of the visual field
- Apraxia

**CUREO® addresses the upper body region:**

- Upper extremities including shoulder girdle, upper arm, Forearm and hand and fingers
- Trunk as well as head movements

## Therapy goals

**Promoting cognitive skills such as:**

- Spatial, shape and color perception
- Attention and perception
- Remembering and learning
- Planning and executive functions
- Memory performance

**Promote motor skills of the upper extremities and trunk such as:**

- Extent of movement, quantity and quality of movement
- Coordination and proprioception
- Postural control in sitting and fall-secured in standing position
- Rich function of the upper extremities
- Hand and finger functions (basic grasping functions and hand opening)
- Fine motor training of the hand, e.g. tweezers and power grip
- Finger movement

**General improvements such as:**

- Stress, anxiety and pain reduction, as well as the alleviation of Depression
- Body awareness (self- and tone regulation)
- Therapy motivation (compliance and adherence)
- Mood enhancement
- Neuroregulation

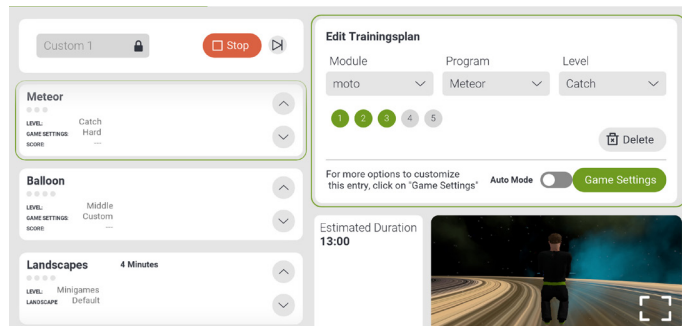
**Disclaimer:** On our website you will find a detailed list of indications, therapy goals and areas of application. Info at: <https://www.cureosity.de/indikationen>



# Efficient therapy tools

## Automated training plan

With the training plan, you receive an efficient tool with which a personalized, varied therapy program can be put together. The plan adapts to the changing needs of patients during the course of therapy and offers relief in everyday therapy.



## Extensive patient testing

Patient testing can be used to assess a patient's sensorimotor cognitive abilities and make the proper training adjustments. The following abilities are tested:

- Range of motion
- Attention
- Memory
- Reaction
- Holding
- Accuracy

## Progress visualization

After the tests have been performed, the results can be exported and provide an excellent overview of progress - for both patients and therapists.



## Group therapy

With CUREIO®, a therapist can treat several patients at the same time. The possibility of group therapy conserves valuable resources and helps you to master demanding challenges in everyday therapy.



# Unique therapy functions

## Embodiment via an avatar

- Patient's movements are transferred to an avatar in VR, patient interacts with virtual world
- Direct visual, acoustic and haptic feedback
- See also „Outlook“ on page 13

## Gamification

- Playful curiosity is awakened
- Level-based, varied game modules activate the reward system and provide self-motivation

## Mirror therapy

- Cross-module, switchable mirror therapy function
- Unique in terms of immersion, adjustment options and precision



## Sonification

- Free movements create sounds
- By sounding the movement, perception of the affected limb is activated synesthetically auditory

## Stepless adaptation to each patient

- Difficulty, localization and speed of exercises parametrically adjustable
- Page distribution or bilateral weighting also customizable
- Automatic, individual adjustment to progress thanks to auto mode

## Transsectoral use

- CUREO® is compact and mobile
- Can be used regardless of time and place
- Therapy can be adapted from phase B to F of rehabilitation

## Remote ability

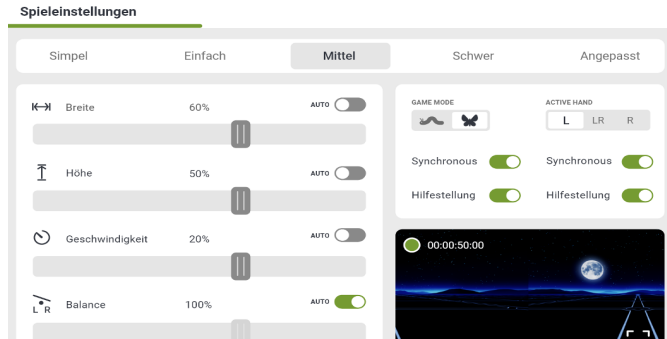
- Therapy control at a distance
- Contact-free therapy with reduced risk of infection

## Motion sickness prevention

- Incorporation of neurophysiological and neuropsychological principles and use of the latest technology in hardware and software ensure that patients should not experience dizziness or motion sickness
- Development effort pays off and ensures satisfied patients

## Effective and user-friendly operation

- Therapist can provide therapy fluently and without interference change during therapy and take different perspectives
- The CUREO® system is multilingual: German, English, Dutch, French, Italian, Finnish, Spanish, Swedish, Slovenian and Arabic are available



## Optimally tailored integration of CUREO®

More and more international clinics are using CUREO® within their daily therapy routine. The Bad Segeberger clinics, for example, show how CUREO® can be integrated efficiently and individually. A separate room has been set up in the day clinic for CUREO® therapy.

The ceiling construction with height-adjustable ropes and safety belts should be emphasized, so that the therapy can be carried out secured against falling while standing.



## More Highlights:

- Smart sideboard for storage and charging devices
- VR therapy is prescribed for stroke patients by occupational therapists as motor training of the upper extremities
- Parkinson's patients are trained mainly in the standing position
- Up to five patients can be cared for by only two therapists in parallel – this saves time and resources

We will be happy to work with you to develop your own concept for the integration of CUREO®.

# Clinical evidence of VR therapy

Research has long shown that the use of new technologies as well as digitized applications can optimally complement classic therapy methods to create greater added value for patients.

## VR therapy as a valuable rehabilitation support

For example, a systematic review from the Research Centre on Aging demonstrates that VR therapy applications reduce pain while improving motor function (Bordeleau et al. 2021). Furthermore, an article from the American Journal of Physical Medicine & Rehabilitation describes the benefits of traditional therapy methods in combination with VR-based rehabilitation for stroke patients. The authors summarize that this combination improves motor skills as well as manual dexterity (Fang et al. 2021).

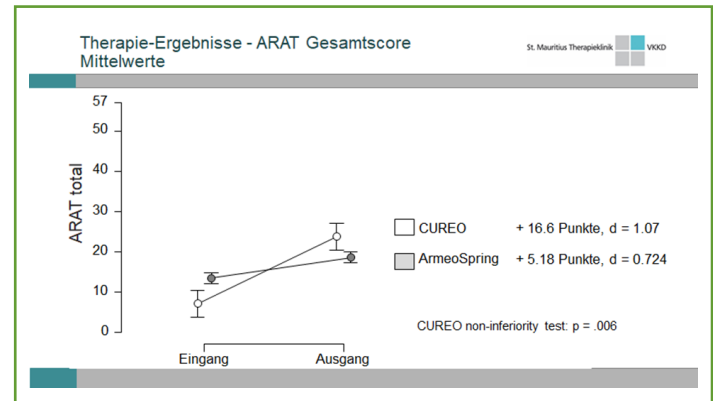
## Gamification

Kooij et al. (2019) proves that game elements have a positive effect on the enjoyment of a therapy exercise. In the systematic review by Pimentel-Ponce et al. (2021), the results of the 10 studies evaluated show that gamification increases motivation and therapy adherence in children and adults with neuromotor impairments (see also Lopes et al. 2021). Based on these results and the feedback from patients and therapists, **CUREO®** also offers a lot of playful content, a high score system, and constantly new challenges to promote intrinsic motivation even over a longer therapy period.

At [www.cureosity.de](http://www.cureosity.de), we provide up-to-date information on the evidence of VR in rehabilitation.  
At [cureosity.de/literaturangaben](http://cureosity.de/literaturangaben) you will find the detailed references.

# Interim results Non-inferiority study

Currently, a non-inferiority study comparing therapy with **CUREO®** and Armeo®Spring - each in combination with a classical therapy - is ongoing. After enrolling half of the patients, first interim results were presented by Dr. Bettina Studer and Dr. Heidrun Pickenbrock at DGNR 2021 in December.



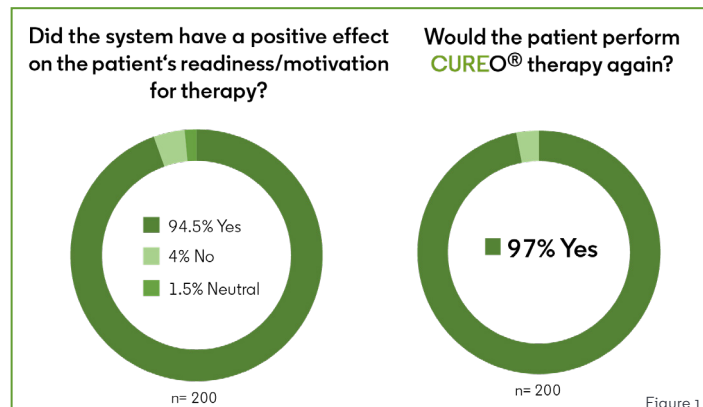
Across the entire group, the before-after comparison shows a clear improvement in arm ability with both therapies as measured by the Action Reach Arm Test (ARAT). It is becoming apparent that therapy with our VR System **CUREO®** is not inferior to Armeo®Spring therapy. We are very excited that enrollment has now been finalized and look forward to the final results.

## CUREO®-Acceptance survey

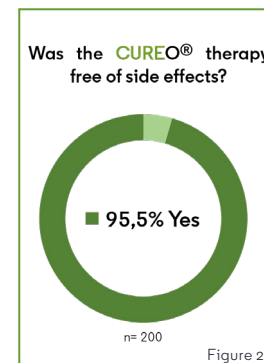
For us, the patient and the therapist are at the center of the development of CUREO®. For this reason, we distributed questionnaires to the therapists at the Saint Mauritius Therapy Clinic (STMTK) in Meerbusch with the request that they complete them during or after therapy. More than 200 questionnaires were answered and evaluated by us.

The STMTK specializes in neurological rehabilitation. On site, the main diagnosis most frequently treated with CUREO® is stroke with about 80%. Furthermore, patients with PNP/ CIP/ GBS, spinal cord disease, post covid, multiple sclerosis, Parkinson's disease, paraplegia and traumatic brain injury were treated with CUREO®.

The patient was asked after the therapy if he would like to do it again, which 97% of the patients answered with a "yes". The therapists could additionally confirm that 94,5% of the patients showed an increased motivation due to the VR therapy with CUREO® (Figure 1).



An additional important aspect of VR therapy is that patients do not feel any discomfort during therapy. 95,5% stated that they did not experience any side effects (Figure 2). Considering the high average age and the severity of the diseases, we are pleased with the result.



### Outlook

It is important to us to continuously optimize our system on the basis of customer feedback and to evaluate it clinically. In 2022, for example, we were able to win over the neurological department of the Charité to test CUREO® in the neuropalliative care unit, among other places. We are starting an efficacy study with the Burgau Therapy Center.

In addition, we are currently conducting a study with Maastricht University to investigate pain relief associated with the CUREO® therapy. Here, embodiment through an avatar is used to change the patient's perception of pain. First interim results show that our approach shows positive results compared to conventional passive VR methods and stands out from them as an active concept.

# The CUREO®- therapy system at a glance

CUREosity offers you a compact, mobile complete system that is ready for immediate use thanks to the pre-installed software. The CUREO®-therapy system consists of the CUREO® software, which is CE-certified as a medical device, and the associated hardware.

## CUREO® service

### Full Service & Support Package

- Initial training ensures that you can start your therapy immediately
- Updates and functional enhancements allow you and your patients to benefit from all new developments
- Our technical telephone support is available for all questions
- A connection to the building services is not required
- Individual adaptations and additions are possible on request



## CUREO® system

### All required hardware included in the scope of delivery:

- Tablet
- VR-Headset with disinfectable silicone cover
- Controller
- Wifi-Router
- Practical carrying case
- 2,5kg light



# About CUREOSITY

**CUREosity is a multiple international award-winning med-tech company that is transforming rehabilitation for good by developing innovative therapy concepts.**

The founders are themselves family affected and have decades of experience in the therapy field. They are guided by the motivation to help affected patients regain their abilities and thus a more self-determined life.

Our VR therapy system combines neuroscientific findings, especially the potentials of neuroplasticity, with many years of therapy experience as well as the technical and creative know-how of our developers.

CUREosity's goal is to relieve clinics, physicians and therapists with innovative products and to help improve the quality of care for their patients. An interdisciplinary team of over 35 specialists from the fields of 3D visualization, IT, game design and medicine has created **CUREO®**, a system that turns virtual therapy into real success.



# CUREOSITY

CUREO® is already applied here, among other:



CUREosity GmbH

Burgunderstr. 27 • 40549 Düsseldorf • info@cureosity.de • +49 211 82 20 46 6 • www.cureosity.de



For more insights, visit our YouTube channel!

