



CONNECT

Robot-assisted early mobilisation

Background

The Munich-based company Reactive Robotics GmbH, founded in 2015, focuses on rehabilitation robotics research to ensure the optimal basis for therapeutic success for patients and effective support for medical and therapeutic professionals. The focus is on the mobilisation of intensive care patients through adaptive robotics. After the company already received CE certification for its VEMO system in 2019, MDR certification followed last year. In addition, Reactive Robotics won the Senetics Innovation Award 2021 with its robotic assistance system.

New approaches to mobilisation

Early mobilisation of intensive care patients has a decisive impact on the course of recovery. The later mobilisation is started, the higher the risk of long-term damage due to the long period of lying down, the degradation of the musculature and the associated muscle weakness. The costs for the health care system also increase the longer patients wait to start their rehabilitation measures. Although the need is obvious, the mobilisation of intensive care patients is nevertheless often delayed. Reasons for this are, on the one hand, structural conditions and, on the other hand, the lack of specialised medical and therapeutic staff in hospitals and clinics. Other reasons may be due to a lack of motivation on the part of the patients or a lack of mobilisation culture.

Robotic early mobilisation is an approach that is intended both to move patients gently and early into the rehabilitation process and at the same time to relieve clinical staff. This can be done either by means of electronic bed bicycles or electronic treadmills as well as with tilting tables. However, there may be a risk that patients first have to be transferred to a separate device.

Manual mobilisation of persons with limited ability to act is a challenge for therapists and caregivers as well as for the patients. Often, due to the physical strain, several caregivers are needed for therapy and to ensure patient safety. In addition to the necessary transfer of the patient, conventional tilt tables also offer the disadvantage that therapy of the legs, the musculoskeletal system as well as the cardiovascular system is only slightly addressed. As a result of the restricted leg movement and the associated cardiovascular instability, the duration of verticalisation is severely limited.

In addition, for about 30% of intensive care patients, manual mobilisation is too dangerous or cannot be performed adequately due to the severity of their symptoms, such as paralysis or unconsciousness. Robot-assisted early mobilisation, on the other hand, makes it possible to treat patients with critical physical conditions and significantly reduce the number of therapists and nurses required.



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The company Reactive Robotics has created a new and innovative method of mobilisation with their innovative VEMO system. The system, consisting of a bed, a robot, a trolley, patient adapters as well as a monitor, allows for individually adjustable inclination and robot-assisted leg movement therapy in a safe environment. The biggest difference and uniqueness of this system is that the patient does not have to be transferred to a separate device, but can simply stay in his or her own intensive care bed, thus avoiding dangerous transfers. In this way, mobilisation and verticalisation can be combined at a very early stage of rehabilitation, which also promotes spatial orientation.

Results from various studies show that robotic early mobilisation not only reduces the duration and incidence of the onset of delirium, but also strengthens haemodynamics, respiration and power and holistically improves physical functions. However, robotic systems not only aid recovery, promote and maintain locomotor function and subsequently improve quality of life, but also offer far-reaching benefits to the entire critical care team, physicians, the hospital and the healthcare system. These include physical relief, more time for patient care and social interaction, as well as a considerable facilitation of therapy goals and documentation of the course of therapy. Hospitals and the healthcare system also benefit from the fact that the modern and advanced technologies can also mobilise seriously ill patients or patients requiring ventilation. It also supports guideline-compliant patient care with early mobilisation as part of the ABCDEF bundle.

Would you like to learn more about advanced methods in robot-assisted mobilisation? We have compiled an overview of companies that deal with this topic. arcoro CONNECT links people, innovations and companies.

COMPANY	LOCATION	WEBSITE	FIELD OF EXPERTISE
Reactive Robotics GmbH	Germany	https://www.reactive-robotics.com/	Robot-assisted early mobilisation
Hocoma	Swiss	https://www.hocoma.com/	Robot-assisted movement rehabilitation
Kuka AG	Germany	https://www.kuka.com/	Robot-assisted mobilisation
Axinessis	Belgium	https://www.axinessis.com/	End effector based robotic rehabilitation
Medica Medizintechnik GmbH / TheraTrainer	Germany	https://thera-trainer.com/	Robot-assisted gait training



Would you like to have a direct contact in the context of early mobilisation? Here, too, we have researched a number of experts for you who stand out due to their many years of experience in the sector and specific specialist knowledge.

INDUSTRY EXPERT	JOB POSITION	FIELD OF EXPERTISE
Dr. Alexander König	CEO at Reactive Robotics GmbH	Robot-assisted early mobilisation
Helle Dokken	Head of nursing University Medical Centre Göttingen	Robot-assisted early mobilisation

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