



## Exoskeleton technology

The exoskeleton as a rehabilitation assistant supports patients in strength, balance and stabilisation. The technological aid enables people with significant mobility impairments or even paraplegia to relearn or optimise standing and walking.

Due to their technical design, exoskeletons belong to the group of active and passive support structures. In addition to mechanical elements, active exoskeletons also have active drive components that help to reduce the patient's load. Passive exoskeletons do not have an active drive, but only provide mechanical support through weights, dampers and springs.

In active exoskeletons, the lower body is usually enclosed by a fixed frame that holds the weight of the exoskeleton itself and its user, as well as the electronics. The frame is important not only because of its support function, but also because it helps the patient to maintain an upright and secure trunk posture and to learn a natural gait. To ensure mobility, the exoskeleton has joints at the hips, knees and ankles. Integrated bio-electric sensors are able to automatically detect weight shifts and send signals to a Smart Assist software, which informs the therapist. The drive is provided by a rechargeable battery unit, which is usually located in a kind of backpack on the back.

The neuro-rehabilitative training with exoskeletons can be individually adapted to the patient and provides important information about progress and changes through the collected data such as training length, walking distance and speed. These are stored in a cloud. With modern exoskeletons, the requirements and motor support can be specified and tracked individually for each leg - depending on the degree of impairment. The spectrum ranges from one hundred percent support to patient-initiated movement and can be controlled in both the stance and swing phases of the walking process. These sensors permanently transmit information and with the help of the software, gentle postures can be detected and corrected at an early stage.

### innovative technological approach

- ◇ **Company:**  
Ekso Bionics Inc
- ◇ **Product:**  
eksoNR
- ◇ **Field of application:**  
rehabilitation after strokes, brain damage or spinal cord injuries
- ◇ **Special feature:**  
Individual adjustment and real-time analysis via movement sequences
- ◇ **Main objective:**  
Train strength and endurance in the legs  
  
To enable standing and walking again with severe mobility restrictions
- ◇ **Website:**  
<https://eksobionics.com/>

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