



Rehabilitation Robots: Concepts and Applications in Stroke Rehabilitation

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Robotics is a tool to assist human in different applications from industry to medicine. There are many reasons that human tends to use these machines. They are very reliable in repetitive, high precision, preprogrammed and high risk jobs in which human is not too good enough. In medicine, robotic applications are evolving so fast that in near future nobody can imagine a surgery without a robot involved. In Rehabilitation we have the same scenario; there are commercialized robots to assist disable people to eat and perform daily activities. There are also clinical rehabilitation robots which can train handicaps. They can help subjects as a passive tool that improves low level impairments such as rigidity. On the other hand robots can train brain as an active tool to have a better movement again. We will see how robots can help therapist to apply repetitive passive movements in quadriplegic subject (i.e. in Brunnstrom stages 1 to 3). On the other hand they can teach subjects how to complete a task in an active manner (i.e. in stages 5 and 6) which can facilitate neuroplasticity. There are different robots designed for different organs; for example rehabilitation of upper extremities (e.g. Gloreha) or lower extremities (e.g. Lokomat). There are also exoskeleton robots to help subjects to grip objects and perform ADLs easily (e.g. Bioservo) or help paraplegic patient to walk again (e.g. Rewalk). In this talk, we will also discuss about how robots are helping rehab specialist to improve standard protocols. For example we will show how action observation therapy, bimanual therapy, assistive active therapy, proprioceptive facilitation and passive mobilization therapy are realized using an upper extremity rehabilitation robot. Robotics is the future of technology and rehabilitation needs this technology. Be part of this technology!

Key words: Robotics, Rehabilitation



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