



The Current

*Helping people regain life thru
neurotechnology*

Summer 2012

New Brain Injury Fact Sheet

A new resource is available on the Neurotech Network website featuring neurotechnology for brain injuries. This FREE resource was created in collaboration with [The Brain Injury Alliance of New Jersey](#) and a team of clinical advisers.

The fact sheet is an introduction to brain injury and neurotechnology including an overview of the many clinical applications, including:

- Respiratory conditions
- Speech and swallowing
- Seizure management
- Paresis and paralysis
- Pain and spasticity

and much more. This new resource also provides information to learn more about this field of clinical technology.

[Click here to download the Fact Sheet](#)

[Click here to view the Brain Injury Education Page](#)

Combination Therapies: Next Generation?

Posted in May 2012 on the NeuroTech Zone, a technology resource website, the article 'Combination Therapies: Is it the next generation of rehabilitation?' features one approach for stroke survivors. This approach capitalizes on motor re-learning using transcranial magnetic stimulation and movement therapy. Read the full posting by [clicking here](#).

Real Stories: James Nall

"I'm so pumped", are words directly from James Nall when he speaks about using the exoskeleton, Ekso. In 2010, James fell down a stairwell in his Colorado home and sustained a C7 incomplete spinal cord injury that left him paralyzed. Nearly two years later, he is continuing his rehabilitation in The Peak Center at Craig Hospital. But this is no everyday out-patient rehabilitation. James has a program rich in technology. He started the program by using FES cycling and then moved on to using the drop foot stimulation system after discovering motor recovery in his legs. Now, he is up and

walking around with the assistance of an exoskeleton. "My first sit to stand, it was just a smile," reflecting on his first time using the system. James further describes the Ekso system as a tool to provide rehabilitation as well as a means of providing him with a sense of freedom. Using the exoskeleton at The Peak Center, he freely moves around the gym on his own. With sensation preserved, James can feel the walking motion. "Some people strive for retirement, I dream of walking." While using the exoskeleton as a vehicle for muscle motor memory, he is getting closer to his dream.

To read more user experiences and the impact neurotechnology makes on their lives, visit the [Real Stories section of our website.](#)

Movement through Thought

The recent article published in the journal *Nature* sparked a wave of attention and for good reason. A team lead by Dr. Leigh Hochberg at Brown University demonstrated how people with paralysis can control a robotic arm using a brain-computer interface. This is the first peer-reviewed published research paper featuring the use of this technology interface by human participants.

The article highlights two people with tetraplegia and how they use this novel technology to move a robotic arm in three-dimensional space. After losing the ability to do simple tasks independently, this technology is a first step to giving some of that independence back. Participants controlled the robotic arm and hand over a broad space without explicit training, using signals decoded from a small, local population of motor cortex (MI) neurons recorded from a 96-channel microelectrode array.

The technology has a long way to go in order to mimic fast and accurate movements of an able-bodied person. Regardless, this latest development in cortical control research has the potential to revolutionize the way we interact with technology. More specifically, the possibilities open a new level of independence for those living with severe paralysis.

[Click here to view the release with media links.](#)

[Click here to link to the journal Nature.](#)

News of Interest

- Technology from a different view. 'Walking Tall: Technology can help PTs empower patients in regaining mobility' features the use of technology in gait rehabilitation from the perspective of a Rehabilitation Manager. [Click here for more.](#)
- For people with mild Alzheimer's Disease, deep brain stimulation may provide some hope. A small phase I research study lead by Dr. Andres M. Lozano from the University of Toronto was published in the *Archives of Neurology*, suggests that a device that sends continuous electrical impulses to specific "memory" regions of the brain appears to increase neuronal activity. Read more by [clicking here.](#)
- Two new technology development programs with human participants were recently announced by Uroplasty, a medical device company. The first program

will investigate an implantable tibial nerve stimulator for the treatment of overactive bladder. The second is a pilot study using the external Urgent PC for the treatment of fecal incontinence. To read more, [click here](#).

- Results from a small pilot study show relief for people living with fibromyalgia. Research led by Dr. M. Bret Schneider of Stanford University, used repetitive transcranial magnetic stimulation (rTMS) deep in the brain producing some striking cases of sustained pain relief when it was tested on five fibromyalgia patients. Read more about this announcement by [clicking here](#).
- Occipital nerve stimulation may significantly decrease the severity and frequency of headaches in patients suffering from debilitating chronic migraines. A study published in 2010 suggests these results but it is not yet FDA approved. The government allows their use "off-label" if the physician feels it is in the patient's best interest. Read more by [clicking here](#).
- Deep brain stimulation may seem like a scary proposition for people with Parkinson's Disease, dystonia or essential tremors. Learning about how it works can help ease the fear and mystery behind the technology. [Click here](#) for a good explanation of DBS.
- Neurotech, a Belgium based developer and manufacturer of neurostimulation devices, announced that it has obtained the European CE Mark for its ADNS-300 system dedicated to the treatment of refractory epilepsy by stimulating the vagus nerve. [Click here](#) to read more.
- A novel, non-invasive treatment is being investigated to help stroke survivors improve speech, memory and numerical abilities. This new brain stimulation technique is being researched by Dr. Jenny Crinion of the University of College London. [To read more, click here](#).

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