



Spring 2014

What's in this issue?

- [Real Stories from Real People](#)
- [Education Sessions, Presentations & Webinars](#)
- [Welcoming our Sponsor - Electrical Geodiscs, Inc.](#)
- [Annual Report](#)
- [Epidural Stimulation - Awakening the Spine](#)
- [News & Headlines of Interest](#)
- [Thank you to our Generous Sponsors](#)

Real Stories from Real People

Personal Stories of people who use neurotechnology on a daily basis brings the technology to life. Here are just a few highlights from users and how the technology has impacted their lives.

Meet Roger Pontz of Reed City, Michigan and how he describes what it is like to view the world through bionic eyes. Roger is one of the first American's to receive the retinal prosthesis to restore sight for those who became legally blind due to retinitis pigmentosa. [Read his story here.](#)

Jonna was featured on NBC's Today Show to tell her story about her journey living with Multiple Sclerosis. She uses the Bioness L300 to keep her mobile and active. [Here is the link to the video.](#)

Sue Sanders of Cheltonham, UK uses the AlterG robotic leg to help her improve her walking ability after a devastating stroke left her with partial paralysis. [Read her story here.](#)

Bill Haynes, aka Super Dad, posted a thank you note for the use of his drop foot stimulation and arm stimulation system to help him regain function after a massive stroke. See the touching photos and personal note [here.](#)

Tremor interrupted not only her career but also her daily life. Kelly Smith since birth has had unpredictable tremors in her upper body. She was finally diagnosed with Essential Tremor disorder. Learn about how receiving a Deep Brain Stimulator changed her life [here](#).

More stories can be found on our [website](#). Do you have a personal story of the impact of neurotechnology? Let us know.

Education Session, Presentations & Webinars

True to our mission, Neurotech Network has been and will continue to be actively providing education sessions, presentations and webinars in 2014. Some sessions are targeted to the consumer and care-giver community while others are targeted to the medical professional and clinical communities.

Here are links to recent events, webinar archives and video presentations

- **Rehab is Over, Now What?** Webinar [Link to the video archive](#)
- **Can I Walk Again?** Webinar [Link to the video archive](#)
- **TEDxCLE: Breakthrough Medical Technologies Better by Design:** Megan Moynahan & Jen French. [Link to the video & slides](#)

Upcoming events:

- **Quick Notice:** Jen French will be on [REDDIT](#) for an 'Ask Me Anything' session on Friday, May 23 @ 9am EDT
- [World Science Festival 2014](#) - New York City, May 31
- [Neural Interfaces Conference 2014](#) - NIH/NINDS, Dallas, TX, June 22-25
- **Introduction to Implanted Neural Prosthesis** - United Spinal Association Webinar, July 9

Learn more about our outreach activities and upcoming events on our [Upcoming Conferences Page](#).

Welcoming our Sponsor: Electrical Geodiscs, Inc.

We would like to welcome Electrical Geodiscs, Inc. (EGI) to our family of Neurotech Network sponsors. EGI has joined as a sponsor of our Fact Sheet 'Epilepsy - Seizure Therapy and Diagnostics'. Learn more about EGI below.



EGI is a leading medical device company that offers advanced EEG and other non-invasive neurodiagnostic products for monitoring and modulating brain activity. EGI's unique gel-free and abrasion-free EEG technology offers unparalleled patient comfort while providing much higher resolution brain activity imaging than conventional EEG. EGI's EEG systems are used by leading researchers and clinicians worldwide in applications ranging from neurostimulation to advanced imaging to assisting in epilepsy diagnosis and pre surgical planning. For more information, visit EGI.com

Thank you for your support and welcome!

Annual Report 2013

The Neurotech Network 2013 Annual Report is posted. View our activities from 2013 and vision for the future. [The link to the report is here.](#)

As a registered 501(c)(3) non-profit organization, we meet the public access requirements through our website and [GuideStar](#), a trusted public information resource for the non-profit community.

Epidural Stimulation: Awakening the Spine

The following commentary is courtesy of Neurotech Reports

The report that three new paralyzed individuals have had voluntary movement restored as a result of epidural stimulation and a training regimen developed at the University of Louisville, UCLA, and other institutions aroused interest in the media, as well as the spinal cord injury community. The report, published in the journal *Brain*, was authored by Susan Harkema at the University of Louisville, Reggie Edgerton at UCLA, and their colleagues. The new report adds credibility to the team's previously published data from a single subject.

This new line of research promises to revolutionize the practice of physical medicine and rehabilitation with respect to spinal cord injury, and conceivably launch a new market segment for neurotech devices. There is already one neurotech startup firm, [NeuroRecovery Technologies, Inc.](#), that is targeting this potential market and others may follow. Nick Terrafranca, NeuroRecovery Technology's CEO, made one of the firm's first presentations at the 2013 Neurotech Leaders Forum.

We were particularly pleased to see the team's research supported-both financially and in the press-by the Christopher & Dana Reeve Foundation. In the early days of that organization, there was more emphasis on potential pharmaceutical interventions than neurotech devices. "The implications of this study for the entire field are quite profound and we now can envision a day where epidural stimulation might be part of a cocktail of therapies used to treat paralysis," said Susan Howley, vice president for research at the foundation.

Of course epidural stimulation is not the only promising avenue of research for individuals with SCI. Very encouraging work on functional electrical stimulation of

paralyzed muscles continues at Case Western Reserve University and other institutions. And innovations in neurorobotics, exoskeletons, and motor prosthetics all point to a day when paralyzed people can regularly walk on their own two feet again. At a minimum, the potential combination of these three approaches should forever banish phrases like "confined to a wheelchair," or "will never walk again."

"This is a wake-up call for how we see motor complete spinal cord injury," said Edgerton. "We don't have to necessarily rely on regrowth of nerves in order to regain function. The fact that we've observed this in four out of four people suggests that this is actually a common phenomenon in those diagnosed with complete paralysis." Hopefully, the new research can also serve as a wake-up call for neurotech researchers and entrepreneurs to not give up on the spinal cord injury community, regardless of the size of the market they represent.

Links to some articles about the epidural stimulation:

- [National Institutes of Health News](#)
- [NBC Health News](#)
- [Voice of American Science & Technology News](#)
- [Archives of Physical Medicine & Rehabilitation](#)

News & Headlines of Interest

RESEARCH

- Researchers at Battelle and Ohio State University, recently implanted an electrode array into the brain of a young man with quadriplegia. The system is expected to connect his thoughts to movement in his arms. The series is featured in the Washington Post. [Read more here.](#)
- Researchers at Northwestern University and the Rehabilitation Institute of Chicago found in a pilot study that **magnetic brain stimulation** added to hand and arm rehabilitation after a stroke nearly doubled the improvement in motor control. [Learn more about this research here.](#)
- **Tongue Drive System** is being developed by researchers in Atlanta to allow a paralyzed person to independently drive a motorized wheelchair by a flick of the tongue. [Read more here.](#)
- Recently published research highlights the use of a combined therapy of brain stimulation using **Transcranial Direct Current Stimulation and Virtual Reality** significantly improved upper extremity function of stroke survivors. [Learn more here.](#)
- New Tinnitus treatment therapy using **vagus nerve stimulation** used in a clinical trial. Showing promising published results, this therapy may help dampen the condition with a constant ringing in the ears. [Read about the study here.](#)
- Restoring the sense of touch in arm prosthetics is becoming a reality by researchers at the Cleveland VA Medical Center and Case Western Reserve University. Using **sensors and electrodes**, the prosthetic hand can offers a sense of touch to those who lost it with the limb. [Learn more here.](#)
- Boston Scientific is enrolling 300 participants to a registry for those with the

Vercise **Deep Brain Stimulation (DBS)** system. The registry is designed to help physicians understand the long term impact of DBS for persons living with Parkinson's disease. [Read more about the registry here.](#)

- Recently published research explores the relationship between impairments and function following a stroke, the potential of **neuroplasticity** and key findings of the EXPLICIT stroke program. [Access the report here.](#)
- Research published in IEEE titled 'External Sensors for Detecting the Activation and Deactivation Times of the Major Muscles Used in Walking' compares the **tilt sensor with the heel sensor.** [View the article courtesy of WalkAide here.](#)

AVAILABLE PRODUCTS AND INDUSTRY NEWS

- An EMG controlled **powered prosthetic arm** was approved by the U.S. FDA allowing users to control the device by neighboring muscles. It was developed and offered by DEKA Integrated Solutions. [Learn more here.](#)
- Brainways Ltd is now offering **Transcranial Magnetic Stimulation**, a noninvasive medical device for the treatment of depression and other neurological conditions. It is available in Sweden at the Karolinska University Hospital. For more information, [click here.](#)
- The **Upper Airway Stimulation Therapy** by Inspire Medical Systems was approved but the U.S. FDA for Obstructive Sleep Apnea. This is a fully implanted stimulation system as an alternative to a CPAP machine. [Read more about the approval here.](#)
- The Indego®, a **robotic exoskeleton**, by Parker Hannifin is designed to offer users the ability to stand and walk. Recently, Craig Hospital join four other institutions as clinical trials sites for the device. Other sites include: Rehabilitation Institute of Chicago; Kessler Institute for Rehabilitation; Rusk Rehabilitation and the Shepherd Center. [Read more here.](#)
- New therapeutic treatments for aphasia using **Transcranial Direct Current Stimulation** is being explored. A website resource features several case studies of how the treatment has impacted people who have received the treatments. [See more here.](#)
- Educational video offers a practical explanation of **Deep Brain Stimulation** for Parkinson's Disease. It is narrated by Dr. Andre Machado, MD, PhD of the Cleveland Clinic. [Watch the video here.](#)
- A new **TENS device** was approved by the U.S. FDA for the prevention of migraine headaches and other types of pain prevention. The Cefaly device is worn around the forehead with 20-minute daily treatments. It is offered by the Belgium based company, STX-Med of Herstal and has been previously approved in Europe and Canada. [Learn more here.](#)
- St. Jude Medical receives EU approval for the Prodigy **spinal cord stimulator (SCS)** with burst technology for chronic pain. The burst technology will prevent paresthesia, a tingling sensation common among SCS users. [Read more here.](#)
- Now seizure-free, Kevin Ramsey tells his story living with epilepsy and becoming drug-resistant. Using the **RNS® System therapy** by NeuroPace, he can now control his seizures. [Read the full story here.](#)
- During a recent TED Talk, Dr. Hugh Herr introduced **revolutionary prosthetic devices** for amputees. He expressed, 'we're in the middle of a revolution in prosthetics, with true bionic integration just over the horizon. But a hidebound

Medicare could prevent thousands of amputees from receiving the cutting-edge - and costly - devices.' [Read more here.](#)

- A video from Medtronic explains how the **bachlofen pump** works for the treatment of spasticity. [Here is the link to the video.](#)

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