brainWAVES

The Newsletter of the Brain Foundation Winter 2013

Brain Awareness Week – 2013

Think About your Brain!

Well, do you?

'Think about your Brain' was the slogan used for **Brain Awareness Week 2013** in March. To give emphasis and publicity to the week, and to encourage everyone to 'think about their brains', this year we had banners flying around Sydney city and a huge one strung across the Story Bridge in Brisbane. To capitalise on this awareness, we also had information stands in Martin Place, Sydney, and one in Queen Street Mall, Brisbane. These 'information centres' proved to very popular with the public. In Sydney, we were very lucky and thankful to have the services of Professor Nicolas Dorsch, who helped out on the stand. He was able to speak at length with people about the questions and enquiries that they had, and provided a lot of valuable information for these people. We would also like to thank our volunteers, Kelly and Nicole from the Brain Tumour Alliance and Shannon and Max for their help in Sydney. Ric Allport – otherwise known as the Super Trivia Guy – was a valuable asset in Brisbane, entertaining all. Our lime green brain stress balls proved to be very popular with everyone and the information about brain disorders and booklets of brain games that were available disappeared very quickly.

Blessed with lovely sunny weather for both days, these stalls were a great success and the Brain Foundation web site experienced an increased level of enquiry. The aim of the week is to increase awareness of the importance of research into all areas of brain disease, and we think it has certainly done that.

You may not be aware, but there are over 1,000 disorders and diseases of the brain, including psychiatric conditions, and most do not have a cure. Many do not have an effective treatment, and many treatments are already quite old with no new ones in the pipeline. Unfortunately, too few of us actually do 'think about our brains' or the essential job they do for us, until something goes wrong – either with ourselves or with someone close to our families. And then it is too late.

Brain and mind disorders have the largest impact of all disease groups in Australia, accounting for nearly half of all deaths and disability. They pose the largest health, economic and social burden of any disease group. With an ageing population, it is estimated that by 2050, one in four of us will have a neurodegenerative illness. It is only with more research that the onset of these conditions can be delayed, minimized or prevented. Achieving even one of those outcomes would save a lot of suffering for individuals and billions of dollars for the nation.

Imagine the benefits if cures could be found for several conditions.

We need basic understanding of disorders to prevent or cure them. Research provides this.

Help us fund research. Think of it as superannuation for *your* brain.

Sydney Flags

Sydney Martin Place

Brisbane Story Bridge

Contact the Brain Foundation
PO Box 579, Crows Nest NSW 1585
Telephone: 02 9437 5967 or 1300 886 660 Fax: 02 9437 5978
Email: info@brainfoundation.org.au
Visit our websites www.brainfoundation.org.au and www.headacheaustralia.org.au

Fabulous Fundraisers

High Time for a High Tea

Several years ago, the Brain Foundation lost one of its long-time supporters. But we weren't the only ones who lost. Dr John Doyle's wife, Cheryl, lost her long time soul mate and love of her life to a brain tumour. To honour her husband and to help in our quest for better understanding and treatments for Brain Tumours, Cheryl and her family held a wonderful high tea at their home in December last year. With an abundance of wonderful treats to eat, raffles and auction items, the fabulous family raised in excess of $7,500 for our brain tumour research program.

Cheryl with a wonderful selection treats

Anyone for cricket?

Alex Fyfe and his mates in Adelaide lost a good friend earlier this year when Jordan Shields succumbed to brain disease. Deciding to take some action, as well as having a get together to remember their mate, Alex organised a cricket match in his honour. Much fun was had by all and the day raised over $1,000. We thank all who played on a very hot Adelaide day.

The 'crew' after stumps

We all know that a healthy brain relies on getting a good night's sleep. Somebody must have forgotten to tell these fabulous fundraisers.

Moreton Bay 24 Hour (Sailing) Race

This wonderful event was held by the Moreton Bay Trailer Boat Club over a weekend in early March. Far from having the sunny weather that SE Queensland is known for, the skies opened and it was a rather soggy and very windy 24 hours out on Moreton Bay. Still, sailors being sailors, they were not going to let a little rain stop them. 21 boats started and 7 continued in the 24 hour race, sent off by Gerald on the motor boat. Our sincere thanks to David Moran and the persistent participants and to all who helped raise over $2000 for us. Anyone for 2014?

The Brain Foundation caps worn by the competitors were the only bright thing on Moreton Bay.

Daniel (left) with Glenn and Katrina

2 for 24 – Golfing Challenge

Life sometimes throws us a 'hook shot' and that was the case for Daniel Kendall in 2012 when he collapsed. Diagnosed with 2 aneurysms, thankfully quick action by his parents, Glenn and Katrina, averted a crisis, and he has had a full recovery.

With life back on track, he and father Glenn decided that a good way to raise some funds for crucial research into this area of brain disease, was to play golf for 24 hours. And so, with the help of Asquith Golf Club and its members, and along with a fundraising page on Everyday Hero, this duo has raised just under $5000. What a great result but I just want to know, how do you see the golf balls in the dark?

The Melbourne Cup – a good excuse for lunch!

Our thanks once again to Louisa Coote and Fiona Greenwood from Brisbane who put on another fabulous luncheon to raise funds for Brain Tumour research.

Louisa's mum, Nancy, has received the news that she has no sign at all of a stage IV Brain Tumour diagnosed last year – so that is excuse enough for a celebration, never mind a small horse race.

A very big thank you to all involved for the effort and the funds raised on the day - $1,400. And a big congratulations to Nancy on her wonderful result.

Nancy looking good – think she picked a winner

Zombies keep rising from the dead

And, we are glad they do.

The Brain Foundation has been supported for several years by the Brisbane and Sydney Zombie walks, but it seems that Zombies are a competitive lot. This year, they will be joined by a hoard from Perth. Get along and support them; you might even like to become one for a day! Maybe.

Dates are: Brisbane October 6, Perth October 12 and Sydney November 2.

Tamworth Fair – always a great day out

Our sincere thanks to the very hard working committee from Tamworth, who once again put together a successful Christmas Fair and Market day last November. This annual event has been the source of many thousands of dollars over the years and last year funded the Research Gift – Whispering Dysphonia, in the Dystonia category. Our thanks go to Pip Warner and all the members of the committee for their tireless efforts year after year.

Good Golfers never, ever give up

This year we were again delighted to have the support of Gary Dawson and Matt Laverty from Bullant Sports, who run the Charity Challenge Cup. Holding fundraising days over the year, they support several charities and the Brain Foundation benefits from their tireless work and expertise in this area, culminating in a wonderful fun filled presentation evening at the combined Charities Ball.

This year we were privileged to receive over $11,000 from their efforts.

Pictured is Gary Dawson presenting the cheque to Val Gibson, Director, Brain Foundation and Gerald Edmunds, Secretary General.

Do you enjoy a game of Golf? Why don't you come along and support Gary, Matt and the Brain Foundation at our day – November 11 at Pymble Golf Club. Contact our office for more details.

Headache News

Some of our migraine supporters have been devastated by the news that the drug DHE or Dihydroergotamine has stopped being manufactured and is no longer available. There are no stocks anywhere in the world to draw from. At this point in time, there is no equivalent substitute, but headache and migraine practitioners here in Australia are in talks with pharmaceutical manufacturing companies, both here and overseas, in an effort to have the drug manufactured once again. There is a worldwide need for this drug and unfortunately there may be a considerable increase in the cost if independent manufacturing takes place. We suggest you discuss options with your physician in the meantime, and will advise members via our headache register if and when we know anything further. If you are not on the register, please download the form on our web site, or call our office and we can help you.

Recently there has been media coverage of some new forms of headache and migraine treatment. These electrical devices come with a lot of encouraging results. We understand that there are no particular side effects, and whilst any clinical trials that have been conducted have been small, they have shown that the devices are safe and can provide effective treatment.

But, they will not help everyone who suffers headache and migraine. We encourage our sufferers who may be interested in these devices to discuss their use with their medical practitioner and to make their own enquiries as to how these machines operate and whether or not they may be of benefit. The two devices do act differently to each other so it is important to understand how they operate. There may also be ongoing costs after purchase of the machines.

Remember that everyone's migraine is different and will react or improve to different treatments.

See the Headache Australia web site for more information.

The Brain Foundation cannot offer medical advice and we must stress the importance of discussing any issues you have with your medical practitioner.

Want to stay informed of research opportunities or important information, then please join our Headache Register on www.headacheaustralia.org.au or call us on 1300 886 660

Headache Australia

Research Grants – Progress Reports

Each year the Brain Foundation funds Australia's brightest researchers.
We are pleased to be a showcase for the following **Progress Reports from projects funded in 2011.**

Molecular imaging in brain AVMs

Dr Thi Thuy Hong Duong (PhD)

Molecular characterisation and analysis in an in *vitro* and in *vivo* model of Brain Arteriovenous Malformations exposed with/without high photon irradiation using the Leksell Gamma Knife.

Brain arteriovenous malformation (AVMs) are abnormal connections between arteries and veins and are a leading cause of intracerebral hemorrhage in young adults. Treatment of large and deep AVMs remains challenging with high associated risk, therefore a new and safer treatment method is required. We assessed the hypothesis that sterotatic radiosurgery can be used to selectively alter endothelial phenotype within AVMs, allowing targeted molecular therapies that do not affect normal vessels.

Earlier in vitro and in vivo studies investigating the gene and surface protein expression in endothelial cells following radiosurgery have identified several molecules such as E-selectin, VCAM and ICAM that warrant further investigation as part of a ligand-direct vascular targeting strategy in the treatment of brain AVMs. The aim of this study was to examine the molecular gene expression of potential molecular targets over various time course exposed with and without radiation in endothelial (bEnd3) cells and in an animal model of brain AVM.

Expression of genes encoding for intercellular cell adhension molecule-1 (ICAM-1) and vascular cell adhension molecule -1 (VCAM-1) was found to be significantly up-regulated post irradiation ($P<0.0001$) compared to endothelial leukocyte adhension molecule-1 (E-Selectin). The maximum level of gene expression was reached at 144h (9 fold) and 168 (6 fold) in ICAM-1 and at 120h (23fold) and 144h (9 fold) in VCAM-1. Further in vivo analyses was performed on VCAM-1 molecular expression in an animal model of AVM and preliminary results shows that VCAM-1 is highly expressed at 3 weeks post irradiation.

The overall aim in this application is to develop and demonstrate the in vitro and in vivo molecular responses that occur both in the endothelial cells and AVM animal model of brain AVM vascular tissue to GKS. At the completion of this project we have identified and characterised radiation-induced AVM E-Selectin, VCAM-1 and ICAM changes overtime and developed a method using optical imaging for future in vivo imaging studies of other molecules. The results of this project are crucial in the development of vascular targeting trials in future experiments, as part of a ligand-directed vascular targeting strategy in the treatment of brain AVMs.

Preliminary in vitro Results

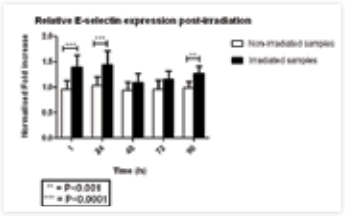


Figure A: E-Selectin

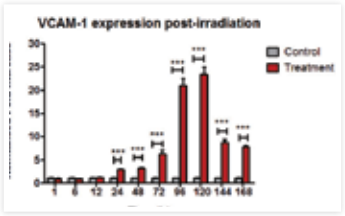


Figure B: (VCAM-1)

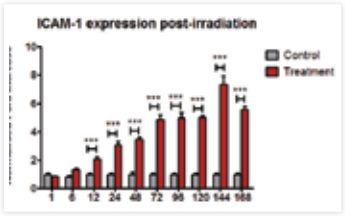


Figure C: (ICAM-1)

Preliminary in vivo VCAM-1 Results:

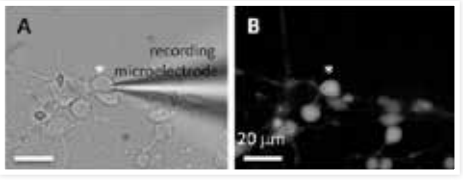
Figure D

Electrical activity in a stem cell model of Friedreich Ataxia

Dr Karina Needham

This study, undertaken together with Dr Mirella Dottori, examines the function of neurons in Friedreich's Ataxia (FA), an inherited degenerative disorder affecting the nervous system and heart. This condition results from a disruption in production of a cellular protein known as Frataxin. To help develop effective treatments for FA and better understand the disease mechanisms, we generated 'embryonic-like stem cells' from FA patient's tissue. These cells, known as induced-pluripotent stem (iPS) cells, have similar properties to embryonic stem cells, and can be used to derive any mature cell type.

In this project funded by the Brain Foundation, we are investigating the electrical activity of FA patient-derived iPS neurons as well as 'corrected' FA iPS neurons genetically modified with increased Frataxin protein levels. To identify these genetically modified FA iPS cell lines before recording their electrical activity, we induced them to express green fluorescent protein (GFP). With this grant we were able to purchase equipment for visualizing GFP-expressing neurons in culture (Figure 1). In addition to having the corrected FA iPS cell line, we also compared the electrical activity of the FA iPS-derived neurons to neurons derived from human stem cells and control iPS cells, which carry 'normal' levels of Frataxin. Data to date suggests that there is little functional difference between these groups, and is consistent with our other tests showing no significant difference in mitochondrial function and cell death between these neurons derived (this data is currently being submitted for publication). Taken together, this grant has enabled us to fundamentally characterize the functional properties of FA iPS neurons and also to establish the technology to record from genetically modified GFP-expressing cells. Both of these outcomes provide the essential groundwork in establishing a neuronal human cellular model of FA in which there is an urgent need.



A. Typical view of the cultured neurons in the dish The recording microelectrode can target a selected neuron (asterisk), as identified by the fluorescent label (B).

The role of upper motor neuron hyperexcitability in amyotrophic lateral sclerosis (ALS) pathogenesis

Associate Professor Steve Vucic

The grant provided by Brain Foundation Australia has enabled me to undertake studies which have helped to elucidate the role of upper motor neurons in the pathogenesis of amyotrophic lateral sclerosis (ALS).

In the first study, I assessed a cohort of ALS patients for the presence of a specific clinical sign, called the split hand. This sign was previously reported to be a specific feature of ALS, and consequently I proceeded to develop a novel diagnostic and prognostic test for ALS, called the split hand index. The results of this study revealed that the split hand index was a highly specific test for ALS and that it also was of prognostic value. These novel findings were published in the international peer-reviewed journal Clinical Neurophysiology, the official journal of the International Federation of Clinical Neurophysiology. Of further relevance, these findings were of pathogenic significance, implying that the upper motor neurons were involved in ALS pathogenesis.

In order to further address the issue of pathogenesis, in particular the role of upper motor neurons, I undertook cortical excitability studies in healthy controls and ALS patients by utilising the novel threshold tracking transcranial magnetic stimulation technique. The findings from healthy control studies disclosed a greater upper motor neuron innervation to the muscles that were clinically affected in the split hand sign. The manuscript describing these novel findings is under peer-review. In addition, the degree of cortical hyperexcitability was significantly greater to the clinically affected muscles in ALS patients, and this manuscript is under preparation. Taken together, these studies implied a role for upper motor neuron hyperexcitability in the symptom development and pathogenesis of ALS.

Separately, my group has further extended the clinical observation in ALS by describing the split hand plus sign, and reporting this to be a specific feature of ALS. These novel findings were published in the international peer-reviewed Amyotrophic Lateral Sclerosis journal, and further underscored the importance of upper motor neurons in ALS pathogenesis. Subsequently, cortical excitability studies were undertaken in healthy controls and ALS patients, confirming the importance of upper motor neurons in the development of the split hand-plus sign and thereby pathogenesis.

Lastly, we are currently in the process of conducting a longitudinal study in ALS patients, whereby the level of cortical excitability is being assessed at regular time intervals. Preliminary studies indicate that upper motor neuron hyperexcitability is an initial event in ALS, preceding the onset of peripheral nerve loss, a cardinal feature in ALS. We anticipate completing this study in the second half of this year.

In conclusion, the funding provided by Brain Foundation Australia, has enabled me to conduct these ground-breaking studies which have implied a role for upper motor neuron hyperexcitability in ALS pathogenesis. Taken together, these novel findings have suggested that ALS begins within the central nervous system,that could be of immense diagnostic and therapeutic significance. I am immensely grateful to the trustees of Brain Foundation Australia for providing me with the opportunity to conduct this research which will pave the way now to apply for more substantial National Health & Medical Research Council funding in the coming year.

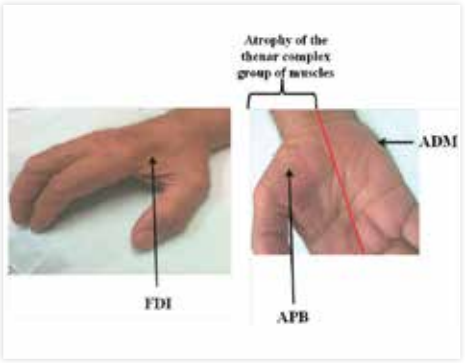


Figure 1

Figure 1: An illustration of the split-hand sign in a patient with amyotrophic lateral sclerosis. Specifically, the split hand sign refers to preferential wasting of the abductor pollicis brevis (APB) and first dorsal interosseous (FDI) muscles in comparison to the abductor digit minimi (ADM). The novel split hand index is calculated by multiplying the compound muscle action potential (CMAP) amplitude recorded over the APB by that recorded over the FDI and dividing the product by the CMAP amplitude recorded over the ADM.

Cerebrovascular contributions to dementia

Dr Hannah Keage
University of South Australia

Co-investigators: Dr Mark Kohler and Dr Owen Churches

The Brain Foundation is currently funding us to investigate cerebrovascular correlates of Alzheimer's disease.

We are currently collecting data – using cognitive and transcranial doppler (TCD) ultrasonography measures. TCD is inexpensive, portable and well tolerated, and provides measures of blood flow velocity in major brain arteries. We take measures at rest and during a cognitive paradigm (i.e. to investigate how blood flow velocity changes during a cognitive operation).

Prior to starting data collection, we conducted a systematic review of studies investigating aging and dementia using TCD methods. The review found that pulsatility index (vessel resistance), spontaneous emboli and cerebrovascular reactivity to hyper-/hypocapnia appeared good discriminators of dementia. Further, that aging was associated with a slowing in blood flow velocity. This article is published in the Journal of Dementia and Geriatric Cognitive Disorders Extra. We have also carried out a pilot study to validate our cognitive TCD paradigm.

We are hugely grateful to the Brain Foundation for their support. This was our first grant as a new lab (https://sites.google.com/site/cnslabunisa/), and had enabled us to investigate what we are passionate about: the underlying biology of age-related cognitive decline and dementia.

The UniSA Cognitive Neuroscience Laboratory, January 2013. Grant investigators: Dr Hannah Keage (top right), Dr Owen Churches (bottom left) and Dr Mark Kohler (bottom middle). The two research assistants working on this grant are also pictured: Ms Atlanta Flitton (bottom right) and Ms Jessica Hofmann (bottom middle).

The control of neural inflammation in traumatic brain injury: the targeting of interferon signalling

Associate Professor Peter Crack
The University of Melbourne

The grant from the Brain Foundation has allowed the completion of a proof of principle study in to the role that neuroinflammation plays in the progression of traumatic brain injury. TBI represents the major cause of death in young individuals in industrialised countries. Despite the improvement of neurosurgical procedures as well as critical care management, morbidity and mortality are still high. Furthermore, approximately 25% of these patients remain with permanent disabilities with a high familiar, social and economic burden for society. Over the past decade it has become clear that the central nervous system (CNS) can exhibit features of neuroinflammation in response to TBI.

In our laboratory we have been researching the effect of the interferon signaling system and neural injury. Interferon is a molecule that is released after an inflammatory event. It can be either beneficial or detrimental – depending on the stimulus that initiates its release. Our research into TBI has found that interferon plays a critical role in regulating neural injury and that mice that lack the receptor for interferon are protected from neural injury induced from TBI. We have also used a monoclonal antibody (called MAR-1) that blocks the interferon receptor and found that treating mice with this antibody reduces the damage seen after TBI. However, a therapy can only be successful in TBI if it is applied after the initiation of injury. In a major advance we have found that application of MAR-1 30 minutes after TBI leads to significant neuroprotection. These novel findings are currently under review in an international peer reviewed journal. This study is the first of its kind to show that a monoclonal antibody that blocks interferon signaling can be a serious potential therapeutic for the treatment of traumatic brain injury.

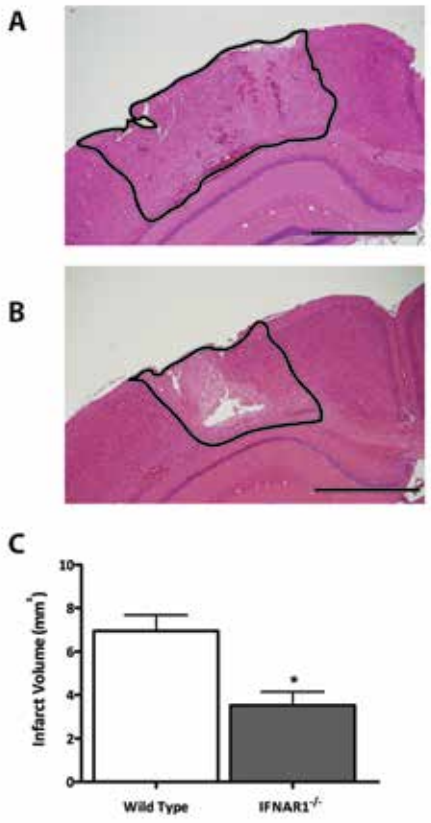


Figure A

Figure A. Absence of IFNAR1 contributes to a smaller infarct volume in mice 24 hours after TBI.A Representative 10µm thick Haematoxylin and Eosin (H&E) stained coronal brain section from a WT mouse post TBI. BH&E section from an IFNAR1-/- mouse post TBI. Sections show the infarct was localised to the cortical region of the ipsilateral hemisphere 24 hours after injury. CIFNAR1-/- mice have significantly reduced infarct volumes compared to WT mice 24 hrs after TBI.

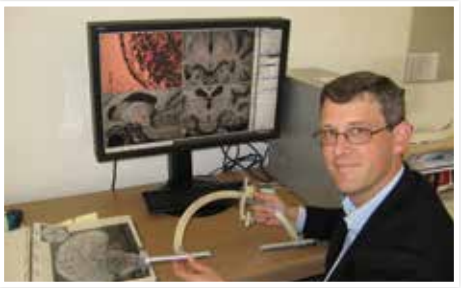
What is the best posterior subthalamic deep brain stimulation target: dorsal or caudal zona incerta?

Or simply: Posterior subthalamic area deep brain stimulation for Parkinson's disease

Professor Christopher Lind, Consultant Neurosurgeon

School of Surgery, University of Western Australia

Neurosurgical Service of Western Australia, Sir Charles Gairdner Hospital



Chris Lind with an early version of the stereotactic arc from the pre-MRI era; part of the system still used today for delivery of electrodes into the brain for treatment of Parkinson's disease. (Courtesy of Cathy Saunders, UWA MeDeFacts)

The Brain Foundation grant for our group in 2011 enabled us to launch a randomised crossover trial comparing these two specific brain area refinements for deep brain stimulation in Parkinson's disease along with a group of functional neuroimaging, biomechanical and neurophysiological studies. The grant got us to the point where we are accruing participants into the study and performing their assessments with no further external funding required. We have recruited 6 participants into the study, all of whom are partway through their clinical and scientific assessments. We expect to complete the project in 2018.

One of the great things about reversible brain stimulation is the possibilities for comparing different settings with the participant and clinician unaware of device settings. This enables a true experimental design to be used for improved scientific validity. Using this approach, our project has created training opportunities for two PhD candidates performing biomechanical analyses and an honours student studying the electrical activity of the brain. With the support of the Brain Foundation we have been able to establish the feasibility of our randomised crossover clinical trial design, the feasibility and acceptability of physiology experiments, and have in place the system we need to continue to collect valuable data for the next five years.

We are grateful for the support of the Brain Foundation. The funds enabled us to employ a research assistant who did a great job getting this suite of studies to a stage that is now maintained by our permanent staff and students. We will provide a further update when final results are ready for publication.

Utilising plasticity to drive functional recovery after spinal cord injury

Dr Michael Lee
Neuroscience Research Australia

Co-investigator: Dr Cindy Lin

The Brain Foundation research grant has allowed me and Dr Cindy Lin to initiate a longitudinal clinical investigation to study peripheral nerve function and spinal reflex plasticity in patients after acute traumatic spinal cord injury (SCI). Lower motor axon function was rarely investigated because it is generally assumed that they remain unaffected by SCI. However, secondary peripheral nerve abnormalities can contribute to muscle atrophy, poor wound healing and neuropathic pain after SCI. A better understanding of the magnitude and time course changes in peripheral nerve after SCI has important clinical implications for rehabilitation.

Continuing our strong collaboration with the Spinal Medicine Department at the Prince of Wales Hospital in Randwick, Sydney, we recruited patients who have recently sustained traumatic injury to their spinal cord. Using novel and well established neurophysiological techniques (including H-reflex, nerve conduction and nerve excitability techniques); we were able to assess changes in spinal reflex pathways and peripheral nerve excitability from as early as 3 days post injury and monitored their nerve function throughout rehabilitation.

Our results showed the threshold current is increased and the size of motor responses is reduced in SCI patients, consistent with axonal loss. In some patients, peripheral motor axons were completely inexcitable. Nerve excitability studies showed profound changes in membrane depolarisation, more prominent in the lower limb axons. However, the rate and magnitude of change is different amongst patients but were all evident within the first month of injury. Spinal reflex (H-reflex) studies showed that SCI patients have a higher threshold, lower reflex amplitude and gain suggesting altered motoneuronal excitability and recruitment post SCI.

Our results provide evidence that lower motor axons are compromised after acute SCI. As such, it raised the possibility that peripheral nerve and spinal reflex plasticity could be a new target for therapeutic intervention during the acute and subacute phases of SCI. We are currently testing the effects of a short-term, daily electrical stimulation-assisted exercise program in patients with acute SCI to see whether the addition of this novel therapy could reverse the maladaptive changes in peripheral nerve and spinal reflex. Preliminary results suggest that daily electrical stimulation therapy produces an immediate membrane hyperpolarisation, which offsets the depolarising effect secondary to SCI. We are currently doing long-term follow up with our patients to see whether those who received daily electrical stimulation therapy shortly after injury achieve better functional outcome.

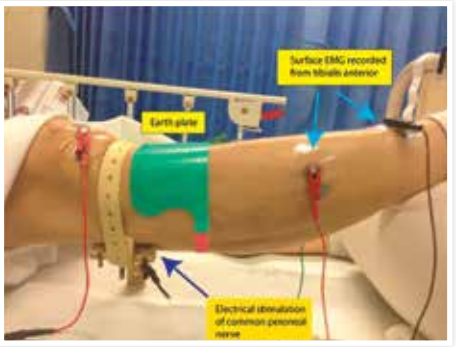


Figure 1. Set up of a peroneal nerve excitability study in a patient with acute SCI (15 days post injury). Surface EMG was recorded from the tibialis anterior muscle.

Exercise your brain

For all our puzzlers, try this quiz. An active brain is a healthy brain!

Our thanks to Ric Allport – Super Trivia Guy – for another great puzzle.

Healthy Brain

Cryptogram Quotes

Solve the number/letter code to reveal the cryptogram quote, and the person who said it.
Keep in mind, not all the letters of the alphabet are used in the cryptogram.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
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Solution will be on our website and Facebook site on July 1, 2013.

Get Involved

Find us on Facebook.
Like us today!

Fun and Fundraising

Supporting our Research Gift Program is easy and fun.

You can hold your own event – such as an afternoon tea or a cricket match – our office can support you with this event, or, you can join a public event like the City 2 Surf through one of our partner fundraising sites. Visit them at:

www.gofundraise.com.au, **www.everydayhero.com.au** or **www.mycause.com.au**

Our thanks go to the following people who have used these sites to raise funds on our behalf:

Go Fundraise: Julia Robertson, Tracy White who is running ten, 10 kilometre races on our behalf this year, Natasya Howell, Dan Roberts and Karen Croker who are celebrating their engagement and Felicity Bowen who is shaving her head to support her grandmother who is fighting a brain tumour.

Everyday Hero: Amy Price, Glenn and Daniel Kendall who did 2 for 24 Golf Challenge, Scott Clayton who is running in the Canberra Times Running Festival and Andrew Taylor.

Stop Press: Andrew Nolan, the son of supporter Lee Pagan (see brainWAVES Summer, 2012) is doing the 2013 Rickshaw Run in India to raise awareness and funds for Dystonia Research. Read all about the race and support the team at **www.everydayhero.com.au/rickshaw-run-september-2013**

City 2 Surf 2013 – now open

Calling all dedicated runners, why not support us in this year's City 2 Surf?

Entries are now open and we would welcome your support – join up and receive one of our 'brainy' caps to advertise your 'team' on the day.

We welcome back Team Steph, led by Daniel and Sabrina Ledonne along with family and friends, who ran last year in memory of their sister, Stephanie. The team raised significant funds for us in 2012 and we wish them all the very best in their fundraising efforts again this year.

Regular Giving

To all our wonderful donors, did you know that you can organise to make regular monthly or quarterly donations? Contact our office or download a form from our website, and we can make the arrangements for you.

Workplace Giving

Alternatively, you could ask your workplace about making a regular donation. The tax deduction is applied immediately and no further paperwork to the Tax Department is required by you. By law, all benefits and allowances are still based on your gross income. Ask your paymaster or speak with Gerald at the Brain Foundation for further information.

Estate Planning and Bequests

Australian Executor Trustees

Our benefactor, Australian Executor Trustees is pleased to offer reduced fees on their Estate Planning Service for Brain Foundation supporters along with an online Wills service at easywill.com.au. For further information please contact Peter Hewish on 02 9028 1021 or peter.hewish@aetlimited.com.au. Please think about a bequest to the Brain Foundation, thank you.

Remember, 100% of your donation goes to our Research Gift Program!

In Memorium

The Brain Foundation would like to extend our sincere thanks to the families of the following who donated in Memory of a loved one.

Leslie (Les) ATKINS

Jordan SHIELDS

Thelma SLATER

Scott PENROSE

Alex FISHER

Caroline WALSH

Emma CATANIA-WICKMAN

Tim BUCKMAN

Michelle LINDSEY

Kay DEVESCOVI

John HUMPHRIES

Harvey BIRTWISTLE

Elsie HOWELL

Natascha EVERETT DUNWELL

Michelle SPOONER

Trevor RUSSELL

In Celebration

Our congratulations go to Dan Roberts and his fiancé Karen who have raised money on our behalf to celebrate their engagement.

Thanks to the following companies for their support:

Australian Executor Trustees

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Brain Foundation

Thank you for supporting brain research through the Brain Foundation

To make a donation please visit our website **www.brainfoundation.org.au/donate** or use the donation form on the letter enclosed.