Botox may be GOOD FOR THE BRAIN

Introducing ‘MOTOR IMPAIRMENT’

Bridge for BRAIN RESEARCH CHALLENGE

RELEARNING WORDS lost to DEMENTIA

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This year marks another significant milestone in our history as we officially open our new building on Barker Street in Randwick.

This architecturally designed building has improved clinic and interview rooms for our many research participants, open and light research spaces and collaboration zones to unite our researchers from different areas and allow for synergies in thinking, methodology and problem-solving. Already, many of our researchers have moved into their new, cutting-edge laboratories. This is just the beginning: two floors still remain to be ‘kitted out’ in the new building. And this building is only the first of a four-phase neuroscience precinct that we envisage will unite brain research programs around Australia, and play an increasingly large role on the international stage too.

Community support, whether it be a small donation or a bequest, continues to play a vital role in helping us achieve our vision for neuroscience research in Australia.

In January this year, long-time publisher, journalist and president of Alzheimer’s Australia, Ita Buttrose, was named Australian of the Year. Ita has tirelessly championed health issues, focussing on dementia and the need for more research. Dementia is the third leading cause of death in Australia, and forecast to affect almost one million people by 2050. Dementia research is thus one of the main areas of research here at NeuRA.

Without research, we won’t find a cure. If you would like to learn more about how you can help us conquer and cure disorders, diseases and injuries of the brain and nervous system, please call us on 1300 888 019.

Professor Peter R Schofield PhD DSc
Executive Director
and Chief Executive Officer
A new education program about restraint use targets early childhood

NeuRA’s Prof Lynne Bilston and Dr Julie Brown and their colleagues at the George Institute for Global Health developed and evaluated an early education intervention program which taught children aged three to five years, their parents and their carers how to correctly use the best restraint for their size. Some of these materials have now been incorporated into the NSW Transport’s Road Safety Education Program.
Semantic dementia is a rarer form of dementia than Alzheimer’s disease, and it attacks the memory system used to store words and their meaning. One of the telling signs of the disease is when the sufferer asks questions like “What’s a clock?”. Sufferers find it difficult to engage in conversations or complete everyday activities that rely on knowing the words for things, such as finding items on a shopping list or reading a book. And, because other cognitive skills may be well maintained, they can be very aware of their frustrating condition.

It also has a younger age of onset than most dementias. Tony was just 58, and both he and Sue were still working at the time. After diagnosis, people like Tony may be forced into early retirement, which can often affect the career of other family members as well.

As with other dementias, there is still much to learn about the disease mechanisms. And, at this stage, there are no available drug therapies for people with semantic dementia.

Research may, in the future, provide a cure for semantic dementia. In the meantime, we need other methods to help improve the lifestyle of people who live with the burden of semantic dementia every day.

During the course of her PhD, clinical neuropsychologist Sharon Savage developed a word-training program that helps restore words and combat these word finding and comprehension problems.

When Tony Martin was diagnosed with semantic dementia eight years ago, the diagnosis was almost as confusing as it was devastating. “When you get a diagnosis of semantic dementia, you’re not really aware of what it is, because it’s not like other dementias,” says Sue Martin, Tony’s wife and carer.

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Aside from their language difficulties, people with semantic dementia still have other thinking skills that remain strong: their everyday memory, their visual skills and their attention. Sharon’s program takes advantage of these cognitive strengths to help boost the language weaknesses.

At home on their computers, patients use the program for 30 to 60 minutes at a time, five to seven days per week, to relearn lists of words. For each word selected for practice, a picture appears of the household item, such as a lemon, keys, phone or watch. Following a click of a button, the word appears, together with an audio recording of someone saying the word. Patients are then encouraged to repeat the word out aloud.

Sharon stresses the importance of selecting items from around the house to use in the training program in order to achieve the maximum gains. In addition, by practising at home, the patient is relearning the words in the space where they will use them, helping with everyday tasks and conversations.

Although Sharon tested a number of elements of the practice to investigate what was most effective, she found that just by showing the picture and the word together improvements could be seen in as little as three weeks.

“What’s nice to know is that a very simple practice can make a difference,” says Sharon. “It didn’t matter whether they were in the early stages of the disease or if they were further along. Everybody showed an ability to improve.”

The ability to relearn vocabulary indicates that even in brains affected by dementia, some recovery of function is possible.

“To do this word training program, to look at the pictures and practice words, he feels like it’s a positive thing that he can do for his dementia,” Sue says. “Keeping the language for as long as he can provides a better quality of life.”

Sharon has now expanded the program to be online and has patients from all around Australia participating in the next phase of her research.

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WHAT IS ‘MOTOR IMPAIRMENT’?
The term ‘motor impairment’ is an umbrella term that covers a range of physical disabilities. It includes conditions such as muscle weakness and paralysis, fatigue, reduced movement at the joint, diminished sensation across the body and a loss of balance.

Motor impairment features in so many diverse health conditions that it is not, itself, a discrete diagnosis. Impairments are the result of many different diseases, including stroke, spinal cord injury, multiple sclerosis, brain injury, Parkinson’s disease, neuromuscular diseases, major orthopaedic injury, cerebral palsy and the frailty associated with old age. Because of this, motor impairment has not been the focus of targeted research programs until now.

WHY ARE YOU RESEARCHING MOTOR IMPAIRMENT?
Motor impairment is a major health problem. It affects a large number of Australians and as our population ages the incidence will grow. And yet, it is an under-researched area of medicine. We are going to fill gaps in our knowledge and develop and trial new treatments.

While we understand the causes for some forms of impairment, we understand nothing about others. For example, one of the leading causes of motor impairment is stroke. Around four million Australians will suffer a stroke in their lifetime, and half will go on to develop disabling muscle stiffening and problems in their affected arm or leg. And yet, current muscle therapies for these stroke survivors are limited.

Another example is that one in three elderly people fall each year, often because of problems with mobility and their balance and sensory systems.

WHAT ARE YOU DOING ABOUT MOTOR IMPAIRMENT?
Our team will begin by studying everyday functions that people take for granted, such as standing, balancing and using our hands. We will study these abilities in people suffering different diseases, conduct some randomized clinical trials of treatments, and we will develop therapies to help restore function and improve quality of life.

A NHMRC-funded, five-year program of study will begin at NeuRA in early 2014, led by myself, Prof Stephen Lord, Prof Rob Herbert and Assoc Prof Janet Taylor.

Follow @MotorImpairment on Twitter to receive updates from the research team and learn more about this field.
Following the launch of the NeuRA summer appeal, we’ve received generous donations towards the work carried out by the Sydney Brain Bank.

We’d like to thank each and every one of our donors for their continued support and contribution towards this vital research resource.

This internationally recognised facility provided crucial materials for 16 research projects last year - a 50% increase on 2011 - and is increasing its collection of tissue essential for studies looking at DNA, RNA and proteins. It’s also building and expanding its association with longitudinal clinical brain donor programs which record participants’ health data for years before researchers use the brain tissue. This unique facility is made possible by continued donor support.

To read more about the Sydney Brain Bank, visit neura.edu.au/support/brainbank

Supporters dig deep TO HELP the Sydney Brain Bank

With the support of the Australian Bridge Federation, NeuRA will again be running the popular Bridge for Brain Research Challenge during the first week of May. Whilst promoting the health benefits of playing bridge, the event has raised over $260,000 for NeuRA’s research since 2004.

This event has been successful due to the commitment of the Australian Bridge Federation and its key volunteers at leadership, state and club levels. Each year, more and more players join the Challenge, which raises substantial funds to support our vital research in neuroscience. NeuRA is proud to be associated with a large voluntary organisation which focuses on the wider needs of the Australian community.

Bridge expert Valerie Cummings, who has supported the event since the first Challenge in 2004, passed away in October 2012. Not only was Valerie an excellent player, but she also made an important contribution to the Challenge by providing the commentary for the deals, including those for this year. Her long-standing efforts have been greatly appreciated.

It’s not too late to register, so please join in the 10th Anniversary Bridge for Brain Research Challenge and play a hand in changing lives.

To register your club or team online visit neura.edu.au/bridge or call 1300 888 019

03 Brian Rathbone, John Dobbins, Zac Isaacson, and Merle Dobbins playing bridge.

04 Dr Claire Shepherd, Manager of the Sydney Brain Bank.
A new imaging technique has been pioneered by a collaboration of senior scientists at NeuRA that allows the movement of muscles in the upper airway to be tracked in real-time during an MRI scan.

The technique records how muscles, such as the tongue, and other tissues move while someone is breathing, and has been used to study how this differs for people with obstructive sleep apnoea – a disorder characterised by repetitive narrowing or closing of the airway during sleep.

These three images are from three people, all male, middle-aged and obese, while they are awake and breathing quietly. People who do not suffer obstructive sleep apnoea (left) have an open airway during breathing. People with mild to moderate obstructive sleep apnoea (middle) have varying muscle and tissue movements, and in this example (middle) there is a partial closure of the airway at one stage. In this particular case, the uvula – the fleshy mass of tissue that is suspended at the back of the mouth and above the throat – has made contact with the back of the airway. People with severe obstructive sleep apnoea (right) tend to have a complete closure of the airway when breathing, and the movement of the tongue is minimal.