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CHAIRMAN & EXECUTIVE OFFICER'S REPORT>

IN 2005 THE VICTORIAN GOVERNMENT ANNOUNCED A SUBSTANTIAL COMMITMENT TO BUILDING NEUROTRAUMA RESEARCH THROUGH AN INVESTMENT OF \$63 MILLION BY THE TRANSPORT ACCIDENT COMMISSION AND THE DEPARTMENT OF INNOVATION, INDUSTRY AND REGIONAL DEVELOPMENT.

The Victorian Neurotrauma Initiative Pty Ltd (VNI) was established to manage the distribution and use of the funds in order to:

- fund internationally competitive research;
- facilitate enhanced capacity and capability within the Victorian neurotrauma research community; and
- facilitate the translation of research findings within the Victorian healthcare system and amongst TAC clients.

By the end of June 2010 the VNI had committed \$46.2 million to support 60 discrete research initiatives in addition to a range of research support activities. VNI's approach to achieving its' strategic goals has been to support world class research through competitive funding rounds, to support areas of identified need through targeted initiatives and to support researchers through people support opportunities and other capacity building activities.

The research funded by the VNI has spanned a wide range of research topics. The breadth of VNI's interest is the result of adherence to the principle that all research that can ultimately lead to improved outcomes for those with brain and spinal cord injury is worthy, and that VNI funds should be directed to those projects that are of the highest quality.

In order to demonstrate the breadth of VNI's research investment we have developed a model which is presented within this Annual Report. The model recognises the practical purpose for which research has been designed: to Fix the injury, to Improve the functional ability of the individual or to assist an individual with an injury to Live

the best possible life they can. The model also considers the stage of the research, which occurs on a continuum from the acquisition of Foundation Knowledge, the Translation of that knowledge into potential interventions, Intervention Trials to determine whether interventions are appropriate and Implementation of proven interventions. Each purpose and each research stage are important elements in achieving improved future outcomes for individuals following brain and spinal cord injury.

In 2009/2010, the Transport Accident Commission (TAC) decided to consolidate all its research investments and to establish an overall TAC research strategy including governance structures. In recognition of VNI's success and in acknowledgement of the importance of research in the area, the TAC announced a further \$20 million would be invested to support neurotrauma research in the next five years. In deciding to integrate health research in this way, the decision has been made to wind up VNI Pty Ltd at the end of the current contract in May 2011. All commitments to VNI research initiatives will transition to the TAC. Moreover, the experience of the VNI to date will inform the development of TAC's strategies to ensure the best use of these funds to improve the lives of individuals affected by brain and spinal cord injury.

In this Annual Report for 2009/2010 we report on the activities and approaches VNI has utilised during the year. These have been focussed on collaboration, capacity building, and ongoing research support.

COLLABORATION

Brain and spinal cord injuries affect people from all walks of life, and from all parts of the world. To address the issues associated with brain and spinal cord injury is an enormous task, a task too great for one group, individual or organisation to tackle alone. It is vital that the pockets of expertise that exist in this area around Australia and the world work together in order to ensure that advancements in the treatments of brain and spinal cord injuries are made as soon as possible.

The VNI is proactively working with groups that recognise the importance of research to improve outcomes for people living with traumatic brain injury (TBI) and spinal cord injury (SCI). In the last year the VNI has focussed on developing collaborative activities with Canada's Ontario Neurotrauma Foundation and Australia's National Health and Medical Research Council.

CAPACITY BUILDING

Neurotrauma is a specialist area focussed around specific injuries that draws upon a range of disciplines including neuroscience, emergency medicine, psychology, and physiotherapy to name but a few. In order to advance the field it is essential to foster clusters of expertise, with a drive and passion to improve the lives of those who sustain brain and spinal cord injuries.

It is clear from the surveys conducted by VNI over the last few years that we have been successful in building upon Victoria's neurotrauma research base. Data presented within this report demonstrates that research groups that were focussed on neurotrauma research prior to the establishment of VNI have increased their level of activity with increased neurotrauma research, publications and staff. Other established researchers who had not previously conducted neurotrauma specific research have taken an interest and applied their neuroscience expertise to the issues of neurotrauma. We also have evidence that during the period of VNI's operations a number of neurotrauma researchers have been attracted to Victoria to conduct their important research.

In addition to funding support for research projects and programs, specific VNI capacity building initiatives have included VNI fellowships, sponsorship of short courses, support for both researchers and consumers to attend conferences and a range of networking and communication activities.

RESEARCH SUPPORT

During the year, funding for seven new projects was granted bringing the total to over 60 initiatives to date funded and managed by the VNI. Twelve projects have successfully completed including 50% of the projects supported in VNI's first round of funding. The four large international programs of research announced last year are well on their way to making a difference in the field.

FINANCIAL POSITION

The total expenditure for the VNI during the financial year was \$9.7 million. VNI has made commitments to support activities that will extend through to early 2015. The full financial statements are provided at the end of this report.

ACKNOWLEDGEMENTS

The VNI relies on significant contributions of time and energy from a large number of individuals. The VNI staff, Board, Evaluation Committee, Scientific Advisory Committee and External Reference Panel members have all been critical for VNI's achievements in this and in previous years. The Transport Accident Commission and the Victorian Government's Department of Innovation, Industry and Regional Development have provided substantial funding and support. Fundamentally the work of the VNI is as a facilitator and supporter of individuals and groups, whose involvement, cooperation, collaboration and hard work in the area of neurotrauma research will lead to the advancements that VNI seeks to promote. Over the last few years the VNI has formed collaborative relationships with other like-minded organisations which have assisted the VNI with input and assistance, most notably the Ontario Neurotrauma Foundation and the National Health and Medical Research Council.

We thank you all for your input. The expertise, experience and resources of all these contributors have provided a solid foundation for future neurotrauma research investment in Victoria.

Geoff Hilton Chairman Melinda Rockell
Executive Officer

"The VNI funding has provided us with a chance to engage the neurotrauma service sector in a clinical research enterprise. Being clinician-researchers, our emphasis tends to be the clinical application of therapeutic work. We have found a welcoming audience... I believe it has been to the university's benefit, that the service sector has seen a clinical application at close quarters through this funded project..."

Dr Grace Couchman

ABOUT THE VNI>

TRAUMATIC BRAIN INJURY AND SPINAL CORD INJURY ARE DEBILITATING INJURIES WITH SIGNIFICANT AND LIFE-LONG IMPACTS FOR THE INJURED PERSON, THEIR FAMILY, FRIENDS, AND COMMUNITIES.

The effects of the injury are not only physical but impact all aspects of daily functioning including the ability to go to school or work, take part in social and community activities and even maintain relationships; these are significant physical, social and emotional costs. Moreover, the economic costs are also significant since the majority of these injuries occur in young adults who require support and care for the rest of their lives.

An Access Economics Report estimated that the lifetime costs of new cases of brain and spinal cord injury occurring in 2008 alone is \$10.5 billion in Australia. In Victoria, the numbers are also considerable: \$2.2 billion for traumatic brain injury and \$575.8 million for spinal cord injury.

It was with great vision that the government of Victoria recognised this issue and established the Victorian Neurotrauma Initiative (VNI) in 2005 through a partnership between the Transport Accident Commission (TAC) and the Department of Innovation, Industry, and Regional Development (DIIRD). A \$63 million health research fund was created to support research into traumatic brain injury (TBI) and spinal cord injury (SCI). The work of the VNI builds on Victoria's established reputation in the neuroscience research sector and funds research by Victorian scientists in collaboration with national and international colleagues. The research funding is enhanced by a suite of research support activities that promote capacity building and the dissemination of research.

The ultimate aim of all funded research is to improve the health and quality of life of individuals living with neurotrauma.

As of 30 June 2010, a total of \$46.2 million in funding has been committed to:

- 22 projects receiving a total of \$15.6 million (Round 1)
- 12 projects receiving a total of \$3.2 million (Round 2)
- 8 fellowships and 10 Skill Development Awards receiving a total of \$1.6 million (Round 3)
- 4 programs receiving a total of \$19.0 million (Round 4)
- 5 fellowships and 11 Skill Development Awards receiving a total of \$1.2 million (Round 5)
- 4 projects receiving \$1.1 million with 50% co-funded by the Ontario Neurotrauma Foundation (Round 6)
- 2 projects receiving a total of \$785,703 (Round 7)

In addition, the VNI has funded 3 targeted initiatives to an aggregate value of \$4.7 million.

2009/2010 HIGHLIGHTS AT A GLANCE>

- Finalisation of the ONF/VNI Grants joint funding round that resulted in over \$1.1 million towards four projects:
 - Serum Biomarkers, as Predictors of Quality of Life, in Children with Traumatic Brain Injury;
 - Safer Roads to Recovery: Assessing Readiness for Driving after Traumatic Brain Injury;
 - Preventable Job Loss Following Return to Work Post Traumatic Spinal Cord Injury;
 - Neurotrauma Knowledge Translation An International Collaboration.
- Collaboration with the National Health and Medical Research Council (NHMRC), Australia's peak body for supporting health and medical research, on both project and people support rounds and the development of a Memorandum of Understanding.
- Commitment of \$784,703 in funding to two projects resulting from cooperation with the NHMRC on their 2009 project round:
 - Long Term Consequences of Childhood Head Injury –
 15 Year Follow-up;
 - Cognitive and Neural Substrates of Socially Maladaptive Behaviours in Adolescents with Traumatic Brain Injury.

- Co-hosting the Trauma Melbourne Conference with the National Trauma Research Institute in November 2009. The Trauma Research and Clinical Management Conference was a success with 240 delegates in attendance.
- Collaboration with the Ontario Neurotrauma Foundation on two networking events for Victorian and Ontarian researchers at major international brain and spinal cord injury conferences: ISCoS 2009 Conference in Florence, Italy and the IBIA World Congress in Washington, USA.
- Completion of six VNI funded projects:
 - A large collaborative program led by The University
 of Melbourne examined new treatments for brain and
 spinal cord injury at the cellular level in order to identify
 targets for therapeutic intervention and limit the extent
 of damage and functional loss;
 - One study based at the Florey Neuroscience Institutes investigated ways to prevent brain cells from dying after the initial injury to reduce further cognitive and physical impairment. This project received further funding from the National Health and Medical Research Council allowing it to build on its initial findings;

"The funds and networking opportunities provided by the VNI have stimulated an increase in the number of researchers with a diverse range of expertise who are performing neurotrauma research in Victoria, which has broadened and enriched the field."

Dr Nicole Bye

2009/2010 HIGHLIGHTS AT A GLANCE>

- A project based at The University of Melbourne investigated the changes after brain injury to the part of the brain responsible for long term memory and emotion – the hippocampus;
- Researchers at the National Trauma Research Institute examined the impact of lack of oxygen to the brain during respiratory distress after injury and the consequences for further brain damage;
- A study based at Caulfield Hospital compared the outcomes of patients who received their rehabilitation at a dedicated spinal cord injury rehabilitation unit versus those at a non-spinal rehabilitation unit;
- A study based at Alfred Health investigated the mechanism behind the differences in mortality in brain injured patients when resuscitated with either albumin or saline.
- Completion of two VNI Training Fellowships:
 - Susan Berney, a senior physiotherapist at Austin Health completed her research Training Fellowship. She will continue her research through her PhD studies and take her research project to the next stage of development;
 - Jane Galvin, a senior occupational therapist at the Royal Children's Hospital completed her research Training Fellowship. She will continue her research through her PhD studies as well as another VNI funded project.

- Presentation of VNI funded research at conferences held locally, nationally and internationally including conferences in six Australian states and territories and eighteen other countries including the USA, Japan, South Korea, France, Hungary and South Africa.
- Sponsorship of peak Australian neurotrauma conferences including the Australian and New Zealand Spinal Cord Society (ANZSCoS) Annual Scientific Meeting held in Perth, Western Australia and the Australian Society for the Study of Brain Impairment (ASSBI) Conference held in Surfer's Paradise, Queensland.
- Coverage of VNI funded research in various types of media including Channel 10 News, Stateline ABC, 7:30 Report ABC, Vision Podcast (The University of Melbourne), The Australian, The Herald Sun, WIN News, Waverley Leader, specialty magazines, consumer newsletters (AQA News Link) and a variety of online newsletters and websites.

BOARD OF DIRECTORS>

The VNI Board of Directors is responsible for the financial and strategic oversight of the VNI and meets at least quarterly. The VNI Executive reports to the Board on the progress of all initiatives and submits an annual business plan for endorsement. The Board reviews and provides final approval of all recommendations for funding from the VNI Evaluation Committee. It also reviews all recommendations from the VNI Scientific Advisory Committee.

Geoff Hilton (Chair)

- Director, Transport Accident Commission
- Director, WorkSafe Victoria

Bill Burdett

- Chair, Neurosciences Victoria
- Council Member, Nossal Institute for Global Health
- Director, Australian International Health Institute Limited
- Director, Investment Technology Group, Inc.
- Director, IRESS Market Technology Limited

Dr Alex Collie

 Chief Research Officer, Institute for Safety, Compensation and Recovery Research, Monash University

Dr Peter Harcourt, AOM

- Senior Clinician, Transport Accident Commission/ WorkSafe Health Services Group

Professor Richard Smallwood, AO

- Emeritus Professor of Medicine, The University of Melbourne
- President, Australian Medical Council

VNI EXECUTIVE>

The VNI's day-to-day activities are managed by an Executive group. The Executive also supports the activities of the Board of Directors and the Committees reporting to the Board.

Melinda Rockell

Executive Officer

Lisa Pitre

Development Manager

Kenneth Dusza

Senior Project Officer

Dr Fan Li

Senior Project Officer

Debora Romero

Project Officer

Sloane Griffin

Project Officer

Sara Tomlin

Administration Assistant

Peter Farley (To 10 February 2010)

Angela Leahy (From 10 February 2010)

Company Secretary

Nadia Coppe

Public Officer

Simon Rabl

VNI Project Manager, Department of Innovation, Industry and Regional Development (DIIRD)

"The VNI has encouraged collaboration amongst groups not previously working together and provided funds to allow projects to come to fruition. It has brought researchers in this field together and brought others not working in the field into the field."

Professor Jennie Ponsford

SCIENTIFIC ADVISORY COMMITTEE>

The Scientific Advisory Committee provides scientific advice to assist the VNI to develop its' strategic research plan and funding plan as well as promote a broad spectrum of research in neurotrauma.

Professor Richard Smallwood, AO (Chair)

- Emeritus Professor of Medicine, The University of Melbourne
- President, Australian Medical Council

Professor Perry Bartlett (Resigned 16 March 2010)

- Director, Queensland Brain Institute, University of Queensland
- Foundation Chair in Molecular Neuroscience, University of Queensland
- Fellow of the Australian Academy of Science

Professor Ian Cameron

- Professor, Rehabilitation Medicine, University of Sydney
- Director, Medical Services,
 Royal Rehabilitation Centre Sydney

Professor Mary Galea

- Foundation Professor of Clinical Physiotherapy, The University of Melbourne
- Director, Rehabilitation Sciences Research Centre, Austin Health
- Senior Principal Research Fellow, Florey Neuroscience Institutes

Professor Trevor Kilpatrick

- Director, Centre for Neuroscience, The University of Melbourne
- Professor of Neurology, University of Melbourne
- Head, Multiple Sclerosis Unit, Royal Melbourne Hospital
- Head, MS Division, Florey Neuroscience Institutes

Professor Elspeth McLachlan (Resigned 17 November 2009)

- Senior Principal Research Fellow, Prince of Wales Medical Research Institute
- Co-Director, Spinal Injuries Research Centre Emeritus Professor, University of NSW
- Fellow of the Australian Academy of Science

Associate Professor James Middleton

- Associate Professor, Department of Medicine, University of Sydney
- Director, NSW Statewide Spinal Cord Injury Service, Royal Rehabilitation Centre, Sydney
- Senior Medical Specialist, NSW Spinal Outreach Service

Professor Jennie Ponsford

- Professor of Neuropsychology, Monash University
- Director, Monash-Epworth Rehabilitation Research Centre
- Co-Director, Rehabilitation, National Trauma Research Institute

Professor Peter Reilly, AO

- Clinical Professor, Neurosurgery, University of Adelaide

EVALUATION COMMITTEE>

The Evaluation Committee formulates recommendations for funding to the VNI Board of Directors. These recommendations are based on review of both the submitted applications and evaluations from an expert panel review. The Committee provides a broad level of scientific review and evaluation.

Melinda Rockell (Chair)

- Executive Officer, VNI

Alan Blackwood

- Manager, Public Policy Program, Multiple Sclerosis Australia

Professor Robert Burton

- Professor, School of Public Health and Preventive Medicine, Monash University

Dr Alex Collie

- Chief Research Officer, Institute for Safety, Compensation and Recovery Research, Monash University

Professor Andrew Lawrence

- Professorial Research Fellow, Head of Behavioural Neuroscience Division, Florey Neuroscience Institutes

Professor Rod McClure

- Director, Monash University Accident Research Centre

Professor Sandra Rees

- Professorial Fellow, Department of Anatomy and Cell Biology, The University of Melbourne



COLLABORATION>

BRAIN AND SPINAL CORD INJURIES AFFECT PEOPLE FROM ALL WALKS OF LIFE, AND FROM ALL PARTS OF THE WORLD. IT IS ESSENTIAL THAT RESEARCHERS ACROSS AUSTRALIA AND AROUND THE WORLD WORK TOGETHER IN ORDER TO ENSURE THAT ADVANCEMENTS IN THE TREATMENTS OF BRAIN AND SPINAL CORD INJURIES ARE MADE AS SOON AS POSSIBLE.

ONTARIO NEUROTRAUMA FOUNDATION>

The VNI is proactively working with other like-minded groups to improve outcomes for people living with brain and spinal cord injuries. During the year, the VNI focussed on developing further collaborative activities with the Ontario Neurotrauma Foundation (ONF) in Toronto, Canada, an organisation with aims and objectives closely aligned to those of the VNI.

In 2008 the VNI and the ONF established a Memorandum of Understanding to maximise each organisation's ability to meet its objectives and to leverage their respective talents. Through the collaboration, the VNI and the ONF sought to develop a collaborative research agenda, build capacity, and develop knowledge mobilisation strategies to complement the research.

During 2008/2009 the seeds for potential collaboration were sown when a research delegation led by executive management from the ONF visited Melbourne and a research delegation from the VNI visited Toronto, Hamilton and Ottawa in Canada. In each case, delegates met with their counterparts working in their area of specialisation. Tangible research collaborations have already resulted.

Building on this success, the VNI and the ONF jointly organised networking forums for Victorian and Ontarian researchers at the major international brain and spinal cord injury conferences. These networking forums gave researchers an opportunity to informally meet their

counterparts in the other jurisdiction and develop their international research contacts. The forums were held at the International Spinal Cord Society (ISCoS) Conference in Florence, Italy in October 2009 and the International Brain Injury Association (IBIA) Eighth World Congress in Washington, USA in March 2010.

During 2009/2010, the VNI and the ONF also announced joint funding for the inaugural ONF/VNI Grants which provided an opportunity for Ontarians and Victorians to work together on research themed activities that advanced neurotrauma research internationally. Up to \$2 million was allocated to fund a variety of initiatives. In order to promote innovation and creativity, Expressions of Interest for any activity that advanced the aims of the ONF and the VNI were accepted. This included one-off information exchanges to complex research projects and anything in-between. Funding requests were considered for grants ranging from less than \$5,000 to \$1 million over two years.

This initiative was well received and the ONF/VNI Grants received 42 Expressions of Interest. Ten Applications were invited to submit a Full Funding Application. Four initiatives were approved for joint-funding by the VNI and the ONF through their respective evaluations processes; the summary of each funded initiative follows.

"It is clear that the VNI has had a remarkable effect on research into neurotrauma. I run a large lab dealing with autonomic function. Although I had been aware of the autonomic consequences of spinal cord injury I previously had no opportunity to put this knowledge to practical use. With VNI support, investigating therapeutic opportunities for improving the health of SCI patients has become a major focus for me and my research group."

Professor John Furness

SERUM BIOMARKERS, AS PREDICTORS OF QUALITY OF LIFE, IN CHILDREN WITH TRAUMATIC BRAIN INJURY

Team leads:

Dr Jamie Hutchison, Hospital for Sick Children (Ontario)

Professor Vicki Anderson, Murdoch Childrens Research Institute (Victoria)

Traumatic brain injury is the most common cause of death and acquired disabilities in children. Currently, health care providers are unable to accurately predict which children will recover well and which children will have residual medical, physical, cognitive and behavioural sequelae. To better plan support services for children and their families during their recovery and rehabilitation it is important to be able to predict, as early as possible, how the traumatic brain injury will affect their quality of life, both in the short- and long-term post injury.

The research team recently discovered that specific proteins are released from the brain into the bloodstream following injury. They have developed new blood tests for these proteins which have the potential to improve treatments and accurately predict outcome. The aim of this study is to evaluate how helpful these blood tests can be in 240 children after TBI. Identifying links between these blood tests and the child's quality of life post-injury, will allow clinicians to more accurately target children at risk of ongoing problems and provide appropriate treatments, when they are likely to be most effective, that is, in the early stages post-injury.

SAFER ROADS TO RECOVERY: ASSESSING READINESS FOR DRIVING AFTER TRAUMATIC BRAIN INJURY

Team leads:

Dr Judith Charlton, Monash University Accident Research Centre (Victoria)

Dr Michel Bédard, Centre for Research on Safe Driving, Lakehead University (Ontario)

More than two-thirds of persons with a traumatic brain injury (TBI) return to driving. Despite this, limited research investigating driving performance following TBI has been conducted. The aims of the study are to examine the nature and causes of driving difficulties following TBI as a basis for developing more reliable and valid assessment procedures for readiness to return to driving. Driving performance will be investigated in simulated, on-road and naturalistic driving conditions. Findings from this study will significantly contribute to a currently limited evidence-base available for rehabilitation clinicians assessing driver readiness. This research will guide the development of more sensitive driving evaluation procedures and driver retraining programs, thereby contributing to improved safety and mobility for those with TBI who return to driving.

COLLABORATION>

PREVENTABLE JOB LOSS FOLLOWING RETURN TO WORK POST TRAUMATIC SPINAL CORD INJURY

Team leads:

Associate Professor Gregory Murphy, La Trobe University (Victoria)

Dr Cheryl Cott, Toronto Rehabilitation Institute (Ontario)

This research aims (a) to identify the range of factors associated with the loss of a job to which an injured individual has returned following discharge from SCI rehabilitation, and (b) to identify interventions that could be implemented to prevent unnecessary job loss (and to assess the costs and benefits of such interventions from a societal perspective). Parallel Victorian-based and Ontario-based studies of the factors leading to job withdrawal by study SCI participants will be conducted as a pre-cursor to focus-group studies aimed at identifying the service delivery implications of major factors emerging from the interviews from the SCI study participants who did not persist with positions of employment gained post injury. Identical focus-group studies involving those with clinical service experience, community-based experience and workplace experience will be held in both jurisdictions.

The results of the interviews and the focus group workshops will be used to guide the development of a survey sent to both Victorian-based and Ontario-based samples of clinicians, vocational service providers and employer representatives to assess their knowledge of and attitudes towards listed potential interventions to prevent unnecessary job loss. A sample of those living with SCI in the Victorian community (and a similar sample of those living in the Ontario community) will also be surveyed about their attitudes to the listed service-development proposals.

A final component of the research will be an economic analysis (conducted from Victoria) of the costs of unnecessary (i.e. preventable) job loss.

NEUROTRAUMA KNOWLEDGE TRANSLATION – AN INTERNATIONAL COLLABORATION

Team leads:

Dr Peter Bragge, National Trauma Research Institute (Victoria)

Dr Mark Bayley, The University of Toronto (Ontario)

The optimum clinical management of neurotrauma patients should be based upon the latest available research evidence. However, the challenge of transferring ever-increasing volumes of medical literature into improved patient outcomes is considerable.

Knowledge Transfer and Exchange (KTE) is the relatively new scientific field of developing and implementing specific strategies to effectively and efficiently translate research evidence into clinical practice. The ongoing development of this field is highly dependent upon dissemination of and advances in KTE knowledge, collaboration between the relatively small community of KTE researchers and expansion of KTE capacity via growth of this community. Interventions in neurotrauma are complex and multifaceted as they involve a large number of health disciplines and care settings. Therefore expanding KTE capacity is critical to the area of neurotrauma.

Harnessing the combined expertise and leadership of VNI and ONF funded researchers in KTE, the aim is to plan and convene an international workshop to drive the science of ensuring that care of brain and spinal cord injury is based on best research evidence, with the ultimate aim of improving the care of these patients.

"It's been an extremely valuable initiative in terms of facilitating the establishment of new collaborative efforts. It's focus on all possible levels of study, from basic science to service delivery, while keeping a focus on the long-range goals of preventing or ameliorating the effects of central nervous system injury has been, I think, unique."

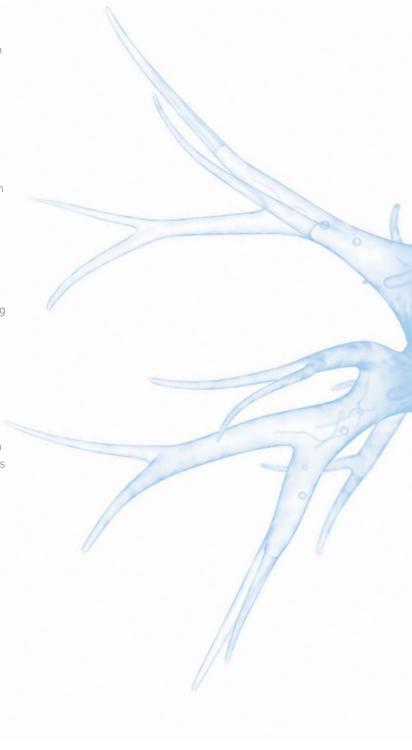
Dr Larry Abel

NATIONAL HEALTH AND MEDICAL RESEARCH COUNCIL>

During 2009/2010 the VNI sought new ways of providing funding that would further advance neurotrauma research and take advantage of existing expertise in Australia. To that end, the VNI collaborated on project and people support funding with the National Health and Medical Research Council (NHMRC), Australia's peak body for supporting health and medical research. As the gold standard for research funding nationally, NHMRC funding is highly competitive and attracts the best of Australian research. By working with NHMRC, neurotrauma research has been elevated at the national level. Cooperation with NHMRC also allowed the VNI to take advantage of NHMRC's considerable expertise in research evaluation and its vast research network. Moreover, applicants were only required to complete one process for consideration by both organisations minimising the amount of time researchers spent completing applications and maximising their time conducting valuable neurotrauma research.

The VNI offered several opportunities as part of the following NHMRC rounds: 2009 and 2010 Project Rounds; 2010 People Support Rounds including Career Development Awards, Translating Research Into Practice (TRIP) Fellowships and Practitioner Fellowships.

The summaries of the two projects that were funded through the 2009 NHMRC Project Round follow, while all other rounds were in progress at the end of the financial year.



COLLABORATION>

LONG TERM CONSEQUENCES OF CHILDHOOD HEAD INJURY – 15 YEAR FOLLOW-UP

Lead Chief Investigator: Associate Professor Cathy Catroppa, Murdoch Childrens Research Institute

How do head injuries suffered in childhood affect the thinking and emotions of adolescents and young adults? Can we identify children who may be at risk of developing social problems, and who could benefit from treatment programs to minimise the effects of their head injury?

A new project led by Associate Professor Cathy Catroppa, Professor Vicki Anderson and Dr Celia Godfrey of the Murdoch Childrens Research Institute will investigate those questions. It extends a study Anderson and Catroppa initiated 15 years ago, in which they tracked the recovery and development of over 140 children who suffered head injury in childhood.

The early study showed that children who suffered moderate or severe head injuries performed worse than children with mild or no injuries in tests of cognitive abilities, including attention, memory and the ability to plan and carry out tasks ten years after their injury. They also showed impairment of behavioural functions, and were less able to adapt to varying social situations. The results of the study challenged the traditional view that young children are resilient and recover fully from brain injury.

The new study will expand this research to include measures of psychological well-being, such as anxiety, depression and quality of life. It will cover an important time in development, that is, when the children have become adolescents and young adults, and are facing more complex demands.

"Even children with mild head injuries may present with social problems, such as difficulties in making and maintaining friends," says Catroppa.

"Children 'at risk' may benefit from interventions, which could include programs aimed to improve attention and memory or reduce anxiety," she says. "Such interventions may assist in the improvement of quality of life, with a possible beneficial impact also on their family and the wider community."

Catroppa hopes that the rich databank compiled in this long-term project will enable the research team to identify factors that can be used to predict which children are at a high risk of long-term difficulties in cognitive and psychological areas. "This could help us to target those needing clinical intervention," she says.

"The VNI has made an unprecedented contribution to neurotrauma research in Victoria.
It is also clear that some of the projects funded by the VNI have had an international impact..."

Associate Professor Robert Medcalf

COGNITIVE AND NEURAL SUBSTRATES OF SOCIALLY MALADAPTIVE BEHAVIOURS IN ADOLESCENTS WITH TRAUMATIC BRAIN INJURY

Lead Chief Investigator: Professor Vicki Anderson, Murdoch Childrens Research Institute

Researchers at the Murdoch Childrens Research Institute are about to investigate in teenagers the lingering effects of traumatic brain injuries sustained during childhood. They want to determine if childhood brain trauma leads to socially inappropriate behaviour in adolescents, including aggression and delinquency.

The link between such behaviour and changes in brain structure and function due to injury is argued to be strong, but elusive, according to lead researcher Professor Vicki Anderson.

"The evidence we have comes mostly from strokes and tumours in adults where localised brain injuries affect the orbitofrontal cortex—an area important for behaviour regulation," says Anderson. "And we also know from the literature that a higher than expected proportion of prison inmates have had brain injuries."

The study will compare the social and moral skills of a group of adolescents with a medical history of moderate to severe traumatic brain injuries to an age-matched control group. The participants in the study will be given several tasks to determine how they make decisions in response to sophisticated social and moral dilemmas, and whether they interpret the intent of ambiguous statements as hostile or benign. During testing, brain scans will show the location and level of brain activity as the participants consider the scenarios presented to them.

"From our pilot studies we think that adolescents with brain injuries are more likely to give aggressive or impulsive answers," explains Anderson. "When presented with a complex dilemma, they may find it difficult to weigh up all of the factors to make an appropriate decision."

The result is that these children may be more likely to react inappropriately to the situations in which they may find themselves.

"Ultimately these kids are at increased risk to be easily led astray by their peers to make bad decisions and may not know when they have crossed the line, and when to stop," says Anderson.

The researchers hope that in addition to providing clues about how brains develop during adolescence, the study will suggest ways to avoid ongoing problems by understanding and treating head injuries in children.

"If we understand how head injuries can affect brain development, then maybe we can work with kids to help them understand their weaknesses and recognise the signs that they may be on the wrong track."

CAPACITY BUILDING>

RESEARCHER SURVEY FEEDBACK>

The article *Gains in neurotrauma research activity and output associated with a Victorian state government funding program written* by VNI Director Alex Collie was published in the Medical Journal of Australia on 21 June 2010 (192: 712-714).

The article highlighted the value of the Victorian Neurotrauma Initiative to the Victorian neurotrauma research community. Specifically, the article noted that:

- A survey of Victorian neurotrauma research units conducted in 2008 showed substantial increases in workforce capacity, collaborative activity and research output during the first three years of the funding program;
- Changes in economic and commercial activity, and research translation activity were also observed;
- The activity and output of the Victorian brain and spinal cord injury research sector increased substantially during a period coinciding with increased funding.

In April 2010, the VNI conducted a follow-up survey of all funded project and program researchers. The responses from the surveys indicated that the increase in research activity and capacity that followed the establishment of the VNI has been at least maintained with additional growth in some measures since the 2008 survey. Specifically, there has been an increase in:

- the number of individual staff involved in projects, presentations and publications in peer-reviewed projects;
- collaborations, particularly with international organisations, and;
- neurotrauma funding, including an increase of \$5,239,945 from all funding sources including the VNI, when compared to 2008.

The VNI also conducted an inaugural survey of its thirteen funded fellows. Their responses indicated an increase in neurotrauma capacity building. The surveys demonstrated a dramatic increase in:

- collaborations, particularly with Victorian and international senior researchers as well as with Victorian, interstate and international organisations;
- translation of research into practice activities, including participation in advisory committees and development of clinical policies and guidelines;
- neurotrauma research funding received, which saw an increase of \$3,042,774 from all funding sources including the VNI, during the period of the fellowships when compared to funding received prior to the fellowships.

The surveys also illustrated that there was significant research output from the fellows by way of peer-reviewed journal articles and presentations.

The results of the 2010 surveys are illustrated in the graphs overleaf. The first set of tables includes the survey data from project and program teams; the subsequent page includes the survey data from VNI Fellows. The comments in the surveys (located in the top corners throughout the document) provide further insights into the nature of this capacity building beyond the numbers.

"The VNI support has allowed the establishment of a resource [Neurotrauma Brain/Tissue Bank] with a significant capacity to make major advances in neurotrauma research."

Professor Catriona McLean

IMPACT OF VNI FUNDING ON WORKFORCE CAPACITY>

	1 July 2005	1 July 2008	1 April 2010
Full Time Equivalent (FTE) staff	47.7	126.2	120.05
Individual staff	104	219	272
Students	38	78	75
Postgraduate qualified	49	105	109
Clinical staff	34	85	107

IMPACT OF VNI FUNDING ON RESEARCH OUTPUT>

	1 July 2005	1 July 2008	1 April 2010
Journal Articles in past 12 months	32	89	99
Book Chapters	29	42	35
Presentations in past 12 months	122	217	253
Invited Presentations	44	89	91

IMPACT OF VNI FUNDING ON THE NUMBER OF RESEARCH COLLABORATIONS WITH OTHER ORGANISATIONS>

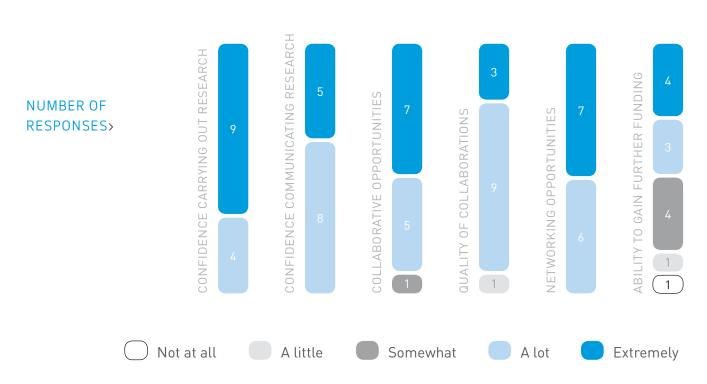
	1 July 2005	1 July 2008	1 April 2010
Total Collaborations	69	218	219
Collaborations with Victorian Organisations	41	115	98
Collaborations with Interstate Organisations	17	52	58
Collaborations with International Organisations	11	52	64

CAPACITY BUILDING>

IMPACT OF VNI FUNDING FOR FELLOWSHIP RECIPIENTS: COLLABORATION WITH OTHER ORGANISATIONS>

	1 April 2008	1 April 2010		
	Num	Number of Collaborations		
Organisations	21	81		
Victorian organisations	16	25		
Interstate organisations	4	37		
International organisations	1	19		

SELF RATED PERCEIVED CAPACITY BUILDING BY VNI FELLOWS>



"The VNI has allowed our research group to extend our expertise in biological psychiatry into the field of neurotrauma."

Professor Paul Fitzgerald

RESEARCH SUPPORT ACTIVITIES>

CONFERENCE ATTENDANCE SUPPORT AND CONFERENCE SPONSORSHIP

During 2009/2010 the VNI aimed to offer a variety of research support activities to enhance the skills of senior and junior researchers in both the academic and clinical fields with a view that capacity building takes many forms in addition to salary support opportunities such as fellowships. These activities included conference sponsorship, conference attendance support, sponsoring training workshops and short courses, and organising seminars, education sessions, mentoring and networking opportunities.

CONFERENCE SUPPORT SCHEME FOR VNI FUNDED RESEARCHERS

Through its' Conference Support Scheme, the VNI offered financial support to senior researchers to present their research at international conferences and to junior researchers to present their research at national conferences. Researchers attended and presented their research through the scheme at the following conferences:

- 19th World Conference of Gerontology and Geriatrics, Paris. France
- ISN/APSN 22nd Joint Biennial Meeting, Taipei, Taiwan
- Joint National/International Neurotrauma Conference, Santa Barbara, USA
- Society for Neuroscience Annual Conference, Chicago, USA
- 38th Annual Meeting of the International Neuropsychology Society, Acapulco, Mexico
- International Brain Injury Association Eighth World Congress on Brain Injury, Washington, USA
- 6th World Congress for Neurorehabilitation, Vienna, Austria
- Australian Society for the Study of Brain Impairment 33rd Annual Brain Impairment Conference 2010, Surfer's Paradise, Queensland

- American Thoracic Society 2010 International Conference, New Orleans, USA
- 1st Annual World Congress of Immunodiseases and Therapy 2010, Beijing, China

Overall, during 2009/2010 VNI researchers gave presentations in six Australian states and territories and in eighteen other countries including the USA, Japan, South Korea, France, Hungary and South Africa.

VNI NEUROTRAUMA COMMUNITY CONFERENCE SUPPORT SCHEME

In 2009/2010 the VNI offered conference attendance support to the wider neurotrauma community, specifically to: individuals with a traumatic brain injury (TBI) or spinal cord injury (SCI), their carers, and members of TBI/SCI advocacy organisations. The aim of the scheme was to promote communication between researchers and those directly affected by brain and spinal cord injury. This funding was noted as critical for individuals who were on disability pensions after injury who may not be able to attend research conferences on issues which directly impact their lives. Ten individuals were funded to attend the conferences listed below:

- Trauma Melbourne 2009 Pre-Conference Workshop, Melbourne, Victoria
- 3rd Regional ABI Conference, Warrnambool, Victoria
- Australian and New Zealand Spinal Cord Society Annual Scientific Meeting, Perth, Western Australia
- 38th Annual Meeting of the International Neuropsychology Society, Acapulco, Mexico
- International Brain Injury Association Eighth World Congress on Brain Injury, Washington, USA
- Australian Society for the Study of Brain Impairment 33rd Annual Brain Impairment Conference 2010, Surfer's Paradise, Queensland

CAPACITY BUILDING>

CONFERENCE SPONSORSHIP

Trauma Melbourne 2009 - Melbourne, Victoria

The VNI was pleased to co-host the Trauma Melbourne Conference for a second year with the National Trauma Research Institute. The Trauma Research and Clinical Management Conference was opened by the Minister of Health, Daniel Andrews. Professor Andrew Maas from the University Hospital Antwerp, Belgium gave an insightful keynote address. The 240 attendees were able to learn more about VNI funded research that was presented throughout the conference. Plenary speakers included VNI funded researchers Professor Jennie Ponsford, Associate Professor Warwick Butt, Associate Professor Alistair Nichol, Professor Jamie Cooper, and Professor Russell Gruen.

ANZSCoS 2009 - Perth, Western Australia

In November, the VNI was a sponsor of the Australian New Zealand Spinal Cord Society Annual Scientific Meeting, on the theme *Are We There Yet?* that was held in Perth, Western Australia. The conference attracted 170 delegates with an interest in spinal cord injury.

ASSBI 2010 - Surfer's Paradise, Queensland

In May, the VNI was a sponsor of the Australian Society for the Study of Brain Impairment (ASSBI) 33rd Annual Brain Impairment Conference on the theme *Innovations in Neurorehabilitation* held at Surfer's Paradise, Queensland. The conference attracted 232 delegates with an interest in brain injury.

ISAN 2009 – Sydney, New South Wales

As part of The 6th Congress of the International Society for Autonomic Neuroscience, the VNI sponsored a session on "The autonomic nervous system in spinal cord injury – bench to bedside" that was chaired by Professor Christopher Mathias and Associate Professor Janet Keast. Invited speakers included: Associate Professor James Brock, Associate Professor Ida Llewellyn-Smith, Assistant Professor Victoria Claydon and Professor Christopher Mathias.

SEMINARS AND EDUCATION SESSIONS

VNI SEMINAR SERIES

Three seminars were held during the year as part of the VNI Seminar Series. The series provides an opportunity for colleagues to hear about the progress of VNI funded research and it also gives researchers an opportunity to disseminate their research to the wider community. The seminars received favourable feedback from the researchers, clinicians, and consumers who attended.

NEW TREATMENTS FOR BRAIN AND SPINAL CORD INJURIES COMPLETED PROJECT

The seminar on 29 September 2009 featured the outcomes of a large collaborative project that involved eight Chief Investigators. The six presentations gave a thorough picture of the outcomes of one of the first projects funded by the VNI. The discussion after the presentations led to an interesting debate on the recent advancements in the field.

Chair: Project Co-ordinator, Professor Norman Saunders, The University of Melbourne: *Project Overview, Traumatic Injury to Brain and Spinal Cord - Secondary Injury, Development and Evaluation of New Treatments*

Session One:

Molecular and Cellular Biology of Traumatic Brain Injury

Dr Peter Crack, The University of Melbourne: *Molecular Approaches to the Study of Traumatic Brain Injury*

Professor Seong-Seng Tan, Florey Neuroscience Institutes and The University of Melbourne: *How Ndfip1 Protect Neurons from Injury in Human Neurons*

Associate Professor Cristina Morganti-Kossmann, National Trauma Research Institute: *Involvement of Fas, Chemokines and Cytokines in the Development of Secondary Damage Following TBI.* "Without the VNI Fellowship, I simply would not have had the opportunity to conduct my current neurotrauma research. Moreover, the fellowship has also allowed me to remain in science/research altogether..."

Dr Steven Miller

Session Two:

Spinal Cord Injury, New Ways to Tackle a Difficult Problem

Dr Mark Habgood, The University of Melbourne: Improved Methods for Assessing Efficacy of Treatments to Limit the Consequences of Spinal Cord Injury

Dr Jenny Callaway, The University of Melbourne: Behavioural Analysis of Spinal Cord Injury and Traumatic Brain Injury

Dr Peter Batchelor, Austin Hospital: *Hypothermia and Decompression of the Spinal Cord*

CAPACITY BUILDING IN NEUROTRAUMA RESEARCH

The seminar on 9 February 2010 incorporated an Information Session on upcoming fellowship opportunities as well as a networking lunch for potential applicants to meet VNI fellows.

Six fellows funded through the 2008 Fellowship Round shared their experiences to date, the benefits of their fellowships and outlined the progress of their research projects. Attendees appreciated learning about the varied experiences of the VNI fellows.

A View from 2008 VNI Fellows

Training Fellowships

Susan Berney, Austin Hospital Jane Galvin, Murdoch Childrens Research Institute

Practitioner Fellowships

Dr Steven Miller, Monash University Dr Gavin Williams, Epworth Hospital

Early Career Research Fellowships

Dr Yona Goldshmit, Monash University Dr Jerome Maller, Alfred Psychiatry Research Centre, Monash University

DISSECTING THE ELEPHANT – HOW THE VNI IS SUPPORTING THE STEPS TO IMPROVE LIVES

The seminar on 19 May 2010 presented a variety of research initiatives funded by the VNI in the areas of Foundation Knowledge, Intervention Trials and Implementation. Audience feedback noted the breadth of the research presented and the high calibre of the speakers.

Chair: Professor Russell Gruen, Director, National Trauma Research Institute

Foundation Knowledge

Professor Jennie Ponsford, Monash University: Longitudinal Head Injury Outcome Study

Dr Kathy Traianedes, St Vincent's Hospital: Matrix Technology for Spinal Cord Repair

Intervention

Professor Jamie Cooper, ANZIC-RC, Monash University: SAFE-TBI and POLAR (The Prophylactic hypOthermia to Lessen trAumatic bRain injury-Randomised Control Trial)

Dr Chris O'Callaghan, Repatriation and Austin Hospitals: Blood Pressure Control in Spinal Cord Injury

Implementation

Professor Sally Green, Monash University: Knowledge Translation—Neurotrauma Evidence Translation

Christine Durham, PhD Candidate, RMIT University and brain injury survivor: *Perspectives of those with a brain Injury – "Keys to the ABI Cage" Project*

CAPACITY BUILDING>

EDUCATION SESSIONS

VNI Executive also organised monthly in-house research education seminars for staff of the Transport Accident Commission (TAC) on the following themes:

- Quality of Life After Trauma Psychological Consequences
- The Economic Costs of Brain and Spinal Cord Injury
- Identifying Needs and Customising Therapy
- Frontiers in Rehabilitation
- Supporting Individuals and Their Families with Brain Injury
- Silent Spinal Cord Issues Breathing and Bowel Control
- Challenges of Traumatic Brain Injury at Different Stages of Life
- Silent Spinal Cord Issues The Sequel

VNI funded researchers presented their research and explained the implications for TAC clients. Throughout the year VNI funded researchers also gave over sixty presentations at education sessions to a variety of audiences including consumer groups, clinicians and academics.



TRAINING AND SKILLS BUILDING

SHORT COURSES AND WORKSHOP SPONSORSHIP

In 2009/2010, the VNI offered sponsorship of several short courses and workshops to VNI funded researchers and their teams. They included:

- Media Training for Scientists
- Hands-on one day workshops with working journalists where scientists learned how to communicate their research to media and a lay audience
- Eight Chief Investigators were sponsored to attend
- Science Writing
- Two-day short course on the concepts of good science writing for clear written communication
- Thirty-Eight team members of VNI funded research were sponsored to attend
- Knowledge Translation in Health
- One day seminar with international guest speakers
- Eleven VNI researchers and TAC Clinical Panelists were sponsored to attend

MENTORING

In November and December, five VNI fellows invited Research Australia Youth Ambassadors to shadow their research. Jane Galvin, Dr Jerome Maller, Dr Alistair Nichol, Dr Cheryl Soo, and Dr Gavin Williams each mentored a secondary student as part of Research Australia's public awareness campaign 'Thank You' Day. Youth Ambassadors were selected for their strong interest in health and medical research as part of a national essay writing competition. Students spoke highly of the value of the mentoring in furthering their interest in health research.

"VNI funding offers opportunities to clinical researchers to develop research skills and projects. Often it is very difficult to attract funding as a clinician without a PhD and whilst maintaining a clinical practice."

Kathleen Bakker

NETWORKING AND OUTREACH

HEALTH ECONOMIC ANALYSIS LAUNCH

In August, the VNI launched the Access Economics Report it commissioned: *The economic cost of spinal cord injury and traumatic brain injury in Australia*. Individuals from academia, hospitals and consumer advocacy organisations attended. Dr Alex Collie who managed the project, gave an overview of the report, while Professor Jamie Cooper and Dr David Berlowitz presented on the two research case studies that were profiled in the report. The analysis of the report confirmed what individuals working in the sector intuitively knew: the costs of brain and spinal cord injury are very high. Researchers welcomed the report and were keen to use the analysis for supporting their research. Two hundred copies of the report were printed and distributed to researchers throughout the year. Copies are also available online.

FELLOWSHIP NETWORKING DINNER

In December the VNI organised an inaugural Fellowship Networking Dinner to give VNI fellows an opportunity to informally share their experience and learnings with other fellows, mentors and VNI stakeholders. The 22 attendees found the experience worthwhile and helpful in making further connections with their colleagues that they might not have otherwise made in a more formal context.

STAKEHOLDER OUTREACH

The VNI Executive meet regularly with funded researchers in formal meetings, at conferences and informal events. Executive staff also attend relevant conferences and events in order to stay abreast of issues related to brain and spinal cord injury and to promote awareness of VNI opportunities and funded research. During 2009/2010, Executive staff attended the following events:

- QBI Forum Frontiers in Spinal Cord Research, St Lucia, Queensland
- Launch of Brain Injury Awareness Week, Melbourne, Victoria
- ISCoS 48TH Annual Scientific Meeting 2010, Florence, Italy
- NHMRC Seminar, Lost in Translation, Melbourne, Victoria
- StepAhead Annual Scientific Conference, Melbourne, Victoria
- Research Australia's 'Thank You' Day Awards, Melbourne, Victoria
- Trauma Melbourne 2009, Melbourne, Victoria
- ANZSCoS 2010 Are We There Yet?, Perth, Western Australia
- 3rd Regional ABI Forum, Warrnambool, Victoria
- International Brain Injury Association Eighth World Congress on Brain Injury, Washington, USA
- Clinical Research Network Symposium, Melbourne, Victoria
- ASSBI 2010 *Innovations in Neurorehabilitation*, Surfer's Paradise, Queensland

MEMBERSHIPS

During 2009/2010, the VNI was a member of Research Australia and the Australian Society for the Study of Brain Impairment (ASSBI) and a supporter of the Spinal Cord Injury Network (formerly ANZSCIN).

CAPACITY BUILDING>

VNI FELLOWSHIPS PROVIDE SALARY SUPPORT FOR RESEARCHERS TO CARRY OUT THEIR NEUROTRAUMA RESEARCH PROJECTS. SINCE 2008 THE VNI HAS AWARDED THIRTEEN FELLOWSHIPS AIMED AT DIFFERENT TYPES OF RESEARCHERS INCLUDING: TRAINING, PRACTITIONER, EARLY CAREER RESEARCH AND SENIOR RESEARCH FELLOWSHIPS. TWO TRAINING FELLOWSHIPS COMPLETED DURING THE YEAR AND ARE SUMMARISED IN THE FOLLOWING PAGES.

COMPLETED FELLOWSHIPS>

TRAINING FELLOWSHIP - SUSAN BERNEY

Susan Berney is a Senior Physiotherapist in the Intensive Care Unit at the Austin Hospital, and has observed that the decision to give a spinal cord injured patient an artificial tube for assistance to breathe and cough (a tracheostomy) can be arbitrary. Through her VNI Training Fellowship, she set out to identify the factors that influence clinical decision making in airway management. Using this information, she developed a decision making algorithm to assist clinicians to determine whether patients were able to breathe for themselves or whether they required a tracheostomy.

Her research found that in Victoria patients who are admitted to the intensive care unit following cervical spinal cord injury are less likely to require a tracheostomy compared to elsewhere in the world. The lung volume, the amount of oxygen in the blood and the amount of phlegm in the lungs were best able to predict who was able to breathe on their own and who would require a tracheostomy. Her results demonstrated that it is possible to predict patients who may be able to breathe on their own and those who will require a tracheostomy using three simple clinical assessments. This model of airway management will facilitate judicious extubation and earlier insertion of a tracheostomy for better patient outcomes. This potentially reduces both the duration of mechanical ventilation and the length of stay in the ICU.

This algorithm is the first clinical decision making tool in airway management for patients with acute cervical spinal cord injury. To date there have been no clinical parameters described to guide clinicians in the decision to extubate a patient with acute cervical spinal cord injury nor have rates of extubation success or failure of the procedure been previously reported.

A busy clinical load would have prevented Susan from carrying out this seminal research in the course of her regular duties: "This fellowship has been invaluable to me in allowing me to complete the first draft of my thesis almost 12 months ahead of time. The relief from clinical responsibilities has allowed me to concentrate on the research process and I feel I have gained much more out of my PhD than I otherwise might have and subsequently have enjoyed the experience."

In addition to her fellowship research, Susan attended short courses and seminars on Muscle Mass and Knowledge Translation in Health.

Her mentor Professor Rinaldo Bellomo notes that Susan's research has contributed significantly to the field since it is the first attempt to provide assistance to clinicians to make an evidence based decision on airway management. Moreover, he says that she has proven to other researchers in the area that these studies are able to be performed and her research will encourage other clinicians to participate in future studies.

Susan plans to continue this area of research to validate her preliminary classification and regression tree model of clinical decision making through the use of an independent data set from an ICU of another specialist spinal centre. This validation is required to either confirm or review the model prior to implementing into clinical practice.

"The VNI has been a wonderful supporter of neurotrauma clinical research, and subsequently has had a far-reaching positive effect in this field...The VNI is noticeably a strong supporter of a wide array of neurotrauma research, from acute stage/trauma interventions and under-the-microscope sciences to retrospective data analysis. This in itself exemplifies the VNI's well-rounded approach to neurotrauma research..."

Dr Jerome Maller

TRAINING FELLOWSHIP - JANE GALVIN

As a Senior Occupational Therapist with the Victorian Paediatric Rehabilitation Service at the Royal Children's Hospital, Jane Galvin knows how fine motor and upper limb challenges in children can affect their ability to learn, play and develop. She commenced her VNI Training Fellowship in April 2008 part-time while maintaining her clinical duties and lecturing at La Trobe University. Through her research project, she aimed to measure and describe recovery and development of fine motor skills and arm use following paediatric brain injury. Children between 6 and 16 years were recruited, their fine motor skills were assessed, along with their abilities in self care, school tasks and participation in the community based activities. The research is ongoing, however, preliminary results suggest that children who have sustained severe traumatic brain injury demonstrate movement difficulties that have a significant impact on their ability to participate in all daily activities. Also children who sustained moderate brain injury demonstrated difficulties with speed and dexterity of movement which impacts on their ability to complete handwriting and other tasks at the same speed as their peers.

As part of her research Jane has written clinical guidelines on the assessment of upper limb function following paediatric brain injury which will be implemented across the five paediatric sites in Victoria – Royal Children's Hospital, Southern Health, Barwon Health, Bendigo Health and Eastern Health. She has also given numerous presentations and published in peer reviewed journals.

During the course of her fellowship Jane supervised three honour students who completed their degrees and also mentored secondary students interested in health research as part of the Youth Ambassador Program organised by Research Australia.

In addition, Jane participated in short courses such as Epidemiology and Analytic Methods 1 & 2, Media Training for Scientists and Science Writing. She was also selected to be part of a VNI delegation that visited Canada as part of an international research exchange with the Ontario Neurotrauma Foundation (ONF).

Jane notes that "The research exchange to ONF in Toronto provided an invaluable experience of networking with international leaders in the area of paediatric rehabilitation, but also with Australian colleagues."

Her mentor Professor Vicki Anderson praised Jane's talent and commitment to her fellowship research project and her ability to mentor those around her. These skills are being put to good use in Jane's role as team leader of the Neuro-Rehabilitation Research team at the Murdoch Childrens Research Institute. She is currently enrolled in a PhD and her focus during the next two years will be on completing it. Jane will continue to be involved in the development of other projects related to neurotrauma, most notably in establishing a research program within the rehabilitation service at the Royal Children's Hospital.

Jane notes that "the Fellowship has been an amazing opportunity to expand my skills and networks in research...
The ability to dedicate time to research as a result of the Fellowship has been invaluable, and has provided an opportunity to begin to develop research skills and expertise, and to demonstrate this through publications and presentations."

RESEARCH PROFILES>

AS OF 30 JUNE 2010, THE VNI COMMITTED FUNDS TO 60 RESEARCH INITIATIVES:
4 LARGE RESEARCH PROGRAMS; 43 PROJECTS, AND 13 FELLOWSHIPS. DURING THE YEAR,
VNI EXECUTIVE COMPLETED THE EVALUATION OF 54 APPLICATIONS FOR RESEARCH FUNDING,
REVIEWED 61 PROGRESS AND FINAL REPORTS AND EXECUTED 5 FUNDING AGREEMENTS.
ONE NEW TARGETED INITIATIVE WAS ALSO FUNDED. A TOTAL OF TWELVE PROJECTS ARE NOW
COMPLETE WITH THOSE FINISHING THIS YEAR SUMMARISED BELOW.

NEW TARGETED INITIATIVE>

EARLY INTERVENTIONS TO IMPROVE OUTCOMES AFTER TRAUMATIC BRAIN INIURY

Lead Chief Investigator: Professor Jamie Cooper, Australian and New Zealand Intensive Care Research Centre [ANZIC-RC]

Could cooling the patient at an accident site reduce the impact of traumatic brain injury (TBI)? How about using a drug to increase the supply of oxygen to the brain?

These are some of the questions that a large research team, led by Professor Jamie Cooper, Director of the Australian and New Zealand Intensive Care Research Centre (ANZIC-RC), Monash University, is exploring. Cooper and his colleagues are studying ways of limiting any additional injury from a lack of oxygen in the brain caused by the brain swelling and compressing blood vessels after TBI.

Previous research in Australia has shown that six months after injury about half of those with severe traumatic brain injury either will not have survived or will be unable to live independently. Given the young age of many patients with severe TBI and the long-term effects of injury, the economic and social cost to the community is high.

Studies in animals have shown that cooling started shortly after sustaining injury decreases the number of brain cells that die and reduces inflammation in the brain. ANZIC research fellow Lynne Murray is now collaborating with ambulance services and hospitals in Australia and New Zealand in a human trial of this treatment, known as

POLAR (prophylactic hypothermia trial to lessen traumatic brain injury).

Immediately after injury, patients are given cold saline by ambulance paramedics through an intravenous drip. When they arrive at hospital, their condition is reviewed. If it is safe to proceed they are cooled further to 33 °C for three days using chest and leg wraps connected to temperature control equipment.

The second project, managed by research fellow Lorraine Little, uses erythropoietin (EPO) to limit additional injury. EPO stimulates the bone marrow to produce red blood cells and is commonly used to treat anaemia in patients receiving cancer treatment and other conditions such as chronic kidney failure.

The role of EPO in treating brain injury is complex and includes improving oxygen supply to the brain, decreasing brain swelling and improving new brain cell growth. In the trial, EPO is administered to patients within 24 hours of injury, and throughout the initial recovery process.

The aim of the study is to determine if EPO improves brain function and helps patients recover better after traumatic brain injury.

Patients participating in both trials will be assessed by a telephone interview six months after their injury. If the trials are successful the team anticipates that the two techniques could be in routine use within five years.

"The VNI has had a terrific influence in the boosting of neurotrauma research in Victoria making this state a unique hub for experimental and clinical research in the field."

Associate Professor Cristina Morganti-Kossmann

COMPLETED PROJECTS>

NEW TREATMENTS FOR BRAIN AND SPINAL CORD INJURY

Project Coordinator and Lead Chief Investigator: Professor Norman Saunders, The University of Melbourne

Chief Investigators:

Professor Seong-Seng Tan, Florey Neuroscience Institutes

Associate Professor Cristina Morganti-Kossmann, National Trauma Research Institute, Alfred Health

Dr Mark Habgood, The University of Melbourne

Dr Peter Crack, The University of Melbourne

Dr Jenny Callaway, The University of Melbourne

Associate Professor David Howells, Austin Health

Dr Peter Batchelor, Austin Health

The search for potential therapies to treat traumatic brain or spinal cord injury over the past 30 years has yielded little in the way of viable drugs.

There have been substantial improvements in life expectancy for people with paraplegia or quadriplegia and people with severe brain injuries, most of whom would not have survived their injury 50 years ago. But these improvements have largely come from advances in clinical care. There is still insufficient understanding of the processes that follow brain and spinal injury and how post-injury damage can be reduced.

Damage to the brain and spinal cord can be split into two types—primary or immediate consequences, and secondary processes that occur after the initial impact. These secondary processes involve complex cascades that lead to the death of nerve cells and other brain cells as well as complications such as brain swelling.

The VNI supported a large multi-centre study to develop a better understanding of the mechanisms that lead to secondary damage following traumatic brain and spinal cord injury. Researchers will use the results to develop new therapies to limit the extent of damage and loss of daily function.

The project focused particularly on inflammatory mechanisms which had previously received little research attention.

Eight lead scientists, coordinated by Professor Norman Saunders from The University of Melbourne, took part in the project: Dr Peter Crack, The University of Melbourne; Associate Professor Cristina Morganti-Kossmann, The National Trauma Research Institute; Dr Jenny Callaway, The University of Melbourne; Dr Mark Habgood, The University of Melbourne; Professor Seong-Seng Tan, Florey Neuroscience Institutes; Associate Professor David Howells, Austin Health; and Dr Peter Batchelor, Austin Health.

"Much of the work in this project wouldn't have happened without VNI support. This kind of research is generally not supported by other funders such as the NHMRC because it is at such an early stage without a large quantity of preliminary data," says Saunders.

Peter Crack expanded the scope of the project by developing a genomic fingerprint of the brain after a traumatic injury. He is the first to carry out such a widespread gene screen. Previous work has focused on individual genes. Crack found that molecular and cellular changes following brain and spinal cord injury are much more complex than previously thought. "One of the interesting things about screening so many genes is that we found that many more genes are affected by injury than people had realised," says Saunders.

Crack found a number of key pathways involved in the development of injury after brain trauma. He has identified up to 50 genes from these pathways that look promising and is evaluating a number of them for use in potential therapies. He found that inflammation-related genes were likely to be important. "If we dream large, then we may have a potential therapy for traumatic brain injury," says Crack.

Seong-Seng Tan investigated a number of genes to see if they protected brain cells after trauma. He used mice and human cerebrospinal fluid to see if a gene called Sez-6 was involved in traumatic brain injury. A second gene, called Rim-binding protein 2, was also investigated by examining its RNA in the brain tissue of injured mice. He found that neither of the genes were significantly involved in the immediate response to injury and did not pursue this line of investigation further. In another study, he investigated the protein Ndfip1 and its role in preventing neuron cell death.

RESEARCH PROFILES>

Cristina Morganti-Kossmann also studied inflammatory genes. Using mice, she found that deleting the gene that regulates the amount of white blood cells that accumulate in the brain led to better outcomes following brain trauma. The injured mice were able to walk better, and fewer nerve cells died in the hours and days after the injury.

The findings are also very relevant for humans. Morganti-Kossmann took samples of cerebrospinal fluid and serum, which reflects changes in the brain tissue, from patients. "We found raised levels of the protein that we had blocked in the mice. It tells us that this protein is also playing a role in brain injury in humans," says Morganti-Kossmann.

In other work, Morganti-Kossmann found that treating mice with traumatic brain injuries over several weeks with the antibiotic minocycline improved outcomes. She used this antibiotic because it suppresses the immune system. But its use needs further evaluation because some studies that Crack carried out found that minocycline has some drawbacks. He discovered that one of the molecular pathways involved in cell death was being activated by the drug.

"The overall conclusion of this work," says
Morganti-Kossmann, "is that, yes, inflammation can
contribute to delayed brain tissue damage after injury, but if
we block it too strongly it inhibits those beneficial aspects of
inflammation that can help tissue to repair itself."

Evaluating whether a new therapy is effective is difficult because the injuries are not consistent, making measurement and comparison hard. Working in Saunders' lab, Mark Habgood has developed a better method to produce and evaluate experimental injuries. The computer-controlled device produces consistent and reproducible brain and spinal cord injuries in mice and rats. Saunders says this work is particularly promising as the ability to produce consistent injuries will make it easier to assess new therapies. The method is now being used by several research centres in Australia and the US with more likely to use it after the details are published. "I think this work will turn out to be really important and it would not have happened without the help of the VNI. They were imaginative enough to encourage us to go ahead," says Saunders.

Saunders and Habgood also looked at the blood-brain barrier. The brain protects itself from toxins and bacteria through a number of mechanisms, collectively called the blood-brain barrier. Most drugs are too big to get through the barrier or are prevented by cellular mechanisms that

stop many drugs and toxins from getting into the brain. However, Saunders and Habgood found that the blood-brain and blood-spinal cord barriers at the site of an injury will allow small molecules through for several hours and up to a week after the injury, depending on their size. This is much longer than was previously thought. It means that toxins could get into the circulation for longer than was thought. It also offers a window during which drugs could be administered directly to the damaged sites.

David Howells and Peter Batchelor worked with Schwann cells which surround and nurture nerve fibres in the peripheral nervous system. This system connects the central nervous system (the brain and spinal cord) to the limbs and organs. The major difference between the two nervous systems is that if you injure a peripheral nerve it can regrow. That isn't the case in the spinal cord or brain. There is good evidence that a major reason for this is that Schwann cells guide the newly growing nerve fibres. There is currently no treatment for recovering human nerve function after injury to the central nervous system.

Howells and Batchelor implanted the Schwann cells into the part of the brain controlling movement and found that the nerve fibres sprouted a huge amount of new growth. "There was enormously enhanced growth but unfortunately we didn't get true regeneration – that is growth past the wound site. We now need to work out how to direct that growth just across the wound site," says Batchelor.

Meanwhile, Jenny Callaway studied the behavioural methods that are used after a brain or spinal injury to assess an animal's daily functioning and the effectiveness of treatment. Testing mostly uses rating scales that score deficits based on observation. These scales are very subjective and are often not sensitive enough to distinguish the effects of treatment.

By using relatively simple quantitative tests, she found that animals used their fore limbs to compensate for their hind limbs. "This compensation could be part of the reason that the degree of improvement after treatment is often over estimated," says Callaway. Her techniques could give a better indication of the effectiveness of new therapies for brain or spinal cord injuries.

This project, bringing together scientists from four institutions, has been very successful, says Saunders. "It has brought new people into the field and yielded some good outcomes. We have extended our understanding of how the brain and spinal cord react to injury and made a substantial contribution to finding potential new therapies."

"The VNI has made an enormous contribution to neurotrauma research, particularly in creating funding opportunities for early career clinical researchers. Experience gained through the application and management of VNI grants provides a firm grounding for future applications to NHMRC and the like. The VNI should also be commended on encouraging applications from part-time researchers."

Dr Catherine Willmott

NEURONAL CELL DEATH POST TRAUMA

Chief Investigator:

Professor Seong-Seng Tan, Florey Neuroscience Institutes

When the brain is injured brain cells, or neurons, die. But the damage is not limited to the site of the injury. In the days, and up to a week, following the injury a ripple effect occurs leaving a much larger area affected. This second wave of damage causes more disability and often death.

Professor Seong-Seng Tan, a senior principal research fellow at the Florey Neuroscience Institutes, is looking for ways to stop this second wave and reduce the number of cells that die. This will give patients a better chance for recovery.

In 2006, Tan discovered that the brain has natural defences to protect the neurons. He found that a protein called Ndfip1 was in the brain cells that didn't die. Normally, this protein is present at low levels but after a brain injury the amount increases massively.

With the support of the VNI, Tan took his research to the next stage, exploring how the protein works. He discovered it acts like a scavenger to clean up metals released by the brain after trauma. The protein binds to a metal transporter that normally carries the metals into the cells and then destroys it, stopping the metals getting into the cells.

Using cells from mouse and human embryos, he has shown that it is possible to boost the amount of this protein so stopping more brain cells from dying.

"The VNI funding provided an important boost at a critical stage when our work was still very immature and we needed to find the underlying principles of neuroprotection by this new protein," says Tan. "The funding allowed us to mine sufficient data to make a strong case for funding by NHMRC, which we did."

Tan is now exploring ways of boosting the levels of the protein in whole mice, with funding from NHMRC. The next step is to search for a drug that can safely boost the protein.

Ultimately, Tan hopes his research will lead to a drug that stops brain cells dying after a traumatic injury. He believes such a treatment could significantly reduce the number of people who die or are permanently disabled as a result of a brain injury.

NATIONAL STUDY OF SPINAL CORD INJURY REHABILITATION OUTCOMES

Chief Investigator:

Dr Peter New, Alfred Health

Do spinal cord injury patients benefit from dedicated rehabilitation units? Or do they receive treatment of similar quality and effectiveness in general rehabilitation centres?

To answer these questions, the outcomes for spinal cord injury patients treated in dedicated spinal cord injury rehabilitation units were compared with those of patients treated in a general rehabilitation setting in a study led by Dr Peter New, head of the Spinal Rehabilitation Unit at Alfred Health's Caulfield Hospital. The study used data collected by the Australian Rehabilitation Outcome Centre for the year 2006.

Dr New found that spinal cord injury patients in specialist units spent much longer in rehabilitation and typically showed greater improvement than did patients in general units. These results agreed with the perception of specialists that their patients ideally should be managed in specialist rehabilitation units. The evidence for the improved outcomes of specialist treatment was strong for patients with non-traumatic spinal injuries—those due to such conditions as cancer, infection, arthritis and other systemic problems. For patients with traumatic spinal injury, however, while the results were suggestive, data limitations meant that the differences between specialist and general rehabilitation outcomes were not statistically significant.

From data collected between 2002 and 2006, the researchers were able to demonstrate that patients with non-traumatic spinal cord injuries often were not admitted into specialised units, ending up in general rehabilitation instead.

"But patients with non-traumatic spinal cord injuries need access to the same expertise and rehabilitation as patients who have traumatic spinal cord injuries," New says. "And the goal of being able to send the patient home with as much spinal function as possible still applies."

A significant proportion of patients with traumatic spinal cord injuries still end up in the general rehabilitation centres instead of a spinal rehabilitation centre, New says.

The limitations of available data have led to a redesign of the data collection process to extract more information about the condition of patients, as well as to reduce errors, says New. The higher quality data from future studies already planned will allow researchers to analyse it in more detail.

RESEARCH PROFILES>

TRAUMATIC HYPOXIA AND CEREBRAL INFLAMMATION

Chief Investigator:

Associate Professor Cristina Morganti-Kossmann, Alfred Health

A study has found that protein markers detected in blood samples may enable doctors to minimise subsequent neurological damage suffered by patients after severe traumatic brain injury (TBI)—and could help in the development of new treatments.

Associate Professor Cristina Morganti-Kossmann and her team at the National Trauma Research Institute studied patients with TBI, focussing on those who also suffered respiratory distress, and therefore reduced oxygen intake immediately after an accident. Lack of oxygen to the brain, or hypoxia, following TBI has been associated with higher levels of neurological damage in many epidemiological studies.

In the study, lead investigator Dr Edwin Yan, working with Dr Laveniya Satgunaseelan, tested whether the level of hypoxia after TBI was correlated with the degree of brain damage and subsequent neurological outcomes in about 30 patients from the Alfred Hospital. To do this, the team identified proteins in the bloodstream after injury which originated in the injured brain.

The study found that two proteins, S100 and myelin basic protein (MBP), showed promise as markers of the degree of hypoxia, the severity of the brain injury, and the degree of long-term neurological damage suffered by the patient.

Patients with higher levels of these brain proteins in their blood immediately following the accident were more likely to die or to remain severely disabled six months after the accident than were patients with lower levels.

Morganti-Kossmann now plans to continue this research using a larger sample size, to validate the use of S100 and MBP as markers of neurological damage.

Monitoring these markers would give the medical team real-time information on how the brain is responding to treatment, she says. An increase in these markers in the hours or days following the accident would indicate additional damage caused by secondary impacts, such as increased brain swelling. This could then prompt treatment.

"These markers could be useful in clinical trials we will be doing at The Alfred, to see if patients benefit from different types of therapeutic treatment," Morganti-Kossmann says. Previously, researchers have only assessed the relationship of these markers with neurological damage six months after the accident.

The research was supplemented with more detailed tests on rats in the laboratory, carried out by Monash PhD student Sarah Hellewell. Some of these tests showed that hypoxia after TBI led to increased levels of structural brain damage and worse neurological outcomes than TBI alone.

"The funding from the VNI has been critical in redirecting the research direction of our translational neuroscience research group into neurotrauma."

Professor Terence O'Brien

IN VIVO HIPPOCAMPAL STUDIES IN RATS

Chief Investigator:

Professor Terence O'Brien, The University of Melbourne

A recently completed research project in rats has tracked how problems such as anxiety, depression, attention disorders and epilepsy develop after traumatic brain injury (TBI). The knowledge gained will be used to design and test novel treatments with the potential to improve the quality of life of TBI sufferers and their families significantly.

The study, led by Professor Terence O'Brien of The University of Melbourne, investigated the long-term changes that occur in the hippocampus—a region of the brain which is essential to the formation of long-term memory and emotion and is the most common source of epilepsy following TBI.

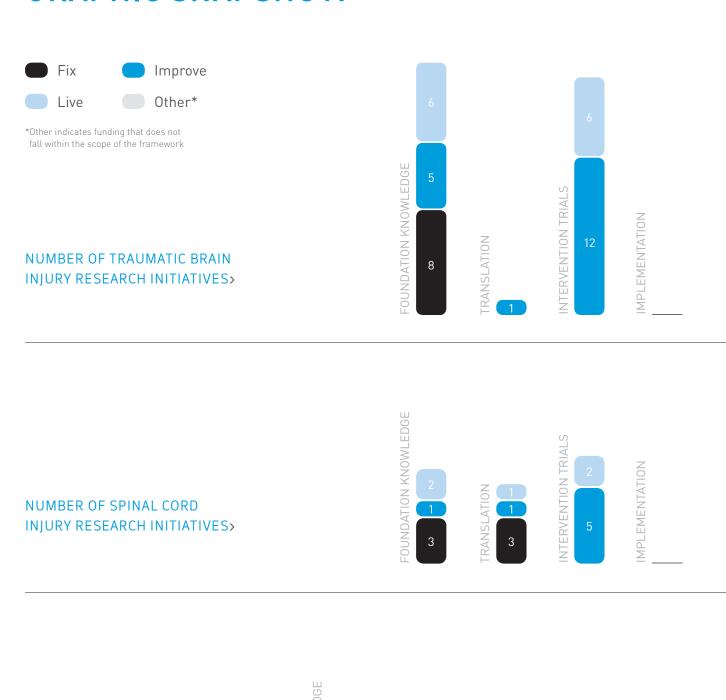
TBI is an important cause of death and disability in children and young adults around the world. For years after the initial injury, survivors suffer from disorders in attention, memory and learning. They also exhibit psychiatric and behavioural problems. Improved understanding of the causes of these long-term disabilities that follow brain trauma, O'Brien says, is the key to developing effective treatments.

O'Brien's team investigated the physical degeneration of the hippocampus in rats using Magnetic Resonance Imaging (MRI) and looked at changes in its function using Positron Emission Tomography (PET). The use of these advanced, non-invasive imaging techniques enabled the researchers to assess the brain repeatedly over time following injury, and to relate the changes they saw to abnormalities in behaviour, cognitive function and the development of epilepsy. They found that the changes picked up by imaging were correlated with changes in behaviour.

Thirty per cent of the rats developed epilepsy within six months of the initial injury. The rats also showed depression and increased anxiety, and struggled to perform simple tasks. This demonstrated that many of these problems which commonly afflict people following a brain injury have, in at least part, a physical basis—they are actually related to structural and functional changes in the brain.

There are currently no effective treatments to reduce the occurrence or severity of psychological, cognitive or epileptic problems caused by TBI. "Using animal models to further our understanding of how long-term brain injuries progress, and when to treat them, provides researchers with a practical way to test potential treatments before starting expensive and lengthy clinical trials", says O'Brien.

VNI FUNDED ACTIVITIES GRAPHIC SNAPSHOT>



NUMBER OF BOTH SCI/TBI RESEARCH INITIATIVES>

FOUNDATION KNOWLEDGE

TRANSLATION

INTERVENTION TRIALS

IMPLEMENTATION

*0

In order to demonstrate the breadth of VNI's research investment we have developed a model that recognises the practical purpose for which research has been designed: to Fix the injury, to Improve the functional ability of the individual or to assist an individual with an injury to Live the best possible life they can. The model also considers the stage of the research, which occurs on a continuum from the acquisition of Foundation Knowledge, the Translation of that knowledge into potential interventions, Intervention Trials to determine whether interventions are appropriate and Implementation of proven interventions. Each purpose and each research stage are important elements in achieving improved future outcomes for individuals following brain and spinal cord injury.

AMOUNT OF FUNDING OF TRAUMATIC BRAIN INJURY RESEARCH INITIATIVES>

	Fix	Improve	Live
FOUNDATION KNOWLEDGE	\$3,876,282	\$2,062,542	\$2,709,928
TRANSLATION	-	\$332,828	-
INTERVENTION TRIALS	-	\$7,783,223	\$2,911,985
IMPLEMENTATION	-	-	-

AMOUNT OF FUNDING OF SPINAL CORD INJURY RESEARCH INITIATIVES PURPOSE OF RESEARCH>

	Fix	Improve	Live
FOUNDATION KNOWLEDGE	\$2,268,726	\$29,372	\$ 405,213
TRANSLATION	\$6,260,706	\$126,340	\$ 307,129
INTERVENTION TRIALS	-	\$10,096,970	\$5,137,349
IMPLEMENTATION	-	-	-

AMOUNT OF FUNDING OF BOTH SCI/TBI RESEARCH INITIATIVES PURPOSE OF RESEARCH>

	Fix	Improve	Live	Other*
FOUNDATION KNOWLEDGE	\$4,186,012	-	-	-
TRANSLATION	-	-	-	-
INTERVENTION TRIALS	-	-	-	-
IMPLEMENTATION	-	-	-	-
OTHER	-	-	-	\$2,278,331

^{*}Other indicates funding that does not fall within the scope of the framework

LIST OF VNI FUNDED INITIATIVES>

TBI PROJECTS

Short title	CI-A	Lead Organisation	Start Date	End Date	Committed Amount	VNI Round
Assessment and Intervention for Mild TBI	Professor Jennie Ponsford	Monash University	1/11/2006	Completed 2008/2009	\$229,955	1
Can Eye Movements Predict Persistent Problems in Paediatric Mild TBI?	Dr Larry Abel	The University of Melbourne	1/11/2008	16/05/2011	\$332,828	2
Cognitive Neuroscience of Maladaptive Behaviors in Adolescents with TBI	Professor Vicki Anderson	Murdoch Childrens Research Institute	1/09/2010	31/07/2013	\$271,718	7
DECRA (DECompressive CRAniectomy Trial)	Professor Jamie Cooper	Alfred Health	1/01/2008	14/07/2011	\$89,769	2
Detrimental Effects of Albumin Resuscitation (SAFE TBI II)	Professor Jamie Cooper	Alfred Health	15/06/2007	Completed 2009/2010	\$227,700	1
Early Interventions to Improve Outcomes after Traumatic Brain Injury	Professor Jamie Cooper	Monash University	1/01/2010	15/01/2015	\$2,086,100	Targeted Initiative
Enhancing Neurogenesis Post TBI (Pilot)	Associate Professor Cristina Morganti- Kossmann	Bayside Health	1/07/2007	Completed 2008/2009	\$162,910	1
Headstart: Multi-family Groups for Traumatic Brain Injury	Dr Grace Couchman	Monash University	1/03/2008	12/03/2012	\$380,180	2
Hypothermia in Childhood TBI (HiTBIC)	Dr John Beca	Royal Children's Hospital - Melbourne	1/07/2007	18/04/2011	\$205,524	1
Improving the Functional Communication Ability of Adults with TBI	Associate Professor Jacinta Douglas	La Trobe University	1/06/2008	14/03/2011	\$343,802	2
In Vivo Hippocampal Studies in Rats	Professor Terence O'Brien	The University of Melbourne	9/10/2006	Completed 2009/2010	\$973,324	1
Longitudinal Head Injury Outcomes Study	Professor Jennie Ponsford	Monash University	25/09/2007	8/10/2010	\$1,201,447	Targeted Initiative
Long-term Consequences of Childhood Head Injury	Associate Professor Cathy Catroppa	Murdoch Childrens Research Institute	26/07/2010	25/07/2013	\$512,985	7
Measuring the Impact of Traumatic Brain Injury on People's Lives	Associate Professor Graeme Hawthorne	The University of Melbourne	1/01/2007	14/12/2011	\$194,820	2

^{*}RESEARCH ACTIVITIES FUNDED THIS FINANCIAL YEAR ARE HIGHLIGHTED IN BOLD

TBI PROJECTS CONTINUED

Short title	CI-A	Lead Organisation	Start Date	End Date	Committed Amount	VNI Round
Mobility Following Childhood TBI	Anne Kissane	Murdoch Childrens Research Institute	1/01/2007	30/07/2010	\$62,605	1
The Neural Basis of Communication Disorder in Children	Dr Angela Morgan	Murdoch Childrens Research Institute	1/04/2008	14/04/2011	\$276,079	2
Neuronal Cell Death Post Trauma	Professor Seong-Seng Tan	Florey Neuroscience Institutes	1/11/2006	Completed 2009/2010	\$1,662,375	1
Normoglycaemia in Intensive Care Traumatic Brain Injury Study (NICE-TBI)	Associate Professor Simon Finfer	Monash University Dept of Epidemiology & Preventive Medicine	1/11/2007	15/04/2011	\$98,797	2
Prevention and Treatment of Social Problems in Childhood / Adolescent TBI	Professor Vicki Anderson	Murdoch Childrens Research Institute	1/07/2007	31/12/2011	\$1,295,135	1
Role of Plasminogen Activator in TBI	Associate Professor Robert Medcalf	Monash University	5/04/2007	4/10/2010	\$578,064	1
Safer Roads to Recovery	Dr Judith Charlton	Monash University Accident Research Centre	1/10/2010	30/09/2012	\$225,143	6
Serum Biomarkers as Predictors of Quality of Life	Professor Vicki Anderson	Murdoch Childrens Research Institute	TBA	TBA	\$272,345	6
TBI in Older Adults: Does Age Matter?	Professor Glynda Kinsella	La Trobe University	8/01/2007	20/07/2010	\$303,188	1
TBI Rehabilitation Using Methylphenidate	Catherine Willmott	Monash University	1/11/2006	Completed 2007/2008	\$35,979	1
Transcranial Magnetic Stimulation (TMS) Treatment in Depression after Traumatic Brain Injury	Professor Paul Fitzgerald	Monash University	10/06/2008	25/06/2012	\$502,950	2
Traumatic Hypoxia and Cerebral Inflammation	Associate Professor Cristina Morganti- Kossmann	Alfred Health	1/03/2007	Completed 2009/2010	\$232,794	1
Virtual Reality and Upper Limb Function Following TBI in Children	Jane Galvin	Murdoch Childrens Research Institute	5/05/2008	18/11/2011	\$162,388	2

^{*}RESEARCH ACTIVITIES FUNDED THIS FINANCIAL YEAR ARE HIGHLIGHTED IN BOLD

LIST OF VNI FUNDED INITIATIVES>

TBI PROGRAM GRANTS

Short title	CI-A	Lead Organisation	Start Date	End Date	Committed Amount	VNI Round
The NET Program: Neurotrauma Evidence Translation	Professor Russell Gruen	Monash University	1/11/2009	21/11/2014	\$4,399,539	4

TBI FELLOWSHIPS

Short title	CI-A	Lead Organisation	Start Date	End Date	Committed Amount	VNI Round
Training	Kathleen Bakker	Murdoch Childrens Research Institute	1/05/2009	16/05/2011	\$63,648	5
Early Career Research	Dr Nicole Bye	National Trauma Research Institute	1/02/2009	15/02/2012	\$326,270	5
Training	Jane Galvin	Murdoch Childrens Research Institute	31/03/2008	Completed 2009/2010	\$61,200	3
Early Career Research	Dr Yona Goldshmit	Monash University	18/02/2008	3/03/2011	\$305,719	3
Early Career Research	Dr Jerome Maller	Monash University	1/02/2008	14/02/2011	\$313,721	3
Senior Research	Associate Professor Cristina Morganti- Kossmann	Alfred Health	1/01/2008	17/01/2011	\$281,880	3
Early Career Practitioner	Associate Professor Alistair Nichol	Monash University	2/02/2009	15/02/2012	\$163,135	5
Early Career Research	Dr Cheryl Soo	Murdoch Childrens Research Institute	2/03/2009	16/03/2012	\$326,270	5
Early Career Practitioner	Dr Gavin Williams	Epworth Hospital	24/03/2008	5/04/2011	\$188,232	3
Early Career Research	Dr Edwin Yan	National Trauma Research Institute	1/01/2009	16/01/2012	\$326,270	5

^{*}RESEARCH ACTIVITIES FUNDED THIS FINANCIAL YEAR ARE HIGHLIGHTED IN BOLD

"By supporting basic research, the VNI gives an opportunity to researchers that try to develop therapeutic approaches and understand the mechanisms involved in neurotrauma."

Dr Yona Goldshmit

SCI PROJECTS

Short title	CI-A	Lead Organisation	Start Date	End Date	Committed Amount	VNI Round
Bone Marrow Grafts for Spinal Cord Repair	Professor Paul Simmons	StepAhead Australia Limited	14/08/2007	27/08/2010	\$736,614	1
Corticospinal Regeneration	Associate Professor David Howells	The University of Melbourne	1/01/2007	14/07/2010	\$626,560	1
Development of EphA4 Peptide Inhibitors for the Treatment of Neurotrauma	Associate Professor Ann Turnley	The University of Melbourne	7/05/2007	Completed 2008/2009	\$573,647	1
Functional Electrical Stimulation for Hand Function in Quadriplegia	Professor Mary Galea	The University of Melbourne	2/01/2008	Discontinued 2009/2010	\$248,492	2
Macrophage Cytotoxicity Post Spinal Cord Injury	Associate Professor David Howells	The University of Melbourne	1/05/2007	15/11/2010	\$547,052	1
Matrix Technology for Spinal Cord Repair	Dr Kathy Traianedes	St Vincent's Hospital	30/10/2007	16/11/2010	\$412,993	1
National Study of Spinal Cord Injury Rehabilitation Outcomes	Dr Peter New	Alfred Health	1/05/2007	Completed 2009/2010	\$29,372	2
Preventable Job Loss	Associate Professor Gregory Murphy	La Trobe University	1/08/2010	31/01/2012	\$46,525	6
Singing in Spinal Cord Injury	Dr David Berlowitz	Institute for Breathing and Sleep	21/01/2008	5/09/2010	\$307,129	2
Sleep Health in Tetraplegia - Population Survey & Home Monitoring	Dr David Berlowitz	Institute for Breathing and Sleep	16/10/2006	Completed 2008/2009	\$358,688	1
Sodium Channel Blockers in Rat Models	Professor Bevyn Jarrott	Howard Florey Institute	1/12/2006	Completed 2007/2008	\$126,340	1
Spinal Cord Recovery in the Opossum	Professor Norman Saunders	The University of Melbourne	1/02/2007	15/07/2010	\$1,095,114	1

^{*}RESEARCH ACTIVITIES FUNDED THIS FINANCIAL YEAR ARE HIGHLIGHTED IN BOLD

LIST OF VNI FUNDED INITIATIVES>

SCI PROGRAM GRANTS

Short title	CI-A	Lead Organisation	Start Date	End Date	Committed Amount	VNI Round
Autonomic Nervous System in Spinal Cord Injury	Professor John Furness	The University of Melbourne	1/07/2009	16/07/2014	\$4,949,117	4
Spinal Cord Injury & Physical Activity (SCIPA)	Professor Mary Galea	The University of Melbourne	1/07/2009	16/07/2014	\$4,676,832	4
Sleep Health in Quadriplegia (SHiQ)	Dr David Berlowitz	Institute for Breathing and Sleep	1/06/2009	16/06/2014	\$4,999,978	4

SCI FELLOWSHIPS

Short title	CI-A	Lead Organisation	Start Date	End Date	Committed Amount	VNI Round
Early Career Practitioner	Dr David Berlowitz	Institute for Breathing and Sleep	1/10/2008	14/10/2011	\$188,232	3
Training	Susan Berney	Austin Health	5/05/2008	Completed 2009/2010	\$46,180	3
Early Career Practitioner	Dr Steven Miller	Monash University	5/05/2008	18/05/2011	\$125,488	3

BOTH TBI & SCI PROJECTS

Short title	CI-A	Lead Organisation	Start Date	End Date	Committed Amount	VNI Round
GEM for TBI and SCI	Professor Russell Gruen	Alfred Health	1/08/2007	16/02/2012	\$1,442,183	Targeted Initiative
Neurotrauma Tissue/ Fluid Bank	Professor Catriona McLean	Alfred Health	1/08/2007	14/02/2011	\$811,148	1
Neurotrauma Knowledge Translation	Dr Peter Bragge	National Trauma Research Institute	1/07/2010	24/12/2010	\$25,000	6
New Treatments for Brain and Spinal Cord Injuries	Professor Norman Saunders	The University of Melbourne	1/09/2006	Completed 2009/2010	\$4,186,012	1

^{*}RESEARCH ACTIVITIES FUNDED THIS FINANCIAL YEAR ARE HIGHLIGHTED IN BOLD

FINANCIAL REPORT>

COMPREHENSIVE OPERATING STATEMENT>

For the year ended 30 June 2010

	Note	2010	2009
		\$	\$
Revenue from operating activities			
Service fee	2	8,859,984	7,311,846
Funding Contribution	3	875,000	570,300
Expenses from operating activities			
Salary and related costs		(349,738)	(416,029)
Operating		(213,143)	(231,081)
Contractors		(373,037)	(317,535)
Research Project funding		(8,799,066)	(6,917,501)
Surplus from operating activities before income tax		0	0
Income tax expense	1(a)	0	0
Net surplus		0	0
Other comprehensive income		0	0
Net comprehensive income for the year		0	0

The above comprehensive operating statement should be read in conjunction with the accompanying notes.

BALANCE SHEET >

As at 30 June 2010

	Note	2010	2009
		\$	\$
Current assets			
Cash		1	1
Total assets		1	1
Equity			
Share capital	4	1	1
Total equity		1	1

The above balance sheet should be read in conjunction with the accompanying notes.

CASH FLOW STATEMENT>

For the year ended 30 June 2010

	2010	2009
	\$	\$
Cash flows from operating activities	-	-
Cash flows from investing activities	-	-
Cash flows from financing activities	-	-
Cash at the beginning of the financial year	1	1
Cash at the end of the financial year	1	1

The above cash flow statement should be read in conjunction with the accompanying notes.

STATEMENT OF CHANGES IN EQUITY>

For the year ended 30 June 2010

	2010	2009
	\$	\$
Equity at the beginning of the financial year	1	1
Net comprehensive income for the year	-	-
Equity at the end of the financial year	1	1

The above statement of changes in equity should be read in conjunction with the accompanying notes.

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENT>

for year ended 30 June 2010

1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Statement of compliance

This general purpose financial report has been prepared in accordance with Australian Accounting Standards and Interpretations. Australian Accounting Standards include Australian equivalent to International Financial Reporting Standards (A-IFRS).

The financial report was authorised for issue by the directors on 17th September 2010.

Basis of preparation

The Directors in consultation with the TAC have resolved on 18 June 2010 that at the conclusion of the funding agreement with the TAC on 30 May 2011, VNI will be wound up and its research activities transferred to the TAC. This was also resolved by the TAC Board on 21 April 2010.

The accounts have continued to be prepared on a going concern basis as the research activities of the VNI will continue, however, will be conducted by the TAC.

The financial report has been prepared on the basis of accrual accounting and the historical cost convention.

Significant accounting policies that have been adopted in the preparation and presentation of the financial report are:

(a) Income tax

The VNI is exempt from income tax.

(b) Cash flow

There are no cash transactions during the year as all costs and expenses incurred by the VNI are paid by the Transport Accident Commission (TAC) and are offset by the service fee payable by the TAC to the VNI.

(c) Commitments

Commitments include operating and capital expenditure commitments arising from non-cancellable contractual sources and are disclosed at their nominal value.

(d) Comparative figures

Where necessary, comparative figures have been adjusted to conform with changes in presentation in the current year in accordance with the accounting standards.

(e) Functional and presentation currency

The functional currency of the VNI is the Australian dollar, which has also been identified as the presentation currency of the VNI.

2. SERVICE FEE

In accordance with the service agreement between the TAC and the VNI, the TAC agrees to pay the VNI a service fee for delivering the Initiative and achieving the VNI's objective. The service fee is calculated to fully compensate the VNI for costs incurred and recognised in the comprehensive income statement for the financial year.

3. FUNDING CONTRIBUTION

In accordance with the funding agreement between the State of Victoria (the State) and the TAC, the State agrees to provide funding to the TAC, to be provided to VNI to assist in delivering the Initiative. The revenue from the funding contribution is recognised in the comprehensive income statement in the year that the contractual commitments have been met.

4. SHARE CAPITAL

	2010	2009
	\$	\$
Issued capital		
1 ordinary share of \$1.00 each, fully paid	1	1

5. REMUNERATION OF AUDITOR

	2010	2009
	\$	\$
Audit fee payable to the Auditor-General's Office	11,000	11,000

6. DIRECTORS' REMUNERATION

The total fees payable to the directors for the year ended 30 June 2010 were \$36,648 (2009: \$27,478).

	2010	2009
The number of directors of the Company whose remuneration falls		
within the following bands:		
• \$1 - \$10,000	2	2
• \$10,001 - \$20,000	2	1

7. RESPONSIBLE PERSONS

Directors

The names of persons who were directors of the VNI at any time during the financial period are as follows:

- Bill Burdett
- Alexander Collie
- Peter Harcourt
- Geoff Hilton (Chair)
- Richard Smallwood

There are no transactions with director related-parties during the financial year.

Other related parties

Bill Burdett is the Chairman of Neurosciences Victoria Limited, which has provided consultancy services to the VNI during the year on normal commercial terms and conditions.

Geoff Hilton is a director of the TAC, which has received reimbursement of salaries and other relevant expenses incurred on behalf of the VNI under a service agreement.

Richard Smallwood was a director of the Murdoch Childrens Research Institute, which has received project funding from the VNI during the year on normal commercial terms and conditions.

8. SEGMENT INFORMATION

The VNI supports and funds research into neurotrauma and its effects in Victoria.

9. COMMITMENTS

At balance date, the total expenditure contracted for research projects but not provided for in the financial report is as follows:

	2010	2009
	\$M	\$M
- No later than one year	7.652	7.081
- later than one year but not later than five years	12.965	12.428
	20.617	19.509

10. ECONOMIC DEPENDENCY

The VNI will continue to receive funding from the TAC in accordance with the agreement to cover the liability and delivery of the commitments of the Victorian Neurotrauma Initiative up to 30 May 2011. After this date, the initiative's commitments will be assumed by the TAC.

DIRECTORS' DECLARATION>

In the opinion of the directors of Victorian Neurotrauma Initiative Pty Ltd

- (a) the comprehensive operating statement, balance sheet, cash flow statement, statement of changes in equity and notes set out on pages 39-42 are drawn up so as to:
 - (i) give a true and fair view of the financial position of the Victorian Neurotrauma Initiative Pty Ltd as at 30 June 2010 and of its performance, as represented by the results of its operations, for the year ended 30 June 2010; and
 - (ii) comply with Australian Accounting Standards and Interpretations; and

(b) there are reasonable grounds to believe the Victorian Neurotrauma Initiative Pty Ltd will be able to pay its debts as and when they become due and payable.

Dated at Geelong this 17th day of September 2010.

Signed in accordance with a resolution of the directors:

Alex Collie

par con

Director

Geoff Hilton

Chair



INDEPENDENT AUDITOR'S REPORT

TO THE BOARD MEMBERS, VICTORIAN NEUROTRAUMA INITIATIVE PTY LTD

The Financial Report

The accompanying financial report for the year ended 30 June 2010 of the Victorian Neurotrauma Initiative Pty Ltd which comprises the comprehensive operating statement, balance sheet, statement of changes in equity, cash flow statement, a summary of significant accounting policies and other explanatory notes to and forming part of the financial report, and the directors' declaration, has been audited.

The Board Members' Responsibility for the Financial Report

The Board Members of the Victorian Neurotrauma Initiative Pty Ltd are responsible for the preparation and the fair presentation of the financial report in accordance with Australian Accounting Standards (including the Australian Accounting Interpretations). This responsibility includes:

- establishing and maintaining internal controls relevant to the preparation and fair presentation of the financial report that is free from material misstatement, whether due to fraud or error
- selecting and applying appropriate accounting policies
- making accounting estimates that are reasonable in the circumstances.

Auditor's Responsibility

As required by the *Audit Act 1994*, my responsibility is to express an opinion on the financial report based on the audit, which has been conducted in accordance with Australian Auditing Standards. These Standards require compliance with relevant ethical requirements relating to audit engagements and that the audit be planned and performed to obtain reasonable assurance whether the financial report is free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial report. The audit procedures selected depend on judgement, including the assessment of the risks of material misstatement of the financial report, whether due to fraud or error. In making those risk assessments, consideration is given to the internal control relevant to the entity's preparation and fair presentation of the financial report in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. An audit also includes evaluating the appropriateness of the accounting policies used, and the reasonableness of accounting estimates made by the Board Members, as well as evaluating the overall presentation of the financial report.

I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my audit opinion.

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INDEPENDENT AUDITOR'S REPORT (CONTINUED)

Matters Relating to the Electronic Presentation of the Audited Financial Report

This auditor's report relates to the financial report published in both the annual report and on the website of Victorian Neurotrauma Initiative Pty Ltd for the year ended 30 June 2010. The Board Members of the Victorian Neurotrauma Initiative Pty Ltd are responsible for the integrity of the website. I have not been engaged to report on the integrity of the website. The auditor's report refers only to the statements named above. An opinion is not provided on any other information which may have been hyperlinked to or from these statements. If users of this report are concerned with the inherent risks arising from electronic data communications, they are advised to refer to the hard copy of the audited financial report to confirm the information included in the audited financial report presented on the Victorian Neurotrauma Initiative Pty Ltd website.

Independence

The Auditor-General's independence is established by the *Constitution Act 1975*. The Auditor-General is not subject to direction by any person about the way in which his powers and responsibilities are to be exercised. In conducting the audit, the Auditor-General, his staff and delegates complied with all applicable independence requirements of the Australian accounting profession.

Auditor's Opinion

In my opinion, the financial report presents fairly, in all material respects, the financial position of the Victorian Neurotrauma Initiative Pty Ltd as at 30 June 2010 and its financial performance and cash flows for the year then ended in accordance with applicable Australian Accounting Standards, including the Australian Accounting Interpretations.

MELBOURNE 20 September 2010

D D R Pearson

Auditor-General

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ANNUAL REPORT 2009/2010

Funding research to improve the health and quality of life of individuals living with brain and spinal cord injury

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