

The National Trauma Research Institute (NTRI) leads the way in research to better understand traumatic injuries and bridge the gap between research, clinical practice and policy for the benefit of injured patients. It continues to work in close association with The Alfred Trauma Service and gain recognition as a national and international hub and resource of trauma-related knowledge.

After restructuring in 2009, NTRI welcomed Business Manager, Craig Sedgman, and Research Manager, Dr Meng Tuck Mok, in 2010. The new team has helped shape the NTRI's structure and activities, which include pillars of activity in stakeholder dialogue, research leadership, knowledge translation and performance improvement.

NTRI again convened its annual scientific conference in 2010, attended by over 300 national and international delegates. The conference was a joint meeting with the Australasian Trauma Society.

Research Highlights

The Global Evidence Mapping (GEM) initiative has been mapping existing neurotrauma-related research. These maps of existing research for traumatic brain injured (TBI) and spinal cord injured patients are available online and are being maintained. The next phase of GEM seeks to develop a system of evidence delivery that pushes evidence out to users through RSS feeds and Twitter, as compared to passive evidence accessed from a website.

The Health Knowledge Exchange Project is to develop a community of practice around performing and maintaining up-to-date high quality systematic reviews in neurotrauma topics. The software will be piloted with local and international communities of practice. The web-based delivery system will support the next phase of the GEM initiative.

The Neurotrauma Evidence Translation (NET) Program is a five-year research program that commenced in 2009, funded by the Victorian Neurotrauma Initiative, and conducted at the NTRI and the Australasian Cochrane Centre, Monash University. This program aims to address one of the biggest challenges in contemporary health care – the effective and timely translation of evidence from research into clinical practice and policy. The NET Program will develop and test strategies to increase the uptake of research into policy and practice

Delegates of the Asia Pacific Trauma Quality Improvement Network (APTQIN) outside the RACS building in November 2010.



to improve outcomes for people after TBI by knowledge generation and synthesis; defining the problems and understanding practice and policy; designing and evaluating strategies for practice change in mild TBI; and building capacity for knowledge translation in neurotrauma by designing an intervention that will be rolled out in a cluster randomised controlled trial.

In the NTRI laboratory, headed by Associate Professor Cristina Morganti-Kossmann, investigations continue to test whether erythropoietin (EPO) provides neuroprotection for post-traumatic hypoxia, a condition known to exacerbate the severity of brain injury leading to worse neurological outcomes for patients with TBI. Using a well-established rat model of diffuse TBI, results favourably show the neuroprotective function of EPO provided after TBI hypoxia by reducing axonal pathology in the most vulnerable regions of the brain.

The DECRA study is led by The Alfred from the NTRI. It is a unique, partially NHMRC-funded, international, multicentre randomised trial to evaluate the effect of early decompressive craniectomy on neurological function in patients with severe TBI. DECRA aims to assess if decompressive craniectomy improves outcome for patients with severe diffuse TBI and brain swelling. The study completed recruitment in 2010.

First APTQIN Meeting

NTRI convened the first meeting of the Asia-Pacific Trauma Quality Improvement Network (APTQIN) in November 2010. The meeting was funded by AusAid and the Canadian Institutes of Health Research. APTQIN brought together influential leaders of trauma services from across the Asia-Pacific region to promote better understanding of the field of trauma quality improvement (QI). Members agreed to support development of trauma care and quality improvement activities at local and national levels across the Asia-Pacific region, build capacity through dissemination of information, tools and technology to support better trauma systems and seek endorsement from the WHO, professional colleges and relevant peak professional bodies.

WHO Trauma Care Checklist Study

This worldwide QI evaluation is being carried out at 12 hospitals globally, in low to middle income countries. Australia is one of only three high-income countries taking part. NTRI oversees this trial at The Alfred to qualitatively evaluate the impact of the program on safety culture, acceptability and implementation of the checklist. This will help determine the usefulness and effectiveness of a checklist in a busy Level 1 trauma centre like The Alfred.

AusTQIP

NTRI and the National Critical Care and Trauma Response Centre in Darwin are jointly developing and implementing the Australian Trauma Quality Improvement Program (AusTQIP) underpinned by national trauma data. AusTQIP represents a unique opportunity to collaborate on a national basis to share expertise, combine trauma data and work together to improve the quality of trauma care, improve trauma system performance and improve survival and quality of life for injured patients.

Psychiatric Disorders Following TBI

Professor Jennie Ponsford at the Monash-Epworth Rehabilitation Research Centre is conducting a prospective study of pre- and post-injury psychiatric disorders. The study is conducted early after injury and up to five years post-injury to look at the nature, frequency and risk factors of post-injury psychiatric disorders, as well as the relationship between psychiatric disorders and functional outcome. Early results indicate depression is strongly associated with poor functional outcome and is shedding some light on the factors that may help predict who is most at risk and when these disorders are likely to emerge. This will enable clinicians to plan early intervention thereby potentially reducing the emotional burden borne by injury survivors.

P.A.R.T.Y. Intervention Program

Prevent Alcohol and Risk-related Trauma in Youth (P.A.R.T.Y.) is a full day, in-hospital injury awareness and prevention program introducing school children to the real consequences of risk taking behaviour. In 2010, the P.A.R.T.Y. intervention pilot program was introduced at The Alfred, targeting young adult offenders aged 18-25 who have been court ordered to attend, with the aim of reducing re-offending rates.

Current Projects

- Post traumatic hypoxia in the exacerbation of cerebral inflammation elicited by brain injury (Morganti-Kossmann MC, Kossmann T)
- Establishment of a neurotrauma tissue/fluid bank within the National Neural Tissue Resource Centre (McLean C, Morganti-Kossmann MC, Kossmann T, Rosenfeld JV)
- Traumatic injury to the brain and spinal cord: secondary injury, development and evaluation of new treatments (Saunders N, Morganti-Kossmann MC, Tan S-S, Callaway J, Crack P, Howells D, McIntyre P)
- Post traumatic hypoxia increases tryptophan metabolite production and exacerbates secondary brain damage (Yan E)
- To determine the role of tissue type plasminogen activator on models of traumatic brain injury (Medcalfe R, Morganti-Kossmann MC, Schmidt HH, Rosenfeld JV)
- Role and mechanisms of NADPH oxidase in ischemic stroke and neurotrauma (Schmidt HH, Morganti-Kossmann MC, *et al.*)
- Correlation of clinical and radiographic findings in acute cervical discoligamentous injury with long term outcomes in road trauma patients (Ackland H, Cameron P, Cooper DJ)
- EPO-TBI: randomised, placebo-controlled trial of erythropoietin in ICU patients with traumatic brain injury (Bellomo R, Cooper DJ, Street A, Nichol A, French C, Presneill J)
- A Phase 2 randomised controlled trial of atorvastatin therapy in intensive care patients with severe sepsis (Kruger P, Venkatesh B, Bellomo R, Kostner K, Cooper DJ, Roberts M)
- Parenteral versus enteral nutrition trial (Doig G, Cooper DJ, Simpson F, Davies A)
- Correlation of clinical and radiographic findings in acute cervical discoligamentous injury with long term outcomes in road trauma patients (Ackland H, Cameron P, Cooper J)
- Decompressive craniectomy in acute traumatic brain injury (Cooper DJ, Dobb G, Bannan P)
- DECRA study (Cooper DJ, Rosenfeld J, Kossmann T, Reilly P, Wolfe R, Murray L)
- RENAL: a multicentre unblinded randomised controlled trial to assess the effect of augmented versus normal continuous renal replacement therapy on 90-day all-cause mortality of intensive care unit patients with severe acute renal failure (Scheinkestel C, Pilcher D, Davies A)
- ENTERIC: a multicentre randomised controlled trial comparing early jejunal feeding (using a frictional nasojejunal tube) and standard feeding in critical illness (Cooper DJ, Pellegrino V, Davies A)
- Phase 2 pilot randomised trial of operative fixation of fractured ribs in patients with flail chest (Marasco S, Cooper DJ)

- NICE TBI: normoglycaemia in intensive care TBI study (Finfer S, Myburgh J, Cooper DJ, Higgins A)
- Fluid resuscitation for patients with TBI – potential mechanisms behind the detrimental effect of albumin resuscitation (Cooper DJ, Myburgh JA)
- Prospective observational study of blood and blood product transfusion practices in Australian intensive care units (Cooper DJ, Bellomo R, Street A, Murray L, Nichol A, Westbrook A, Syres G, French C, Santamaria J, Wood E, Phillips L, Orford N)
- Evaluating the incidence and clinical importance of heparin induced thrombocytopenia in the critically ill (Warkentin TE, Cook DJ, Cooper DJ, *et al.*)
- Trauma in older adults: does age matter? (Kinsella G, Olver J, Kossmann T, Ong B)
- The operation and utilisation of the Victorian State Trauma Registry (Cameron P, Gabbe B, McNeil J)
- VOTOR: Victorian Orthopaedic Trauma Outcomes Registry (Gabbe B, Cameron P)
- ARISE: Australasian resuscitation in sepsis evaluation randomised controlled trial (Bellomo R, Cooper DJ, Cameron P, *et al.*)
- POLAR: prophylactic hypothermia trial to lessen TBI randomised controlled trial (Cooper DJ, Bernard S, Rosenfeld JV, Cameron P, *et al.*)
- Transfusion research improving outcomes (McNeil J, Cameron P, Phillips L)
- Using data to improve quality of healthcare (Cameron P, Sprivilis P, Stoelwinder J, Forbes A, McNeil J, Campbell D)
- Improving outcomes measurement and monitoring in trauma (Gabbe B)
- VSTORM: Victorian State Trauma Outcomes Registry (Cameron P)
- Bi-national Burns Registry (Cameron P, Gabbe B, Cleland H, Edgar D)
- Hyperbaric oxygen in lower limb trauma: a randomised controlled clinical trial (Millar I, Cameron P)
- Massive Transfusion Registry (Cameron P)
- Defining and benchmarking clinically appropriate exceptions to the Emergency Department Four Hour National Access Target (Brand C)
- Australia's blood supply in a major disaster or pandemic: how will we meet clinical demand (Phillips L)
- Telephone-administered early psychological intervention for depression and anxiety following serious injury (O'Donnell ML, Creamer M, Bryant R, Ellen S, Holmes A, Kossmann T, Judson R)
- Longitudinal head injury outcome study (Ponsford J, Olver J)
- Headstrong: multi-family groups for TBI (Couchman G, Ponsford J)
- Motivational interviewing with cognitive-behaviour therapy for anxiety and depression following TBI (Ponsford J, O'Donnell M, Lee N)
- Safer roads to recovery: assessing readiness for driving after TBI (Charlton K, Bedard M, Ponsford J, Marshall S, Stolwyk R, Ross P, Gagnon S)
- Longitudinal head injury outcomes study (Ponsford J, Olver J)
- The Global Evidence Mapping (GEM) initiative in TBI and spinal cord injury (Gruen R)
- NET Program: improving evidence-based care and the outcomes of patients with TBI and spinal cord injury through a program to facilitate knowledge transfer and exchange (Gruen R, Green S)
- Health Knowledge Exchange Project (Gruen R, Elliot J, Cavedon L, Zobel J, Harrison T)
- Australian Satellite of Cochrane Effective Practice and Organisation of Care Group (Gruen R)
- Evidence based action plans in the surgical areas of ENT, Trauma/ Injury, Transplantation and Ophthalmology in the Australian Indigenous population (Gruen R)
- Neurotrauma Knowledge Translation international collaboration (Gruen R)
- TAC/WorkSafe Evidence Service (Gruen R)

Postgraduate Students

19 PhD Students
9 Other Doctoral Students
3 Masters Students

Publications

82 Journal Articles
1 Book
5 Book Chapters