

Neurotrauma Research Program



ISCRR

Institute for Safety,
Compensation and
Recovery Research



MONASH
University



**TRANSPORT
ACCIDENT
COMMISSION**

Independent Review



Traumatic brain injury and spinal cord injury are debilitating injuries that have a life-long impact on the injured person, their family and the community.

Neurotrauma Research Program overview

The ISCRR Neurotrauma Research Program 2011-2015 is a \$20 million, major brain and spinal cord injury research program that assists the Transport Accident Commission (TAC) to support the recovery and independence of clients.

About the review

Strategic Project Partners (SPP) conducted an independent review of the Institute for Safety, Compensation and Recovery Research (ISCRR) Neurotrauma Program in late 2014. It included extensive consultations with key stakeholders from the TAC, ISCRR, the research community and clinicians. TAC's economic data was used for the financial modelling. SPP used its proprietary Research Impact Tool to determine the significance and reach of the research. This tool delivers a validated method that has been utilised to review a range of Cooperative Research Centres (CRCs) for impact.

Role of the ISCRR

The Institute for Safety, Compensation and Recovery Research (ISCRR) is a research-policy partnership established in 2009 via an agreement between Worksafe Victoria, the TAC and Monash University.

It is Australia's only research Institute dedicated to studying injury compensation systems and their health, social and economic impact. The ISCRR plays a crucial role as a research broker, coordinating collaboration between the research community, TAC, Worksafe Victoria (WSV) and stakeholder groups including the Neurotrauma Advisory Council.

Research funding

The TAC provided \$20 million funding, covering the period from July 2011 to June 2015. This comprised \$16.5 million for research costs and \$3.5 million for support costs. As at December 2014, \$9.3 million had been contracted for research projects and a further \$6 million had been committed to projects in development.

The funding is guided by the TAC's research framework and allocated across four priority areas broadly in line with the Neurotrauma Research Strategy.

Investment allocation by priority area	Intended	Actual
1. Models of lifetime care: promoting independence for clients with traumatic brain injury or spinal cord injury who require long-term care.	35%	24%
2. Improving rehabilitation and disability management: improving the treatment and rehabilitation of brain and spinal cord injury to reduce the severity and long-term impact of these injuries.	35%	37%
3. Bench to bedside: conducting promising biometrical interventions or technical innovations in humans.	15%	16%
4. Capacity building: providing financial support to build researcher and database capacity to support brain and spinal cord injury research.	15%	23%

Research activity

As at December 2014, a total of 43 research projects have been initiated. Of these, 16 projects have been completed, 19 projects are in progress and ISCRR has committed to six new projects and two extension projects.

ISCRR's approach is to fund a range of seeding projects to prove research concepts. Successful projects are then developed into larger research initiatives. The need to undertake small seed projects has contributed to a slow ramp up of expenditure.

Other factors contributing to a slower start to the program than expected included the need to recruit additional researchers and a streamlining of the program's governance procedures. As a result, most of the major research projects are in the early stages.

Key findings

The ISCRR Neurotrauma Research Program has developed a formidable suite of applied research that is expected to have a profound impact.

The program has been successful, resulting in changes to client treatment methodology, strong client outcomes and benefits to the TAC

Changes to client treatment methods:

- The research is expected to result in substantial changes to Victoria's clinical system through the introduction of new injury and rehabilitation treatments and models of care.
- Four of the projects are also expected to have major client impacts beyond the TAC's Victorian area of responsibility within ten years – both nationally and globally.

Client benefits:

- *The restoration of upper limb function in quadriplegic patients through nerve transfer surgery,*
- *A reduction in the level of damage arising from spinal cord injury through immediate cooling and emergency decompression techniques,*
- *New models of care, already adopted at the Alfred Hospital, for people with severe acquired brain injury that improve rehabilitation times and outcomes,*
- *Early intervention for brain injury patients suffering post-traumatic amnesia,*
- *Improvements in bowel management after spinal cord injury,*
- *New housing and accommodation designs for people with spinal injuries to improve their level of independence and integration within the community.*

Benefits to the TAC:

- The research program is expected to provide excellent value for money for the TAC.
- Six of the projects, with a total TAC investment of \$4.2 million, have the potential to yield a total financial benefit¹ to the TAC of \$83.4 million, with benefits starting to emerge within the next two years. This represents a very high return on investment.
- The financial benefit from these six projects alone is more than four times the TAC's total financial contribution of \$20 million.

Realising benefits from research within a five-year timeframe is extremely challenging. Going forward, to realise value from ISCRR's work, consistent planning is required from TAC:

- To make sure that research outcomes are successfully translated into practice, clinical trials and implementation processes need to be embedded in initial project planning.
- TAC has already appointed a Research Translation Manager
- Further resources for translation of research evidence into clinical and community settings would be highly valuable.

Impact of research

SPP used a robust and validated method, its proprietary Research Impact Tool, which has been used to review Federal Government partnerships such as CRCs for impact. The CRC Program supports industry-led collaborations between researchers, industry and the community and is comparable to ISCRR's collaborative research approach.

The Research Impact Tool was used to assess the anticipated client impacts and financial benefits to the TAC for a set of nine projects.

The nine projects were chosen across the four priority areas, and represent 71 per cent of total contracted funding.

Given the early development stage of most projects, it was feasible to model the financial impact for six of the nine projects. It is projected that the initiatives implemented as a result of these six projects will yield a financial benefit to the TAC with a present value of \$83.4 million. The benefits will start to emerge within the next two years.

Financial benefits refer to the expected reduction in cost to the TAC of lifetime treatment and care for major brain and spinal cord injury clients. These are have been adjusted for:

- the risk that research outputs differ from that predicted;
- the risk that research findings are not implemented as expected; and
- time.

Present value as at December 2014.

TAC investment in six projects

\$4.2m



Expected benefit to the TAC

\$83.4m

Similar returns will not be achievable from capacity building projects in priority area four, as this work does not generate direct financial benefits. Projects in the other three areas may result in strong financial returns. However, based on these six cases alone, the research program is expected to deliver excellent value for money for the TAC.

¹ Financial benefits refer to the expected reduction in cost to the TAC of lifetime treatment and care for major brain and spinal cord injury clients. They have been adjusted for both risk and time. Present value as at December 2014.

The research program is expected to dramatically improve client quality of life outcomes

Case study research projects

1. Restoration of upper limb function in quadriplegic patients using nerve transfer surgery

- This project is expected to have profound impact for clients, by restoring upper limb function. Early success in nerve transfers to be extended to a wider variety of cases to improve mobility and independence of patients with quadriplegia.
- Financial benefit to the TAC of \$19.6 million. Currently, the TAC supports 210 quadriplegic clients. It has been estimated that approximately 10% of active quadriplegic clients will benefit from restoration of upper limb function. The difference between the expected lifetime cost for the TAC to support a quadriplegia client and a paraplegia client is \$3,200,000.

2. Immediate Cooling and Emergency Decompression (ICED) for the treatment of spinal cord injury

- By improving clients' quality of life, this project will have major impact. The new treatment, ICED, may substantially reduce the level of damage between time of injury and surgery. This will give clients greater levels of mobility and independence.
- Financial benefit to the TAC of \$49.7 million. ICED is estimated to have the potential to reduce the expected lifetime costs to TAC of supporting a quadriplegic client by 60% for suitable candidates. The current expected lifetime cost is \$6,100,000. If immediate cooling and emergency decompression within 24 hours of trauma can be provided, two cases per annum are expected to benefit.

3. Post traumatic amnesia: assessment and efficacy of early treatment following brain injury

- By improving clients' quality of life, this project will have major impact. Through early intervention, hospital stays for traumatic brain injury clients suffering post-traumatic amnesia will be reduced.
- Financial benefit to the TAC of \$0.9 million. This is based on a reduction in the length of hospital stay for suitable clients by approximately three days. On average, 66 TAC traumatic brain injury clients suffer post-traumatic amnesia per annum. The current cost of inpatient care per day to TAC is \$607.51.

4. Improving health after spinal cord injury: bowel management

- This project is expected to have reasonable impact for clients. Through using new medication to improve bowel management, clients will become more independent and less dependent on constant attendant care.
- Financial benefit to the TAC of \$9.9 million. It has been estimated that the successful use of a new medication, capromorelin, can reduce one hour of attendant care per patient per day (at \$42.15 per hour) for suitable spinal cord injury clients. The TAC supports 466 Spinal Cord Injury clients, with 25% of these estimated to be suitable candidates.

5. Process – Rehabilitation after acquired brain injury

- This project is an evaluation of the process of developing a statewide, evidence based specialist severe acquired brain injury rehabilitation service. By improving clients' quality of life, this project will have major impact.
- The Alfred Hospital has already successfully implemented these new models of rehabilitation care, which improve rehabilitation timelines and outcomes.

6. Outcome - Rehabilitation after acquired brain injury

- This involves an evaluation of outcomes of care achieved within a slow-stream ABI rehabilitation service. By improving clients' quality of life, this project will have major impact.
- The finance benefits to the TAC of Projects 5 & 6 were analysed together. The two projects have an estimated financial benefit to the TAC of \$3.4 million. The median total annual cost of supporting a TAC severe acquired brain injury patient is \$280,732. This initiative has the potential to reduce the cost of care for these clients by 10%. Currently, the TAC supports 1,348 acquired brain injury clients, with the 10 most severe cases each year estimated to be suitable candidates.

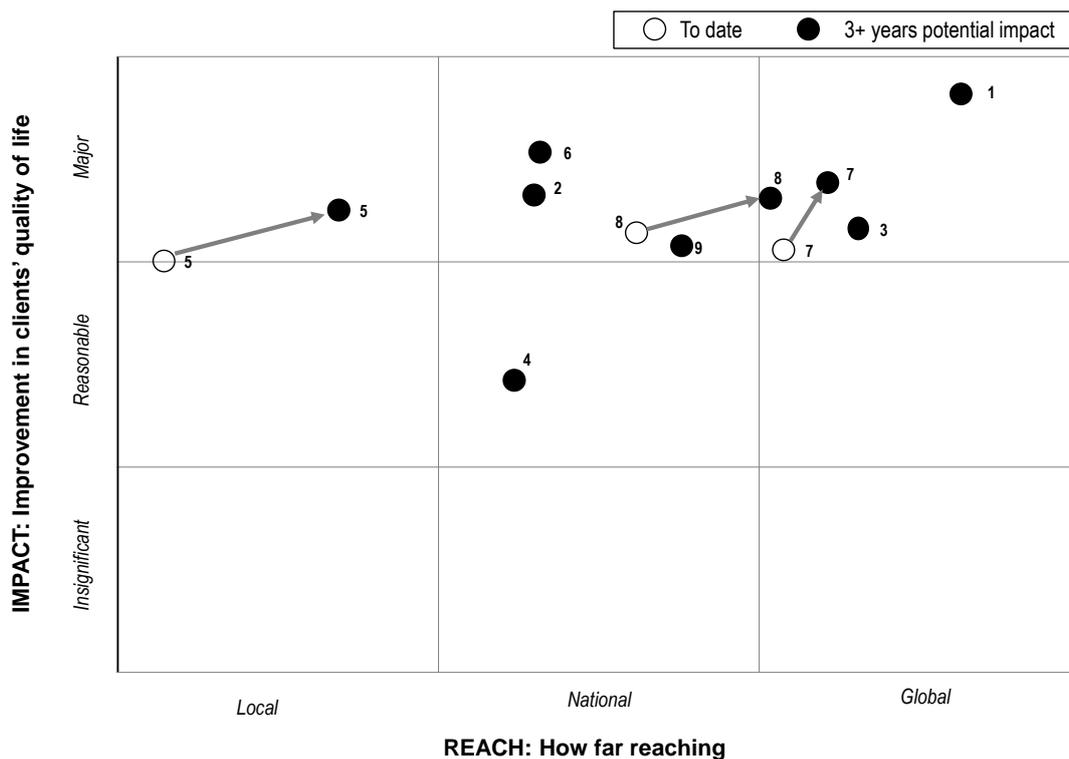
Within 3 years, the research projects are expected to significantly impact client treatment methods in Victoria, nationally and globally

Three further projects 7, 8 and 9 were not assessed for financial outcomes but were assessed for client outcomes.

The following figure illustrates the expectations of clinicians and researchers of the impact and reach of these six case study projects.

The research projects are expected to produce significant changes to client treatment methods. Translation of this research is expected to have national, and in some cases, international impact based accounts of global interest and participation in the research projects themselves.

Figure 1: Client impacts of selected research projects



Project key

Project	Potential Impact	Expected Reach in 3 yrs
1 Restoration of upper limb function with nerve transfer surgery	Major	Global
2 ICED for treatment of Spinal Cord Injury	Major	National
3 Post traumatic amnesia early treatment	Major	Global
4 Spinal Cord Injury Bowel management	Major	Local
5 Rehabilitation after Acquired Brain Injury – Phase 1	Reasonable	National
6 Rehabilitation after Acquired Brain Injury – Phase 2	Major	National
7 Longitudinal Head Injury Outcome project	Major	Global
8 Residential Independence Pty Ltd (RIPL) – accommodation guidelines	Major	Global
9 RIPL Pilot project in supported accommodation for people with neurotrauma	Major	National

Disclaimer

SPP has taken all due care in the preparation and development, however, the material contained within this report is for information only and is based on best-estimates prepared by SPP. SPP has taken due care in the development of the material but takes no responsibility or liability for decisions based upon it.

ABOUT SPP



Strategic Project Partners is a generalist, strategy consulting firm.

Established in 2005, SPP has undertaken strategic and program reviews for many of Australia's leading research organisations. We combine robust, fact-based analysis with simple communication and strong project management to identify improvement opportunities and deliver robust recommendations.

SPP specialises in:

- Working at the intersection of research, education and industry to bring a commercial and pragmatic perspective to prioritise and assess the impact and level of research programs;
- Assisting universities and research institutions to develop compelling and successful business cases to gain government and industry funding along the full research pipeline from concept to commercialisation;
- Assessing and assisting research organisations to evaluate and quantify the value they deliver; and
- Implementing the proprietary impact assessment approach we developed and refined over 10 years.

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