

# National Trauma Research Institute

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Annual Report  
2020-2021



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# Our Mission

A photograph of a medical team in a hospital hallway. Four people, two men and two women, are attending to a patient lying on a gurney. One man in blue scrubs is on the left, another man in a white lab coat is on the right, and two women are in the background. The patient is lying on their back, and the team appears to be providing medical care. The hallway is brightly lit with overhead lights.

**Improving care of the injured.  
Integrating injury research,  
education, medical technologies  
and trauma systems development  
to improve clinical care and  
outcomes.**



# NTRI Achievements 2020-2021

	2020	2021	TOTAL
 <p>Publications</p>	66	79	147
 <p>Federal Grants awarded</p>			2
 <p>NTRI supported Trauma junior medical education training program</p>	<b>29</b> Registrar	<b>36</b> Registrar	138
	<b>20</b> Residents	<b>23</b> Residents	
	<b>18</b> Interns	<b>12</b> Interns	
 <p>Health workers trained in Trauma Team Training</p>	<b>28</b> Physicians	<b>28</b> Physicians	105
	<b>28</b> Nurses	<b>19</b> Nurses	
	<b>2</b> Paramedics		
 <p>NTRI supported accreditation of Resuscitative Thoracotomy</p>		<b>12</b> Consultants	16
		<b>4</b> Fellows	

# Foreword

We started 2020 with bushfires across Victoria followed by the COVID-19 infections spreading across the globe. For the NTRI, the COVID lockdowns during the last two years has impacted on the Institute's research activities, education programs and especially, our international collaborations.

Nevertheless, the NTRI had a productive year despite remote working arrangement and disruptions we all faced in our day-to-day lives. The pandemic has highlighted the importance of investment in health and medical research. It also underscored the need for effective communication and relationship between science, health care delivery, communities and governments.

With significant changes to the NHMRC schemes in recent years and the highly competitive nature of the grants system, it was satisfying to see the NTRI achieving two successes in 2021 - an Investigator Grant and the Medical Research Future Fund Traumatic Brain Injury Mission grant. These results reinforce our level of national competitiveness and potential for future funding opportunities.

Apart from the NHMRC and projects-related awards, we received Federal Government funding, Department of Health and the Bureau of Infrastructure and Transport Research Economics, for the coordination of the Australia New Zealand Trauma Registry. We are proud of our contribution to the bi-national registry and this body of work blends well with our Alfred Hospital Trauma Registry output.

I would like to thank the Central Clinical School, Monash University, for their continual support and engagement in COVID times. We were able to function at a high level

whilst reprioritising our research activities and strategy due to their support.

Finally, I would like to thank all of our researchers and management team who delivered an exceptional year for research output despite the challenges.

## **Director**

### **Professor Mark Fitzgerald (ASM)**

MBBS | MD (Research) | GradDiplnetComm | FACEM | AFRACMA



# Message from the Research Manager

During the last two years, the NTRI adjusted to a virtual working environment, adapted to working collaboratively and delivered a range of programs online. This has affected our researchers, students, education and administration team, yet they stayed motivated and engaged despite the challenges.

With change, comes new insights and opportunities. Throughout this annual report, you will find how we stayed on course as well as the progress made, resultant from change. This includes a promotion in reflecting on our skillset individually and as a part of the NTRI team, to pursuing government funded research grants and expanding education programs online. Of our achievements in 2020 and 2021, the most notable are (in no particular order):



**Dr Yen Kim PhD**

Research Manager & AusTQIP Manager, National Trauma Research Institute, The Alfred  
Adjunct Research Fellow, Department of Surgery, Central Clinical School, Monash University

Success in receiving:

- Investigator grant – NHMRC’s flagship scheme which accounts for 40% of the Medical Research Endowment Account. The objective of the Investigator Grant scheme is to support the research program of outstanding investigators at all career stages.
- The Medical Research Future Fund (MRFF) 2020 Traumatic Brain Injury Mission – an ongoing research fund set up by the Australia Government, with a particular focus to strengthen relationship between researchers, healthcare professionals, governments and community.
- Developing educational programs online, for example our Prevent Alcohol & Risk-Related Trauma in Youths (P.A.R.T.Y.) program.
- NTRI continued to coordinate funds and milestones for the Australia New Zealand Trauma Registry
- We have established the Alfred Hospital Trauma Research Committee to review and facilitate studies, particularly those involving Alfred Trauma inpatients. It will also facilitate feedback from trauma study results across The Alfred.

We continued to pursue research collaboration and commercialisation opportunities for innovation, and this will remain as one of our top priorities for the coming years. For 2022, we look to consolidate our research governance framework, and grow our research team.

We are grateful for the support of our funders, partners, and collaborators in Australia and overseas during the pandemic. We look forward to resuming and strengthening our research activities nationally and internationally.









The NTRI research program is delivered by a collaborative effort between clinicians, researchers and our partners. We center our projects around clinical trials, accelerating research processes for emerging technologies and developing Trauma Systems framework.



# Research

## Key Research Areas

### Trauma Systems Development

Implementation of an effective Trauma System save lives, beginning with the pre-hospital phase of care through to the in-hospital setting. An integral part of trauma systems development is trauma research support.

As part of our work in Trauma Systems Development, our involvement in trauma registries is an important evidence of the impact of treatment and healthcare delivery.

### Resuscitation and Traumatic Shock

This body of research has a focus on management of critical bleeding after trauma during the pre-hospital phase and during resuscitation in-hospital.

### Human Factors and Decision Support in Trauma Resuscitation and ongoing care

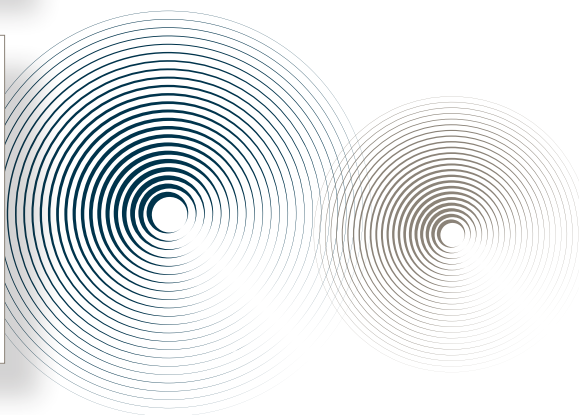
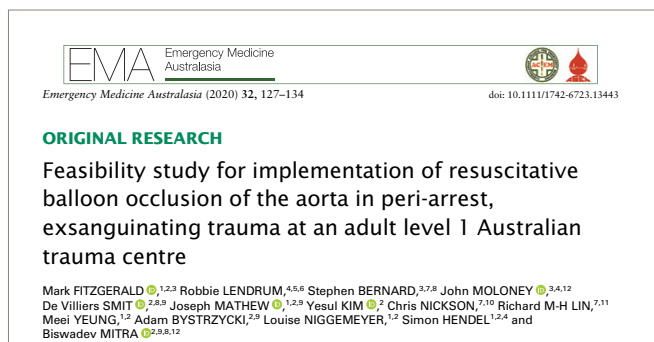
Understanding how human factors affect decision-making will help clinicians make better decisions and perform optimally in trauma management.

### Thoracic Trauma

Our experts in Thoracic Trauma focus on the effectiveness in the delivery of timely lifesaving interventions such as pleural decompression. We also focus on evaluating diagnostic performance and improving lifesaving procedures such as thoracostomy.

### Neurotrauma and Spinal Injuries

The Spine and Neurotrauma group, led by Associate Professor Jin Tee, continues to build on its strong foundation of research into fracture classification, frailty, and postoperative spinal infections. As an Asia-Pacific representative of AO International, the group is involved in classification and refinement of spinal fracture classifications. The group is also one of the few worldwide who have in-depth research on the association of frailty with poorer patient outcomes in the spinal trauma population.





## Grants Awarded in 2021/22

### NHMRC Investigator Grant L2

#### Professor Mark Fitzgerald 'Reducing resuscitation errors'

Resuscitation is an infrequent reason for Emergency Department attendance. Consequently, emergency health practitioners are infrequently exposed to resuscitation. However, the diagnoses made, and treatments administered, play a fundamental role in the survival and subsequent recovery of the critically ill. It is vital to provide the correct level of care with high efficiency and most importantly, with minimal human errors. Yet, the resultant, fast-paced resuscitations lead to stressful environments that contribute to errors in care and lead to detrimental consequences. Errors increase the likelihood of prolonged Intensive Care Unit and hospital lengths of stay as well as long-term disability and death.

Whilst no single tool for decision-making can adequately target resuscitation, a combination of physiological parameters, communication, documentation and cognitive aids is important for quality care. The low resuscitation case incidence, the infrequent emergency health provider resuscitation exposure and the clinical and regional variability in outcomes all support the development of a real-time, cognitive resuscitation aids. Error prevention software providing immediate information to the personnel may improve the level of advice required to successfully treat the patient.

A computer-assisted, resuscitation decision support system has already been shown to reduce clinical errors and improve outcomes during the resuscitation of the severely injured. However, only one in seven (14%) of all ED resuscitations are for trauma and the diagnosis of injury is usually obvious. This project will redevelop this trauma resuscitation system for cardiac, stroke, sepsis, paediatric, toxicologic and obstetric emergencies and determine efficacy and effectiveness in these domains.

The expected outcome of this project is a more broadly applicable resuscitation decision support system with demonstrably fewer resuscitation errors and improved clinical outcomes.

### MRFF Mission Grant Stream 3

#### 'Australian Traumatic Brain Injury National Data (ATBIND) Project'

The Australian Traumatic Brain Injury National Data (ATBIND) Project will identify the key determinants of outcomes for patients with moderate to severe traumatic brain injury (TBI) across Australia. Specifically, at the end of this project, the outcomes achieved will be:

- A valid determination, across Australia and pre-specified subgroups (including Aboriginal and/or Torres Strait Islander peoples), of the incidence of priority outcomes (following TBI), including survival to discharge home;
- A fresh and clear understanding of the main patient- and system-level determinants of survival and function at hospital discharge;
- A targeted priority list of the major patient- and system-level predictors for death and disability at hospital discharge;
- The development of valid models predicting death or disability at hospital discharge;
- The measurement, using current and extended targeted data, of the impact of variations in location, demographics, injury mechanism, system-level processes of (TBI) patient referral, transfer, prehospital care, emergency department reception and hospital care on hospital discharge disposition; and
- The establishment of a data-based set of national clinical quality indicators, targeting the identified key gaps (including for the health of Aboriginal and/or Torres Strait Islander communities) and inconsistencies in patient- and system-level interventions linked to identified variations and inconsistencies in outcomes of Australians sustaining a moderate or severe TBI.

# International Projects

In 2020-2021 we have supported projects remotely to improve trauma care internationally through collaboration with our partners in China, Kingdom of Saudi Arabia, India and Sri Lanka.

Last year, due to the COVID pandemic travel restrictions, all international programs were suspended until 2022.

We are fully committed to re-commence our international programs with our partners to improve trauma care for the injured worldwide in 2022.



Saudi Trauma Conference, 2019, Riyadh, Kingdom of Saudi Arabia

Delivering Trauma Team Training in Longgang Central Hospital, Longgang, China

# PhD Projects

## Madeline Green

This year I completed an BMedSc(Hons) year at the NTRI as part of my medical degree, investigating the feasibility of right brachiocephalic vein access for the resuscitation of shocked adult trauma patients. I decided to complete this project as I'm interested in critical care and saw this as a chance to begin to develop my research skills whilst gaining clinical exposure. I chose the NTRI for the opportunity to complete research at a major trauma centre, and the connection with Monash University, where I am currently studying.

This year has been so much more than I imagined and has ignited a passion for clinical research. My supervisors and the NTRI have been extremely supportive of both my research and clinical development, which has allowed me to appreciate the integration between research and clinical practice.

I am hoping to pursue a PhD and continue my research on right brachiocephalic vein access for trauma resuscitation. I am passionate about the project and want to further develop my research and critical thinking skills, which I believe will be extremely valuable for my future medical and research career. I'm excited to continue at the NTRI and am extremely grateful for the support of the institute.

## Christopher Groombridge

I am an emergency physician turned trauma consultant working to finish a PhD on the impact of stress on clinicians during resuscitation. During my career I have been fortunate enough to have enthusiastic mentors who, when confronted with my clinical questions, steered me towards answering these questions with research. The NTRI is the perfect entity with which to continue this journey. A research institute that combines knowledgeable researchers, aligned with Monash University, with dedicated clinicians caring for critically injured patients at The Alfred Hospital, the busiest trauma centre in Australasia.

My goal is to identify the clinical questions that have the potential to incrementally improve patient outcomes and then set about answering these questions with high quality research.





# Education

## Trauma Team Training

We want to share our trauma expertise and resources with our trauma colleagues to improve clinical care and outcomes of trauma patient through training and education.

The Trauma Team Training Program (TTTP) aims to improve quality of trauma patient care through the standardisation of trauma patient reception and resuscitation. Last year, we delivered TTTP to over 100 medical and nursing staff in 1 adult major Trauma Centre and 5 regional Trauma Centres.

In collaboration with the Trauma Services clinical team, we aim to promote a cohesive approach to trauma resuscitation and reception in the regional centres through high quality and effective trauma education programs.





# P.A.R.T.Y Program

The Prevent Alcohol and Risk-Related Trauma in Youth (P.A.R.T.Y.) Program ([www.partyalfred.org](http://www.partyalfred.org)) is a dynamic and interactive injury awareness and prevention program which utilises true stories and experiences by health professionals, patients and families to demonstrate the impact of injury.

## Development of P.A.R.T.Y. Online Program

Over the course of 2020-2021 P.A.R.T.Y. at The Alfred have been unable to deliver In-hospital programs due to the COVID-19 pandemic. The usual face-to-face delivery was adapted to an abridged online program in 2020 to allow the continued delivery of the primary P.A.R.T.Y. messages of injury prevention.

## Delivery to school students

The Online Program has been delivered to senior school students via Microsoft Teams since September 2020 after students returned from remote learning to face-to-face classroom learning. The Online Program for schools includes a combination of pre-filmed and live presentations from Emergency and Trauma Centre (E&TC) nursing and medical staff, Ambulance Victoria paramedics, and an injury survivor. The program is delivered over a double lesson, allowing it to fit in with the school lesson schedule. To date, the Online Program has been delivered to 1150 school students across Victoria.

Four full day face-to-face programs were piloted to students from Footscray High School in between lockdowns in 2021. The P.A.R.T.Y. Program Coordinator, a senior E&TC nurse, and injury survivor delivered a revised version of the Online Program in the classroom to 220 Year 10 students.

## Delivery to the RAN recruits

P.A.R.T.Y. at The Alfred have been delivering a two-hour online program to the Royal Australian Navy (RAN) recruits over the course of 2020-2021. This program has a slightly different format to the school Online Program but has both live and pre-recorded segments. The Online Program has been delivered to 700 RAN recruits since September 2020. The final program for this year was delivered face-to-face to 110 recruits at HMAS Cerberus.

## Benefits of the online P.A.R.T.Y. program

The online program has the benefit of reaching a greater number of participants at any one time and can remove the barrier of travel for those in regional areas.

## Future program delivery

The Online Program and some face-to-face programs will continue to run in 2022 as In-hospital programs remain on hold. The online program has received positive feedback from both educators and participants alike.



Face-to-face RAN program 2021

# Trauma Registries

## Alfred Hospital Trauma Registry

The Alfred Hospital Trauma Registry (AHTR) is a trauma epidemiology, injury surveillance and performance monitoring program, the primary deliverable of which is the provision of data to the Alfred Health Trauma Service for continuous improvement of patient care.



The Australian Trauma Registry (ATR) has 28 contributing trauma hospitals from across Australia. In the 2019-20 financial year, the ATR received data for 8,585 Major trauma patients and The Alfred Hospital, through AHTR, contributed 15% of the data.

The AHTR has evolved significantly since its inception in 1999. It developed from the original Microsoft Access database, through multiple upgrades, to the current bespoke database that is integrated with Cerner Millennium, the hospital wide clinical information system.

The dataset contains a collection of more than 200 variables; with a daily, robust routine methodology that screens and captures every injury presentation to the Alfred that potentially meets inclusion criteria. The AHTR also enables research processes at the NTRI by providing important data for retrospective cohort studies.

The 2020-2021 financial year has proved to be both a challenge and a triumph for the AHTR. The Registry team stabilised at the end of 2019 to a team of three people, who developed a routine that consistently met statutory reporting deadlines and achieved a high level of data integrity and service delivery. Operations were disrupted by the transition to working from home, due to the restrictions imposed by Covid-19. The lack of face to face interaction with clinical and non-clinical colleagues was challenging for the team. As the NTRI adjusts to a hybrid working model, we ensured flexible working arrangements without compromising productivity.

Trauma numbers have risen consistently each year since data collection commenced; continued to do so in 2020-2021 despite the periods of reduced community activity during Covid-19 related lockdowns, and are expected to increase still further in 2021-2022. The Registry is anticipating ongoing challenges yet confident that it can build on the excellent work done in 2020-2021.

**Jane Ford**

Trauma Registry Manager

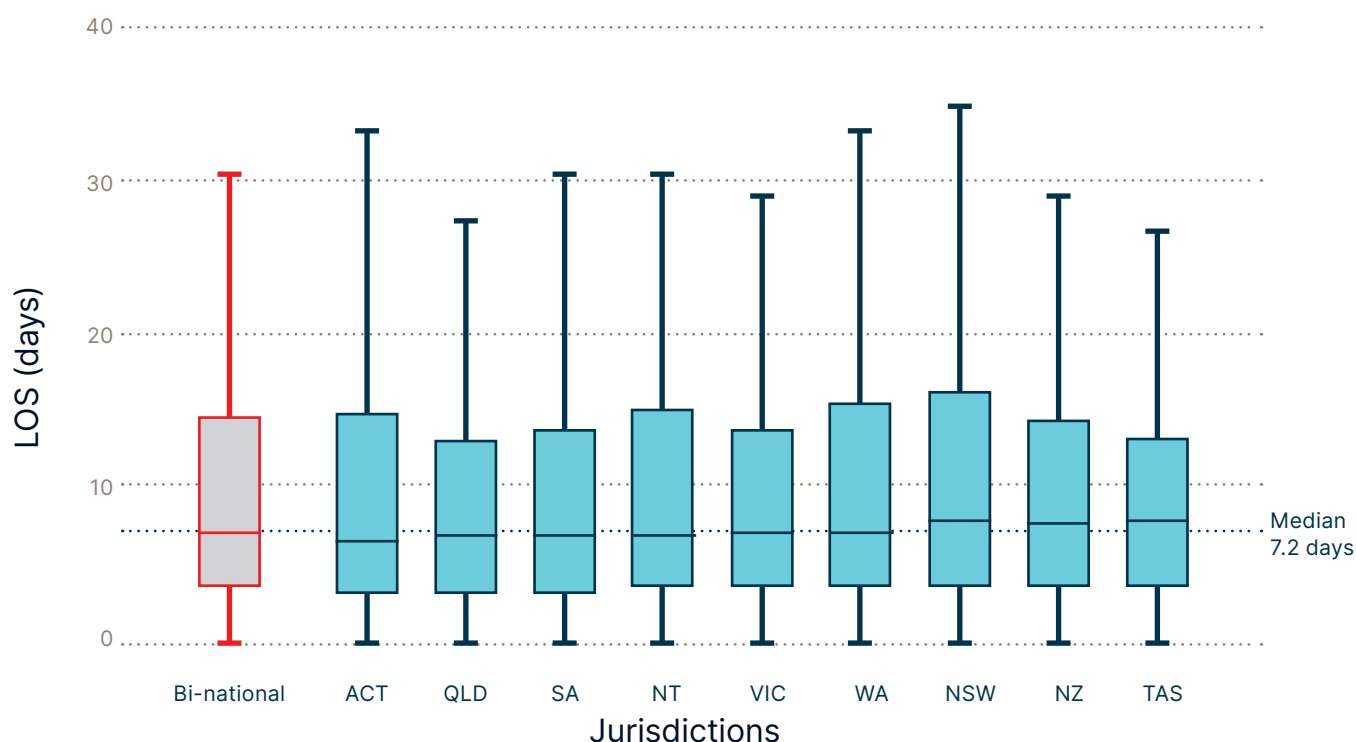
# Australia New Zealand Trauma Registry (ATR)

The National Trauma Research Institute, Alfred Health received a Research Grant Agreement (March 2020-June 2022) from the Commonwealth, represented by the Department of Health (DoH) and The Department of Infrastructure, Transport, Regional Development and Communications (BITRE) for the Australian New Zealand Trauma Registry. As the legal entity, the NTRI, Alfred Health, is responsible for the coordination of funds and reporting milestones. The NTRI employs the AustQIP Manager to maintain the overall operations and functions of the ATR including the coordination of NTRI funds and communicating with the funding bodies. We have contracted the Department of Epidemiology and Preventive Medicine, School of Public Health and Preventive Medicine, Monash University for data host and management of the ATR, with a long-standing working relationship with them on this project.

The ATR is a leading clinical quality registry, providing risk adjusted outcomes on mortality and length of stay from 26 Australian and seven New Zealand designated trauma services. The ATR houses over 5 years of quality data for research purposes, and is recruiting more sites to collect population-level major trauma data across Australia and New Zealand. In 2021, we have successfully executed a variation agreement, which permits the identification of jurisdiction and sites in data reporting. Additionally, the ATR Portal, is currently in production and will be trialled in early 2022 to allow for contributing sites to make meaningful comparisons.

ATR receives data requests and supports research processes for publication. You can find the most recent annual report and publications on [www.atr.org.au](http://www.atr.org.au).

## Length of Stay by Jurisdiction



# AHTR Year at a glance – 2020-2021

## WHO?

**4608**

*Cases registered on the database*



**69%**

male



Youngest person

**16** years



Median age

**57** years



Oldest person

**102** years



## HOW?



**38%**

*Road traffic crashes*



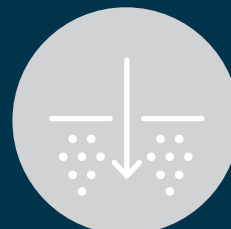
**26%**

*Low falls*



**90%**

*Blunt trauma*



**4%**

*Penetrating trauma*

## WHERE?

**38%**

*Road/street/highway*



**30%**

*Home*



**10%**

*Unknown place*



## WHEN?

Peaks on weekends



Peak during daylight hours

## PRE-ARRIVAL

**2183**

80% Patients arrived from scene by road ambulance



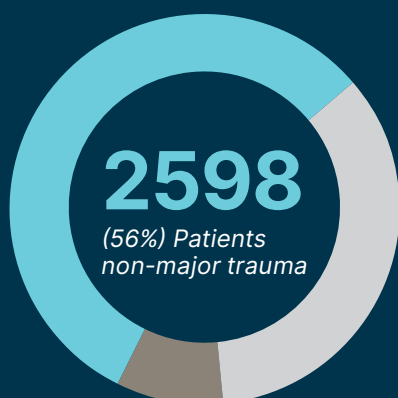
**1308**

29% Patients transferred from referral hospitals



**423**

15% Patients arrived from scene by helicopter



**2598**

(56%) Patients non-major trauma

**1607**

(35%) Patients major trauma

**403**

(9%) Patients non-trauma i.e. no injuries identified

**3620**

Patients discharged home



**525**

Patients discharged to rehabilitation facilities

**142**

Patients died (automatically classified as major trauma)





# Coming soon Highlights

## Research

A Prospective, Multicenter, Randomised, Double-Blind, Placebo-Controlled Large Simple Trial Evaluating the Use of BE1116 to Improve Survival in Patients with Traumatic Injury and Acute Major Bleeding

## Education

Master of Advanced Nursing – Trauma Care (commencing in Semester 2, 2023)

## Trauma Systems Development

Recommence engagement with our international partners

For further information or to get in touch contact:

**Jeffrey Gerobin**

Research Assistant

The National Trauma Research Institute

The Alfred

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# Publications

## 2020

1. Akhlaghi H, Vogrin S, Parnis S, O'Reilly G, Esmaeilian Z, Golshani K. Clinical Decision Tools to Predict Orotracheal Intubation and In-Hospital Mortality Among COVID-19 Patients: A Retrospective Multi-Centre Study. Available at SSRN 3681497. 2020.
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