OUR VISION
The health and wellbeing of our Midland communities will be improved by reducing the burden of trauma.

OUR MISSION
To improve clinical trauma care, reduce the incidence of injury and enable safer, more efficient systems along the trauma journey.

OUR VALUES
Our work will be guided by our beliefs and commitments to our values.

- Patients first: The needs of the patient and family guide our actions
- Communication: Open, honest, helpful
- Collaboration: Together we achieve more
- Excellence: Quality care and information
- Forward looking: Integrity, diversity, creativity

Foreword
Trauma is the leading cause of death for New Zealanders under 45 and continues to have a major impact on our Midland communities and health services. Disability and suffering can continue long after discharge. It can be a long road for survivors with injuries who need a range of ongoing complex physical, psychological and emotional care.

At Midland Trauma System (MTS) we believe that we can improve clinical care for patients and their family/whānau by understanding their needs better, and by taking an evidence-based approach to improving their journeys to recovery. As always our focus is on putting patients first.

We also believe that most trauma is preventable. Through our research program we are identifying communities and groups at risk of injury that may benefit from focused preventions. We believe the way forward is to work in partnership with a range of community safety agencies and networks to reduce the burden of trauma.

On behalf of the MTS team, I am delighted to bring you the 2018 annual report.

Grant Christie
Clinical Director
Midland Trauma System
Executive summary

Trauma continues to inflict an enormous burden on Midland communities. The MTS team documented over 7000 admissions to Midland hospitals in 2018, involving 27,882 bed days at a cost to our hospitals of over $47 million.

Māori in our region are on average 20% more likely to be hospitalised due to an injury and the numbers are increasing. This is especially prominent in the 15-24 age group. Older person trauma is also on the rise and we are revealing inequities in both the incidence of injury and delivery of care. Falls continue to be the greatest cause of injury and will be the topic of more focused research in 2019.

The MTS continues to operate a comprehensive regional trauma registry that captures patient data on all age groups and injury severities admitted to our Midland hospitals. This data provides a robust platform for evidenced based system analysis and forms the backbone of our Trauma Quality Improvement Programme (TQIP). The Midland Trauma Research Centre (MTRC) has been concentrated on developing links with other organisations to maximise the value gained from our trauma registry data. Current collaborations include NZTA, St John, WINTEC and the Universities of Waikato and Auckland.

MTS continues to host the New Zealand Major Trauma Registry (NZ-MTR) and provide support and training for staff in all district health boards (DHBs) in New Zealand. Major trauma makes up 8% of our regional trauma patient volume and the data are submitted to the Major Trauma National Clinical Network (MTNCN).

Key achievements for 2018 include:

- Introduction of the Optimised Recovery After Trauma (ORAT) programme
- Attainment of Level 1 trauma verification status by Waikato Hospital – the highest level possible and a first for New Zealand
- Completion of our regional trauma education and training needs assessment
- Completion of patient experience study in collaboration with WINTEC
- Implementation of integrated trauma work plans in all Midland DHBs directly contributing to regional strategic health priorities
- Snapshot infographics to translate trauma information for individual DHBs and stakeholder groups
- Publication of research on the topics of psychiatric comorbidities in adult survivors of major trauma, livestock related injuries, equine injuries, audit findings on ethnicity data and on monitoring the pre-hospital transport of severely injured patients

Future focus areas

- Maintain continuous, high-value service from MTS
- Revise regional trauma guidelines and matrices with clinicians
- Develop processes for streamlining trauma reception processes
- Use patient and whānau experience feedback to improve services
- Develop a regional trauma education and training programme
- Implement standardised loop closure across Midland DHBs processes for identified issues
- Interrogate trauma registry data further to identify and address inequities in incidence and clinical care
- Further development of informatics
  - Snapshot programme
  - Registry enhancement
  - TQual development
- Develop linkages with trauma related agencies and networks
- Further develop research collaborations and external funding streams
- Support Major Trauma National Clinical Network (MTNCN) work
Trauma in the Midland region 2018

Data drawn from the MTS trauma registry, admissions 2018 as at 1 April 2019

7047 Hospital admissions
19 admissions every day

6105 events
5612 Non-major events (92%)
493 Major* events (8%)

*Major events = ISS > 12, Non-major events = ISS < 13, ISS: Injury Severity Score

Ethnicity
Incidence per 100,000
Māori: 685
Pacific Island: 510
Asian: 137
Other: 633
Population ethnicity adjusted (MoH 2018 Projections) Midland resident events only

Gender
61.5% Male
38.5% Female

Children and older persons (Events)
0-14 years: 1157
65+ years: 1169

Road trauma
~47% of Major trauma due to on-road transport crashes

Falls
~33% of Non-major events due to slips, trips, and falls

Time in ED (Average)
0-14 years: 242 mins
15-64 years: 284 mins
65+ years: 341 mins
Older persons (65+ years) spend a significantly longer time on average in the Emergency Department before admission (Major and Non-major)

27,882 total bed days (Average)
Length of stay = 3.95 days
Non-major = 3.49 days
Major = 8.89 days

Mortality
0.87%
Case Fatality Rate (all events)
Non-major = 0.19%
Major = 8.5%
(NZ National CFR Majors, range = 7-11)

NZ$47.5 million
Approximate direct cost to Midland DHBs in 2018 (Based on 97% patients costed)
Non-major: NZ$36.54 million
Major: NZ$10.94 million

Trauma continues to have a major impact on Midland communities. In 2018, over 6000 patients were admitted to hospital as a result of injury. Over 7000 hospital admissions resulted in almost 28,000 total bed days of treatment. The direct cost to Midland DHB hospitals is estimated at over $47.5 million, the intangible cost to patients and their families is enormous.

MTS continues to put patients first. By providing a regional network of clinical specialists, MTS is committed to giving Midland communities the highest quality trauma care possible.
Our trauma system

Established in 2010 MTS is a network consisting of skilled clinical personnel in each of the five Midland DHBs. Our clinicians are supported by an experienced central hub service dedicated to helping trauma patients, their families and the wider Midland community. MTS is the first regional trauma system in New Zealand.

The MTS has the following aims:

1. Improve the delivery of equitable, high-quality clinical care to trauma patients
2. Develop, implement and maintain integrated, trauma system infrastructure including workforce and information systems
3. Support injury prevention and awareness by identifying inequities and groups at risk
4. Establish a Trauma Quality Improvement Programme (TQIP) to enable evidence-based change that is clinically relevant and cost effective

MTS operational model

Midland Trauma Registry (MTR)

The MTR has been operating continuously since 2012, and captures comprehensive patient data across all age groups and injury severities; this includes time and date stamping of transfer of patients to and between hospital facilities. It also captures interventions to allow detailed clinical outcome and process evaluation. The MTR now holds over 48,000 Midland trauma patient event journeys. This data provides a robust platform for evidenced based system analysis and population based studies that form the backbone of our TQIP/MTRC activities. Continuous monitoring and performance feedback enables improvements to service delivery and patient outcomes. The TQIP programme aligns with MTS ethos of putting patients first.

Midland Trauma Research Centre (MTRC)

The MTRC is embedded in the MTS and was established to translate data into knowledge. The focus of the MTRC is to identify and monitor trauma issues which can then be addressed by the appropriate people in the wider team – whether the issues are clinical, systems infrastructure or injury awareness or prevention in nature. The ethos of the MTRC aligns with that of MTS as a whole, in which research will be focussed primarily on the needs of patients, their whānau/families and their communities. The MTRC research manager position is actively and supported by the MTRC research coordinator.

Trauma Quality Improvement Programme (TQIP)

In 2018 MTS formalised its TQIP programme to facilitate continuous monitoring and improvement of trauma clinical care and system efficiencies in the Midland region. A TQIP coordinator has been recruited and is working with the five Midland DHBs to progress this work. The TQIP programme is dedicated to improving patient outcomes and aligns with MTS ethos of putting patients first.
Hospital volumes and trends

The MTR is unique in that it collects data from patients of all age groups and severities on a single, standardised system. This allows us to understand our patient groups and trauma population trends in new and highly detailed ways.

Midland region 2018
Total admissions: 7045

**Bay of Plenty DHB**
- Admissions: 1628
- Events: 1557
- DHB resident events: 1567
- Incidence: 595 per 100,000 population

**Hauora Tairāwhiti**
- Admissions: 325
- Events: 323
- DHB resident events: 282
- Incidence: 589 per 100,000 population

**Taranaki DHB**
- Admissions: 852
- Events: 734
- DHB resident events: 677
- Incidence: 566 per 100,000 population

**Lakes DHB**
- Admissions: 1089
- Events: 910
- DHB resident events: 574
- Incidence: 545 per 100,000 population

**Waikato DHB**
- Admissions: 3151
- Events: 2878
- DHB resident events: 2253
- Incidence: 554 per 100,000 population

The total number of admissions to Midland hospitals in 2018 was 7049 patients. Across Midland, we are seeing steady volumes of hospital admissions, with rises experienced in Waikato and Taranaki districts.

Our region

The Midland region covers an area of 56,728 km², or 21% of New Zealand’s land mass stretched across the middle of the North Island. It has a population of 951,965 with 241,030 Māori (26%) and 43 local iwi groups. The Midland region is characterised by a mixture of urban and rural, flat and hilly terrain and a wide variety of occupations and activity types with differing risk factors for trauma.

Our six regional objectives

- Health equity for Māori
- Integrate across continuums of care
- Improve quality across all regional services
- Build the workforce
- Improve clinical information system
- Efficiently allocate public health system resources

Source: Midland Regional Services Plan 2019/20
When looking at admission rates adjusted for population, Bay of Plenty and Tairawhiti have the highest rates of injury followed by Taranaki, Waikato and Lakes.

Volumes by age group

Figure 4 shows the volumes of trauma admissions by age group seen in each DHB in 2018. Volumes were generally higher in the younger age groups (<30 years), particularly in the Waikato DHB.

Within this younger cohort there are three points to note:

1. Volumes in both Bay of Plenty and Waikato DHBs were higher but variable at the younger ages whereas volumes rose by age group in the Lakes and Taranaki DHB up to ages 25-29 years.
2. In comparison, admissions in Tairawhiti DHB show a differing pattern with higher volumes for those aged 0-4 years followed by declining volumes through to ages 15-19 years.
3. With the exception of Tairawhiti, all DHBs saw admission volumes rise from ages 40-44 years through to 60-64 years. Bay of Plenty was the only DHB to see volumes rise for people aged 70+ years, possibly reflecting the larger population of older persons in that region and increasing activity levels and therefore greater exposure to injury in the growing demographic of ‘well and active’ older persons.

Admissions for those aged 0-4 years are predominantly from injuries due to falls; and at 15-26 years and 45-60 years are predominantly due to Road Traffic Crash (RTC) and assault. Incidence rates per 100,000 population peak in the 20-24 and 25-29 age groups and then again in the oldest age groups with the main mechanisms noted earlier being RTC and assaults and then falls in the older ages. Work continues to better understand the reasons for these high numbers and rates so focussed interventions can be developed with community safety partners.
Ethnicity in focus

Māori are at relatively high risk of trauma, representing an inequity in incidence related to ethnicity. Approximately 2000 Māori trauma patients are admitted to Midland hospitals per year (Figure 7). Over time trauma volumes are generally rising (Figure 6) with a relative incidence of 1.12 in 2018 compared to non-Māori. This means that across all age groups and DHBs Māori have 12% higher chance of being injured than non-Māori in our region. This percentage rises dramatically in high risk subgroups such as 15-24 years old. Focussed definition and action is required as a priority to understand and address this inequity in injury hospitalisation rates.

The incidence of trauma among Māori in the Midland Region has been rising slowly over the past five years. An equity gap has also continued to persist over this time. In 2018 the relative risk for Māori was 1.12 compared to non-Māori.

- Young Māori, particularly male Māori between 15-39 years of age, are at significant risk compared to non-Māori of the same age.
- Falls remain the greatest cause for trauma admission for both Māori and non-Māori. Road traffic crash and assault are prominent in Māori, and justify focussed interventions. Burns are also a significant cause of injury among Māori, 46.7% (28/60) of which were among those aged 00-04 years.
- Health equity for Māori remains a priority for Midland DHBs. Identifying Māori specific issues will assist DHBs to consider actions to improve health outcomes.

Figure 6: Midland region 2018 relative risk for Māori: 1.12

Young Māori (those aged less than five years old) are at higher risk of injury from falls and burns than non-Māori. Between the ages of 15 and 40 years old, Māori are at extreme risk of injury, predominantly from RTC, assault and falls. The decline in age-adjusted rates seen in Figure 8 compared to non-Māori over 70 years of age may be related to variance in levels of activity or comorbidities. Although these rates are age-standardised the low numbers of surviving Māori in the population over 80 years makes the interpretation challenging.
Cause of injury

As seen in Figure 9, falls remain the largest cause of injury by a significant margin, mostly resulting in non-major injuries. RTC is responsible for the highest number of major trauma injuries, followed by falls, motorcycle crashes and assault.

Quality indicators

The Trauma Quality Improvement Programme is unique in New Zealand because it monitors process indicators for all severities and age groups of admitted trauma patients. The registry is able to continuously monitor performance of clinical activities, systems and processes and outcomes. MTS has been involved in developing the Royal Australasian College of Surgeons (RACS) binational trauma process indicators, including regional benchmarks and has applied these to its TQIP Programme.

Trauma team activation

- Trauma team activation (%) is a measure of how many major trauma patients receive a trauma call activation on arrival in Emergency Department (ED) based on trauma call criteria outlined in the MTS regional trauma guidelines.
- Activation percentages are steady at approximately 70% in Bay of Plenty, Tairāwhiti and Taranaki. Rates have declined in Lakes and Waikato to about 50%. The MTS is working with DHBs to raise these level toward the target across Midland DHBs.

Figure 9: Midland region 2018 trauma events, by cause and Major (ISS > 12) or Non-Major (ISS < 13). *Crush injuries include those due to being caught, crushed, or pinched in or between objects

Figure 10: Percentage annual Major (ISS > 12) trauma admissions with a trauma team activation by Arrival Facility DHB (Target = 80%)
Time in Emergency Department

This reflects the ability of a facility to diagnose a patient, institute early treatment and transfer to an inpatient bed. Delays to admission can reflect heavy workloads in Emergency Departments and issues finding beds within the hospital, however they are unlikely to improve the outcomes or experience of injured patients so have a role as process indicators. It is concerning to note the average time in ED for all trauma patients is similar for both major and non-major trauma patients and is between 242 and 344 minutes. Considering that our current standard is that an optimal diagnostic and early treatment sequence in mature trauma services is about 60 minutes for non-major trauma patients and 30 minutes for major trauma patients, these results are disappointing and are a focus for further work. Notably longer time in ED is seen on older persons, possibly reflecting the effect of comorbidities, but raising the possibility of age bias against older persons from reluctance to admit complex patients directly to sub-speciality teams.

<table>
<thead>
<tr>
<th>Age group (Yrs)</th>
<th>Severity</th>
<th>Major</th>
<th>Non-Major</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-14</td>
<td>278</td>
<td>242</td>
<td>344</td>
</tr>
<tr>
<td>15-64</td>
<td>278</td>
<td>284</td>
<td>341</td>
</tr>
<tr>
<td>65+</td>
<td></td>
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</tr>
</tbody>
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Figure 11: Average time in Emergency Department by age group

Average time to Index CT

An index computed tomography scan (Index CT) is the first CT scan a trauma patient gets on arrival in hospital. Typically it takes 30 minutes to assess a patient and organise a CT scan, which should occur promptly in a well-running trauma call process. This should be largely independent of hospital size.

Delays to imaging can also delay decision making and treatment. Our current target is that the average time to Index CT should be under 60 minutes. Only Taranaki is currently achieving this target; however all DHBs were under 80 minutes by the end of 2018 and making steady progress towards the target.

Figure 12: Average time to Index CT (minutes), by arrival year and DHB
Case Fatality Rate (CFR)
The Case Fatality Rate is the percentage of patients that die in hospital as a result of their injuries. International best practice benchmarks for CFR are <1% for all trauma patients; <10% for major trauma patients. It is encouraging both of these benchmarks are exceeded across the Midland hospitals.

<table>
<thead>
<tr>
<th>Major and non-major</th>
<th>Major only</th>
<th>Non-major only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Events</td>
<td>6105</td>
<td>488</td>
</tr>
<tr>
<td>Died</td>
<td>53</td>
<td>42</td>
</tr>
<tr>
<td>CFR</td>
<td>0.87%</td>
<td>8.6%</td>
</tr>
</tbody>
</table>

Cost of trauma
The cost of hospital treatment alone for trauma patients is significant, however it is encouraging that this appears to be trending downward since 2016. Age group analysis reveals cost peaks at 15-24 years and 40-60 years, with a significant proportion from major trauma patients. Overall, non-major trauma costs over three times more than major trauma; therefore it is reasonable to look for cost efficiencies in the treatment of this patient group. At almost $1 million per week across Midland, small gains in system improvement or injury prevention are likely to result in significant cost savings. MTS is committed to analysing relational data and identifying these opportunities across all injury types and severities.

Figure 14: Direct cost of trauma to Midland DHBs (2012-2018) by age band and Major (ISS > 12) or Non-Major (ISS < 13) (Costs are approximate only, based on 96% costed patients).

Figure 13: Total direct cost of trauma per year 2012-2018 by Midland DHBs (Costs approximate only, based on 96% costed patients).
Key achievements for 2018

**RACS Trauma Verification**

All Midland DHBs have been verified in the first regional verification in New Zealand.

In 2018, Waikato Hospital attained level 1 trauma centre status – a first in New Zealand. As part of the participation in the ongoing RACS verification programme all Midland DHBs will require reassessment in the next two years.

**Optimal Recovery After Trauma (ORAT) programme**

Trauma patients have complex needs that require integration of many services and personnel to optimise recovery. ORAT offers a system that ensures the wider multi-disciplinary team are well informed and engaged around the individual needs of the trauma patient and their family/whānau, so that all injured patients receive the same quality of ward based and discharge care regardless of the hospital or ward they are admitted to. This programme is currently operational in Waikato and will be further developed for regional use.

**Research activities**

The MTRC is actively producing significant volumes of high-quality information from the registry that is informing our regional stakeholders and stimulating real change at a local, regional and national level. To continue this work in a structured way the MTRC has produced a three year strategic plan that identifies its value proposition and research priorities. This plan is aligned with Ministry of Health, Regional Service Plan, and MTS objectives. The MTRC is streamlining processes for researchers to access information and extend collaborative activities. In 2018 the MTRC concentrated on developing links with other organisations to maximise the value gained from our trauma registry data. Current collaborations include NZTA, St John, WINTEC and the Universities of Waikato and Auckland. Recent publications are included at the end of this document.

**Regional education and training needs assessment**

A region-wide trauma education and training needs assessment was completed for Midland clinical staff. Staff were asked questions about attendance at trauma education and training opportunities, barriers to attendance, future topics to be considered and preferred format for trauma training and education delivery. In total 256 people responded to the survey from a range of clinical groups. Preliminary findings indicated trauma education and training within the region is variable and existing programs are inconsistent and open to institutional and individual variation. Building on this work in 2019, a working group will use this information to inform trauma education planning for our region.

**Hosting of the New Zealand Major Trauma Registry (NZ-MTR)**

Since 2015 the MTS has hosted the NZ-MTR on behalf of the Major Trauma National Clinical Network (MTNCN). It records over 2000 major trauma events per year across New Zealand. As part of the hosting agreement MTS provides support to all DHBs which includes:

- Training and support for data collection
- Data quality assurance
- Data entry and management
- Interpretation of the National Minimum Data Set (NMDS)
- Coding advice including Abbreviated Injury Scoring (AIS) and ICD 10 coding
- Regular and adhoc reporting on multiple indicators
- Regional data extractions
- Registry helpdesk service

Over the last few years information services have evolved to provide more efficient data management capability. Further enhancements of the MTR are required to capitalise on these advances.
Turning data into information

Data is only useful when it can be turned into information that supports current practice or leads to change. The MTS has several work streams to make data accessible and useful to a wide range of interested groups.

- Snapshots
The snapshot programme utilises infographics to compress key information into interesting and useful formats. In 2018 this included snapshots on trauma in Māori, older persons and paediatrics. This information was well received and utilised across the region.

Paediatric trauma in the Midland Region 2018

**1157 Children**
aged 00-14 Years were admitted to Midland DHB hospitals in 2018 due to traumatic injury

**1311 Admissions**
- 26 admissions every week

**Trends**

**Causes of injury**

- Top 6: Falls, Struck, Punch, Struck, Crushed, Burn

**Places of injury**

- Top 6: Home, Public area/school, Road traffic crash, Farm, Sidewalk

**Care and outcomes**

- Average time to ED before being admitted: Length of stay is age 9 years upwards.
- Non-Major trauma: 242 mins (Median 218 mins)
- Major trauma: 278 mins (Median 235 mins)
- Case Fatality Rate: 0.17%

**Key messages**

- Across the Midland Region as a whole, older persons trauma has been somewhat variable but has been declining over the past five years.
- Older trauma patients spend on average ~6.6 days in hospital, compared to 3.4 days for those aged under 65 years.
- Estimated $10.38 million cost to Midland DHBs.

**Issues for Māori**

- The ten-year age group of Māori males is almost solely among Māori in the 15-19 year age group.
- The peak in incidence of trauma among Māori in the 15-39 year age group is almost solely among Māori males.
- The incidence of trauma among Māori males in the 15-39 year age group is significantly higher than for non-Māori males of the same age.

**Māori: Age and Gender**

- Māori males: Male vs Female
- Māori: Age vs Non-Māori
- Non-Māori: Male vs Female

**Causes of injury**

- Top 6: Fall, Struck, Punch, Crushed, Burn, Struck, unintentional

**Relative risk**

- 1.12X Relative risk: Māori vs Non-Māori
- 2.02X Relative risk: Male vs Female
- 1.50X Relative risk: Male vs Male Non-Māori

**Relative risk**

- Māori males (ISS** > 12) events (7.7%)
- Other: 107 (9.4%)

**Age profile**

- 0-14: 185 (14.0%)
- 15-24: 187 (14.1%)
- 25-34: 134 (10.3%)
- 35-44: 134 (10.3%)
- 45-54: 150 (11.6%)
- 55-64: 96 (7.3%)
- 65+: 359 (27.7%)

**Issues for Māori**

- Māori males: Male vs Female
- Māori: Age vs Non-Māori
- Non-Māori: Male vs Female

**Causality gap among Midland trauma patients.**

- The ten-year age group of Māori males in the 15-39 year age group is almost solely among Māori males.
- The peak in incidence of trauma among Māori males in the 15-39 year age group is significantly higher than for non-Māori males of the same age.

**NZ$10.83 Million**

- Estimated direct cost to Midland DHBs.
Integrated DHB work plans

To ensure our services and systems are aligned with national and regional priorities the MTS developed and implemented an integrated work-plan across the clinical trauma services in each of the five Midland DHBs. These work plans are aligned directly with the Midland Regional Services Plan and the MTS Strategic Plan to ensure that MTS is meeting its regional objectives comprehensively and on time.

The work plan elements include clinical quality improvement, infrastructure development and injury prevention. These have been augmented with recommendations from the RACS verification review from February 2017 and are driving work streams for trauma across the Midland region.

Quarterly reporting now occurs from each of the five DHB trauma services which is amalgamated into the MTS regional quarterly report. These work plans enable the trauma services to highlight the work being undertaken and also where challenges to progress exist. Feedback from these reports has been overwhelmingly positive and we will look to further enhancements over the next two years. Another outcome from the development of these reports are that all clinical services are working towards common goals outlined in our Midland Regional Services Plan and district plans.

Future focus areas

Regional review of trauma guidelines and matrices

Streamlining trauma reception processes

Commence trauma outcome study. Use patient and whānau experience to improve services

Trauma education and training programme development

Interrogate trauma registry data to identify and address inequities in incidence and clinical care

Maintain continuous MTS service by approval of 2020 business case by the Midland DHBs

Implement standardised loop closure processes to address clinical, system and process issues

Further development of informatics
- Snapshot programme
- Registry enhancement
- TQUAL development

Advocate for comprehensive regional trauma rehabilitation services

Develop linkages with trauma related agencies and networks

Develop research collaborations and external funding streams

Support the work of the Major Trauma National Clinical Network (MTNCN)

Qlik Sense

MTS further developed Qlik Sense as an intuitive visualisation tool that all DHBs can utilise to analyse and report on their own data at any time. DHB staff can select any combination of patient groups to produce graphs and charts for clinical, administrative and research purposes. Presented below is a screenshot of one of the 14 selection screens available to answer key questions for clinicians and hospital managers.

TQUAL development

A relational data base called “TQUAL” is being developed to improve data management capability. This data base will enable MTS to import data from many authorised sources for reporting, monitoring and specific studies, thereby multiplying the value of the registry to inform system and process changes. This will improve efficiencies in data management by reducing duplication of data handling, applying automated data quality checking to entered data, enabling easy extraction of data in a wide range of formats for stakeholders, and providing an advanced and flexible platform for innovative research.
Recent publications from the Midland Trauma Research Centre

Cycling-related injuries and cycling promotion: A trauma service perspective

Aim: Current policy direction seeks to promote participation in both recreational and active transport cycling. We evaluate cycling-related injuries resulting in hospital admission across the Midland Region of New Zealand.

Conclusion: Hospital admission volumes and rates are rising with underlying variation in patient demographics, location and severity of injury. Current policy direction to grow cycling participation based on the health, environmental and economic benefits is ahead of the implementation of safer cycling infrastructure, creating a timing lag. From a regional hospital-based trauma service perspective, this timing lag needs due consideration if the full benefits of increasing cycling participation are to be realised.


Improving patient experience and outcomes following serious injury

Aim: To explore injured patients’ experiences of care to identify areas for improvement in routine service delivery from surgical teams in the transition from inpatient to community-based care.

Conclusion: This study highlights perceived issues in the patient care pathway in the transition from inpatient to community-based care, especially communication and discharge information provided by surgical clinical teams and Accident Compensation Corporation (ACC). Comprehensive inpatient care and clinical handover to primary care (rather than discharge planning processes) by dedicated clinical trauma services may provide more holistic models for surgical services to improve their influence on the transition of trauma patients into the community, assisted by organisation changes and support to enable effective service delivery. Specifically, trauma patients and their carers perceived the need for better screening and treatment for psychological trauma in the inpatient and outpatient setting; better information exchange prior to the transition from inpatient to primary care; more convenient and accessible follow-up services including a single point of contact for coordination of post-discharge care; and acknowledgement and practical support to relieve the significant and pervasive carer burden identified in this study. These findings provide the opportunity to implement focused system changes to provide more equitable and effective support in the transition to community care and beyond. The end result will be better experiences for patients and whānau, and improved health and vocational outcomes following serious injury.


The epidemiology of work-related injury admissions to hospitals in the Midland region of New Zealand

Aim: To describe the epidemiological characteristics of patients with work-related injuries (WRI) admitted to hospitals in New Zealand’s Midland Trauma System (MTS) during a four year period.

Conclusion: Work-related injuries are a preventable cause of harm and health inequities in New Zealand, and targeted by the Government for a reduction of 25% by 2020. Characteristics of WRI in the Midland Region of New Zealand identified in this study may assist in identifying areas for intervention.

http://dx.doi.org/10.1016/j.injury.2017.09.018

Characteristics of older adults hospitalised following trauma in the Midland region of New Zealand

Aim: To describe the epidemiology of injuries sustained by older adult trauma patients admitted to hospitals in the Midland Region (population 886,000) of New Zealand.

Conclusion: These findings illustrate the growing participation of older adult trauma patients admitted to hospitals in New Zealand’s Midland Trauma System (MTS) during a four year period.


Monitoring pre-hospital transport of severely injured patients in the Midland Region of New Zealand

Aim: Pre-hospital triage strategies aim to identify the type and extent of patient injuries and ensure that they are transferred to the most appropriate trauma centres. Despite the importance of appropriate pre-hospital transport, there is little evidence base to assist medical staff on optimal destination policy for emergent pre-hospital transport. This paper explores the spatial relationship of patient transfers prior to the implementation of the Midland Pre-Hospital Trauma Destination Matrix in New Zealand, and is a retrospective view of practice against a destination policy that was applied after the study period.

Conclusion: Approximately one-third of patients were not directly transported to the preferred definitive care hospital subsequently defined in the Midland Pre-Hospital Trauma Destination Matrix. Ongoing monitoring of the pre-hospital transportation system and the implementation of a formal pre-hospital transport policy may improve the efficiency of the Midland Trauma System. Future studies should examine the possible reasons for variations in triage decisions across the Midland Region.


Ten-year experience of splenic trauma in New Zealand: the rise of non-operative management

Aim: The aim of this study was to describe the demographics, mechanisms of injury, management and outcomes in patients who suffered splenic trauma in Christchurch, New Zealand.

Conclusion: Splenic injuries have shown a steady increase in the last decade. Splenectomy rates have decreased in favour of non-operative techniques. Radiological intervention with splenic artery embolisation was successful in all selected patient with high-grade injuries.


Monitoring pre-hospital transport of severely injured patients in the Midland Region of New Zealand

Aim: Pre-hospital triage strategies aim to identify the type and extent of patient injuries and ensure that they are transferred to the most appropriate trauma centres. Despite the importance of appropriate pre-hospital transport, there is little evidence base to assist medical staff on optimal destination policy for emergent pre-hospital transport. This paper explores the spatial relationship of patient transfers prior to the implementation of the Midland Pre-Hospital Trauma Destination Matrix in New Zealand, and is a retrospective view of practice against a destination policy that was applied after the study period.

Conclusion: Approximately one-third of patients were not directly transported to the preferred definitive care hospital subsequently defined in the Midland Pre-Hospital Trauma Destination Matrix. Ongoing monitoring of the pre-hospital transportation system and the implementation of a formal pre-hospital transport policy may improve the efficiency of the Midland Trauma System. Future studies should examine the possible reasons for variations in triage decisions across the Midland Region.


Ten-year experience of splenic trauma in New Zealand: the rise of non-operative management

Aim: The aim of this study was to describe the demographics, mechanisms of injury, management and outcomes in patients who suffered splenic trauma in Christchurch, New Zealand.

Conclusion: Splenic injuries have shown a steady increase in the last decade. Splenectomy rates have decreased in favour of non-operative techniques. Radiological intervention with splenic artery embolisation was successful in all selected patient with high-grade injuries.


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Livestock-related injuries in the Midland region of New Zealand


Aim: To assess the incidence and patterns of injury resulting from force transferred from large livestock in the Midland Region of New Zealand, and to identify foci for prevention.

Conclusion: This study has identified high-risk animals, activities, age intervals and times during which large livestock-related injuries may occur, and revealed the significant impact on hospitals and communities that these injuries result in.


Equine-related injuries requiring hospitalisation in the Midland Region of New Zealand: a continuous five-year review


Aim: To examine the pattern and outcomes of equine-related injuries for hospitalised patients in the Midland Region of New Zealand over a five-year period.

Conclusion: The study has identified the demography, injury types, risk factors and outcomes for equine-related injuries in the Midland Region of New Zealand. Indications are that the severity of such injuries may be less than previously reported. However, the volumes and costs of injury represent a significant burden on the health system, individuals and communities. More detailed understanding of causative factors will allow targeting of prevention strategies to address high-risk activities and demographic groups.


Psychiatric comorbidities in adult survivors of major trauma: findings from the Midland Trauma Registry


Aim: To determine the extent to which adults’ experience impaired health-related quality of life (QoL), symptoms of post-traumatic stress disorder, depression, chronic pain and harmful alcohol use during the year following major trauma, and to identify factors associated with outcomes.

Conclusion: A significant proportion of adults experience adverse psychosocial outcomes in the first year following major trauma. Screening and management of potentially comorbid psychosocial needs could improve care and outcomes for survivors.


Audit of ethnicity data in the Waikato Hospital Patient Management System and Trauma Registry: pilot of the Hospital Ethnicity Data Audit Toolkit


Aim: To audit the quality of ethnicity data captured by the Waikato Hospital Trauma Registry and Waikato Hospital patient management system against self-identified ethnicity.

Conclusion: The degree of misclassification of Māori ethnicity data among patients in the Waikato Trauma Registry and the Waikato Hospital patient management system highlights a need for improvements to how ethnicity data is captured within these databases and potentially many other similar entities collecting ethnicity data in New Zealand. The release of revised standardised protocols for the collection of ethnicity data is timely given the recent establishment of a national trauma registry. Without quality data, the opportunity to investigate and address ethnic inequalities in trauma incidence and management is greatly compromised.


Quad bikes injuries in Waikato, New Zealand: an institutional review from 2007-2011


Aim: The aim of this study was to assess the burden of all-terrain vehicle (ATV) injuries within the Waikato region of New Zealand.

Conclusion: Quad bike injuries are an increasing burden on Waikato health care. The best strategy to tackle this epidemic needs to be further debated.

https://doi.org/10.1111/ans.12106

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The New Zealand Major Trauma Registry: the foundation for a data-driven approach in a contemporary trauma system


Aim: To describe the development of the New Zealand Major Trauma Registry (NZ-MTR) and the initial experiences of its use.

Conclusion: Despite the challenges working across multiple jurisdictions, initiation of a single-instance web-based registry has been achieved. The NZ-MTR enables New Zealand to have a national view of trauma treatment and outcomes for the first time. It will inform quality improvement and injury prevention initiatives and potentially decrease the burden of injury on all New Zealanders.


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