Improving Trauma Outcomes

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Definitive management at MTS

![Graph showing the percentage of cases over VSTORM years.](image)
Injury Severity Score
ICU admission

% with ICU admission - No. ICU admissions

VSTORM Year

Operative management
In-hospital death rate for major trauma
Preventable and Potentially Preventable Deaths
Excluding elderly & patients with comorbid conditions

% Non-elderly and Non-Comorbid Deaths of Total Major Trauma

VSTORM Year

Year 1 | Year 2 | Year 3 | Year 4 | Year 5
Victorian State Trauma System

- Regional trauma system since 2001
Discharge destination (survivors)
How do we monitor survivors??
No clear direction from other Registries
Potentially labour intensive
Not a research project
Potentially huge loss to follow up
## MMMT Project

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Prediction</th>
<th>Alternate form reliability</th>
<th>Sensitivity</th>
<th>Responsiveness</th>
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<tbody>
<tr>
<td>GOS</td>
<td>-</td>
<td>+++</td>
<td>-/+</td>
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<tr>
<td>GOS-E</td>
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<td>+++</td>
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<td>Modified Loco</td>
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<td>Modified FIM</td>
<td>-</td>
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<tr>
<td>FIM total</td>
<td>++</td>
<td>na</td>
<td>++++/-</td>
<td>+</td>
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<tr>
<td>FIM motor</td>
<td>+++</td>
<td>na</td>
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<tr>
<td>FIM cognitive</td>
<td>-</td>
<td>na</td>
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*Consistent for head injury (AIS>2) vs. no head injury*
Implementation of MMMT findings

- Continue with modified FIM at discharge
  - NTDB minimum dataset item
  - No clear alternative
- Cessation modified FIM at 6 months
- Commence GOS-E at 6 months
  - April/May 2006 implementation
  - Patients with a date of injury Oct-Dec 2005 (Y3Q2)
- All adult major traumas
  - i.e. not just MTS hospitals
Major trauma outcomes
Follow-up rates
Follow-up and post-discharge death
At 6 months

- 2,926 followed-up
- Responders
  - More severely injured
  - Less penetrating trauma & assault
  - Less males
- 2,836 survivors at 6 months
  - 3% mortality rate post-discharge
Living status
At 6 months

- Other
- Rehabilitation facility
- Aged care facility
- Home - additional care
- Home - no additional care

% of cases
Established to monitor and evaluate the state’s trauma system

- State-wide, population-based registry
- All health services managing trauma (n=138)
- Monitor major trauma patterns
- Tracking of patients across the system
- Quality improvement
- Collecting data since 1st July 2001
Return to work or study
6 months post-injury

% of cases

Working or studying prior to injury

Return to work or study

Yes
No
Moving forward
Achievements

- Population-based monitoring of adults
  - Unique
  - Identify prevention opportunities
    - eg ladder falls (Mitra 2007 MJA)
  - Improve Prehospital Triage
  - Assess outcomes in major trauma sub-groups
  - Identify predictors of poor outcomes
    - eg compensation (Gabbe 2007 MJA)
  - Quality Indicators (Willis 2007 Injury)
  - Monitor changes in outcome over time
  - Capacity to develop benchmarking tools around functional outcomes rather than mortality (>90% survive)
Limitations

- No quality of life measurement
- Is 6 months the right time point for follow-up?
- Limited return to work information
  - Nested cohort funded by VTF
    - SF-12, global outcome questions, extended RTW information
    - 6, 12, 18 and 24 months post-injury
- No paediatric follow-up
  - VTF funded project to address this
    - KOSCHI, GOS, weeFIM, FIM, PedsQL, CHQ
- Follow-up rates
  - Reliant on hospitals for contact details
  - Making progress
  - Difference between a research project and a registry/population study
Moving forward

- **Outcomes**
  - Addition of QOL measure
  - Paediatric outcomes
  - Further time points

- **System**
  - Evaluation and improvement of quality of life outcomes
  - Potential to develop benchmarking for longer term outcomes
  - Transfers against the system and transfer times
  - Linkage with compensable datasets
  - Comparison with other compensation schemes - esp NZ
  - International benchmarking
Funding sources

Department of Human Services, Victoria

This project is proudly supported by the Victorian Trauma Foundation
Definition of major trauma

- Death due to injury
- ICU stay >24 hours, requiring mechanical ventilation
- Injury Severity Score (ISS) >15
- Urgent surgery
Data collected

- Patient details
  - Patient demographics
- Injury event details
- Pre-hospital
  - Ambulance Patient Care Record
- Hospital
  - Emergency department
  - ICU
  - Injury details
  - Diagnostic data, procedures, etc
Outcomes collected

- In-hospital mortality
- Discharge functional measure
- Hospital length of stay, discharge destination, etc.
- 6 month outcomes
  - Death, living status
  - Functional measure
  - Return to work
  - (quality of life)
- (Deaths registry, NCIS, MAS/RAV)
Hospitalised major trauma in Victoria

Number of major trauma patients

Quarter

Jul - Sep 2001
Oct - Dec 2001
Jan - Mar 2002
Apr - Jun 2002
Jul - Sep 2002
Oct - Dec 2002
Jan - Mar 2003
Apr - Jun 2003
Jul - Sep 2003
Oct - Dec 2003
Jan - Mar 2004
Apr - Jun 2004
Jul - Sep 2004
Oct - Dec 2004
Jan - Mar 2005
Apr - Jun 2005
Jul - Sep 2005
Oct - Dec 2005
Jan - Mar 2006
Apr - Jun 2006
Jul - Sep 2006
Prior to Trauma System - <50% of patients had definitive treatment at an MTS