TRAUMA IN THE ELDERLY

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SENIOR EMERGENCY PHYSICIAN
RNSH SYDNEY
ISSUES FOR INJURY IN OLDER PEOPLE

• Increasing numbers in UMIC
• Multiple co-morbidities
• Finite resources / cost
• Manage patient / family expectations
• ? Predict outcomes
TSUNAMI (HARBOUR WAVE)
MOTOR VEHICLE CRASHES

2\textsuperscript{nd} Leading cause of injury in trauma patients > 75 Years

- Nationwide and at RMH
ELDERLY TRAUMA

HEATHER DAVIS ACNS TRAUMA
IS ELDERLY TRAUMA A PROBLEM FOR TRAUMA CLINICIANS?
PROPORTION OF THE AUSTRALIAN POPULATION AGED 65 AND OVER FROM 1970 – FUTURE PREDICTION
AUSTRALIAN GOVT INTERGENERATIONAL REPORT 2015

- **Age 65-84 yrs**
  - 2014-15: 3.1 million (13% pop)
  - 2054-55: 7 million (18% pop)

- **Age > 84 yrs**
  - 2014-15: 500,000 (2%)
  - 2054-55: 2 million (5%)

- **Av Life expectancy (yrs) if born in 2054-5**
  - 95.1 men / 96.6 for women
  - 40,000 people > 100 yrs (122 only today)

SIGNIFICANT TRAUMA LOAD > 65 YRS
USA DATA

• 14% total pop in 2014
• 21% by 2050
• Accidental injury 5\textsuperscript{th} most common cause of death in 2009/10
• 40% of trauma admissions by 2050

Banks et al Anaesthesiology Clinics 2013
AUSTRALIAN TRAUMA REGISTRY DATA 2010-2012

- Total injuries ISS > 12 or died: **20,435**
- Total deaths: **2051** (10%)

Deaths due to injury in elderly
- 65-74 yrs: 16%
- 75-84 yrs: 23%
- > 85 yrs: 28%

Caring for the Severely injured in Australia. AusTQIP 2014
AIHW REPORT 2014

2009-10

- Injury → 10,668 deaths (7.6% total deaths)
  - 1/3 Male deaths > 64 yrs
  - 2/3 female deaths > 64 yrs

- Cause of deaths
  - Falls (32%)
  - Intentional self harm (21%)
  - Transport related (14%)
<table>
<thead>
<tr>
<th>Age group</th>
<th>No injured (%)</th>
<th>Case fatality rate %</th>
</tr>
</thead>
<tbody>
<tr>
<td>65-69</td>
<td>191 (6%)</td>
<td>7.9%</td>
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<tr>
<td>70-74</td>
<td>194 (6%)</td>
<td>15.5%</td>
</tr>
<tr>
<td>75-79</td>
<td>210 (7%)</td>
<td>20.5%</td>
</tr>
<tr>
<td>80-84</td>
<td>199 (6%)</td>
<td>21.6%</td>
</tr>
<tr>
<td>85 and over</td>
<td>345 (11%)</td>
<td>34.5%</td>
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</tbody>
</table>
# RNSH AGE COMPARISON FOR 2013
(672 TRAUMA ADMISSIONS)

<table>
<thead>
<tr>
<th></th>
<th>Age &gt; 64</th>
<th>Age &lt; 65</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number</strong></td>
<td>286 (43%)</td>
<td>386 (57%)</td>
</tr>
<tr>
<td><strong>M:F</strong></td>
<td>56:44%</td>
<td>78:22%</td>
</tr>
<tr>
<td><strong>Av Age (yrs)</strong></td>
<td>79</td>
<td>38</td>
</tr>
<tr>
<td><strong>Av ISS</strong></td>
<td>17</td>
<td>18</td>
</tr>
<tr>
<td><strong>ICU Admit</strong></td>
<td>58%</td>
<td>64%</td>
</tr>
<tr>
<td><strong>Fall</strong></td>
<td>78% (224)</td>
<td>30%</td>
</tr>
<tr>
<td><strong>Road trauma</strong></td>
<td>15%</td>
<td>44%</td>
</tr>
<tr>
<td><strong>Av LOS (days)</strong></td>
<td>13</td>
<td>21</td>
</tr>
<tr>
<td><strong>Died</strong></td>
<td>20%</td>
<td>7%</td>
</tr>
</tbody>
</table>
RNSH ELDERLY TRAUMA 2013

• Increasing no. and increasing age
  • 92/270 (34%) > 84 yrs
• Multiple medical co-morbidities
• Discharge destination:
  • 123 (45%) Rehab / NH
  • 86 (32%) Home
  • 61 (23%) Died
Major trauma: the unseen financial burden to trauma centres, a descriptive multicentre analysis

Kate Curtis¹,²,³,⁷ BNurs, GDipCritCare, MN(Hons), PhD, Associate Professor, Trauma Nurse Consultant
Mary Lam⁴ MHIM, PhD, Research Fellow, Statistical Analyst
Rebecca Mitchell⁵ MA, MOHS, PhD, Senior Research Fellow
Cara Dickson² BSc(Hons), Performance Analyst
Karon McDonnell⁶ DipAppSci(Nurs), Trauma Nurse Consultant

AV COST : $10,705
AV LOS : 6.5 DAYS
COULD WE HAVE DONE BETTER?

• Can the trauma literature provide any guidance?
Predictors of mortality in geriatric trauma patients: A systematic review and meta-analysis

Ammar Hashmi, MD, Irada Ibrahim-Zada, MD, PhD, Peter Rhee, MD, Hassan Aziz, MD, Mindy J. Fain, MD, Randall S. Friese, MD, and Bellal Joseph, MD, Tucson, Arizona

- Overall mortality (15%) in injured geriatric trauma patients > among adult trauma population (6.5% in 18-64 yrs)
- Patients > 74 yrs at higher risk of dying than 65-74 yrs
- Trauma mortality remains same after 74 yrs
- Severe injury ISS> 15, Mortality rate 26.5% (Odds ratio 9.5)
- Extremely severe ISS > 24, OR death 52.34 (98.1% probability)
- Low SBP OR 2.16 for mortality

J Trauma Acute Care Surgery 2014
Injured older patients > 66 yrs
- Risk of death at 5 yrs = 1.7 relative to uninjured cohort
- Risk of death increased with comorbidities
- Increased risk of death immediate and 5 years after injury
- Further study required

Arch Surgery 1997
HEAD INJURY IN THE ELDERLY

• All Head injuries have worse outcomes
  • Assoc with higher ISS
  • Lower GCS
  • Anticoagulation Rx

• One study mod-severe brain injury
  • Overall in-hosp mortality 30%
  • Any pt with GCS < 9 – mortality 80%

Utomo et al Injury 2011
CAN WE PREDICT OUTCOMES IN ELDERLY TRAUMA?

- Age
- ISS
- Comorbidities
  - All NOT predictive (except head injury)

Duvall et al J Pall Med 2015
AGING AND FRAILTY

- By 2050, the proportion of the global population aged > 64 years is projected to reach 20%
- The estimated average prevalence of frailty among older people in the community is 10%
  - Range of 4–59% due to variability in definition used and studied population

Collard et al., 2012.
WHAT IS “FRAILTY”

• A state of vulnerability to minor homeostatic stressors due to an age-related decline in physiological reserve

• Frail people are at greater risk of adverse outcomes
  • Falls, increasing disability, hospitalisation, transfer to higher level of care, and mortality
  • Considerable heterogeneity

Freid et al J Gerontology 2001
Joyce et al Current Opin Anaesth 2015
HOW TO ASSESS FRAILTY?
# REPORTED EDMONTON FRAIL SCALE

Hilmer  Aust J Aging 2009

<table>
<thead>
<tr>
<th>Cognition</th>
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<tbody>
<tr>
<td>General Health Status</td>
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<tr>
<td>Functional independence</td>
<td></td>
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<tr>
<td>Social support</td>
<td></td>
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<tr>
<td>Medication use</td>
<td></td>
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<tr>
<td>Nutrition</td>
<td></td>
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<tr>
<td>Mood</td>
<td></td>
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<tr>
<td>Continence</td>
<td></td>
</tr>
<tr>
<td>Self reported performance</td>
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- Non frail: 0-7
- Frail: 8-18
A PROSPECTIVE COHORT STUDY EXAMINING THE PREVALENCE AND IMPLICATIONS OF FRAILTY IN OLDER SURGICAL INPATIENTS

SIMONE CHEUNG
SYDNEY MEDICAL SCHOOL
2015
UNPUBLISHED
100 PATIENTS ADMITTED TO RNSH SURGICAL SERVICES

• 33% Frail
  • In hospital
    • Increased falls
  • At 3/12
    • Transfer to a high level NH facility
    • Falls post-discharge
    • ADL disability
  • No relationship between frailty and hospital readmission, confusion or death
FRAILTY INDEX IN ELDERLY TRAUMA POPULATION

- Frailty index FI (50 pre-admission variables)
  - Co-morbidities (IHD)
  - Daily activities (shopping)
  - Health attitude (lonely)
  - Function (exercise)
  - Nutrition (recent wt loss)

Joseph et al. J Trauma ACS 2013
Joseph et al. JAMA Surg 2014
FRAILTY INDEX

• High FI = Worse outcome
  • > 0.25
  • Increased susceptibility to disability due to
    • Physical loss
    • Cognitive impairment
    • Social isolation
    • Psychological distress

Searle et al BMC Geriatric 2008
OUTCOMES

• In-hospital complications
  • Cardiac, lung, infections, renal, re-operate
• Adverse D/C
  • NH or death
Favourable v Unfavourable Outcome
250 pts over 24 months

- **Favourable Outcome (FO)**
  - Mean Frailty Index 0.19
  - D/C to Home or Rehab facility

- **Unfavourable Outcome (UFO)**
  - Mean Frailty Index 0.30
  - D/C to Skilled Nursing Facility (NH) or Death
RESULTS

• 110 (44%) FI > 0.25
  • Higher in-hospital complications ( OR 2.5)
  • Adverse D/C disposition ( OR 1.6)

• High FI independent predictor of UFO

• Age, ISS, GCS, Head AIS score
  • NOT assoc with discharge disposition
SUMMARY: FRAIL ELDERLY PATIENTS

- Increased LOS
- Increased adverse events
- Increased costs
- **Frailty Assessment** allows:
  - Better prediction of potential outcome
  - Informed communication with family
  - Better allocation of resources
AGED CARE TRAUMA LOAD WILL CONTINUE TO INCREASE AS POPULATION INCREASES

- WILL REQUIRE AN EVIDENCE-BASED APPROACH
- CURRENT "ALL TREATMENT" OPTIONS NOT SUSTAINABLE
RECOMMENDATIONS

- Early Frailty Assessment for all elderly patients
  - Allows realistic and appropriate care
  - Early discussion with family re goals of care
  - Assist with discharge planning
  - End of life issues
  - Mod- severe Head Injury bad outcome
  - Avoid ICU if high FI due to likely poor outcome
Editorial

Trauma in the elderly: Burden or opportunity?
“The necessity of nature’s final victory was expected and accepted in generations before our own. Doctors were far more willing to recognise the signs of defeat and far less arrogant about denying them.”

Sherwin Nuland “How we die”
In Atul Gawande’s Being Mortal
Time to shut down the acute care conveyor belt?

Kenneth M Hillman, Gordon D Rubenfeld and Jeffrey Braithwaite


A rapid response system may be an appropriate model for meeting the urgent need for more suitable care for patients at the end of life.

Hospitals can be dangerous places where people can unexpectedly die. Hospitals can also be dangerous places because people are not allowed to die. When they eventually die, it can be a prolonged and demeaning experience.¹ ²
SURVIVE INJURY TO LIVE A PRODUCTIVE AND INDEPENDENT OLD AGE BY KEEPING ACTIVE?
MY FATHER - FRAILTY INDEX 0.36