“Beyond Hip Fracture”
Trauma in the Older People
Dr M. A. Baxter
Consultant Trauma and Orthopaedic Medicine
Director of Major Trauma
Southampton General Hospital
Aims

- Background
- What is trauma
- Update in state of Trauma in Older People
  - Local
  - National
- Future approaches
Introduction

- What is orthogeriatrics?
- Trauma Networks went live 04/2012
- Regional triage protocols
- Demographics of trauma patients (level 1 and 2) different to expected
- What is trauma?
- Who suffers from major trauma?
Background of trauma in Older People

- **Finelli et al 1989**
  - Mortality rates;
    - <45yrs – 10%
    - 45–55yrs – 15%
    - 75yrs – 20%
  - Doubles irrespective of ISS, mechanism or body region
  - ^ complication rate
  - ^ LOS double younger patients
  - Advised LOWER threshold for referral to MTC in elders

- **Champion et al 1989**
  - Highlighted risk to viability of MTC if reimbursement of elders not addressed
Grant et al, 2000 – Scotland

- Analysis of management by age
  - Resus
  - Medical seniority
  - Transfers to ICU
  - Regional transfer
- Conclusions
  - Mortality higher than predicted for elders
  - Transfers lower in elders
  - Improved mortality by more dynamic approach
A systematic approach to falls and fracture prevention.

A systematic approach to falls and fracture prevention
Four key objectives

- **Stepwise implementation - based on size of impact**

  - **Hip fracture patients**
    - Objective 1: Improve outcomes and improve efficiency of care after hip fractures – by following the 6 “Blue Book” standards

  - **Non-hip fragility fracture patients**
    - Objective 2: Respond to the first fracture, prevent the second – through Fracture Liaison Services in acute and primary care

  - **Individuals at high risk of 1st fragility fracture or other injurious falls**
    - Objective 3: Early intervention to restore independence – through falls care pathway linking acute and urgent care services to secondary falls prevention

  - **Older people**
    - Objective 4: Prevent frailty, preserve bone health, reduce accidents – through preserving physical activity, healthy lifestyles and reducing environmental hazards

Martin F C Age Ageing 2009;38:640-643
How Do you define trauma?

- Defined as an Injury Severity Score (ISS) $\geq 15$
- ISS is derived from Abbreviated injury scale (AIS).
- 6 body sites
  1. Head & Neck
  2. Face
  3. Chest
  4. Abdomen
  5. Extremity
  6. External
## Defining trauma 2 – Abbreviated Injury Scale

<table>
<thead>
<tr>
<th>AIS Score</th>
<th>Injury Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Minor</td>
</tr>
<tr>
<td>2</td>
<td>moderate</td>
</tr>
<tr>
<td>3</td>
<td>serious</td>
</tr>
<tr>
<td>4</td>
<td>severe</td>
</tr>
<tr>
<td>5</td>
<td>critical</td>
</tr>
<tr>
<td>6</td>
<td>unsurvivable</td>
</tr>
</tbody>
</table>
# Injury Severity Scale

ISS is calculated from square of top 3 most severe injury sites

<table>
<thead>
<tr>
<th>Site</th>
<th>AIS</th>
<th>Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head &amp; neck</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>face</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>chest</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>abdomen</td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>extremity</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>external</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td><strong>ISS</strong></td>
<td></td>
<td><strong>29</strong></td>
</tr>
</tbody>
</table>
Degree of trauma

Relates to;
- Type of injury (blunt or penetrating)
- Mechanism of injury (RTC/ falls)
- Patient Factors;
  - Bone fragility
  - Physiological changes
Who suffers Trauma?

Histogram of the ages of major trauma patients treated 2011-2012 (analysis of TARN data)

Data courtesy of NHS England
Who Suffers Major Trauma?

Data courtesy of NHS England
Who Suffers Major Trauma – Mechanism

- **Patients aged under 18**
  - Falls: 26.5%
  - RTC: 49.4%
  - Blow(s): 9.5%
  - Stabbing: 5.2%
  - Crush: 1.1%
  - Shooting: 0.7%
  - Blast: 0.1%
  - Burn: 0.2%
  - Amputation: 0.1%
  - Other: 7.3%

- **Patients aged 18-65**
  - Falls: 37.6%
  - RTC: 42%
  - Blow(s): 9.6%
  - Stabbing: 3.9%
  - Crush: 1.7%
  - Shooting: 0.7%
  - Blast: 0.2%
  - Burn: 0.1%
  - Amputation: 0.1%
  - Other: 4.1%

- **Patients aged 65+**
  - Falls: 84.3%
  - RTC: 12.9%
  - Blow(s): 1.2%
  - Stabbing: 0.2%
  - Crush: 0.3%
  - Shooting: 0.0%
  - Blast: 0.0%
  - Burn: 0.1%
  - Amputation: 0.0%
  - Other: 1.0%

Data courtesy of NHS England
Total number of patients >65 and ISS >15 per year at UHS MTC
Growing Problem

![Graph showing growing problem]

Courtesy of TARN
UHS PEG # Audit Results

- N=40
- 30:10 Female : Male
- Mean age = 83 (Range 60–97)
- 7 referral centres – other than Soton (4)
  - Poole (8)
  - Bournemouth (5)
  - Chichester (2)
  - IOW (5)
  - Basingstoke (1)
  - Winchester (7)
  - Portsmouth (6)
Results

Treatment
- 39 in collar – mixture of 6 weeks / 3 months duration
- Majority local follow up
- 1 Halo – managed locally
Summary of Literature

- If going to fix – fix early –
- Anatomical reduction doesn’t correlate with clinical outcomes
- Anatomical reduction doesn’t correlate with union rates
- Union rates do not correlate with clinical outcomes
- Halo’s and old people don’t go well together
- Some Elderly patients do not benefit from a collar
  - Delirium
  - End of Life care
Conclusions

- Very limited role for surgical intervention seems to echo evidence (poor quality)
- Do we need adequate / structured follow up
- Functional scoring would be useful as 6 weeks post injury to establish outcomes – (research nurse role?)
- Standardisation of approach
- Increased orthogeriatric care
UHS Management of Peri–prosthetic Fractures

The series included 23 periprosthetic fractures around a hip arthroplasty, mean patient age 80.

*Surgical procedures*
- 16 revisions (10 uncemented, 6 cemented)
- 5 femoral locking plates
- 1 proximal femoral replacement
- 1 acetabular revision with a buttress augment

*Key outcomes*
- 5 day median time from admission to surgery (range 0-9)
- 9 patients > 1 week
- (24 hours for #NOF patients in Southampton)
- 2.8 hours mean operative time (S.D. 0.79)
- 29 day mean length of stay (S.D. 19.1, range 10-81)
- (18.5 days for #NOF patients in Southampton)
- 3 post-op mortalities (13%) due to medical complications
Total 53 patients
- 19 male, 34 female
- Average age 87.9 years (range 80–100)
- Average CCS 1.8 (range 0–4)
- Average ISS 11 (range 1–75)
Admissions by Injury Severity Score

- 1-9: 60%
- 10-20: 20%
- >20: 10%
Mortality by head injury severity

Mild (n=45) GCS 14-15: 6.60%
Moderate (n=5) GCS 8-13: 20%
Severe (n=4) GCS<8: 60%
Overall (n=53): 60%

30 day mortality
1 year mortality

Graph showing mortality rates for different levels of head injury severity.
Conclusions

- Admission to hospital with a head injury is associated with an increased mortality and morbidity. This seems to be applicable even to mild head injuries.
- Risk appears comparable to that of a hip fracture.
- This might suggest that head injury is a frailty admission similar to Hip Fracture.
- No difference is apparent if patient receives a falls assessment.
- Outcomes are worse in medical wards.
- Patients may benefit from more integrated trauma care with orthogeriatrics.
Recognition of Trauma in Older People – UHS study

- Identified a cohort of elderly major trauma patients from TARN data
- Extensive retrospective notes review
- Peer review of missed injury cases
- Evaluated data for common themes

Solutions:
- EDUCATION
  - Improving recognition of major trauma throughout the whole patient pathway
UHS MTC Data

- Total no. of patients admitted to MTC - 2160
- Total no. of patients with ISS >15 - 969
- Total no. of patients aged over 65 - 808
- Total no. of patients aged over 65 with an ISS>15 - 298
TARN Data

- **298** patients
  - Aged 65 or greater
  - ISS 15 or greater

- ‘Go Live’ of MTC 1/4/2012 until 31/8/2014

- Included patients arriving by TU bypass and secondary transfer as well as direct admissions
MTC Demographics

- Male 182 (61%), Female 116 (39%)
- Avg. age – 78.5yrs
- Avg. ISS – 24
- Avg. Acute LOS – 15 days
- Avg ICU stay – 6.5 days
- In hospital mortality – 19.7%
24% had a delayed diagnosis of injury (68/282)
These included >9% with >3 diagnoses
Injuries missed included
Injuries with a delayed Diagnosis

31% (21) patients required a surgical procedure as a result of their missed injury

- Burr holes
- Splenic embolisation
- Orthopaedic fixation
- Chest drains
MTC for Older people

- Moore et al, 2012 – Quebec
  - State wide registry comparing hospital (MTC) outcomes for young and old
    - Outcomes for young in MTC do not correlate for geriatric patients
    - Highly specialised care
    - Require specific triage and protocols

- Dinh et al, 2013 – NSW
  - Costs for older people with MT – 30% higher
  - Causes:
    - LOS
    - ISS
MTC treatment for Older People

Day et al, 1994 – Sydney
- Mortality and functional outcome
- 3 year follow up
- > 60 yrs
- ISS > 15
- Conclusion – Age factor for death BUT those who survive return to full function
- Advise aggressive trauma care for older people

Van der Sluis, 1996 – Groningen
- 2x mortality in elders
- 2 yr functional outcome same
- Advise Aggressive care for older people
MTC for Elders

- Meldon et al, 2002 – Ohio
  - Outcomes between MTC, TC and AC in >80’s
  - Major trauma outcome studies
  - Mean age 85.9
  - TC performed as predicted
  - AC less than predicted
  - MTC better in ISS 21–45 vs AC (survival 56% v 8%)

- Davis et al, 2012 – Miami
- Elderly under triaged to MTC
How Do we approach these issues

- Older people have limited physiological reserve and require Specialist input in trauma
- Limited evidence points to more aggressive input into older people
- Triage protocols—they need to be specific for older people (UTAH)
- Better recognition of Hidden trauma in older people (ED/AMU)
- More proactive mindset across the networks
- Comprehensive and integrated care of trauma patients
Older people suffer a variety of trauma
Older people deserve proactive trauma management
Trauma in older people is under-recognised and under triaged
Orthogeriatricians are specialists in Elder Trauma Care
These issues require a coordinated and integrated approach
Thank You

Any Questions?