Decision-making in trauma team activation at a Dutch Level 1 trauma centre

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Background
Research question:
What is the perceived importance of patient factors in the trauma team activation decision making process, for ED nurses at a Dutch Level 1 trauma centre?

• Is there an influence of the ED nurses’ knowledge and experience on the decision making process?
Methods

• Cross-sectional fractional factorial design
• 6 patient factors (attributes), 22 levels identified
• SPSS Orthoplan: 25 of 2304 possible scenarios
• Questionnaires consisting of 26 clinical vignettes

• 44 ED nurses of a Level 1 ED with a two-tiered trauma response
  • 30.000 ED patients/year
  • 200 multi trauma patients/year (ISS > 15)
  • 320 team activations/year (60% full TT and 40% basic TT)
# 6 Attributes - 22 levels

<table>
<thead>
<tr>
<th>Age</th>
<th>Child</th>
<th>Adult</th>
<th>Elderly</th>
<th>No information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanism of Injury</td>
<td>Traffic accident &gt;65km/hour (HET)</td>
<td>Fall height &gt;5m (HET)</td>
<td>Fall with bicycle (LET)</td>
<td>Fall from stairs halfway (LET)</td>
</tr>
<tr>
<td>Injuries sustained</td>
<td>Blunt abdominal trauma (minor)</td>
<td>2 fractures femur/humerus (major)</td>
<td>1 fracture (minor)</td>
<td>Head wound (minor)</td>
</tr>
<tr>
<td>Airway Breathing</td>
<td>Stable</td>
<td>Unstable</td>
<td>Intubation</td>
<td>No information</td>
</tr>
<tr>
<td>Circulation</td>
<td>Stable</td>
<td>Unstable</td>
<td>No information</td>
<td></td>
</tr>
<tr>
<td>RTS (PTS in children)</td>
<td>&gt;11 (PTS &gt;9)</td>
<td>&lt;11 (PTS &lt;9)</td>
<td>No information</td>
<td></td>
</tr>
</tbody>
</table>
Example Clinical Vignette

Vignette 12

Pre-notification from ambulance:
“We will arrive at your ED with a female patient who fell down the stairs halfway. She sustained possible fractures to her right upper arm and right femur. Airway and Breathing are stable. RTS 12.”

What kind of team would you activate for this patient?
- Normal ED team (ED physician and ED nurse)
- Basic trauma team
- Full trauma team

Why? Please rank the 3 most important factors in your decision.
(1=most important)
1.
2.
3.
Results

- 27/44 Questionnaires completed (61%)
- ED nurses age: mean 43.4 years (25-61)
- Years of experience: mean 16.3 years (3-36)
- Team activations per respondent:

<table>
<thead>
<tr>
<th></th>
<th>Normal ED team</th>
<th>Basic trauma team</th>
<th>Full trauma team</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mean (SD)</strong></td>
<td>2.2 (0.9)</td>
<td>3.5 (2.2)</td>
<td>17.0 (2.6)</td>
</tr>
<tr>
<td><strong>Min-max</strong></td>
<td>1 - 5</td>
<td>0 - 9</td>
<td>9 - 20</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>59 (9.6%)</td>
<td>95 (15.5%)</td>
<td>460 (74.9%)</td>
</tr>
</tbody>
</table>
Results – Attribute importance

Mean rank scores

1. Airway-Breathing: 2.85
2. Mechanism of Injury: 3.19
3. Circulation: 3.27
4. Revised Trauma Score (RTS): 3.71
5. Injuries: 3.89
6. Age: 4.59
Results – Relative rank sum weight

1. Airway-Breathing, Unstable (0.115)
2. MOI, Fall height >5m (0.171)
3. Airway-Breathing, intubation (0.172)
Conclusions

• Large variation in decisions for trauma team activation

• *Unstable Airway-Breathing, Fall from height >5m* and *Intubation* were ranked the most important in trauma team activation decisions

• Years of work experience no influence
  • data not shown
Discussion

• Improve uniformity in trauma team activation decision-making

• Use of perceived importance of levels when developing decision support system

• Other possible influencing factors

• Repeat study to generalize results
Thank you for your attention!

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