AUDIT OF THE QUALITY OF INTER-HOSPITAL TRANSFERS OF PATIENTS WITH ACUTE BRAIN INJURY IN SOUTH WALES

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Welsh Intensivists in Training Meeting – May 2013
DEFINITIONS

• Acute Brain Injury (ABI) – Traumatic brain injury and spontaneous subarachnoid haemorrhage.

• South Wales – All hospitals transferring neurosurgical patients to University Hospital of Wales (UHW).
AIM

• To audit the quality of care received during transfer to UHW by all level 3 patients with an acute brain injury in the calendar year 2011.
GOLD STANDARDS

1. Designed for Life: Welsh guidelines for the transfer of the critically ill adult
   - March 2009

2. South East Wales Critical Care Network Regional Transfer Course
   - Transferring the Critically Ill Adult
   - Pre-course Handbook
   - Fourth Edition - April 2011

3. National Institute for Health and Clinical Excellence
   - Head injury
   - Triage, assessment, investigation and early management of head injury in infants, children and adults
   - Issue date: September 2007
   - This is a partial update of NICE clinical guideline 4
OBJECTIVES

• PRIMARY OUTCOMES
  ▪ Determine the composition of transfer team.
  ▪ Evaluate the quality of preparation for transfer.

• SECONDARY OUTCOMES
  ▪ Assess the quality of neuro-protective care administered during transfer.
DATA COLLECTION

• South Wales Critical Care Network.
• UHW neurosurgical admissions database.
• 84 neurosurgical transfers between 1/1/2011 and 31/12/2011.
• 71 were level 3 patients.
• Transfer documentation interrogated for the 71 relevant patients.
RESULTS
MODE OF TRANSPORT

• 69 road transfers
• 2 air transfers
TEAM COMPOSITION AND PREPARATION

Designed for Life:
Welsh guidelines for the transfer of the critically ill adult

March 2009
TRANSFER TEAM

- **Escort 1**
- **The Doctor:**
  - 6 months critical care experience and with daytime sessions on the ITU.
  - Advanced airway skills of at least ST3 level or equivalent.
  - ALS or ATLS provider.

- **Escort 2**
- **The Nurse:**
  - Spent at least 2 years in a critical care environment, either ITU or A&E.
  - ALS or ILS providers.

- **The ODP:**
  - Be at least 2 years post qualification.

Designed for Life: *Welsh guidelines for the transfer of critically ill adult.* 2009
<table>
<thead>
<tr>
<th>Escorting Doctor</th>
<th>Number of transfers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consultant</td>
<td>4</td>
</tr>
<tr>
<td>(6%)</td>
<td></td>
</tr>
<tr>
<td>SAS Grade</td>
<td>12</td>
</tr>
<tr>
<td>(17%)</td>
<td></td>
</tr>
<tr>
<td>ST 3-7</td>
<td>23</td>
</tr>
<tr>
<td>(32%)</td>
<td></td>
</tr>
<tr>
<td>CT 1-2</td>
<td>29</td>
</tr>
<tr>
<td>(41%)</td>
<td></td>
</tr>
<tr>
<td>Not recorded</td>
<td>3</td>
</tr>
<tr>
<td>(4%)</td>
<td></td>
</tr>
</tbody>
</table>
### ESCORT 2

<table>
<thead>
<tr>
<th>Second escort</th>
<th>ODP</th>
<th>ITU Nurse</th>
<th>A&amp;E Nurse</th>
<th>Paramedic</th>
<th>Not recorded</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>40</td>
<td>17</td>
<td>3</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>(57%)</td>
<td>(24%)</td>
<td>(4%)</td>
<td>(4%)</td>
<td>(4%)</td>
<td>(11%)</td>
</tr>
</tbody>
</table>

The chart shows the number of transfers for different roles:

- ODP: 40 (57%)
- ITU Nurse: 17 (24%)
- A&E Nurse: 3 (4%)
- Paramedic: 3 (4%)
- Not recorded: 8 (11%)
PREPARATION

• Venous access must be secured before departure. At least 2 wide bore cannulae or central venous cannulae.

• Arterial blood gas analysis should be performed prior to departure after the patient has been on the transport ventilator for at least 15 minutes.

Designed for Life:  *Welsh guidelines for the transfer of critically ill adult.*  2009
VENOUS ACCESS

Venous access

<table>
<thead>
<tr>
<th>Number of patients</th>
<th>≥2 cannulae</th>
<th>&lt;2, CVC present</th>
<th>&lt;2 no CVC</th>
<th>Not recorded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Venous access</td>
<td>56</td>
<td>10</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>(79%)</td>
<td>(14%)</td>
<td>(4%)</td>
<td>(3%)</td>
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</tbody>
</table>
BASELINE DOCUMENTATION

GCS and ABG Documentation

<table>
<thead>
<tr>
<th></th>
<th>Number of patients</th>
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<tbody>
<tr>
<td>ABG</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>45 (63%)</td>
</tr>
<tr>
<td>No</td>
<td>26</td>
</tr>
<tr>
<td>GCS</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>51 (72%)</td>
</tr>
<tr>
<td>No</td>
<td>20</td>
</tr>
</tbody>
</table>
NEUROPROTECTION
STANDARDS

- **Management during transfer:**
  - All patients must receive the same level of care during transfer as they would in their base ITU.
  - The patient must be monitored continuously throughout the transfer and their observations recorded on the transfer chart.

Designed for Life: *Welsh guidelines for the transfer of critically ill adult.*  2009

- \( \text{PaO}_2 \geq 13\text{kPa}. \)

- \( \text{PaCO}_2 \) – 4.5 – 5.0kPa.
  - Taken as \( \text{EtCO}_2 \leq 4.5\text{kPa} \)

- Maintain \( \text{MAP} \geq 80\text{mmHg}. \)


- Pupils should be monitored throughout transfer.

Transferring the Critically Ill Adult. *South East Wales Critical Care Network.*  April 2011.
**END TIDAL CO₂**

<table>
<thead>
<tr>
<th>EtCO₂ ≤ 4.5kPa</th>
<th>Number of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>44</td>
</tr>
<tr>
<td>No</td>
<td>18</td>
</tr>
<tr>
<td>Not recorded</td>
<td>9</td>
</tr>
</tbody>
</table>

(62%) (13%) (25%)
MEAN ARTERIAL PRESSURE

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Not recorded</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAP ≥ 80mmHG</td>
<td>41</td>
<td>28</td>
<td>2</td>
</tr>
<tr>
<td>(58%)</td>
<td>(39%)</td>
<td>(3%)</td>
<td></td>
</tr>
</tbody>
</table>

Number of patients
PUPILS

Pupils checked during transfer

<table>
<thead>
<tr>
<th></th>
<th>Number of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>52 (73%)</td>
</tr>
<tr>
<td>No</td>
<td>19 (27%)</td>
</tr>
</tbody>
</table>
• During transfer patients should receive **same level of care** as in base ICU.

• 41% of transfers by CTs.

• Failure to undertake neuro-protective management in ~40% of transfers.

• Standard of documentation of transfers is inadequate.

• Current practice is not in line with national guidelines.

• Reconfiguration and centralisation.
Recommendations

• Short term:
  • Direct feedback regarding standards of care during transfer to staff involved.
  • Improve transfer training- simulation center based training for both medical and second escorts undertaking transfers.

• Long term:
  • Dedicated transfer teams/ retrieval teams.
  • Pre-hospital physicians bypassing DGHs for head injured patients.
ACKNOWLEDGEMENTS

• Ms. Julia Jayne Welsh Critical Care Network
• Critical Care UHW


QUESTIONS?