Application of Human Factors tools to a clinical incident

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Methodology

Understanding the incident
- London protocol
- Data collection via incident management system (Riskman) & Identification Committee
- Simple task analysis in collaboration with local managers & clinical staff
Methodology

Error analysis
• ABC
• FMEA
• Human HAZOP

Decision making
• Reason’s culpability model decision tree
• Hierarchy of controls
## Error Analysis – ABC Analysis

<table>
<thead>
<tr>
<th>Activity</th>
<th>Antecedent</th>
<th>Behavior</th>
<th>Consequence</th>
<th>Positive/Negative</th>
<th>Immediate/Future</th>
<th>Certain/Uncertain</th>
</tr>
</thead>
</table>
| Delivering medication through IV pump | Example only  
• Dose on drug chart is illegible  
• IV pump has guard rails software  
• Correct medication chosen from pump library | RN enters incorrect dose for medication into pump | Incorrect dose allowable within drug library prescribed range and allowed to proceed  
Pump library will not allow dose outside of prescribed range process is halted  
Incorrect dose harms patient | Positive | Immediate | Uncertain |
|                                | • IV pump has guard rails software  
• Correct medication chosen from pump library | RN enters the correct dose | The correct dose allowable within drug library prescribed range and allowed to proceed | Positive | Immediate | Certain |
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</thead>
<tbody>
<tr>
<td>Entering dose into IV Pump</td>
<td>Incorrect dose entered into pump</td>
<td>-RN has to re-set pump -Pt receives incorrect treatment -significant harm done to pt</td>
<td>10</td>
<td>-Illegible dose on drug chart -IV pump screen not clear IV pump unclear r which channel is being programmed</td>
<td>1</td>
<td>-Drug library software on pump does not allow dose outside of range</td>
<td>3</td>
<td>30</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>Dose set for incorrect IV line</td>
<td>- RN has to re-set pump -Pt receives incorrect dose of medication with no harm -significant harm done to pt</td>
<td>10</td>
<td>-Pump has two IV lines leading to one physical channel -Unclear when programeing which IV line is chosen</td>
<td>1</td>
<td>-Manual checks by RN - labelling of IV bags with additive labels</td>
<td>9</td>
<td>90</td>
<td>-Lines to be labelled with drug from bag to pump</td>
</tr>
</tbody>
</table>
Error Analysis – Human HAZOP

Very structured approach to considering errors

Usually used proactively

Useful structure however did not add value in this review
Figure 3. From Reason (1997) A decision tree for determining the culpability of unsafe acts. p209
Summary

• Applying the HF approaches added value
• Application of the tools needs understanding of HF concepts to gain value
• Valuable additions to tool kit for serious incident review

- Culpability model as a tool to illicit further discussion beyond the error itself
- London Protocol as an alternative to RCA methodology for particular types of incident