The Impact of Bed Occupancy on Patient Flow

David Dolan

The Salford EAU Project
The Salford EAU Project

• Aims to improve services and outcomes in acute medicine

• Long-term study based on electronic database – extensively refined, contains nearly 11,000 individual patient events

• Looked at 3 research areas as part of “Project Option”
  
  • Patient Flow
  
  • Work pressure
  
  • Staffing
Patient Flow:

- Refers to movement of patients and resources as part of a patient’s care pathway
- Good patient flow indicates efficient system
- Extensive literature review
Salford EAU

- Already made improvements in attempt to maximise flow:
  - Daily bed state meetings (up to 3x daily)
  - Patient education
  - Ambulatory care and virtual ward (alternatives to admission)
Aims

• To examine the link between bed occupancy and patient flow

• Using two markers of patient flow:
  • Breaching in the Emergency Department
  • “Out of Hours” (OOH) ward transfer
Methods

- Six-month study period was selected
- Data collected prospectively on EAU
- Used data for a retrospective cohort analysis of six month period
- 10,913 patients were in cohort
Methods

- Also obtained bed occupancy data from trust data services
Methods

• **Bed Occupancy and Breaching in the ED**

• Additional breaching data was acquired from ED database

• This looked only at patients admitted via ED (n=10,067)

• **Bed Occupancy and OOH ward transfer**

• Used only EAU bed occupancy

• This included only patients who were transferred from the EAU to another hospital ward (n=4483)

• **Logistic Regression models were used to test the hypotheses** – Reference group was a situation where no beds were available
Results

- **Bed Occupancy and Breaching in the ED**
- Logistic Regression Results:

<table>
<thead>
<tr>
<th>Reference Group</th>
<th>Comparison Group</th>
<th>Odds Ratio</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Beds Available</td>
<td>1 - 15 Beds Available</td>
<td>0.754</td>
<td>0.015</td>
</tr>
<tr>
<td></td>
<td>16 - 30 Beds Available</td>
<td>0.690</td>
<td>0.001</td>
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<tr>
<td></td>
<td>31 - 45 Beds Available</td>
<td>0.634</td>
<td>0.000</td>
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<tr>
<td></td>
<td>46 - 60 Beds Available</td>
<td>0.526</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>&gt; 60 Beds Available</td>
<td>0.570</td>
<td>0.000</td>
</tr>
</tbody>
</table>
Results

- **Bed Occupancy and Breaching in the ED**

![Graph showing the likelihood of breaching with varying number of beds available.](image-url)
Results

• **Bed Occupancy and OOH ward transfer**
• 27% of transfers took place through the night (between 00:00 and 04:00)
• **Logistic Regression Results:**

<table>
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<th>Comparison Group</th>
<th>Odds Ratio</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Beds Available</td>
<td>1 - 3 Beds Available</td>
<td>0.762</td>
<td>0.014</td>
</tr>
<tr>
<td></td>
<td>4 - 6 Beds Available</td>
<td>0.778</td>
<td>0.022</td>
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<tr>
<td></td>
<td>7 - 9 Beds Available</td>
<td>0.672</td>
<td>0.005</td>
</tr>
<tr>
<td></td>
<td>10 - 12 Beds Available</td>
<td>0.645</td>
<td>0.034</td>
</tr>
<tr>
<td></td>
<td>&gt; 13 Beds Available</td>
<td>0.604</td>
<td>0.037</td>
</tr>
</tbody>
</table>
Results

- Bed Occupancy and Night Time ward transfer
Conclusions

• 100% bed occupancy occurs fairly commonly

• It is associated with adverse outcomes for patient flow

• The frequency of night-time transfers is high
  
  • This raises concerns about quality of care in elderly patients

• This warrants further research
Limitations

• Was preliminary research
• Statistical analysis didn’t account for confounding variables
• Only six month study period
• Patient flow is very complex – results need to be interpreted in context of existing literature
Recommendations

• Consider overflow measures for when the trust is reaching capacity

• Implement guidelines and pro-forma to reduce number of night transfers from EAU

• Further research is needed

• Learning points from the literature
  • Address training of clinicians as managers
  • Patient Education
  • Use of new technologies to monitor patient flow
Actions

• EAU at SRFT takes patient flow seriously

• Some things that have been done to improve patient flow:
  • Electronic flow management
  • Acute medicine consultant “in-reach” to ED
  • Results to be highlighted amongst ED and EAU team
  • Data regarding night time transfers returned to trust
  • Further research planned for next summer
Thank You

- Special thanks to Dr Darren Green and Dr Anu Trehan on EAU
- Also to Dr James Ritchie