EARLY EXPERIENCE WITH AN OVERCAPACITY PROTOCOL

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Declaration

- This research was carried out whilst an employee of the Australian National University Medical School and was not separately funded
- Views expressed are those of the authors and do not necessarily reflect those of any employers
- Overcrowding is my major research interest
- The Unit has received research funding
- Author has received travel/other expenses to speak
- Author owns no related shares
INTRO: ED Overcrowding is bad

- **Overcrowded EDs are dysfunctional and unsafe**
  - Worse process outcomes
  - Worse quality outcomes
  - Worse patient outcomes

- **Multiple international studies show increase in patient mortality associated with overcrowding**

- **One of the major causes is access block (“boarding”), prolonged stays by patients awaiting inpatient beds**


Shen Y, Hsia RY. Association Between Ambulance Diversion and Survival Among Patients With Acute Myocardial Infarction. JAMA. 2011; 305(23): 2440-2447

Overcrowding can be addressed

- Three basic approaches
  - Mitigating the bad effects and decreasing ED LOS (ED internal)
  - Cutting occupancy with particular groups (ED collaborative)
  - Whole of hospital change
- There is sufficient before-after jurisdiction-wide evidence that it can be changed medium term
  - Reversibility of flow issues demonstrated
  - Not specific interventions, but financial incentives & resources
  - Sustainability much less clear in long term


Geelhoed GC, de Klerk NH. Emergency department overcrowding, mortality and the 4-hour rule in Western Australia. Med J Aust. 2012 Feb 6;196:122-6
“Overcapacity Protocols” form part of it

- Multiple descriptions of fixed protocols mandating transfer of inpatients to ward spaces when ED capacity is exceeded
  - Objective is to spread hospital overcrowding so that it falls more evenly across units, not just ED
- All the published descriptions are positive
  - Likely publication bias
- Many of the studies are of low methodological quality


“Overcapacity Protocols” form part of it

- Most recent review (2010) found insufficient evidence
  - “Although FCPs may be a promising alternative for overcrowded EDs, the available evidence upon which to support implementation of an FCP is limited. Additional efforts are required to improve the outcome reporting of FCP research using high-quality research methods.”

- The consensus view amongst experts is that this is about to change once formal publication of the Alberta experience occurs
Impact of an Overcapacity Protocol on ED access and flow in a Health Region

Grant Innes, Andrew McRae, Dongmei Wang, Eddy Lang

Department of Emergency Medicine, University of Calgary
Access Block in Alberta

• Many flow projects and capacity expansions: 2005 - 2008
• A multi-million dollar system-wide acute access program (GRIDLOCC – 2007 / 2008) failed to improve hospital access or reduce ED boarding times
• Dec 2010: Implementation of the Alberta Overcapacity Plan
• 14 Teaching Hospitals across Alberta simultaneously
• >650,000 patients /year
• All wards/units including EDs identified overcapacity spaces (“OCP spaces”) for patients
**OCP simplified**

**ED Inflow:**
1) Arriving CTAS 2/3 patients will move within 15/30 min into an ED acute care space.
2) If no ED space available, patients will move to an ED overcapacity or intake space so care can be initiated.

**Hospital Inflow:** If . . .
   a) ED is overcapacity by 10%, and
   b) 35% of ED stretchers are blocked, and
   c) arriving patient needs stretcher-based care

The most stable admitted patients go to OCP spaces on the most appropriate inpatient units
Results

Primary outcomes:

- Mean ED LOS (ADM pts) fell by 33% (17.2 to 11.6 hr.)
- Mean # of admitted pts at 10am fell by 46% (11.3 to 6.1)

Secondary outcomes:

- Wait time to MD fell from 113.2 min to 99.3 min
- LWBS rate fell from 4.0% to 3.8%
- OCP effects sustained over time; but varied by site

*All differences significant at p<0.001 (sample size)
The ACT Experience

• The Canberra Hospital attempted to introduce an overcapacity protocol modelled on Alberta in 2013
  – Sending patients to “overcapacity” spaces (corridors) not accepted
• Revised to an overcapacity protocol which sent admitted patients to registered hospital beds when these beds were closed out-of-hours
  – Criteria of ED overcrowding, 10+ inpatients waiting for beds, and 3+ from same hospital division
  – Second component of ED cost centre charging wards for admitted patients from 2 hours after admission
• This enabled ED to staff the overcapacity inpatient beds until they were reopened by ward staff in the morning
AIM

- To describe the early impact of the modified Overcapacity Protocol introduced at The Canberra Hospital
METHODS

• Prospective Before-After study with additional historic controls
• ED Data from three consecutive 5 week periods starting:
  – 25-Mar-13 (BEFORE)
  – 29-Apr-13 after opening of Chest Pain Evaluation Unit (CPEU)
  – 3-Jun-13 after the OCP introduced (NEW)
• Standard ED measures of demand and performance
• Additional calculation: number waiting for inpatient beds
• Comparison between the groups and with historical data from same weeks last 4 years
### RESULTS: Before-After

<table>
<thead>
<tr>
<th></th>
<th>BEFORE</th>
<th>CPEU</th>
<th>NEW</th>
</tr>
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<tbody>
<tr>
<td>Daily</td>
<td>184.0</td>
<td>183.8</td>
<td>187.9</td>
</tr>
<tr>
<td>Ward Admit</td>
<td>41.7</td>
<td>44.6</td>
<td>44.4</td>
</tr>
<tr>
<td>EMU</td>
<td>20.8</td>
<td>20.6</td>
<td>20.8</td>
</tr>
<tr>
<td>DNW</td>
<td>8.6%</td>
<td>7.7%</td>
<td>7.8%</td>
</tr>
<tr>
<td>Mean Occupancy</td>
<td>27.3</td>
<td>28.6</td>
<td>27.5</td>
</tr>
<tr>
<td>Mean Waiting Beds</td>
<td>5.4</td>
<td>7.95</td>
<td>6.72</td>
</tr>
<tr>
<td>NEAT for admissions</td>
<td>22.6</td>
<td>21.2%</td>
<td>22.5%</td>
</tr>
</tbody>
</table>

- Not a big change but historical controls suggest that 4 more patients per day and going into winter normally associated with worse crowds
Number Waiting for Beds

- Dramatic difference in distribution of the number waiting for beds
  - In 5 weeks CPEU, 8.1% of time (68:23) over 13
  - In 5 weeks NEW, 0.8% of time (6:43) over 13
    - A 90% drop (P<0.001)
- Subgroup analysis: performance better through briefer severe overcrowding periods
- Activated 6 times in 5w
  - ED safety valve, hospital incentive
10 Week Analysis

Number waiting For Beds (exact)
10 Week Analysis

Number waiting For Beds (exact)

<table>
<thead>
<tr>
<th>Year</th>
<th>Pres</th>
<th>WardADM</th>
<th>DNW</th>
<th>%DNW</th>
<th>%&gt;10</th>
<th>%&gt;13</th>
<th>Mean</th>
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<tbody>
<tr>
<td>2011</td>
<td>11873</td>
<td>2634</td>
<td>1199</td>
<td>10.1</td>
<td>12.4</td>
<td>3.01</td>
<td>6.60</td>
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<tr>
<td>2012</td>
<td>12586</td>
<td>2944</td>
<td>1282</td>
<td>10.2</td>
<td>14.8</td>
<td>4.37</td>
<td>6.78</td>
</tr>
<tr>
<td>2013</td>
<td>12951</td>
<td>3068</td>
<td>1006</td>
<td>7.8</td>
<td>7.6</td>
<td>0.58</td>
<td>5.73</td>
</tr>
</tbody>
</table>
DISCUSSION

• Overcapacity protocol (and bed management changes) was associated with highly significant decrease in ED crowding
  – Greatest decrease in duration of extremes (>13 waiting for beds)
  – Improved service as measured by Did-Not-Wait
  – Greater throughput to match increasing demand

• Sustained for at least 10 weeks
  – Long term effect remains to be seen

• As yet no evidence of adverse events such as inappropriate discharges – increased readmissions
  – This will be followed up closely, but insufficient data in 10w

• By preventing extremes, avoids vicious cycle of crowding

• Not actually used often – 6 times in first 10 weeks
  – Anecdotally, major effect was the effort to avoid it being triggered
CONCLUSIONS

- Despite being a limited OCP, active only after hours and using only registered inpatient beds, this intervention appears highly effective.
- Does not “cure” ED crowding, but spreads the load and prevents extremes.
- Clear association with increased throughput and performance.
- Further long term study needed.