SEND - System for Electronic Notification and Documentation

Peter J Watkinson
What’s the problem?
How do we recognize who is at risk?

Tarassenko et al: Centile-based early warning systems derived from statistical distributions of vital signs Resuscitation 2011:82;1013-8
Who needs the information?

- Bedside
- Nursing station
- Remote teams
- Boardroom

From patient to...
Ergonomic, efficient design
Fast, easy data entry
Clear intuitive display of vital signs

Blood pressure

Heart rate
Deteriorating patients identified at a glance

<table>
<thead>
<tr>
<th>Bay/Bed</th>
<th>Bed</th>
<th>Patient</th>
<th>Starred</th>
<th>Admission</th>
<th>Priority</th>
<th>Priority Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Side Room</td>
<td>26</td>
<td>26</td>
<td></td>
<td>Admitted 30 Sep 2015</td>
<td>3</td>
<td>obs 1 hr 7 min overdue</td>
</tr>
<tr>
<td>Bay A</td>
<td>04</td>
<td></td>
<td></td>
<td>Admitted 17 Oct 2015</td>
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<td>obs 1 hr 4 min overdue</td>
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<td></td>
<td>Admitted 27 Sep 2015</td>
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<td>obs 1 hr 44 min overdue</td>
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<tr>
<td>Bay B</td>
<td>06</td>
<td></td>
<td></td>
<td>Admitted 14 Oct 2015</td>
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<td>obs 1 hr 17 min overdue</td>
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<tr>
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<td>25</td>
<td></td>
<td>Admitted 11 Oct 2015</td>
<td>1</td>
<td>obs 1 min since last obs</td>
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<tr>
<td>Bay C</td>
<td>09</td>
<td></td>
<td></td>
<td>Admitted 15 Oct 2015</td>
<td>1</td>
<td>2 hr 47 min since last obs</td>
</tr>
</tbody>
</table>
Real-time audit – continuous quality improvement

Overall Performance
All observations taken on time this month

- On Time: 61%
- Late: 39%

1 Hourly Obs
(T&T score of 3 or more)
- On time: 19%

4 Hourly Obs
(T&T score of 1-2)
- On time: 32%

12 Hourly Obs
(T&T score of 0)
- On time: 94%
Proven in practice

• 4 hospitals
• 7.5 million observations
• 43,000 patients
• No down time
The benefits of good research coupled with good design

- Up to 3 minutes faster per observation set
- Minimal training
- System Usability Score 77.8
- Improved organizational management
The immediate future
From addition to a multi-dimensional space
Subpopulation models

And then?
Individualised alerting

HAVEN
Hospital Alerting Via Electronic Noticeboard
Individualised alerting

Villarroel et al, health technology letters 2014