Monitoring the impact of CPOE on healthcare delivery – a benefits realisation approach

Andrew Georgiou,¹ Mary Lam² Johanna I Westbrook,¹
¹Health Informatics Research & Evaluation Unit
²Health Informatics Discipline, Faculty of Health Sciences

Health Informatics Research & Evaluation Unit
Faculty of Health Sciences
The promise?

- Rapid information retrieval, efficient data management
- Incorporate decision support mechanisms
- Potential to improve quality of care
Systematic review* of the impact of ICT in health

- 257 studies (24% from 4 US centres, all home grown systems)
- Only 4% (n=9) studies examined the impact of commercial systems
- Very few Australian studies
- Challenges for health care organisations

Aim

To outline a suite of key indicators of Computerised Pathology Order Entry (CPOE) performance, assess their value as measurements of care delivery and their relevance to health professionals and patients.
Performance indicator

A statistic, or other unit of information which reflects, directly or indirectly, the performance of a system*

Template

Definition of the indicator
Aim
Rationale
Potential uses
Confounders
Data sources
Evidence
The pathology test order process*

* Georgiou, Williamson, Westbrook, Ray *Int J Med Info* 2006
Turnaround time (TAT)

Time from receipt of specimen to availability of a result
<table>
<thead>
<tr>
<th></th>
<th>Before implementation (95% CI)</th>
<th>After implementation (95% CI)</th>
<th>t test results*</th>
</tr>
</thead>
<tbody>
<tr>
<td>All test assays</td>
<td><strong>73.8</strong> (72.2-95.4)</td>
<td><strong>58.3</strong> (57.1-59.4)</td>
<td>t=15.6 (df 184257) p=0.000</td>
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<tr>
<td>Prioritised tests</td>
<td><strong>44.6</strong> (42.4-46.8)</td>
<td><strong>40.1</strong> (38.7-41.6)</td>
<td>t=3.3 (df 37830) p=0.001</td>
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<td>Non-prioritised tests</td>
<td><strong>81.5</strong> (79.6-83.5)</td>
<td><strong>65.9</strong> (64.4-67.4)</td>
<td>t=12.6 (df 148493) p=0.000</td>
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<tr>
<td>Tests in business hours</td>
<td><strong>81.8</strong> (80.1-83.5)</td>
<td><strong>69.0</strong> (67.4-70.6)</td>
<td>t=10.7 (df 141219) p=0.000</td>
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<tr>
<td>Tests outside business hours</td>
<td><strong>54.0</strong> (50.6-57.4)</td>
<td><strong>39.2</strong> (37.8-40.5)</td>
<td>t=7.9 (df 37524) p=0.000</td>
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<tr>
<td>Tests in control ward</td>
<td><strong>68.7</strong> (63.9-73.5)</td>
<td><strong>64.7</strong> (60.4-69.0)</td>
<td>t=1.2 (df 12993) p=0.218</td>
</tr>
</tbody>
</table>

*Westbrook et al. (2006) J Clin Pathol*
Volume of tests and specimens*

Average number of test assays per patient did not change
92.5 assays/patient versus 103.2 (P=0.23)

Average number of specimens per patient did not change
10.8/patient versus 11.7 (P=0.32)

*Westbrook et al. (2006) J Clin Pathol
Redundant tests

Tests reordered within an inappropriate time frame which provide no additional information
Research evidence

- Bates et al. (1999; *Am J Med*) RCT all inpatients at Brigham & Women’s Hospital US
- Computerised reminders about redundant tests vs. no reminders
- Reminders performed 27% of redundant tests vs. 51% for no reminders (p<0.001)
- Authors reported that only 50% of tests were monitored – room for greater improvement
Length of stay

- Efficiency and effectiveness of care
- Most CPOE studies in this area show no change in LOS
- ED settings (Lee-Lewandrowski [2003] Arch Path Lab Med)
Caveats

- Indicators only indicate
- They do not provide the whole picture
- Potential for "gaming"
Conclusions

• Indicators encourage explicitness
• Measure to understand and improve (e.g., Statistical Process Control)
• Benefit realisation (what works for whom and in what circumstances?)
Health Informatics Research & Evaluation Unit

http://www.fhs.usyd.edu.au/hireu/

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