Cornerstones of achieving measurable performance improvements with Lean implementation

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"Not all Lean is created equal"

- Adoption, implementation, scale
- Social aspects: Culture
- Technical aspects: Tools
- "You can do any old crap and call it Lean"

What is the recipe for success?
A mixed-methods study

• Quantitative analyses
  – 847 US hospitals, data from the 2017 National Survey of Lean/Transformational Performance Improvement in Hospitals (NSL) linked with 2015 and 2018 performance data from CMS and AHRQ databases
  – Performance measured in Triple Aim dimensions:
    • Composite measures for financial performance and clinical outcomes
    • HCAHPS for patient satisfaction
    • Hospitals ranked in each category, responses to NSL items between top and bottom quartiles compared

• Qualitative analysis
  – Semi-structured interviews based on preliminary quantitative results
  – Interviews with 17 Lean healthcare experts from 15 healthcare organizations across the US, audiotaped and transcribed verbatim
  – Grounded theory used for the qualitative content analysis

Quantitative analyses

<table>
<thead>
<tr>
<th></th>
<th>2015</th>
<th>2018</th>
<th>p-value</th>
<th>2015</th>
<th>2018</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>high performance</td>
<td>low performance</td>
<td></td>
<td>high performance</td>
<td>low performance</td>
<td></td>
</tr>
<tr>
<td><strong>PATIENT SATISFACTION</strong></td>
<td>n=194</td>
<td>n=194</td>
<td></td>
<td>n=195</td>
<td>n=196</td>
<td></td>
</tr>
<tr>
<td>Length of time doing Lean (years)</td>
<td>5.4</td>
<td>4.7</td>
<td>0.05</td>
<td>5.3</td>
<td>4.3</td>
<td>0.39</td>
</tr>
<tr>
<td>Number of units doing Lean</td>
<td>14.5</td>
<td>12.6</td>
<td>0.02</td>
<td>14.3</td>
<td>13.5</td>
<td>0.29</td>
</tr>
<tr>
<td>Size of central improvement team (number of people/total hospital bed count)</td>
<td>0.13</td>
<td>0.05</td>
<td>&lt;0.01</td>
<td>0.18</td>
<td>0.05</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td><strong>CLINICAL OUTCOMES</strong></td>
<td>n=169</td>
<td>n=169</td>
<td></td>
<td>n=180</td>
<td>n=181</td>
<td></td>
</tr>
<tr>
<td>Length of time doing Lean (years)</td>
<td>5.5</td>
<td>5.3</td>
<td>0.36</td>
<td>6.0</td>
<td>4.9</td>
<td>0.01</td>
</tr>
<tr>
<td>Size of central improvement team (number of people/total hospital bed count)</td>
<td>0.08</td>
<td>0.05</td>
<td>0.05</td>
<td>0.04</td>
<td>0.10</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td><strong>FINANCIAL PERFORMANCE</strong></td>
<td>n=160</td>
<td>n=161</td>
<td></td>
<td>n=159</td>
<td>n=160</td>
<td></td>
</tr>
<tr>
<td>Beyond start-up stage (%)</td>
<td>91.8</td>
<td>83.3</td>
<td>0.05</td>
<td>91.6</td>
<td>82.0</td>
<td>0.04</td>
</tr>
</tbody>
</table>

• Standard work was among the Top 5 Lean Tools and methods reported among hospitals high performing on clinical outcomes (2015 and 2018) and patient satisfaction (2015), but not in low-performing hospitals.
Semi-structured interview themes

- Performance improvement and Lean
  - Few significant differences in Lean implementation between the top and bottom quartiles in financial performance, patient outcomes, and patient satisfaction
  - Examples of specific Lean activities that can be linked to measurable performance improvements
  - Success factors and biggest barriers for achieving measurable performance improvements with Lean
  - Optimal metrics for measuring the effect of Lean implementation
  - Secret sauce?
- Number of units doing Lean
- Standard work
- Central improvement team

Q6: Could you identify three factors, in order of importance, that you consider imperative for achieving measurable performance improvements with lean?

<table>
<thead>
<tr>
<th>TOP 5 Success Factors</th>
<th>Weighted average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leadership engagement and commitment</td>
<td>1.71</td>
</tr>
<tr>
<td>Focus and alignment</td>
<td>1.06</td>
</tr>
<tr>
<td>Baselining and measuring</td>
<td>0.53</td>
</tr>
<tr>
<td>Culture change</td>
<td>0.47</td>
</tr>
<tr>
<td>People engagement and empowerment</td>
<td>0.41</td>
</tr>
</tbody>
</table>

Q7: Could you identify three factors, in order of importance, that you consider to be the biggest barriers of achieving measurable performance improvements with lean?

<table>
<thead>
<tr>
<th>TOP 5 Biggest Barriers</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of leadership engagement</td>
<td>1.35</td>
</tr>
<tr>
<td>Lack of focus and alignment</td>
<td>1.12</td>
</tr>
<tr>
<td>Culture issues</td>
<td>0.53</td>
</tr>
<tr>
<td>Problems with data</td>
<td>0.29</td>
</tr>
<tr>
<td>Independent physicians</td>
<td>0.29</td>
</tr>
</tbody>
</table>
**Subgroup analysis: high performing organizations vs low performing organizations**

- Based on self-assessments and publicly available data from CMS Hospital Compare website, the overall performance of interview participants’ organizations was categorized as high, intermediate, or low.
- Weighted averages of success factors and biggest barriers were examined separately for high performing and low performing organizations.

**Q8: In your opinion, what are the optimal metrics for measuring the effect of Lean implementation from these four perspectives: financial performance, quality of care and health outcomes, patient experience and satisfaction, employee and staff work-related satisfaction and wellbeing?**

<table>
<thead>
<tr>
<th>Three categories of metrics suggested</th>
<th>Proposed individual metrics and methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Currently used institutional measures (50%)</td>
<td>• Time (applicable to all four categories, “a currency of Lean”)</td>
</tr>
<tr>
<td>• Measures tailored to Lean initiatives (35%)</td>
<td>• Readmissions</td>
</tr>
<tr>
<td>• Population level measures (15%)</td>
<td>• Balanced measures, paired process and outcome metrics</td>
</tr>
<tr>
<td></td>
<td>• Measures that are meaningful up and down the line and correlating lean interventions to used metrics</td>
</tr>
<tr>
<td></td>
<td>• Benchmarking</td>
</tr>
</tbody>
</table>

- All participants identified the difficulties associated with tracing the impact of Lean.
- Readmissions were identified by two participants as a good metric for the success of the previous hospitalization.
- Warnings against focusing too much on outcomes instead of processes or focusing solely on costs.
- Savings achieved by Lean practices may not directly be visible in the bottom line since the freed resources may be used elsewhere.
- If Lean is done right it becomes an inseparable part of all operations and thus its effect is unquantifiable highlighting the need to measure the change of organizational culture.
**Q9.** In your opinion, is there a “secret sauce” that differentiates between healthcare organizations that achieve measurable performance improvements with Lean implementation from those that do not?

**Q9a:** If yes, what would/could it be?

**Q9a Themes:** Frequency of mentions categorized according to the participant’s response to Q9

- **Resources:** 1
- **Clarity of expectations and integration with HR:** 1
- **People and culture:** 6
- **Comprehensive implementation:** 5
- **Perseverance and sustainment:** 3
- **Alignment, focus and prioritization:** 2
- **Leadership:** 10

**Themes:**
- **Ambivalent**
- **Positive**

**Q10.** Do you think that the number of units using lean in an organization contributes to the likelihood of achieving measurable performance improvements?

**Q10 Themes:** Frequency of mention by different participants categorized according to the participant’s response to Q10

- **Critical mass, scope and pace:** 6
- **Gauge of culture:** 2
- **Cannot start to small but can start too big:** 1
- **All in, bridging the silos:** 2
- **Which units matters:** 2
- **Organizational bandwidth:** 2
- **What is actually being done:** 3

**Themes:**
- **Negative**
- **Ambivalent**
- **Positive**
Standard work

• Unanimously recognized by the interview participants as a key to improving clinical outcomes and patient satisfaction
  – Improves efficiency, reduces variation
  – Ensures evidence-based practices
  – Decreases memory burden, frees capacity to clinical problem solving
  – Not just that standard work exists but the work that goes behind it and how it is used, updated and audited

Q12a: In your opinion, what are the main ways in which the central improvement team contributes to improved outcomes?

- Educational: 12, 38%
- Supportive: 3, 9%
- Catalyzing: 4, 13%
- Standardizing: 3, 9%
- Connecting the dots: 9, 28%
- Focus on organizational priorities: 3, 9%
No (or insufficiently resourced) central improvement team?

- Resources poorly deployed
- Slower pace, smaller scope, even fading/failing
- Lack of alignment with organizational priorities
- Becoming enablers, not leaving capacity behind, lack of coaching
- No standards in improvement, being eaten up by operational priorities

Lean in healthcare organizations: conquering the mountain

<table>
<thead>
<tr>
<th>Technical</th>
<th>Socio–Technical</th>
</tr>
</thead>
</table>
| Lean as an improvement approach  
  - Not just implementing tools and methods but controlling they are used and improving them continuously  
  - Model cells: projects are limited to the units, not bridging silos | Succession planning and sustainability  
  - Cooperation with partners in improvement |
| Lean Management System partially implemented  
  - Frontline and middle management | Lean Management System throughout the organization  
  - Top leadership commitment  
  - Hoshin Kanri planning  
  - Alignment |

Steep climb towards the top, but the views are blocked by the trees  
Beginning to see the broader landscape, but the hill gets steeper  
Destination reached (and the next one in sight)  
Finding firm footing in the swamp
Conclusions

• Lean is a socio-technical system, both aspects contribute and need attention to ensure achieving measurable performance improvements
• Current data does not show significant correlations between specific Lean implementation strategies/models and high performance
• More research is needed to resolve difficulties in measuring the extent of Lean implementation and defining optimal metrics to quantify the impact of Lean

Thank you!

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