Lean management and hospital performance: adoption versus implementation

Stephen M. Shortell, PhD, MBA, MPH
Blue Cross of California Distinguished Professor Emeritus of Health Policy and Management
Co-director, CLEAR, UC Berkeley School of Public Health
Co-authors: Janet C. Blodgett, MSc; Thomas G. Rundall, PhD; Rachel Mosher Henke, PhD; Elina Reponen, MD, PhD

Outline

• Central question
• Prior research
• Current study and results
• Conclusion and discussion
Central question

• To what extent might lean, if fully and widely implemented, provide a foundation for larger and more sustainable improvement in the quality and cost of care than what we have achieved to date?

Lean working definition

• An overall management/operating system that uses a continuous improvement culture that empowers front line workers (nurses, physicians, support staff) to solve problems and eliminate waste by standardizing work to improve the value of care delivered to patients.

• A socio-technical system approach emphasizing culture, leadership, work design, tools.
Prior research

• Consistent evidence of positive results when used in individual projects/units/departments
• Less evidence and mixed evidence of its use organization wide

Key results from the national survey of lean - 2017

• 61 percent (adjusted for non response) of hospitals report using Lean
• Only 12 percent (102 hospitals) report being “mature” in its use – having it implemented throughout the hospital
• Extent of use positively associated with self reported performance
• Adoption of Lean by 2014 positively associated with lower adjusted Medicare spending per beneficiary in 2015
  – Associated with no other independent objective performance measures
• For a subset of public hospitals it was positively associated with EBITDA margin and fewer patients leaving the ED without being seen. No other relationships.
Current, updated study

- 2017 adoption and implementation measures linked to 2018 objective
  independent publicly reported performance measures

Adoption and implementation measures

- Adoption of any Lean
- Number of operating units throughout the hospital using lean (0-29)
- Number of years using lean
- Leadership Commitment Index
- Daily Management System Index
- Education and Training Index
Performance measures

• 30-day risk adjusted mortality index
• 30-day unplanned readmission rate
• Adjusted inpatient expense per discharge
• Composite: appropriate/efficient use of medical imaging
• Composite: patient safety
• Composite: timeliness of care
• Death rate among surgical inpatients with serious treatable conditions
• EBITDA margin
• HCAHPS score
• Medicare spending per beneficiary

Control variables

• Ownership
• Member of a system or network
• Core-based statistical area type
• Member of Council of Teaching Hospitals
• Bed size
• Market concentration
• Percent Medicaid discharges
• Primary care/Specialist provider ratio
Results

- Lower adjusted inpatient expense per discharge
- Lower 30-day unplanned readmission rate
- Above national average in appropriate use of imaging
- Higher HCAHPS patient experience scores
- Top quartile of hospitals implementing lean (20-29 units using it) versus the bottom quartile of hospital units using lean (0-9 units) had adjusted inpatient expense per discharge approximately $1,000 lower

Linear regressions summary across dependent variables
(β and 95% CI for relationship with number of units doing Lean)

Control variables include number of years using lean, ownership, system or network membership, core-based statistical area type, bed size, teaching status, percent Medicaid discharges, market concentration, primary care/specialist provider ratio.
Logistic regressions summary across dependent variables
Odds ratio and 95% CI for relationship with **number of units doing Lean**

- **Composite: timeliness of care**
- **Composite: patient safety**
- **Composite: appropriate/efficient use of medical imaging**

*Odds ratio >1 indicates that using Lean in more units is associated with greater odds of being above the national average on that composite performance measure*

Control variables include number of years using Lean, ownership, system or network membership, core-based statistical area type, bed size, teaching status, percent Medicaid discharges, market concentration, primary care/specialist provider ratio.

---

**Conclusion**

- It is the degree of implementation and spread that really matters, not mere piecemeal adoption
- The results are encouraging, but we are far from the *tipping point* of achieving sustainable everyday quality improvement
For discussion

• Have hospitals using Lean done a better job of responding to Covid-19?
• What role can Lean play in making breakthrough improvements in quality and financial performance?
• What might payers and policymakers do to accelerate hospitals and other healthcare organizations use of lean and related transformational performance improvement approaches?

Relevant publications

Acknowledgements

- IBM Watson Health
- American Hospital Association Survey Data Center
- Catalysis
- Lean Enterprise Institute
- Rona Consulting Group – Moss Adams
- Value Capture
- The Jewish Healthcare Foundation of Western Pennsylvania

Thank you

For more information see: clear.berkeley.edu

Contact: shortell@berkeley.edu