

# Implementation and Impact of Lean Redesigns in Primary Care

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Lean Transformation in Health Care Summit

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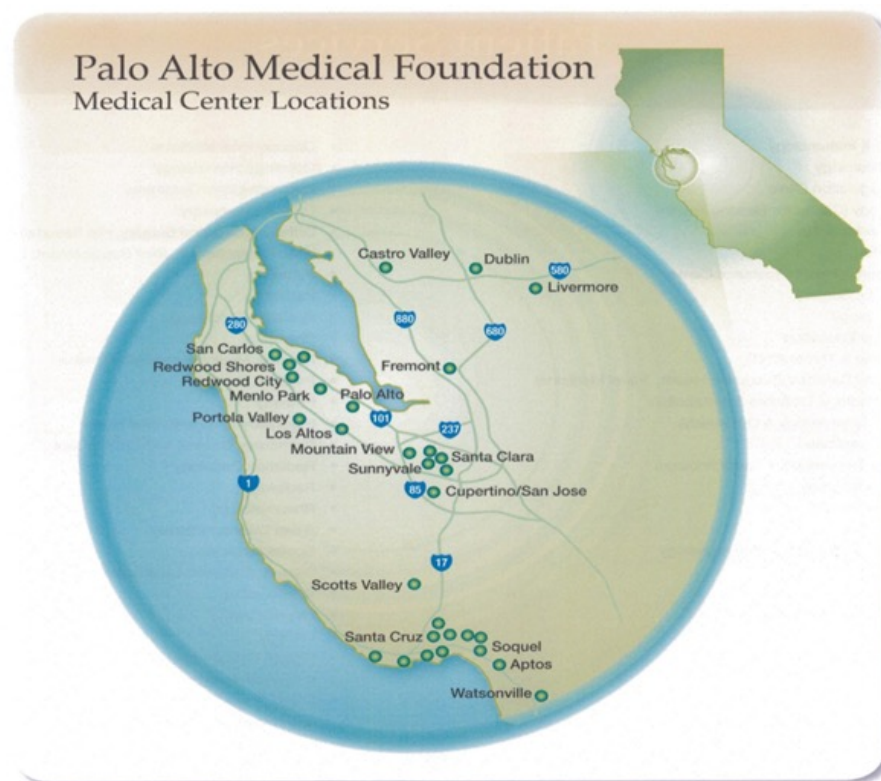
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Accelerating Change & Transformation in Organizations and Networks  
(ACTION II)

# Palo Alto Medical Foundation (PAMF)



- Multispecialty, not-for-profit ambulatory care delivery system
- Serves over 1 million patients
- Operates in 6 counties in San Francisco Bay Area

- >900 physicians, 5000 non-MD staff
- Majority fee-for-service:
  - 70% commercial FFS
  - 12% commercial HMO
  - 13% Medicare/Medicaid
  - 5% Self-pay or Other



# Implementation of Lean in Primary Care at PAMF

Systematic spread across all primary care clinics



# Implementation of Lean Redesigns

Sequence of Lean-based improvements in all clinics



Value Stream Mapping



5S of Work Space



## Workflow Redesigns:

- Co-location of MD/MA dyads
- Daily huddles
- Agenda setting
- In-basket management



Call Management



# Qualitative Data Sources

In-depth interviews (N=113)

- Physicians
- Clinic leaders

Focus Groups (N=11 groups, 3-6 members each)

- Medical Assistants

Observations (N=20)

- Improvement events
- Workflows



## In-depth Interviews by Professional Role

	Interviewed
<u>Frontline Physicians</u>	
Family Practitioners	26
Internists	19
Pediatricians	24
<u>Organizational Leaders</u>	
Physician Leaders	21
Operations Leaders	23
<b>Total</b>	<b>113</b>

# Implementation Measures

- ❖ Study focused on two aspects of implementation:
  - **Acceptance** – Degree to which those impacted by the Lean change effort viewed the changes as acceptable *in principle*
  - **Adoption** – The reported adoption, attempt to adopt, or conversely, abandonment of Lean redesigns *in practice*



# Outer Setting

- Economic pressures and policy changes facilitated acceptance of Lean as a potential solution for primary care.

*“Burning platform”*

*“Hamster health care”*

*“The burning platform was really our **affordability targets** and how are we going to weather [this] when we come upon it.”* – Clinic Leader

*“Just grinding out patients as a primary care doc... it feels like emptying the ocean with a teaspoon. The psyche of being a primary care doctor these days has got to get better...”* **“It’s hard to be on a treadmill...”**  
– Physician



# Intervention Characteristics

- Co-location affected frontline experiences with Lean redesigns.
- Physician-Medical Assistant (MA) dyads sit side-by-side to facilitate communication, patient care workflows.

*“It’s really a teachable moment too...we’re finding that the physicians are saying, ‘Oh, you know that patient that had X, Y, and Z...this is what the diagnosis is and this is what it means,’ or ‘Here are some symptoms to look out for.’ So, it’s a really good opportunity for that dyad to have teaching.”*

*- MA Supervisor*





# Intervention Characteristics

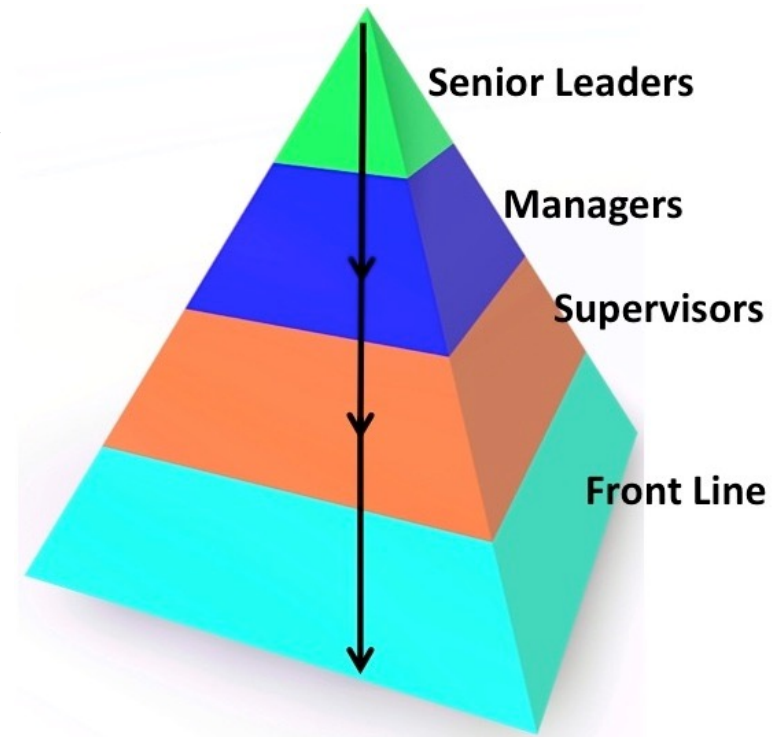
- Challenges to accepting Lean standardization of workflows and care processes.

*“You have to say **please trust me because if we all do it the same way and we all follow the same rules...then the whole team can perform at an optimum level** from the patient service representative, to the doctor and everyone in between, and you not only get back more time, you build a better care, you can see more patients, and you feel better about coming to work.” – Clinical Director*



# Process of Implementation

- “Top-down” vs. “Bottom-up”
  - Some characterized Lean as a top-down effort led by “*higher ups*”
    - At odds with Lean principle of “respect for people” doing the frontline work
  - Others described this as an “*appropriate approach*”
    - System-wide, **complex changes** like Lean may necessitate this style



# Process of Implementation

- Engaging frontline employees in developing Lean work designs is a critical aspect of “Process.”

*“[I think for Lean to be successful] ...make sure that the doctors and the staff continue to have a say in what happens. That's always a big concern is that... people are worried things just happen from above and we're losing control.” – Internist*

- Leads to greater willingness to “*try out*” Lean redesigns.



# Characteristics of Individuals and Teams

- Changing work roles and relationships between care team members influenced uptake of redesigns.
- **Required skillsets and work scope of medical assistants (MAs)** as newly designated “Lean Flow Manager”
- **Physician compliance** with redesigns affected team’s ability to adopt the new workflows.



# Characteristics of Individuals and Teams

- Physician autonomy and adherence to Lean redesigns:
  - Those most resistant to Lean believed they were “*already highly efficient.*”
  - Some were concerned that Lean threatens their autonomy; others acknowledged they still had “*authority where it matters*” most—in exam room:

*“I don't feel like my work has changed so much that I'm not **in control**. I still decide **what I'm doing with my patients**. It's just that Lean presents my patients to me in a nicer way so that I can do my work better.” – Physician*



# Summary

- Similarities but also many differences between clinics in successful implementation of Lean redesigns
- External environment impacted acceptance of Lean *in principle*
  - Market pressures, Patient demand in primary care
- Local factors played critical roles in adoption of Lean *in practice*

Intervention characteristics	Process of Implementation	Inner setting	Individuals and Teams
<ul style="list-style-type: none"><li>• Co-location</li><li>• Standardization</li></ul>	<ul style="list-style-type: none"><li>• Top-down vs. Bottom-up</li><li>• Employee engagement</li></ul>	<ul style="list-style-type: none"><li>• Organizational culture</li><li>• Local leadership</li></ul>	<ul style="list-style-type: none"><li>• Work roles &amp; relationships</li><li>• Physician autonomy</li></ul>

Hung DY, Gray CP, Martinez MC, Schmittiel J, Harrison MI. [Acceptance of Lean Redesigns in Primary Care: A Contextual Analysis](#). *Health Care Management Review*. 2016 Mar 2. [Epub ahead of print]

# Impact of Lean on System Performance

- Longitudinal analysis of a range of performance metrics typically used for operational purposes
- Performance areas examined:
  - Workflow Efficiency (“Flow” metrics)
  - Physician Productivity
  - Operating Expenses
  - Clinical Quality
  - Patient Satisfaction
  - Physician and Staff Satisfaction

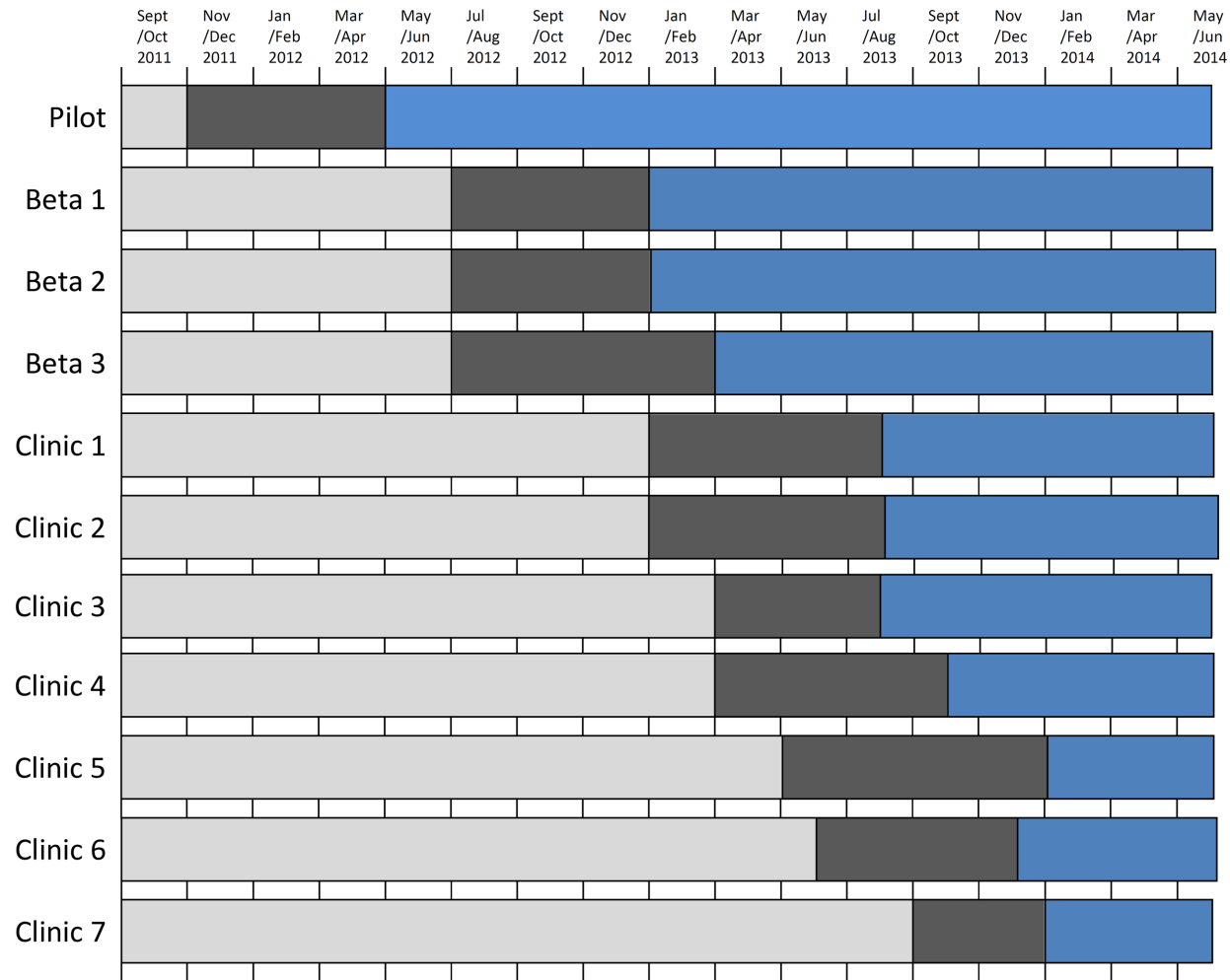


# Methods

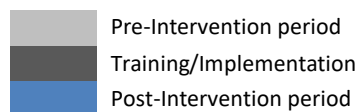
- Data sourced from dashboards, billing, quality reports, Experience of Work, AMGA, and Press-Ganey surveys
- Generalized linear mixed models, MD-month unit of observation (N=328 MDs employed consecutively from 2011-2014)
- Estimated overall impacts over time using interrupted time series analysis and non-randomized stepped wedge design
- Phased implementation of Lean across the system:  
*Projected* metrics (“counterfactual” in the absence of Lean) vs. *Observed* after Lean redesigns were implemented in all clinics across the system



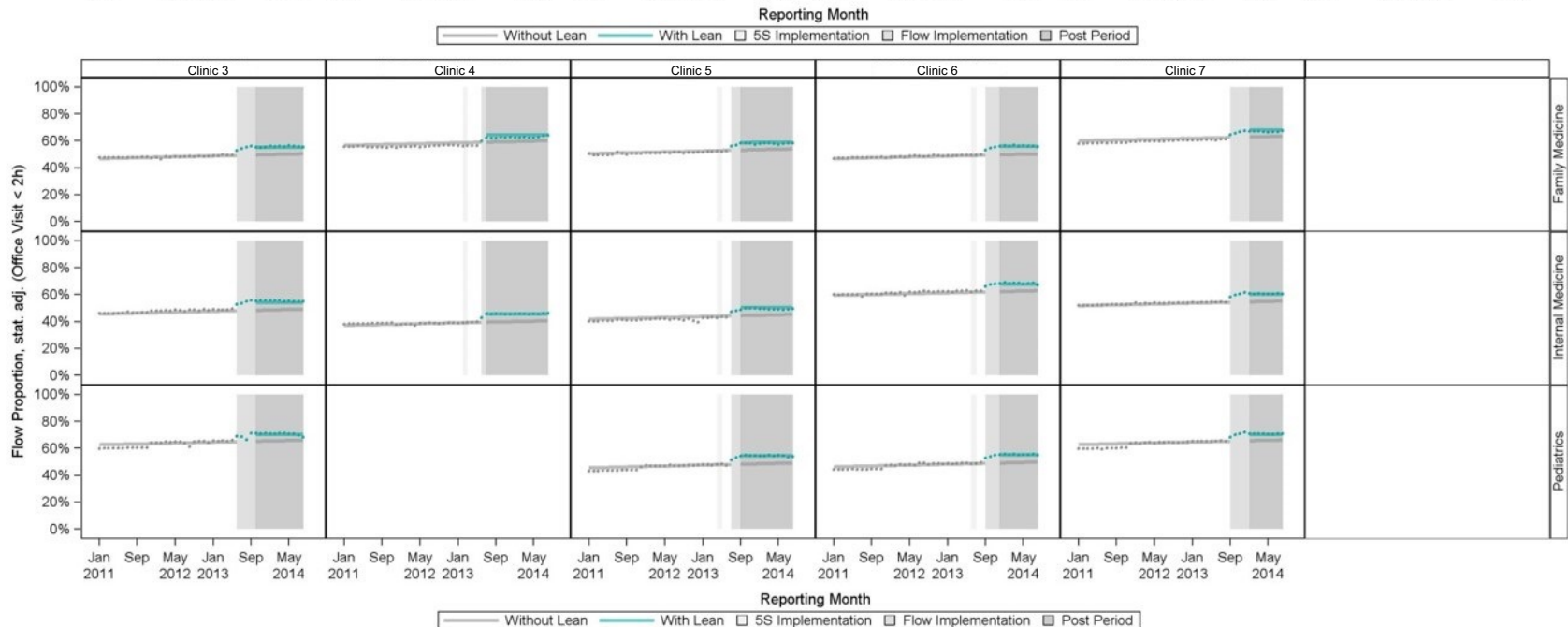
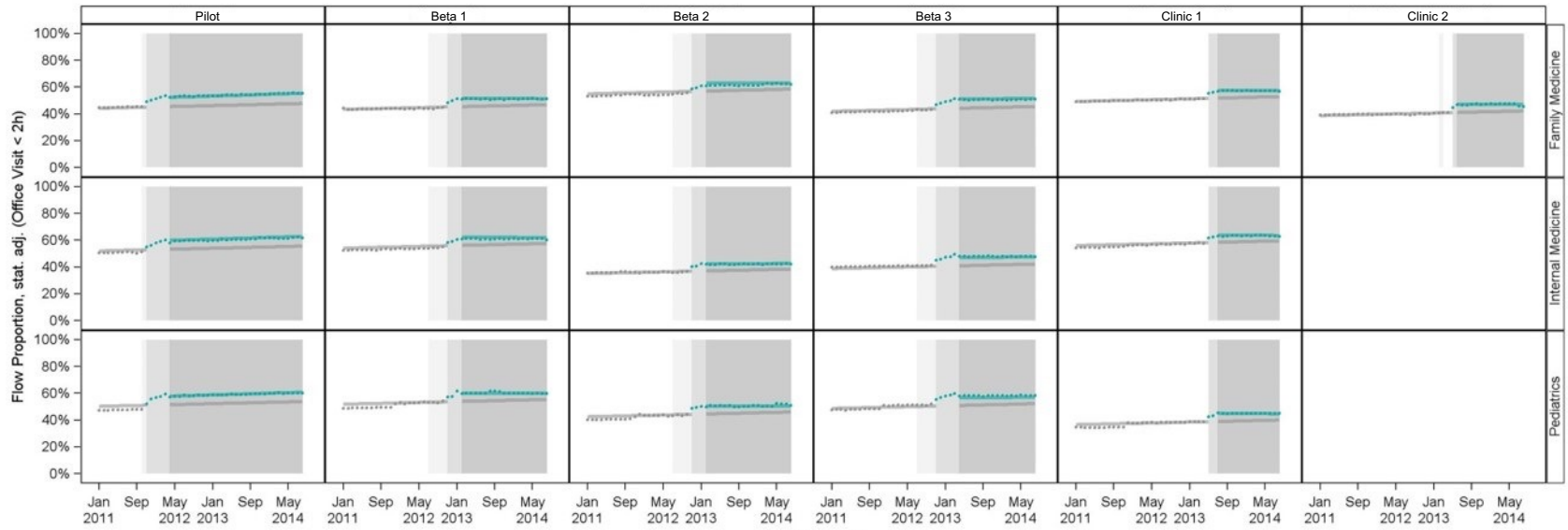
# Phased Implementation of Lean Redesigns



Note: All listed Clinics (except 4 and 7) have additional satellite clinic sites that were included for analysis.



# Example: Office Visit Charts Closed < 2 hours



# Workflow Efficiency

Flow Metric	Projected Value	Observed Value	Mean Difference (95% bootstrap)	% Change from Baseline
Office Visit Charts < 2h	51.2%	56.2%	5.0% *	<b>10.0%*</b>
E-messaging < 4h	79.5%	77.7%	-1.9%	-3.4%
Rx Renewal < 4h	63.4%	71.4%	8.0% *	<b>12.6%*</b>
Telephone Closed < 4h	57.3%	62.4%	5.1% *	<b>8.9%*</b>

\*p<0.05

## Flow Metrics

- Office visit charts closed within 2 hours
- Electronic patient messages responded within 4 hours
- Prescription refills renewed within 4 hours
- Telephone encounters closed within 4 hours

# Physician Productivity

RVU Metric	Projected Value	Observed Value	Mean Difference (95% bootstrap)	% Change from Baseline
wRVU/cFTE	252.3	265.0	13.9*	<b>5.5%*</b>
wRVU/visit	1.5	1.5	0.0	0%

wRVU: work Relative Value Unit  
cFTE: clinical Full-Time Equivalent

\*p<0.05

- RVUs restated to CMS 2014 v2 valuation
- wRVU/cFTE: Production per clinical FTE
- wRVU/visit: Production per office visit (service intensity)

# Clinical Quality

- IHA Pay-for-Performance clinical quality metrics for each physician
- Interrupted time series analysis on metrics that had an initial statistical difference pre- vs. post-Lean:
  - Coordinated Diabetes Care: A1c < 8.0%
  - Coordinated Diabetes Care: A1c < 7.0%
  - Coordinated Diabetes Care: LDL-c < 100 mg/dL
  - Coordinated Diabetes Care: Nephropathy Screening
  - Cervical Cancer Screening, Asymptomatic Women
  - Chlamydia Screening in Women (16-20 yo)
  - Adolescent Immunizations: Meningococcal

# Clinical Quality

Quality Metric	Projected Value	Observed Value	Mean Diff. (95% bootstrap)	% Change from Baseline
Diabetes: A1c Control < 7.0%	64.5%	67.9%	3.4%*	<b>5.3% *</b>
Diabetes: A1c Control < 8.0%	35.5%	39.4%	3.9%*	<b>11.0% *</b>
Diabetes: LDL < 100 mg/dL	48.1%	53.1%	5.0%*	<b>10.4% *</b>
Diabetic Nephropathy Monitoring	75.7%	79.9%	4.2%*	<b>5.5% *</b>
Cervical Cancer Screening	71.9%	71.1%	-0.8%	-1.1%
Chlamydia Screening 16-20	61.7%	60.7%	-1.0%	-1.6%
Immunizations - Meningococcal	77.9%	69.0%	-8.9%*	<b>-11.4% *</b>

\*p<0.05

# Patient Satisfaction

- For each physician, examined proportion of satisfaction scores > 90% in each domain and in composite overall score
- Patient satisfaction domains:
  - Composite Overall Score
  - Access
  - Care Provider
  - Moving Through the Visit
  - Nurse/Medical Assistant
  - Handling of Personal Issues

# Patient Satisfaction

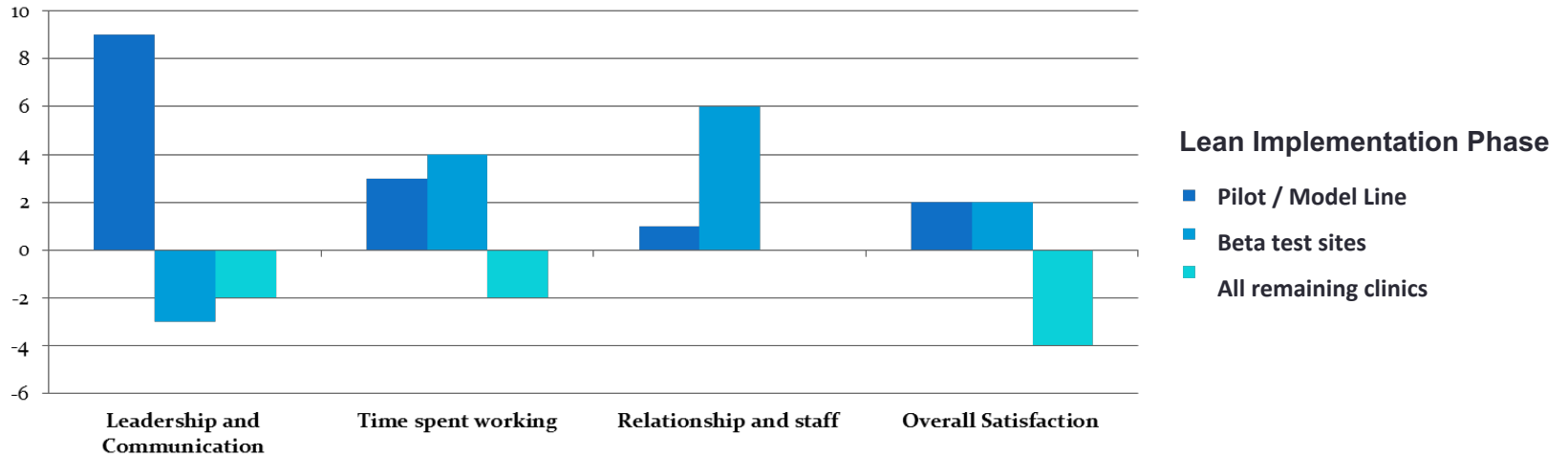
Domain (proportion of 90% satisfied or higher)	Projected Value	Observed Value	Mean difference (95% bootstrap)	% Change from Baseline
Composite Score	49.1%	63.2%	14.1% *	<b>28.7% *</b>
Access	37.4%	55.4%	18.1% *	<b>48.4% *</b>
Care Provider	79.0%	69.8%	-9.2% *	<b>-11.6% *</b>
Moving through Visit	50.9%	49.3%	-1.6%	-3.1%
Nurse/MA	66.2%	68.0%	1.7%	2.6%
Handling Personal Issues	69.0%	74.5%	5.5% *	<b>8.0% *</b>

\*p<0.05



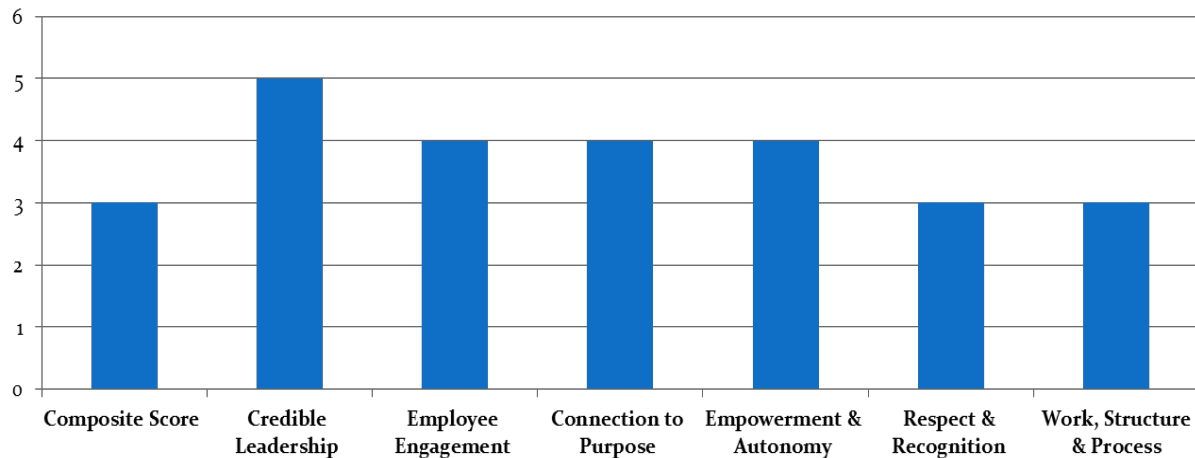
# Physician Satisfaction % Differences (2011 vs. 2014)

## By phase of implementation



# Staff Satisfaction % Differences (2011 vs. 2014)

## All primary care clinics system-wide



# Summary

Topic	Conclusions
<b>Workflow Efficiency</b>	Increase in timeliness of completing 3 of 4 workflow measures: office visit chart closures, medication renewals, telephone responses.
<b>Physician Productivity</b>	Higher wRVUs generated per physician per month. No change in wRVUs per office visit (service intensity).
<b>Operating Expenses</b>	Lower total operating expenses (including staff compensation, and drugs and supply costs) standardized per tRVU. Not significant at $p < 0.05$ .
<b>Clinical Quality</b>	Improvements in coordinated diabetes care metrics, no change in preventive screening metrics, and decreased meningococcal immunization among adolescents.
<b>Patient Satisfaction</b>	Higher satisfaction overall and in specific domains, including access to care and handling of personal issues. Lower satisfaction with interactions with care providers.
<b>Physician Satisfaction</b>	In pilot and beta clinics: Higher satisfaction overall and in specific domains, including time spent working and relationships with staff. Lower satisfaction overall in last phase of gamma clinics to implement Lean.
<b>Staff Satisfaction</b>	Higher satisfaction overall and in specific domains, including credible leadership, employee engagement, growth / development, connection to purpose, healthy partnerships, empowerment and autonomy.

Hung DY, Harrison MI, Martinez MC, Luft HS. Scaling Lean in Primary Care: Impacts on System Performance. *American Journal of Managed Care*. 2017;23(3):294-301.

# Conclusions

- Importance of local context
  - Successful implementation & outcomes requires:
    - Engagement of all frontline staff
    - Alignment with internal clinic environments
  
- Overall, there were beneficial effects of Lean redesigns on performance metrics without harm to clinical quality
  
- Using Lean techniques to redesign care delivery
  - Strength of Lean's attention to "Flow"
  - Change management: involve providers and show results

