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Title

No Pain, No Gain: Using Quality Improvement Processes to Improve Onboarding Efficiency

Keywords (up to 5 main terms/phrases that describe the initiative)

IIS, quality improvement, interoperability, onboarding

Is this initiative Evidence/Guideline Based? *(if yes, please include reference)*	x_Yes __No

Reference: Quality Improvement is recognized by the IOM and HRSA as a systematic approach, with actions that lead to measurable improvement. It is directly linked to a service delivery approach. http://www.hrsa.gov/quality/toolbox/methodology/qualityimprovement/

Background (scope of the immunization need or problem)

Currently, the Colorado Department of Public Health and Environment (CDPHE) has a backlog of approximately 525 healthcare providers interested in electronic data exchange with the Colorado Immunization Information System (CIIS). At the current staffing level, the average interface project takes approximately nine months to complete. In 2015, CDPHE completed a Quality Improvement (QI) project intended to improve the cycle time for IIS interface implementation with the long-term goal of eliminating the healthcare provider backlog and improving data completeness and timeliness within the IIS. The timing of the QI project was crucial as CIIS had just received funding to hire more interoperability and data quality staff and is in the process of rolling out a self-serve Health Level 7 (HL7) testing tool.

Description

Describe the initiative's goals and objectives.

At a high level, the goal of the QI initiative was to assist the CDPHE team in identifying ways to improve the cycle time for IIS interface implementation. Specifically, the QI project team identified five objectives as part of the target state for the new CIIS onboarding process:

1. 100% of new interfaces use the new self-serve testing tool to decrease wait time in the testing phase.

2. Workflow is updated, documented and understood by interoperability staff.

3. Decrease waiting times, steps and hand-offs of the entire onboarding process.

4. Decrease rework and wait time in the data validation phase of the onboarding process.

5. Increase percentage of providers moved from the backlog to active onboarding.

What were the main implementation activities?
QI participants identified the reasons for action, conducted process mapping of the initial state as well as the desired target state, gathered baseline and post-implementation metrics, performed root cause analyses, identified and tested potential solutions, and conducted 30, 60, 90, and 120-day post-implementation meetings to measure progress.
CDPHE incorporated several changes to its interface implementation process to: (1) ensure healthcare providers are adequately trained on entering data into their Electronic Health Record system (EHR); (2) identify show-stopper data quality issues earlier in the interface projects; and (3) identify champions within the clinics to acknowledge project expectations and gain ongoing project commitment.

Where and when did the initiative take place?
The initiative took place at CDPHE from May to December of 2015.

How much staff time was involved?
A total of 13 staff (9 CDPHE, 2 Health Information Exchange, 2 contractors) were involved in one or more of the meetings and work activities of the project. Full group meetings, smaller work group meetings, and check-in meetings (30, 60, 90 and 120 day) kept the process on track and accounted for approximately 100-120 total staff hours.

What were the costs associated with the activity? What was the funding source?
The primary cost for this project was staff time. The cost of procuring and implementing the self-serve testing tool was covered with PPHF funding, and staff time was paid for through federal and state funding.

Identify the target population that the initiative affected.
The target population for this QI initiative included all providers interested in electronic data exchange with the IIS, Electronic Health Record (EHR) vendors and Health Information Exchange (HIE) organizations. The outcome of the QI initiative also affected CDPHE and HIE staff struggling with an inefficient onboarding process.

If partners were involved, include who was involved, and how.
The CDPHE Director of Planning, Partnerships and Improvement facilitated the QI initiative, leading the participants through each QI phase. The Managing Director of Health Informatics from Atlantic Management Center (vendor of the CIIS Resource Center) participated remotely in several of the QI meetings to provide subject matter expertise on how best to implement the self-serve HL7 testing tool. A project manager from Point B participated in the QI initiative to align similar QI efforts with CDPHE's implementation of a new real-time, bi-directional messaging gateway. The Senior HIE Program Director and the Data Validation Analyst from the Colorado Regional Health Information Organization (CORHIO) participated in the QI project as CORHIO also implements interfaces to the IIS for its participants.

Timeframe of Implementation (Start and Stop Dates)
The kick-off meeting for this project took place May 20, 2015.   The wrap-up meeting is scheduled for December 30, 2015.

Evaluation Data: Was the implementation and/or effectiveness of this initiative assessed? *(if "yes" or "limited," provide any data that is available)*   _x_ Yes __ No   __Limited

Data:

Prior to implementing changes in the CIIS onboarding process, the QI project team gathered the following baseline data from multiple tracking systems: cycle times for past interface implementations, CIIS wait list by

provider type, CIIS wait list by EHR, CIIS wait list by provider type and EHR, sites on CIIS wait list per year, completed sites by provider type, completed sites by EHR, interfaces in-process by provider type, and interfaces in-process by implementation phase. CDPHE is utilizing the gathered baseline data to prioritize onboarding projects and increase transparency to our stakeholders and legislators. The results of the QI project intervention continue to be measured post-implementation.

Goal 1: 100% of new interfaces use the new self-serve testing tool to decrease wait time in the testing phase. Status: Met. All new interface projects complete self-serve testing through the online tool. As of 120 days post-implementation, 76 individual users and 48 organizations have registered within the CIIS Resource Center for self-serve testing. Broadscale rollout of the CIIS Resource Center is scheduled for January 2016.

Goal 2: Workflow is updated, documented and understood by interoperability staff. Status: In process. Target state process map and documentation for new workflow is complete; development of standard operating procedure underway.

Goal 3: Decrease waiting times, steps and hand-offs of the entire onboarding process. Status: Met. The number of waiting times decreased from 13 to 10 (23%); the number of steps decreased from 52 to 47 (10%); and the number of hand-offs decreased from 13 to 11 (15%).

Goal 4: Decrease rework and wait time in the data validation phase of the onboarding process. Status: Partially met. The number of wait times decreased from 5 to 4 (20%).

Goal 5: Increase percentage of providers moved from the backlog to active onboarding. Status: Met and in process. As of 120 days post-implementation, 22 sites have passed the initial testing phase, and 14 clinics have moved from the backlog to active onboarding (approximately 3% of backlog). Approximately 7.5% of providers in the backlog have moved to self-serve testing through the CIIS Resource Center.

Conclusions / Lessons Learned / Key Factors for Success

Mapping the current onboarding process workflow as a first step allowed the QI project team to identify where duplication and unnecessary hand-offs were occurring. The analysis of baseline data gave meaningful context to the problem and potential solutions. Not all root causes of the problem can be addressed by proposed solutions, so it is important to remain focused on interventions that are within your control. Realizing measurable results of a new process does not happen overnight; it is important for team members to remain consistent with new processes even though it is tempting to fall back on the "known" way of performing business. Rapid experimentation of proposed solutions, coupled with the collection and analysis of metrics, allows you to document that you are on the right track and identify parts of the new process that may not be working as expected. External partners can be integral to the success of "internal" quality improvement initiatives; engage your partners early and often.

Check if any of the following are being submitted to complement your submission:

(All materials will be posted on the AIM website)

__Testimonials	X__Project photo(s)
__Quote from partner/participant	__Publication (e.g., news story, journal article)
X_Sample of materials produced	__Video/audio clip
__Press release	__Website URL
__Promotional materials	_X_Tables or graphs
	_x_Other — Explain: included in the powerpoint

Colorado Immunization Information System (CIIS)
Quality Improvement Project

November 2015

Project Team: Heather Roth, Kim Gulliver, Steve Jarvis, Vanessa Willis, Janeece Lawrence (CORHIO), Paige Lehtola (CORHIO), Darrin Rosebrook (AMCI), Andrew Gablehouse (Point B), Lynn Trefren, Diana Herrero, Chris Wells

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Process Owner: Heather Roth
Executive Sponsor: Rachel Herlihy, Larry Wolk, Tista Ghosh
Project Leader: Heather Weir & Elyse Contreras

CIIS Background

Confidential, secure, population-based, web-based system that:

- Consolidates immunization records for Coloradans of all ages.
- Recommends the vaccines a patient needs based on history and age.
- Supports activities to increase and sustain high immunization coverage rates.

CIIS by the numbers:

- Total Patients: 4.8 million
- Total Vaccinations: 52.3 million
- Active Users: 4,618

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Reason for Action

Reason for action:

Customer: Provider sending data
EHR Vendor / CORHIO

Process: Interface dev.

Waste: Writing (for provider)
Communication-rework / tell again
Errors state - Incomplete data
Rework for providers
↑ training / individual (over email)
Done 1 at a time / Manual
Duplication (CIIS / CORHIO) / QA

- Backlog of providers that need to have an interface developed
- Time it takes to set up an interface varies considerably (from 1 month to 2 years)
- IZ program recently received additional funding to address backlog
- Want an efficient process before onboarding new staff
- Working with CORHIO (also building interfaces from Electronic Health Records to CIIS)
- Backlog of providers is causing gaps in data contained in CIIS (as some providers have stopped manually entering data while awaiting an interface)

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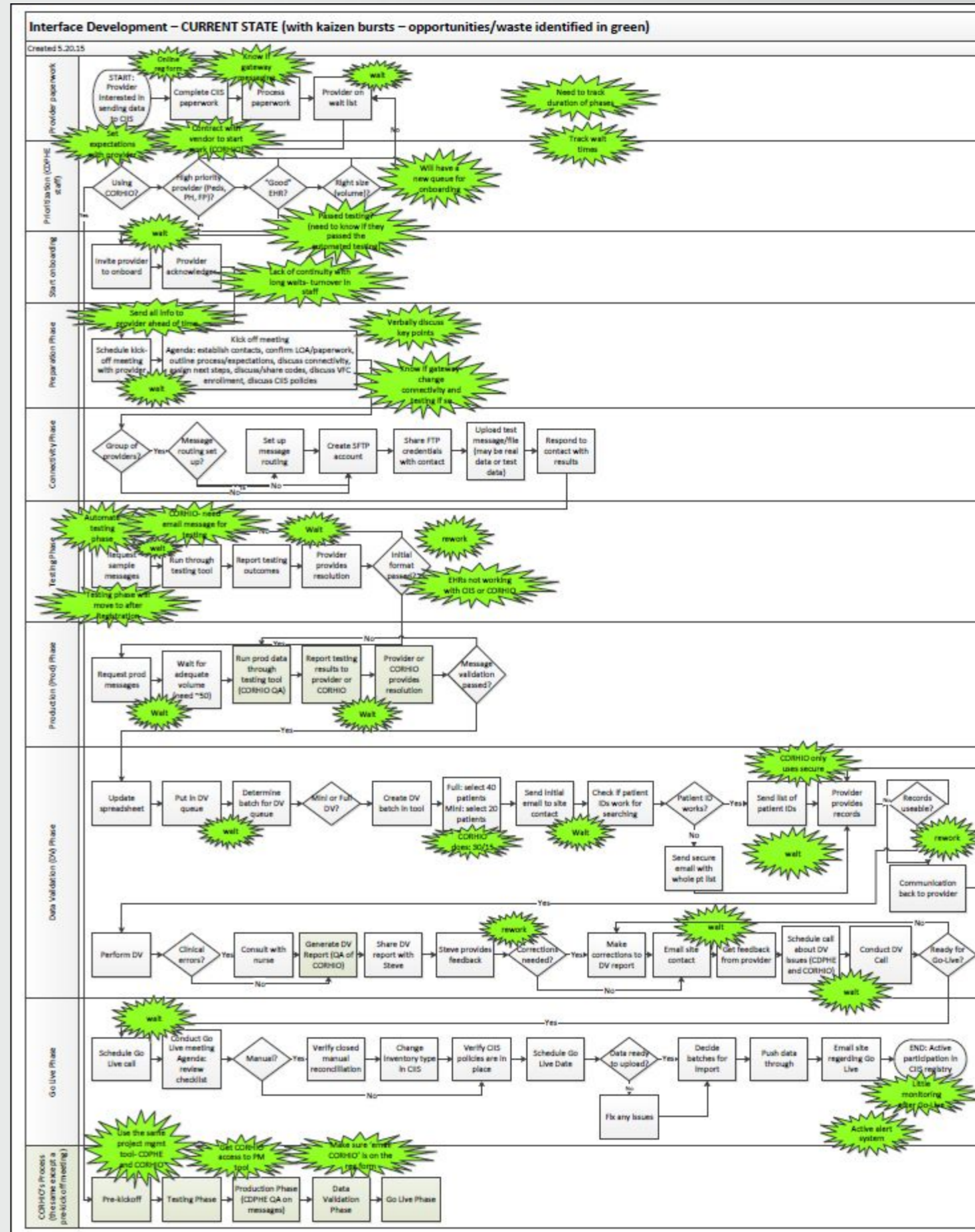Department of Public
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Current State - Process Mapping

Current State

of handoffs = 13
# of waiting periods = 13
# of main phases = 9
# of steps in the process = 52
# of decision items = 16

Interface Development – CURRENT STATE (with kaizen bursts – opportunities/waste identified in green)

Background Data

- 525 sites on the wait list

1. Cycle Times for Interface Implementation

Year	n (clinics)	Average Duration	Notes
2011	132	6.2 months	82 sites did not have a begin date recorded and are not included in calculation of duration.
2012	96	9.2 months	6 sites did not have a begin date recorded and are not included in calculation of duration.
2013	101	14.0 months	9 sites did not have a begin date recorded and are not included in calculation of duration.
2014	71	19.8 months	22 sites did not have a begin date recorded and are not included in calculation of duration.
2015	41	8.9 months	26 sites did not have a begin date recorded and are not included in calculation of duration.

Shortest cycle time = 1 month; Longest cycle time = 35 months

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Target State

1. 100% of new interfaces using self-serve testing tool (decrease wait time in testing phase).
2. Workflow updated, documented and understood by interoperability staff.
3. Decrease waiting times, steps and hand-offs of entire interface process.
4. Data Validation Phase: Decrease rework and wait time.
5. Increase the number passing initial self-serve testing phase (increase number on wait list with those qualified, increase percentage moved to "active onboarding queue", increase percentage moved from current wait list to active self-serve testing).

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Target State

of handoffs = 11 (2 fewer)
# of waiting periods = 10 (3 fewer)
# of main phases = 9
# of steps in the process = 47 (5 fewer)
# of decision items = 16

Cause and Effect Investigation

- Why is the Data Validation Phase taking so long?
- Why is there so much waiting throughout the interface process?
- Why are there so many errors in data (leading to back and forth with EHRs/providers)?

Root Cause

1. Providers need more effective training on entering data correctly into their EHRs.
2. The Data Validation Phase takes longer because errors don't look like errors in the initial testing phase.
3. Clinical point of contact for interface project doesn't always have the knowledge, sense of urgency/time, and same value of importance as CIIS staff.
4. (out of scope) Validation logic in EHRs.
5. (out of scope) Requiring EHRs to meet minimum Federal standards.

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Solution Options

Solution Options:		
	Impact	Level of Effort
Provider training on entering data correctly into EHRs		
• Discussion with EHR vendors	H	L
• Development of FAQ/Tip Sheet (for CDPHE and CORHIO)	H	H
• AMCI Product Enhancements	M	Depends on AMCI
• Kick-off meeting changes	M/H	L
• Webinar	L/M	H

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Solution Options

Errors don't look like errors in the Testing Phase (found in the Data Validation Phase)		
• Template for vaccination lists (at project kick-offs)	H	L
• CVX list is mapped and pulled from EHR	M/H	M
• 2 Reports: Vaccine Parameter and Data Quality • De-identify (anonymizer) and send examples to clinic • Expose reports thru the portal • Enhance each report (provider profiles and vaccine frequency) • Automate	H/M H H M	L/L&M M/H L H
• AMCI enhancements to incorporate anonymizer within the tool	H	M/H

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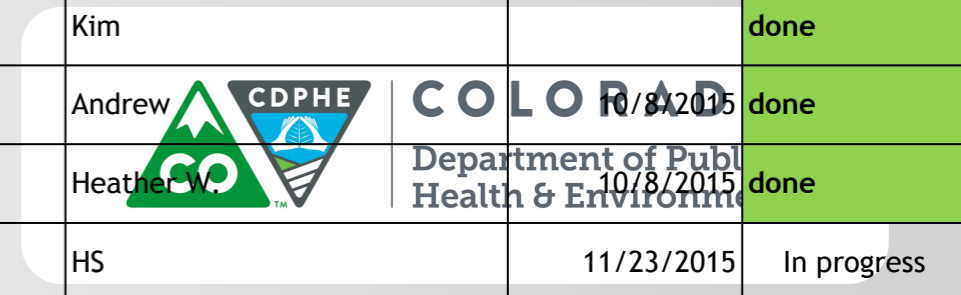Department of Public
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Solution Options

Point person (PM) doesn't always have knowledge, urgency/time, same value of importance		
• Set an expectation for the total duration of the integration	L	M
• Track response timelines	H	H
• Confirmation email and response needed to serve as documentation of acknowledgement of what's required by the provider.	L/M	L
• Create templates from every EHR we've worked with to share very early in the process - to be shared during registration	H	H in total, may be Low for some EHRs
• Understand provider resources (e.g. Numbers, and EHR Champion?) How will they handle turnover?	M/H	L/M
• Review current data validation reports to ensure language can be better understood by clinics	H	H

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Implementation Plan:				
Task #	Task	Who	By	Status
1	Update A3 and create process maps in visio	Heather W/Elyse	5/27/2015	done
2	Collect additional measures and share with team on: 1) # CORHIO sites live/year, 2) # in progress by provider type on wait list, 3) completed by provider type, 4) # in testing or data validation phase	Kim/Heather S.	5/27/2015	done
3	Pilot the testing tool	Steve/Kim	6/3/2015	done
4	Show the project mgmt tool to CORHIO	Kim	6/2/2015	done
5	Explore options with CORHIO and ISIIS	Heather S.	6/3/2015	In progress
6	Explore provider training options (ex. webinar, EHR)	KG, JL, Darrin, VW, SJ, PL	6/15/2015	done
7	EHR vendor meeting (new and existing vendors) incoporated into kick-off meetings	KG, JL, Darrin, VW, SJ, PL	TBD	done
8	Develop a FAQ/Tip Sheet	Vanessa	10/8/2015	done
9	Kick-off meeting changes (use webX and get a EHR demo at kick-off meeting)	KG, JL, Darrin, VW, SJ, PL	9/10/2015	done
10	Explore how we "catch" errors earlier	HS, KG, SJ, PL, VW	6/15/2015	done
11	Create template for vaccination lists (at kick off)	Vanessa	TBD	done
12	Incorporate the ask for a mapped CVX list pulled from EHR into kickoff	SJ, KG	TBD	done
13	Updates to the 2 Reports: Vaccine Parameter and Data Quality (see above for details)	SJ	10/8/2015	In progress
14	Talk with AMCI about: integrating the anonymizer, ways to track time and product enhancements	SJ	10/8/2015	done
15	Explore how to get the "point person" to be: knowledgable, accountable, prioritize	AG, KG, HS, JL	6/15/2015	done
16	Set an expectation for the total duration of the integration (after one DV cycle is completed)	TBD	TBD	done
17	Draft the confirmation email and response needed to serve as documentation of acknowledgement of what's required by the provider.	Kim		done
18	Create templates from every EHR we've worked with to share very early in the process - to be shared during registration	Vanessa	9/30/2015	In progress
19	Understand provider resources e.g. Numbers, and EHR Champion? How will they handle turnover?	Kim		done
20	Update the target state process map	Andrew	10/8/2015	done
21	Compare baseline process map with target state process map: handoffs, phases, etc.	Heather W.	10/8/2015	done
22	Create and share report out of QI project with EL; explore venues for sharing.	HS	11/23/2015	In progress

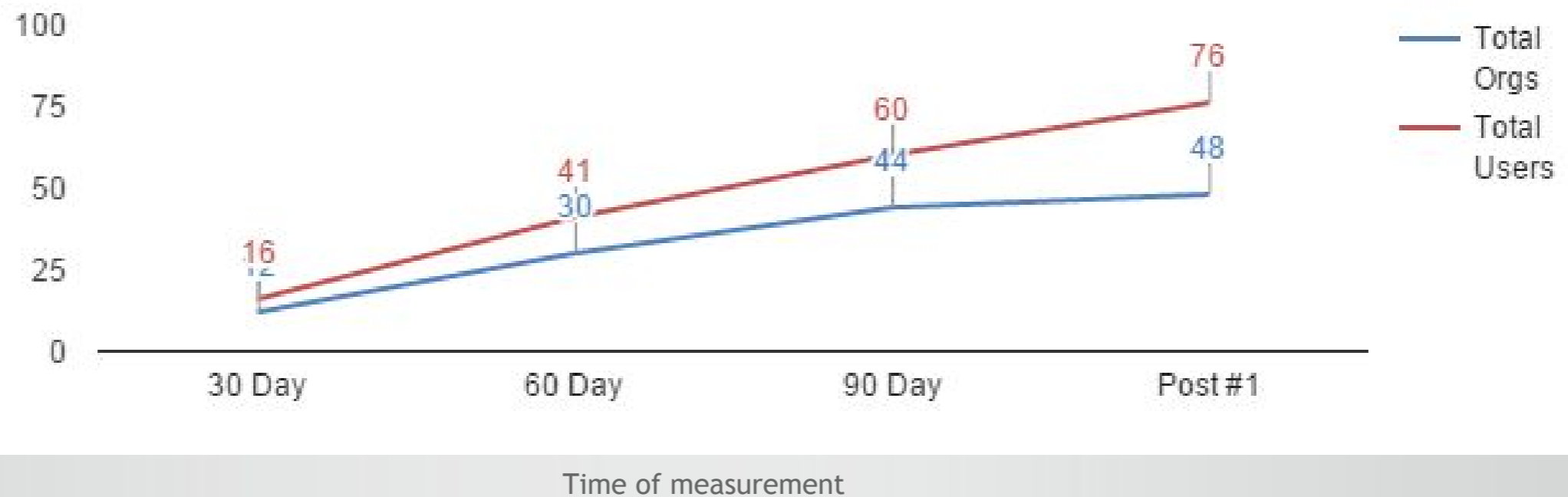# Results

TARGET 1: 100% of new interfaces using self-serve testing tool (decrease wait time in testing phase).

Status: MET

Results

TARGET 2: Workflow updated, documented and understood by interoperability staff.

Status: In process.

- Target state process map is complete.
- Documentation for new workflow is complete
- Outstanding: Development of formal standard operating procedure.

Results

TARGET 3: Decrease waiting times, steps and hand-offs of entire interface process.

Status: MET

	Pre-Intervention	Post-Intervention	% Decrease
Number of waiting times	13	10	23%
Number of steps	52	47	10%
Number of hand-offs	13	11	15%

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Results

TARGET 4: Data Validation Phase: Decrease rework and wait time.

Status: Partially met.

	Pre-Intervention	Post-Intervention	% Decrease
Number of reworks	2	2	--
Number of wait times	5	4	20%

Results

TARGET 5: Increase the number passing initial self-serve testing phase (increase number on wait list with those qualified, increase percentage moved to "active onboarding queue", increase percentage moved from current wait list to active self-serve testing).

Status: In process.

	60-day	90-day	120-day
Number of sites passing initial testing phase (EHRs and clinics)	12	25	22
Number of sites in new onboarding queue	2	5	14
% of sites on waiting list moved to onboarding queue	0.4%	1.0%	2.7%
% of sites on waiting list moved to self-serve testing tool	--	7.1%	7.5%

Follow-Up Activities

- Document prioritization and measurable goals for provider onboarding.
- Create communication and marketing strategies for broadscale rollout of self-serve testing tool.
- Hard launch of self-serve testing tool in January 2016.
- Hire and train additional CIIS interoperability staff members.
- Create formal SOP for interface process workflow.

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Lessons Learned

- Baseline data analyses give context to problem and potential solutions.

  - Wait list by provider type (43% family practice)
  - Wait list by EHR vendor (9 vendors account for 63% of sites on list)
  - Wait list by provider type and EHR vendor (2 vendors account for 51% of all OBGYN sites on list)
  - Completed sites by provider type
  - Completed sites by EHR vendor/product
  - Interfaces in-process by provider type
  - Interfaces in-process by implementation phase

Lesson: Not all sites on wait list are equal!

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Lessons Learned

- Not all root causes can be addressed by proposed solutions.
  - Target energy where you have the power to change outcomes.

- Results do not occur overnight.
  - Be patient and remain consistent with new processes when in the "valley" of despair.

- Rapid experimentation proves you are on the right course.
  - Collect and analyze metrics post-QI project to see progress, and then make tweaks to processes that are not working.

- External parties can be integral to "internal" quality improvement.
  - Engage stakeholders in QI project to gain greater perspective.

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Questions?