

Decreasing Patient Throughput Time and Increasing Operational Efficiency in an Outpatient Family Medicine Clinic

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JANUARY – JUNE 2014

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Background

- Patient throughput optimization is an essential management strategy
- Cycling patients efficiently and effectively through a clinic
 - assures efficient use of resources
 - enhances patient access
 - improves service
- Understanding throughput requires a systems perspective

The Chartris Group. (2007, Fall). White Paper. Retrieved March 31, 2014, from

http://www.chartis.com/files/pdfs/chartis_group_patient-throughput-critical-strategy-for-success.pdf

Willis, D (2005, April). Making every minute count: Tools to improve office efficiency. *Family Practice Management*, 12(4), 61-6.

What We Are Trying to Accomplish?

The aim of the project is to decrease total patient visit time (patient sign to check out) at the McAllen Family Medicine Residency Clinic by 60%, with the goal of 60 min. and no more than 90 min. by December 2014.

What is the problem?

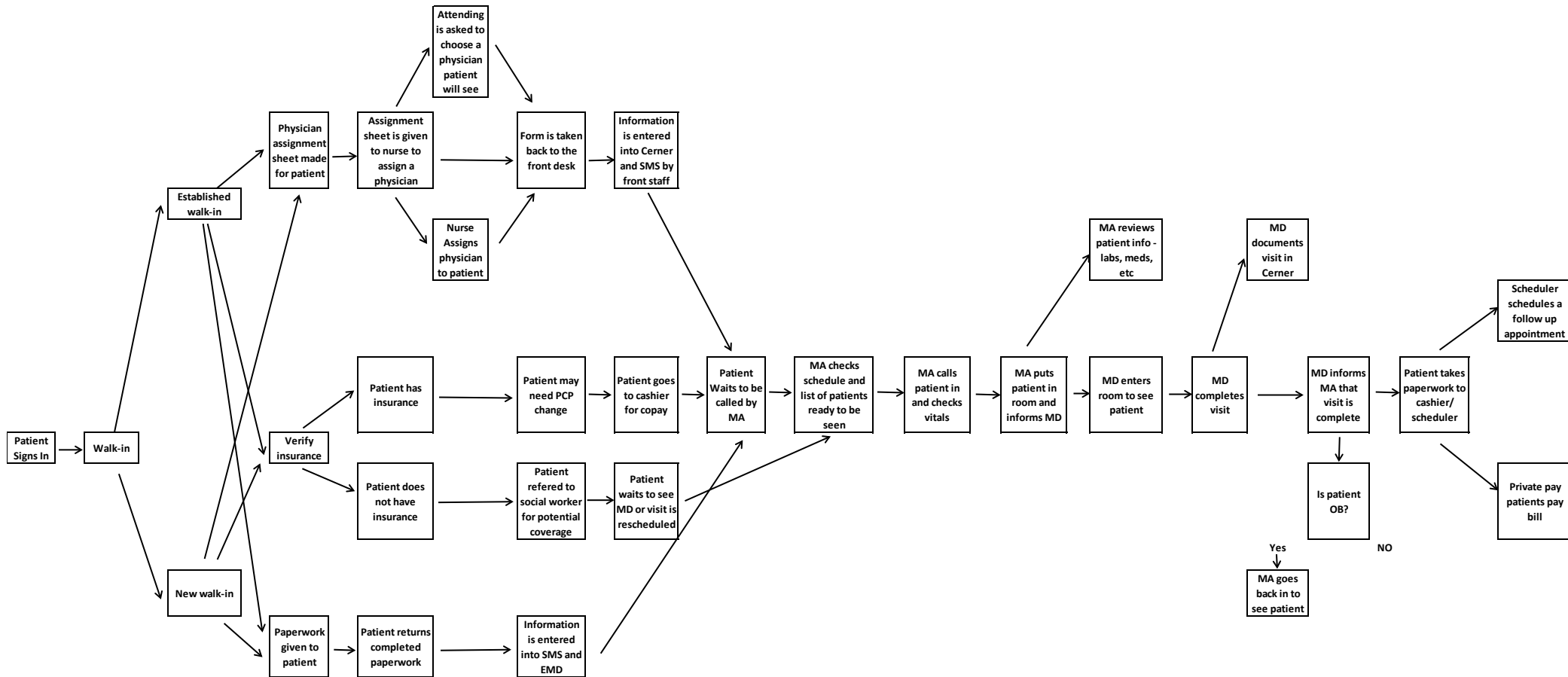
- Patients, physicians and clinic staff have complained that patients are waiting too long for their visit
- Physicians commented that they are ready to see a patient at 8:30 but won't see one until 10 am
- Patient Satisfaction survey comments
 - Waiting always more than an hour
 - Did not complete, left after 82 min
 - Told by phone did not need appointment, to come in before 10AM
 - Left without being seen
 - Minimize the paperwork; Marvin Baker patient since inception of this clinic!!!!!!

Understanding the Problem

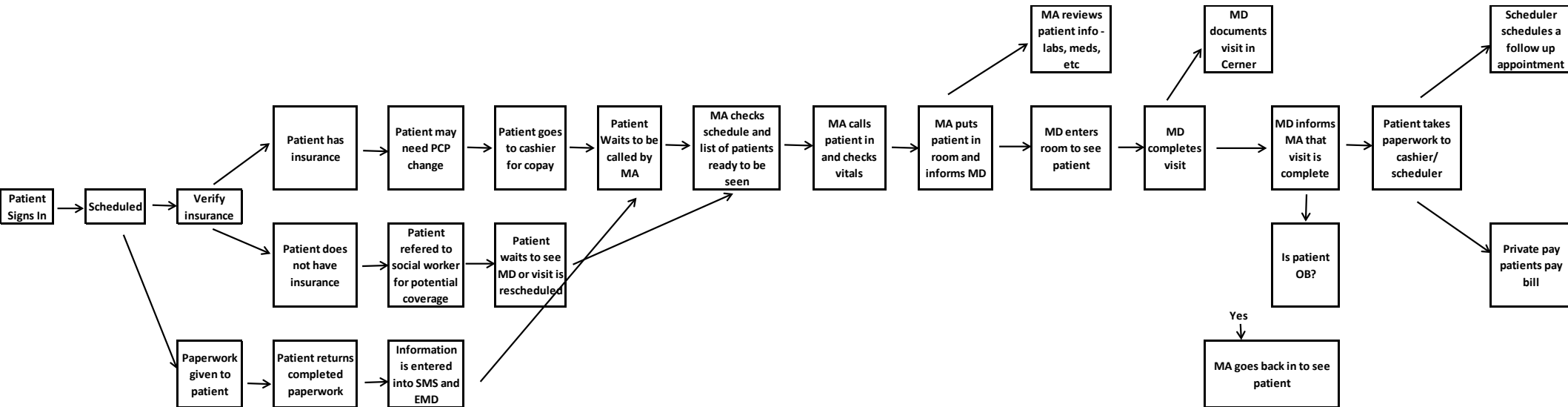
Interdepartmental interdisciplinary team meetings

- Clinic administrative staff, physician faculty and residents, and nurses
- Brainstorming
- Process Map
- Cause and Effect /Fishbone Diagram

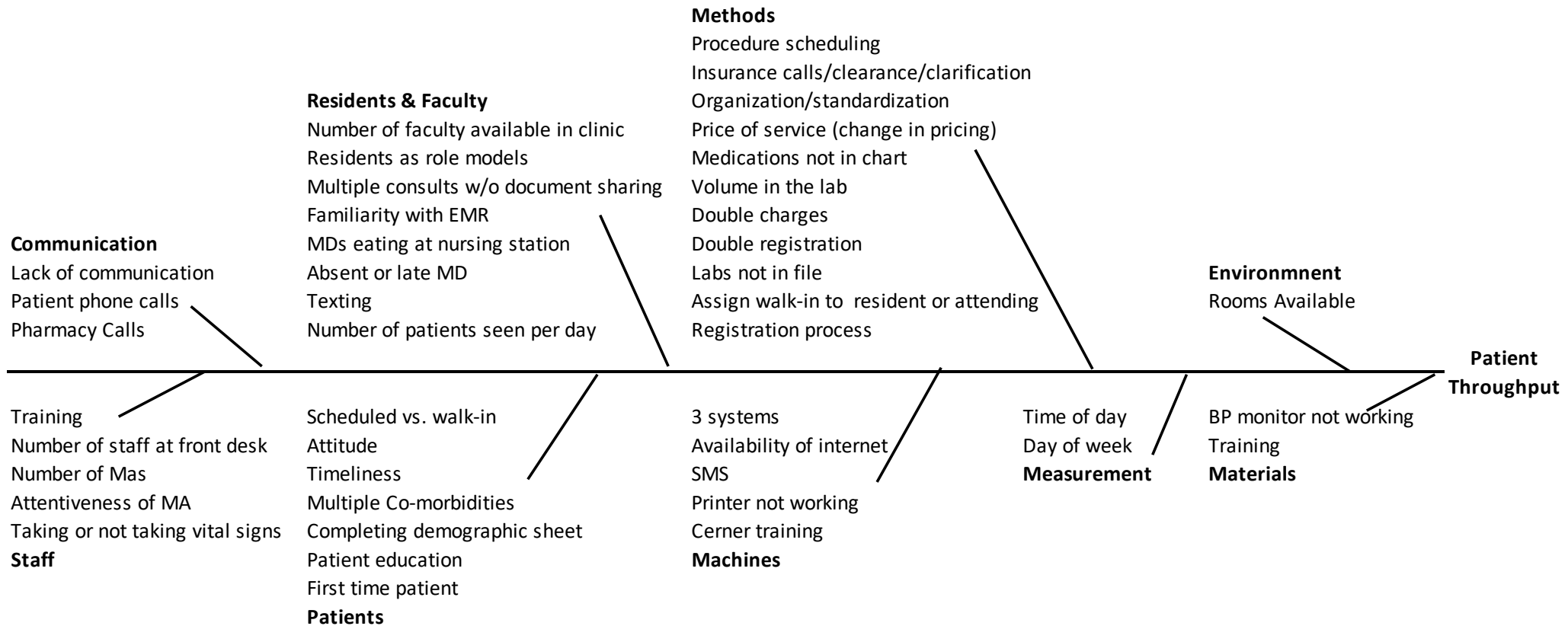
Process Analysis – *Process Map*



Process Analysis – *Process Map*



Process Analysis – *Fishbone Diagram*



Baseline Status

Retrospective chart review (EMR)

Stratified random sample

February 11 to 28, 2014

5 am & 5 pm visits, M-F (n = 119)

Both genders, all ages and who had a physician visit

Cycle time measurement was performed to help reveal bottlenecks and waste

Statistical analysis using Excel

Baseline Data Collection Tool

MFPRC - Patient Throughput Data Collection Tool

Date: _____
Pt. Name: _____
Physician Name: _____

<u>Time Intervals:</u>	Time
Sign In	_____
Check-in	_____
Seen by Nurse	_____
Check-out	_____

Patient Information (for completion by QI data collector)

Scheduled Appointment time: _____
 Walk-in

New Patient Private Pay
 Established Patient Medicare

Follow-up Medicaid
 Lab Insurance
 MD Visit

Baseline Data Collection SOP

Patient Throughput: Chart Audit Form SOP

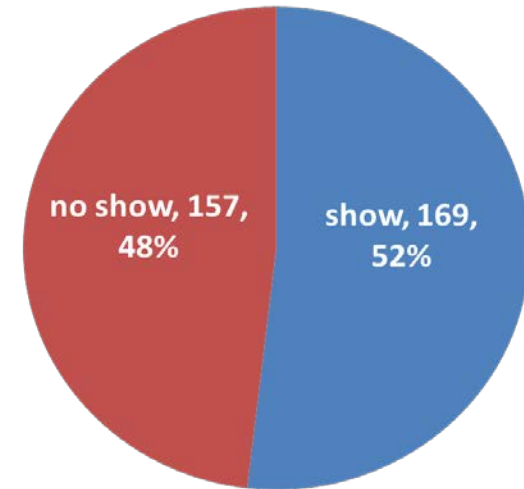
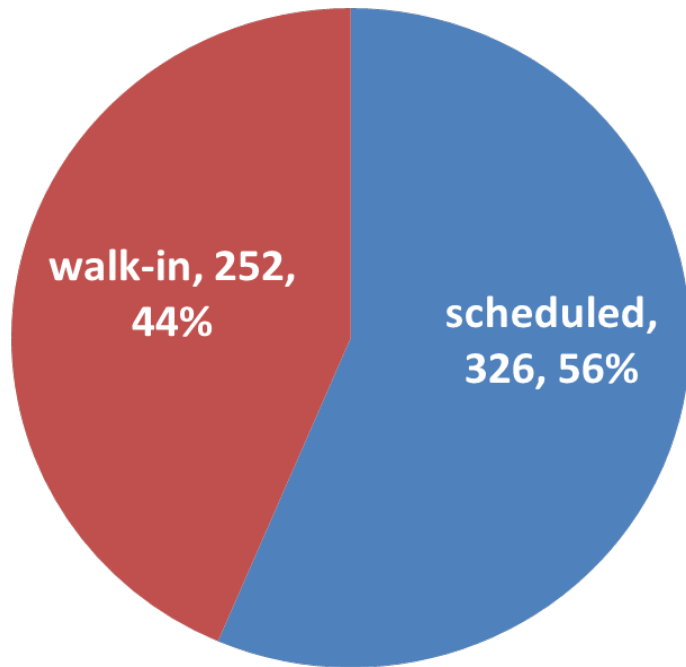
Open Cerner PM to access patient schedule

1. Go to assigned date and randomly select 5 morning and 5 afternoon patients for each day, making sure to only select patients that were fully checked out and were not here for just labs
2. The name, MRN, physician, and insurance can recorded before selecting patient name
3. After clicking on patient name, go to 'Past Appointments' tab, deselecting filters box if appointment does not appear
4. Right-click on appointment with physician as Resource (not lab), and select 'Display Appointment History'
5. Select 'Action History Details' to record Check-in, Seen by Nurse, and Check-out times
6. Vitals by Nurse time is the same as time of Chief Complaint on doctor's note from PowerChart
7. From PowerChart you can see whether patient is New/Established, Follow-Up/MD(initial visit)

Decision Making

Baseline Data

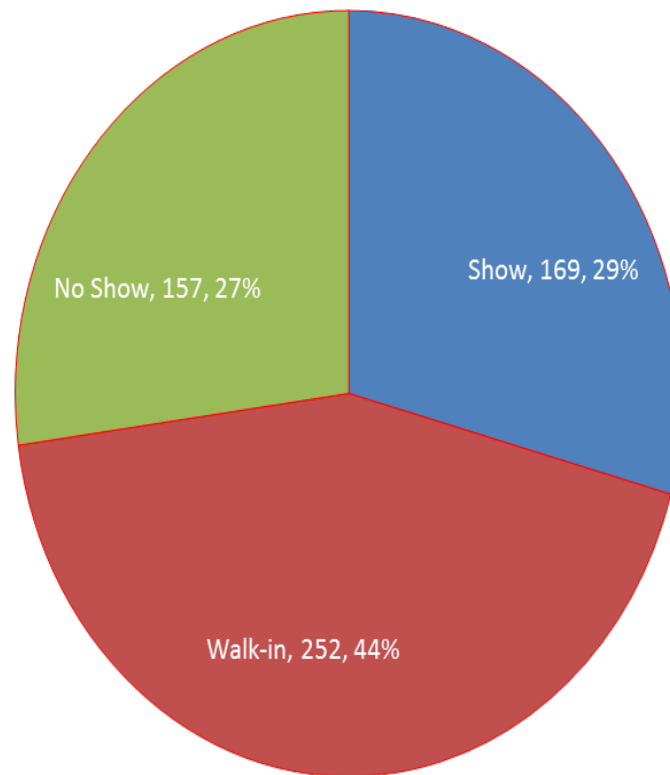
2/11 - 2/28; n = 578 patients (excluding lab only)



n = 326 scheduled

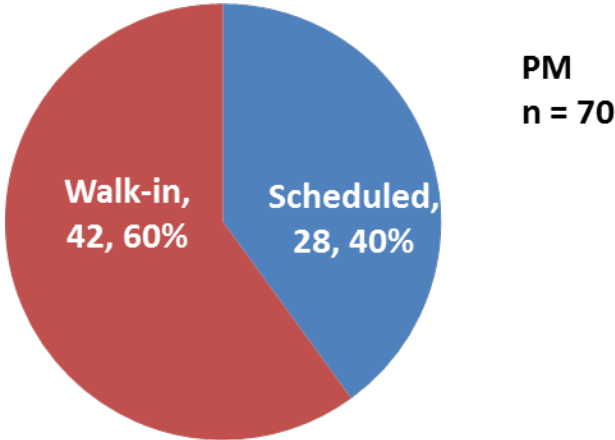
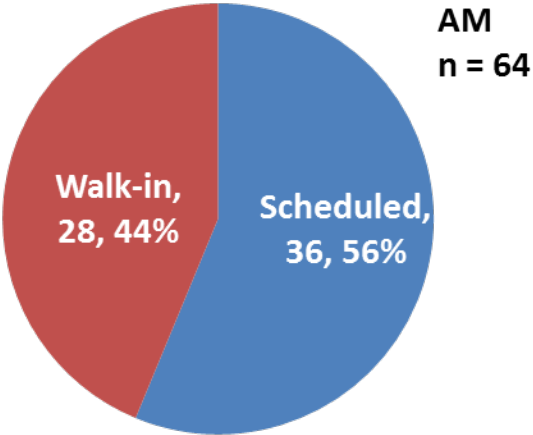
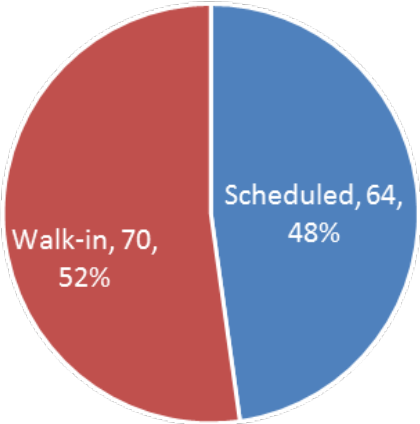
No Show vs. Walk-in vs. Scheduled

n= 578 patients

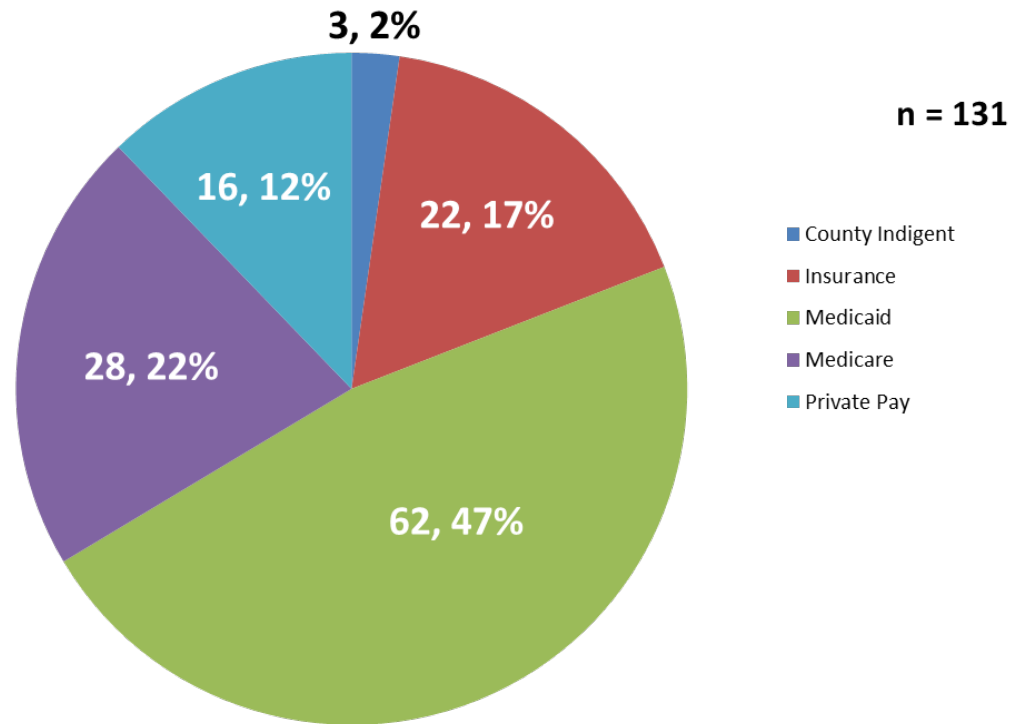


Scheduled vs. Walk-In

Scheduled vs. Walk-In

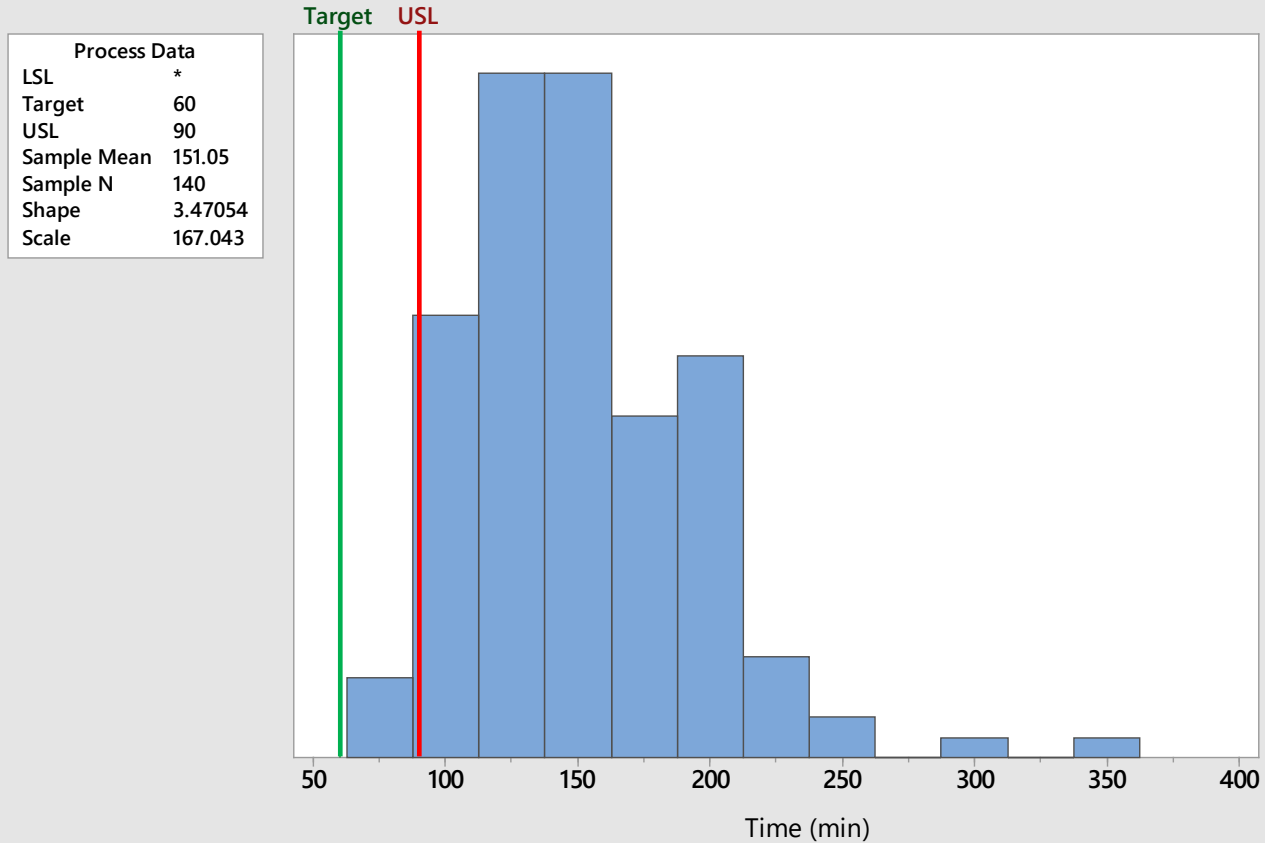


Payment Type

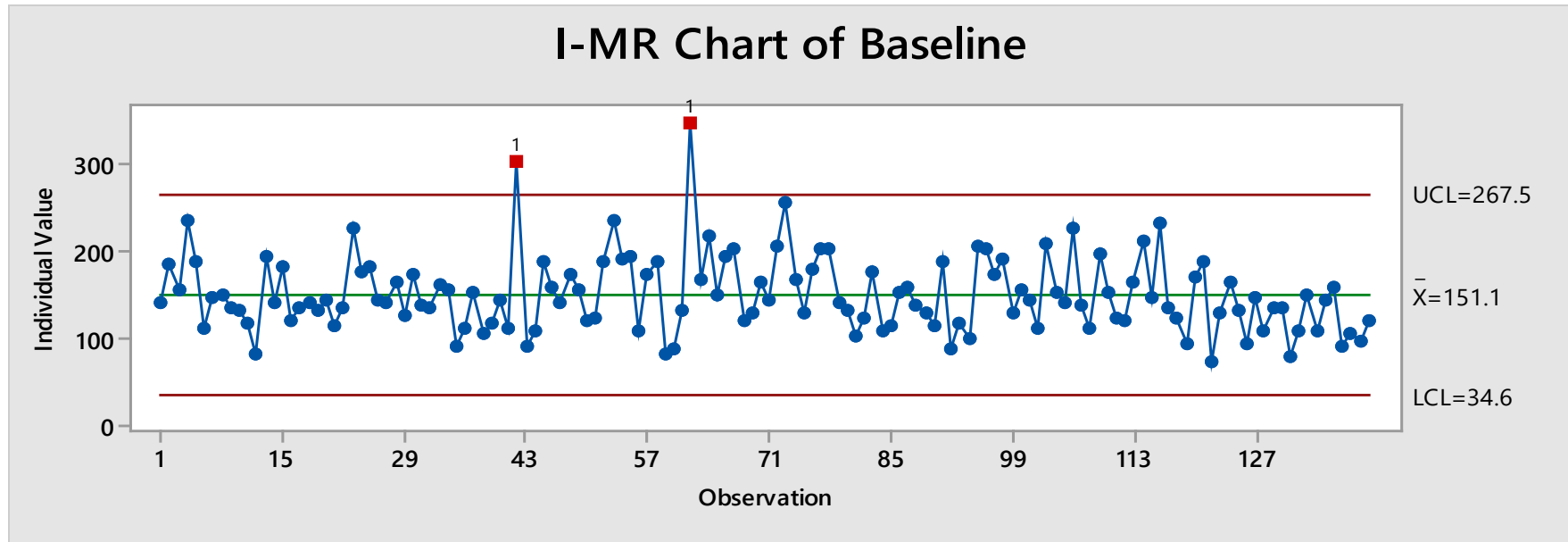


Baseline Performance

Process Capability Report for Baseline Throughput Time



Baseline Performance



Baseline Performance

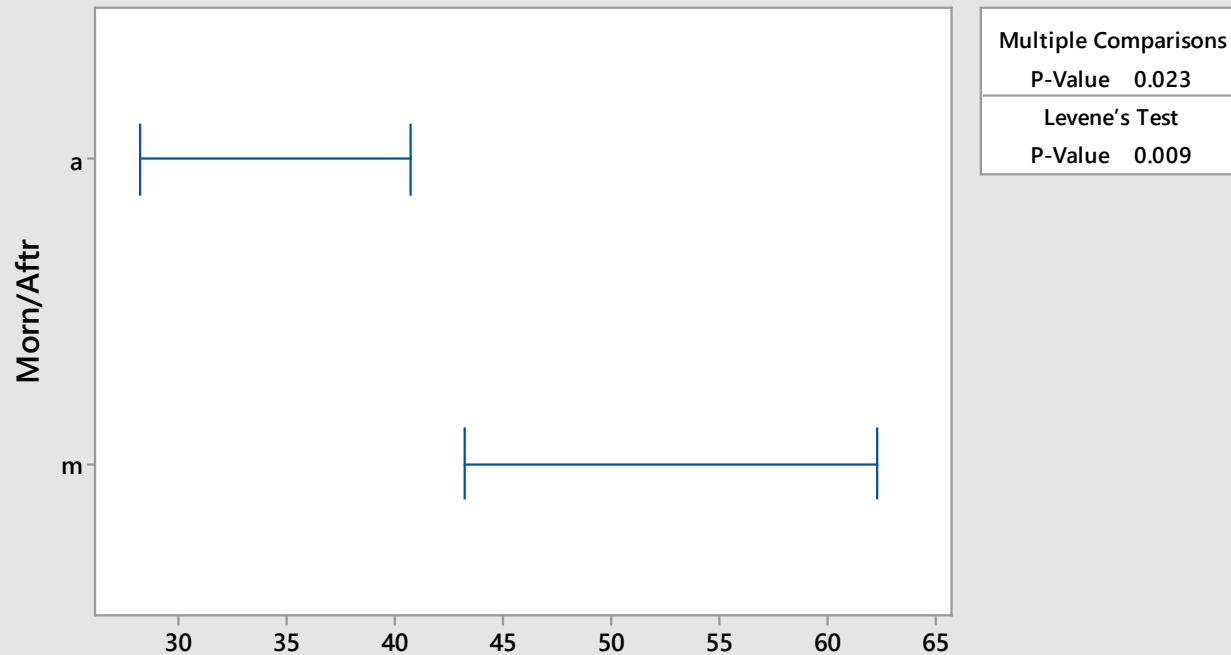
MFMRP Clinic Throughput			
Target: 60 min USL: 90 min n = 140		Baseline	
		TAT (min)	
		Mean	Std. Dev.
Y	Clinic Sign-in to Check-out	151.1	43.4
y1	Sign-in to Admission/Check-in	48	23.3
y2	Admission/Check-in to Nurse receives patient	29.4	20.5
y3	Nurse receives patient to Check-out	73.7	38.1

Baseline Performance

		BASELINE			
Data Collection Period 2/11/14- 2/28/14 n = 140		Mood's Median		Levene's	
Y = Patient Throughput Time		P-Value	Statistically Significant Difference	P-Value	Statistically Significant Difference
Ho: There is no difference in throughput time by day of week		0.301	NO	0.239	NO
Ho: There is no difference in throughput time by time of day (morning/ afternoon)		0.310	NO	0.009	YES
Ho: There is no difference in throughput time by patient status (established/new)		0.353	NO	0.114	NO
Ho: There is no difference in throughput time by insurance class (Medicaid, Medicare, Hidalgo County Indigent, Commercial Insurance, & Private Pay)		0.259	NO	0.264	NO
Ho: There is no difference in throughput time by visit type (scheduled/ walk-in)		0.314	NO	0.922	NO
Ho: There is no difference in throughput time by visit type (initial/follow-up)		1.000	NO	0.691	NO

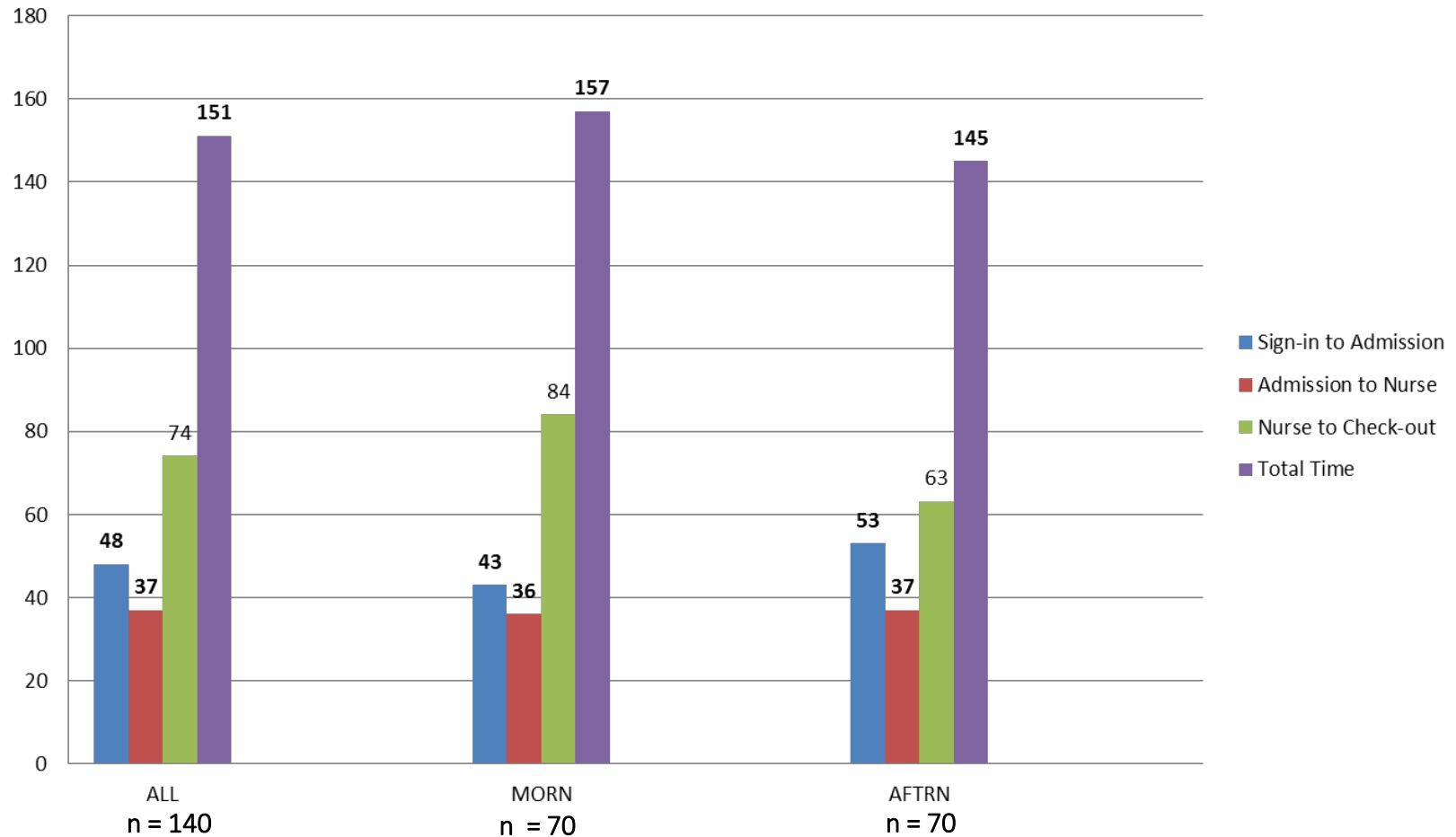
Time of Day

Test for Equal Variances: Y: Baseline Total Throughput Time vs Morn/Aftr
Multiple comparison intervals for the standard deviation, $\alpha = 0.05$

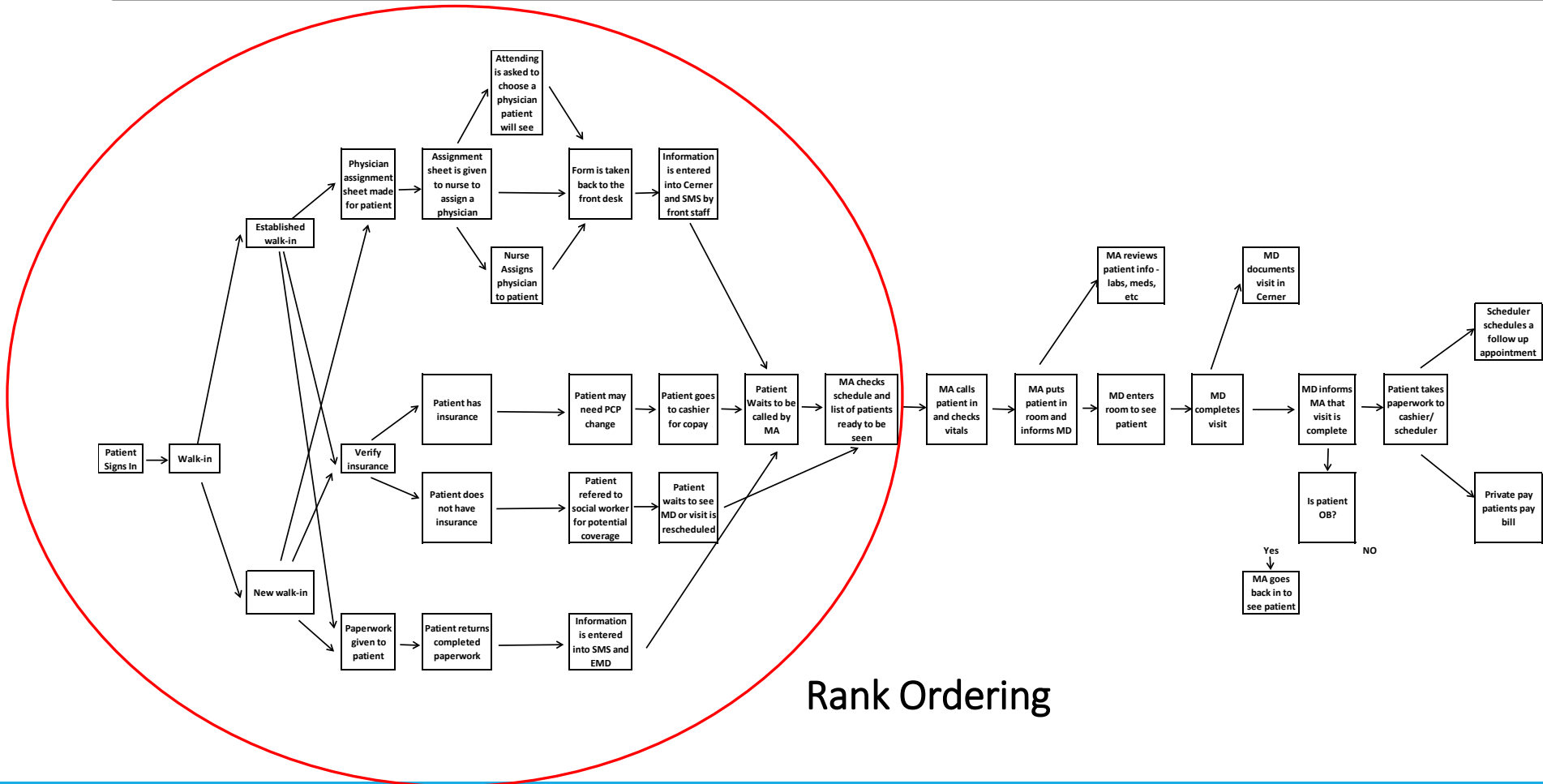


If intervals do not overlap, the corresponding stdevs are significantly different.

Time of Day



Decision Making



Improvement Efforts

PATIENT ADMITTING/REGISTRATION	
BEFORE	AFTER
Staff members assumed specific tasks	Staff were cross-trained to schedule appointments, verify benefits and enter patient information into the EMR
Staff had offices throughout the clinic	Staff were moved to front office so that they are easily accessible/available
Greeter would sign in patient then be responsible for admitting and registering the patient	Greeter now signs in patient, gives patient paperwork and asks patient if he/she requires assistance
Front office staff (2-3) were responsible for entering all registration into EMR	Completed paperwork it is handed to the first staff member (6) available to enter into the EMR

Improvement Efforts

SCHEDULING

FAMILY MEDICINE RESIDENCY CLINIC

Patient Type	Time Frame
Est. Patients	15-20 minutes
New Patient	30 minutes
First AM Appt.	8:00am
Last New AM Appt.	10:30am
Last AM Appt.	11:30am
Lunch Block	12:00PM-1:15pm
First PM Appt.	1:15pm
Last PM New Appt.	3:30PM
Last PM Appt.	4:00pm

DO NOT Schedule 2 NEW PTS Back to Back

Please ask New Patients to arrive 15 mins prior to their appt
Schedule at 8:00am, 8:30am, 9:00am, etc

Improvement Efforts

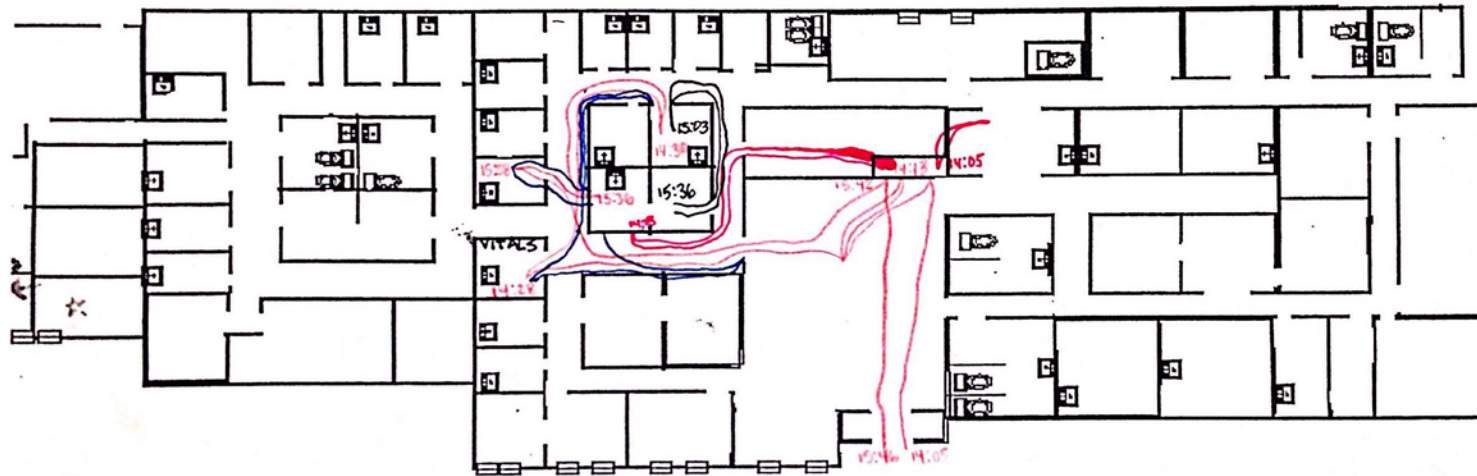
MRN# 70108
 * 4/11/2014 *

FIRE EVACUATION

14:16 - Arrived Robert Status Amb
 14:16 - Check-in (MaryAnn)
 14:26 - Seen by Nurse (Matilde)
 14:35 - CC/Vitals by Nurse (Matilde)
 15:37 - Seen by Mid-Level (Dr. Smith)
 15:45 - Seen by Nurse/Student (Matilde)
 15:45 - Check Out (Terry)

- PATIENT
 - FRONT STAFF
 - MA

RN
 ALL
 RN
 Goes around and confirms patients and help with anything MA's/physicians need



Allen Family Practice Residency Program
 Family Medical Center - UT

Improvement Efforts

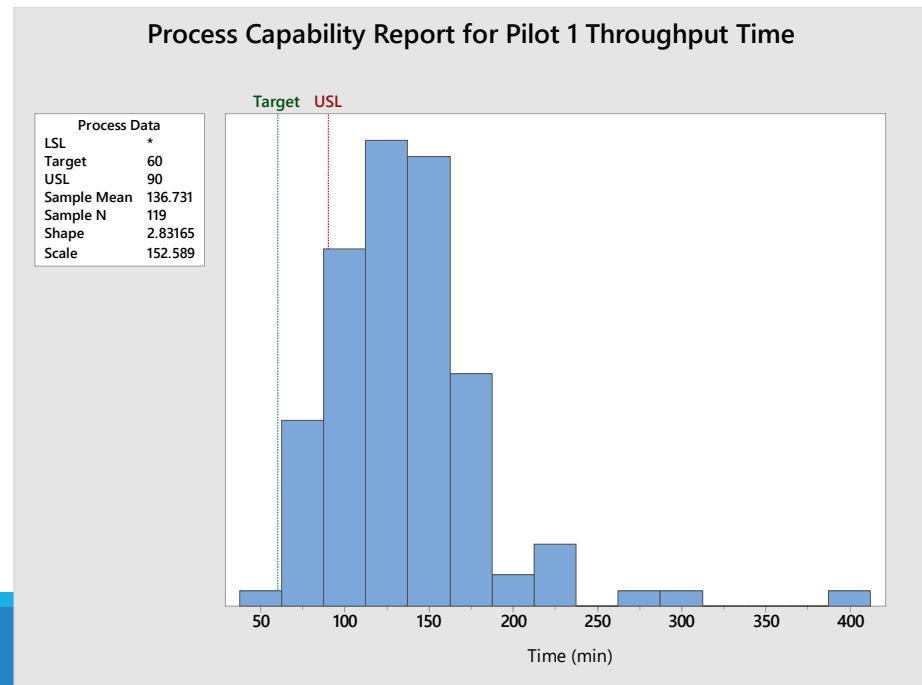
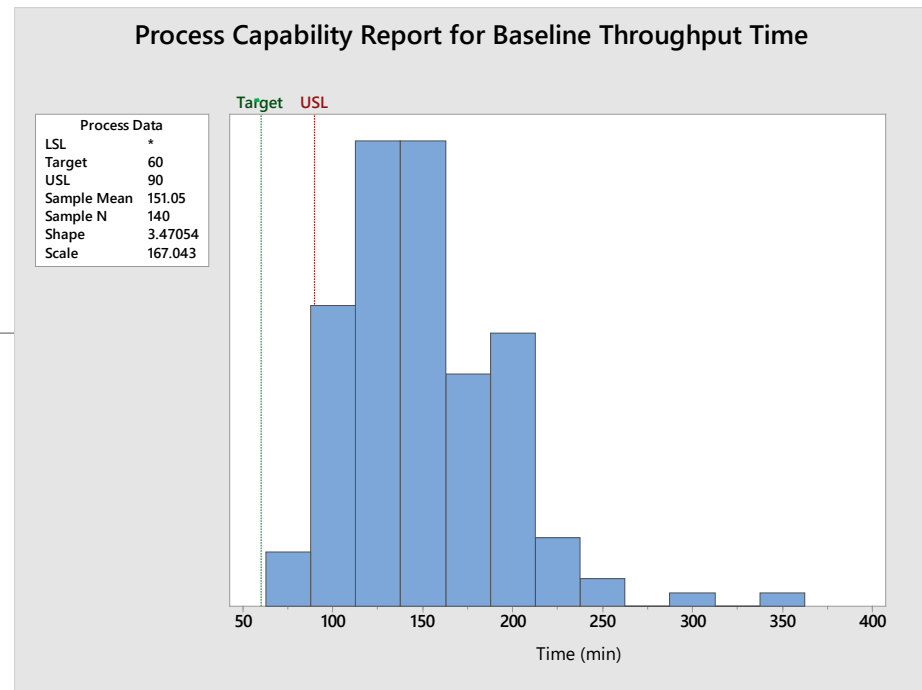
SCHEDULING	
BEFORE	AFTER
Scheduled and walk-in patients waited approximately the same time to be seen. Patients learned it was easier to come in as a walk-in	Scheduled patients are prioritized; separate tracking sheets help identify scheduled vs. walk-in patients
Patients who had been seen were asked to call the clinic to schedule a follow-up appointment	Goal is to make physician schedule available at least 3 months out
Patients who called the clinic were told to come in before 3pm if they wanted to be seen that day	Patients who call the clinic are given an appointment, including same day appointments
Scheduler placed reminder calls the day before scheduled appointments	Automated appointment reminder calls now occur in the evening before 6- 8 pm two days before an appointment
No-shows did not receive a follow-up call to reschedule	Patient no-shows and cancelled appointments are rescheduled

Pilot 1

- Improvements: February 28 - March 10, 2014
- Similar data collection methodology
 - Retrospective chart review (EMR)
 - Stratified random sample
 - March 11-24, 2014
 - 5 am & 5 pm visits, M-F (n = 119)
 - Both genders, all ages and who had a physician visit

Pilot 1 - Results

METRICS	BASELINE	PILOT 1
Dates	2/11/2014-2/28/2014	3/11/2014-3/24/2014
Sample Size	140	119
Mean	151.1 minutes	136.7 minutes
Standard Deviation	43.4 minutes	47.6 minutes
Minimum	75 minutes	52 minutes
Maximum	348 minutes	389 minutes
Hypothesis Testing		
P-Value (Baseline to Pilot 1)		Levene's Test p = 0.920 Mann Whitney p = 0.00



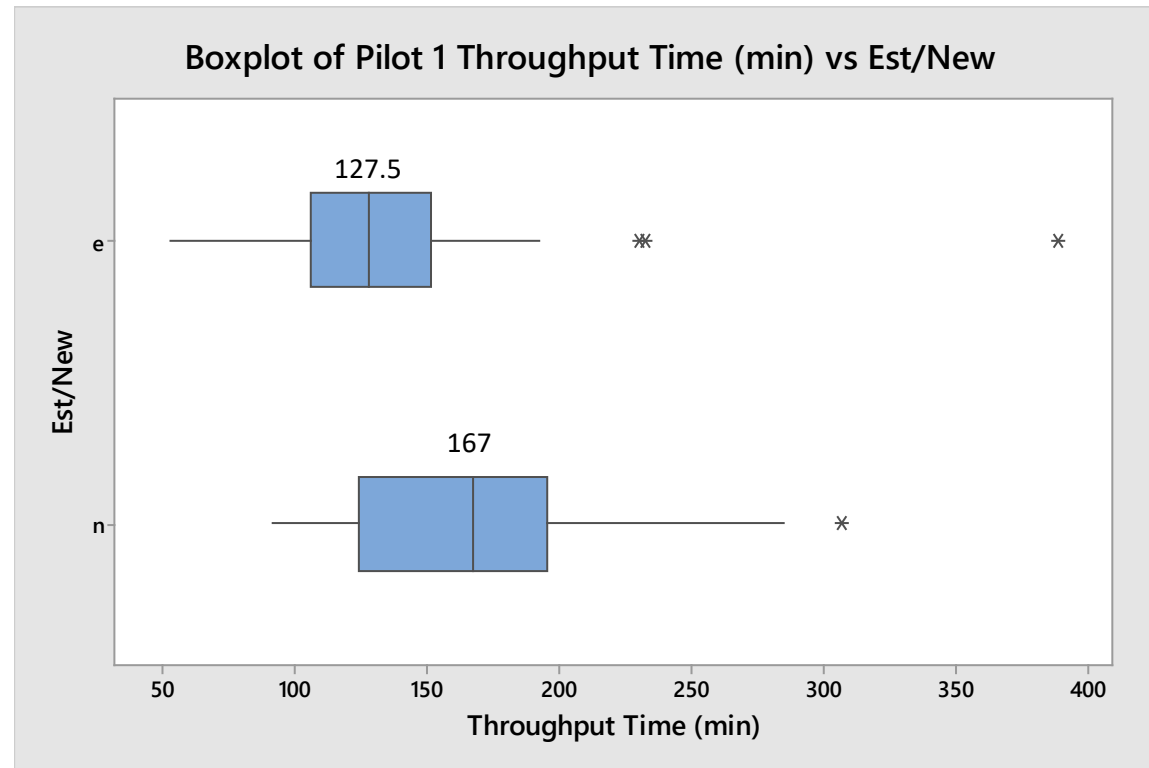
Pilot 1 - Results

MFMRP Clinic Throughput							
		Baseline		Pilot		Levene's	Mann Whitney
		Turnaround Time (minutes)					
		Mean	Std. Dev.	Mean	Std. Dev.	p value	
Y	Clinic Sign-in to Check-out	151.1	43.4	136.7	47.6	0.92	0.00
y1	Sign-in to Admission/Check-in	48	23.3	33.4	19.6	0.28	0.00
y2	Admission/Check-in to Nurse receives patient	29.4	20.5	25.9	20.7	0.70	0.01
y3	Nurse receives patient to Check-out	73.7	38.1	77.5	41.4	0.64	0.25

Pilot 1 - Results

		PILOT 1			
Data Collection Period Baseline: 2/11/14- 2/28/14 Pilot 1: 3/11/14- 3/26/14		Mood's Median		Levene's	
Y = Patient Throughput Time		P-Value	Statistically Significant Difference	P-Value	Statistically Significant Difference
Ho: There is no difference in throughput time by day of week		0.863	NO	0.919	NO
Ho: There is no difference in throughput time by time of day (morning/ afternoon)		0.648	NO	0.821	NO
Ho: There is no difference in throughput time by patient status (established/new)		0.018	YES	0.130	NO
Ho: There is no difference in throughput time by insurance class (Medicaid, Medicare, Hidalgo County Indigent, Commercial Insurance, & Private Pay)		0.521	NO	0.466	NO
Ho: There is no difference in throughput time by visit type (scheduled/ walk-in)		0.793	NO	0.503	NO
Ho: There is no difference in throughput time by visit type (initial/follow-up)		0.055	APPROACHING SIGNIFICANCE	0.558	NO

Pilot 1 - Results



Additional Improvements

RN

- Present in clinic to help troubleshoot and manage patient flow
- Balance resident workload by distributing walk-ins
- Preps rooms for physicians to avoid additional movement

Clinic Staff

- Medical assistants help balance workload by assisting each other with vitals
- No longer “my doctor” mindset

Additional Improvements

Scheduling

- Wellness exams are scheduled 30-45 min
- Reschedule: no-show scheduled patients are called the same day or no more than one business day from missed appointment
- 10:30 am and 3:30 pm reminder calls for scheduled appt.
- 5/20 – 6 pm reminder phone call day before

Flow

- On Wednesdays, high-risk OB moved to another part of the clinic to free up patient exam rooms

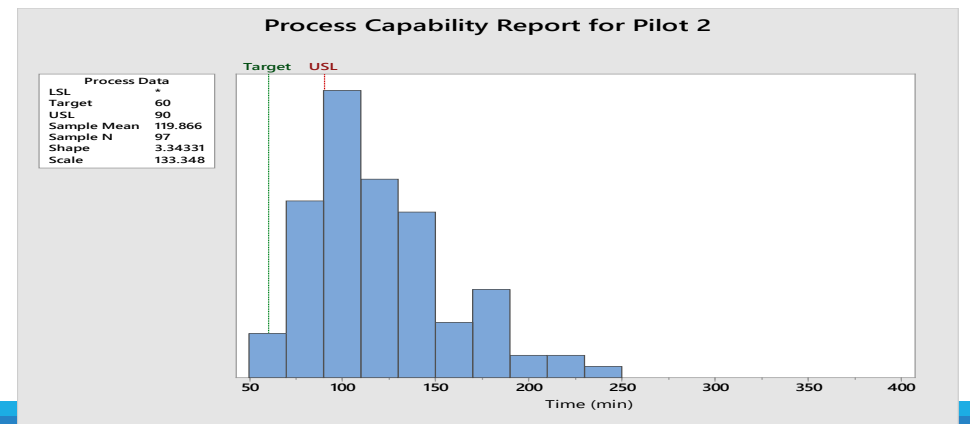
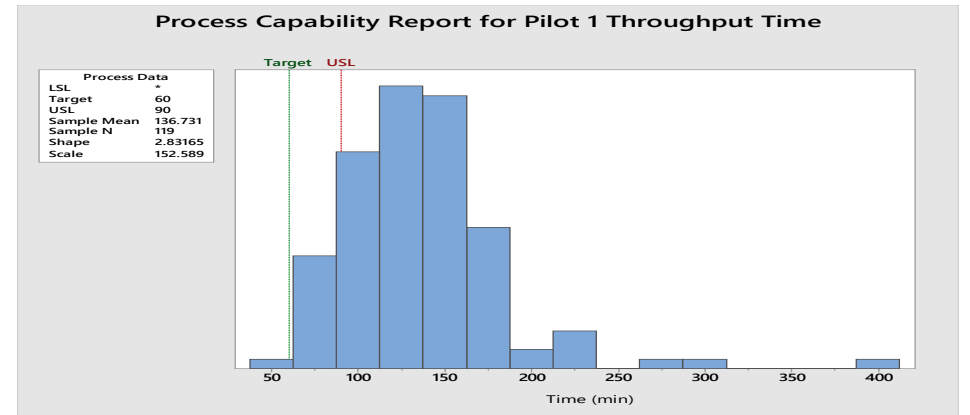
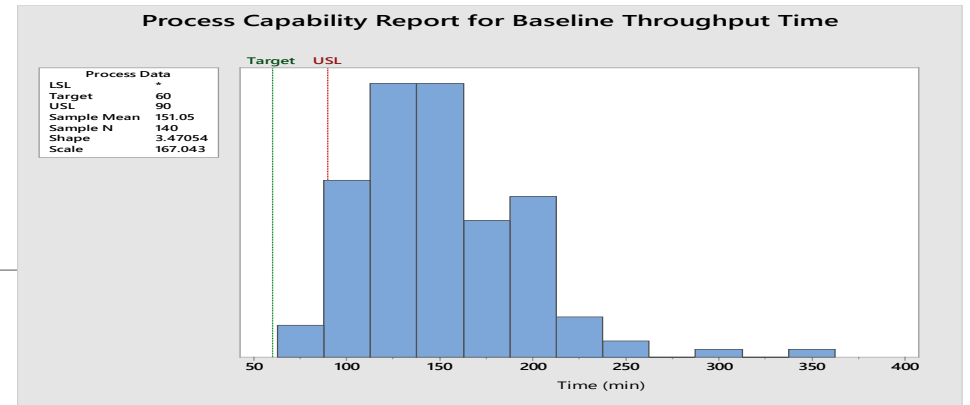
FAMILY MEDICINE RESIDENCY CLINIC

Patient Type	Time Frame
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Please ask New Patients to arrive 15 mins prior to their appt
Schedule at 8:00am, 8:30am, 9:00am, etc

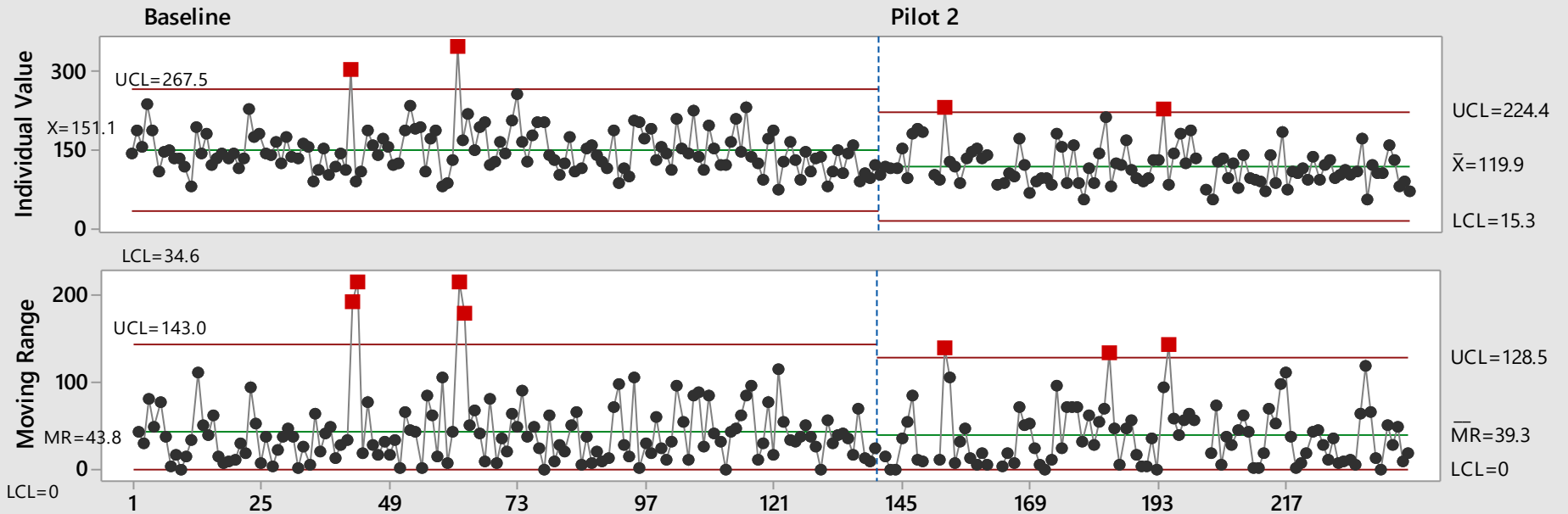
Pilot 2 - Results

METRICS	BASELINE	PILOT 1	PILOT 2
Dates	2/11/2014-2/28/2014	3/11/2014-3/24/2014	4/21/14 - 5/2/14
Sample Size	140	119	87
Mean	151.1 minutes	136.7 minutes	121 minutes
Standard Deviation	43.4 minutes	47.6 minutes	37 minutes
Minimum	75 minutes	52 minutes	55 minutes
Maximum	348 minutes	389 minutes	234 minutes
Hypothesis Testing			
P-Value (Baseline to Pilot 1)		Levene's Test p = 0.920 Mann Whitney p = 0.00	
P-Value (Baseline to Pilot 2)			Levene's Test p = 0.304 Mann Whitney p = 0.00



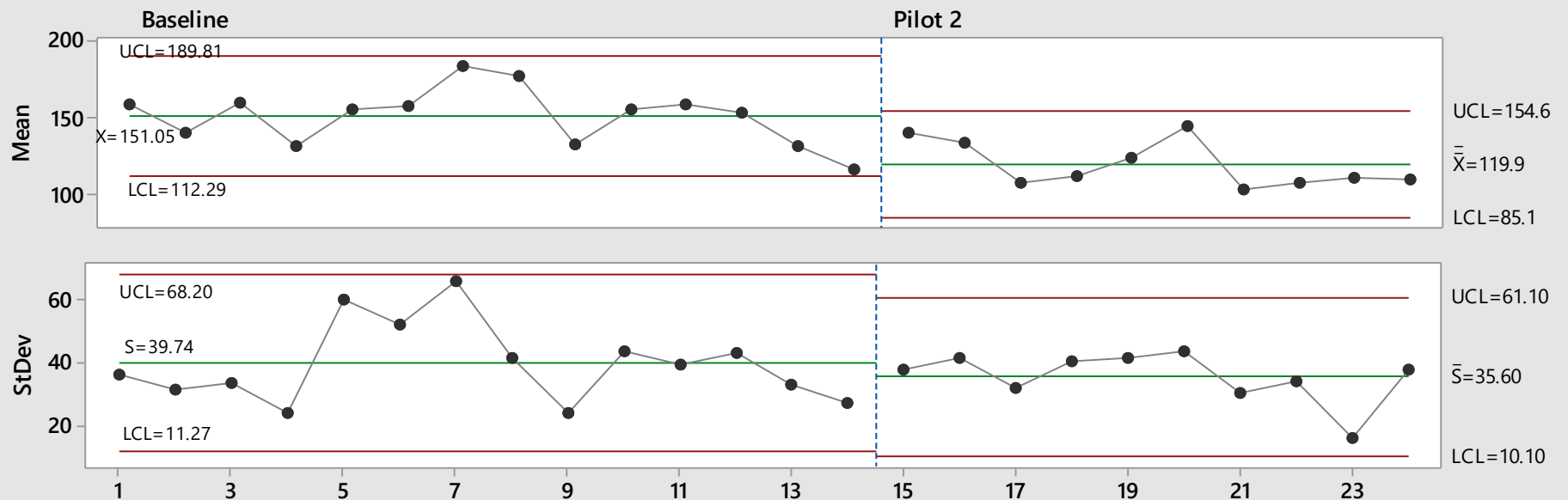
Pilot 2 - Results

Before/After I-MR Chart of Baseline vs Pilot 2



Pilot 2 - Results

Before/After Xbar-S Chart of Baseline vs Pilot 2



Pilot 2 - Results

MFMRP Clinic Throughput							
		Baseline		Pilot 2		Levene's	Mann-Whitney
		Throughput Time (minutes)					
		Mean	Std. Dev.	Mean	Std. Dev.	p-value	
Y	Clinic Sign-in to Check-out	151.1	43.4	120.7	37.3	0.30	0.00
y1	Sign-in to Check-in	48.0	23.3	31.3	20.7	0.75	0.00
y2	Check-in to Nurse	29.4	20.5	18.2	20.8	0.27	0.00
y3	Nurse to Check-out	73.7	38.1	82.9	49.2	0.67	0.06

- Cerner documentation
- Resident conducts wellness exam; attending will repeat exam (2 visits)
- Checkout pending completion of doctor's documentation
- HealthWorks (May)

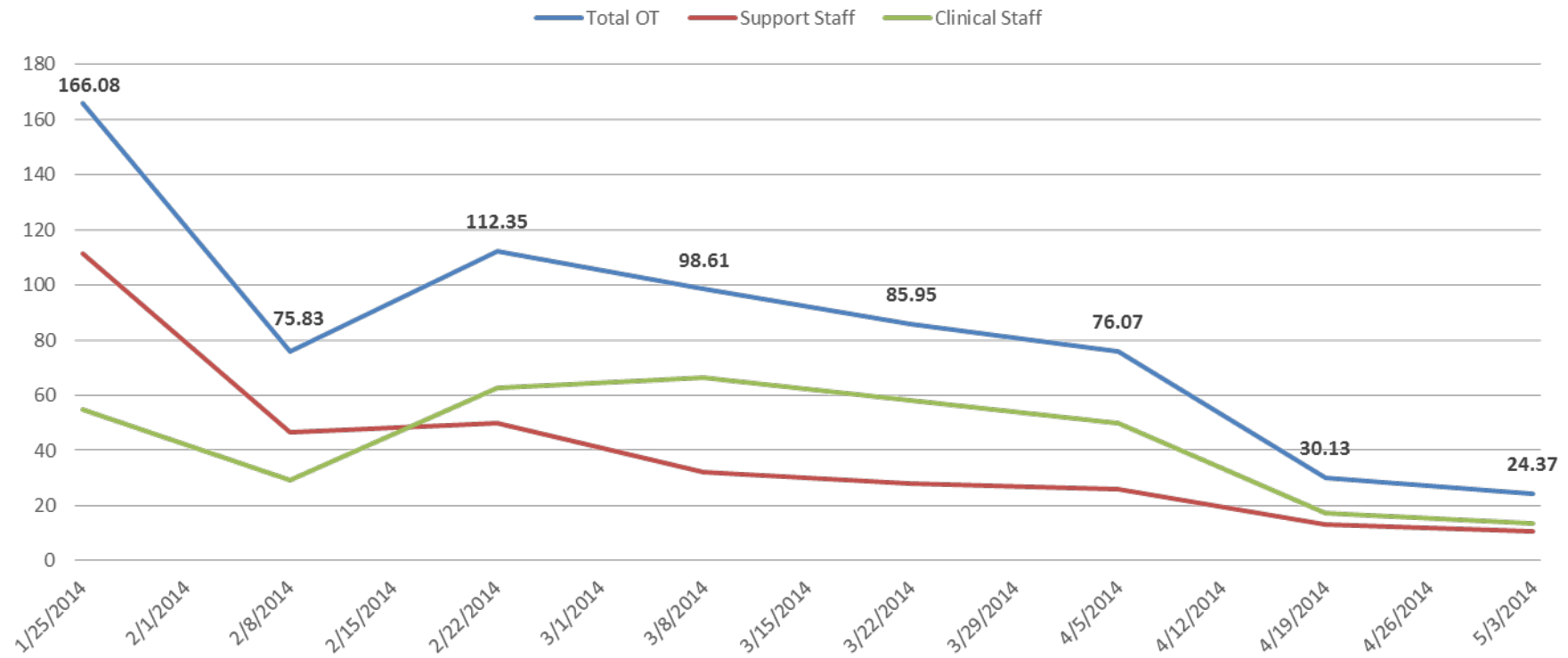
Pilot 2 - Results

PILOT 2					
Data Collection Period Baseline:2/11/14-2/28/14 Pilot 1: 3/11/14-3/26/14 Pilot 2: 4/21/14- 5/2/14	Mood's Median		Levene's		
	Y = Patient Throughput Time	P-Value	Statistically Significant Difference	P-Value	Statistically Significant Difference
Entries					
Ho: There is no difference in throughput time by day of week	0.022	YES	0.689	NO	
Ho: There is no difference in throughput time by time of day (morning/ afternoon)	0.92	NO	0.967	NO	
Ho: There is no difference in throughput time by patient status (established/new)	0.075	APPROACHING SIGNIFICANCE	0.464	NO	
Ho: There is no difference in throughput time by insurance class (Medicaid, Medicare, Hidalgo County Indigent, Commercial Insurance, & Private Pay)	0.152	NO	0.072	APPROACHING SIGNIFICANCE	
Ho: There is no difference in throughput time by visit type (scheduled/ walk-in)	0.039	YES	0.388	NO	
Ho: There is no difference in throughput time by visit type (initial/follow-up)	0.525	NO	0.241	NO	

Return on Investment

Total OT		Clinical		Support	
166.08	98.61	54.86	66.58	111.22	32.03
166.08	85.95	54.86	57.96	111.22	27.99
166.08	76.07	54.86	49.95	111.22	26.12
166.08	30.13	54.86	17.18	111.22	12.95
166.08	24.37	54.86	13.63	111.22	10.74
830.4	315.13	274.3	205.3	556.1	109.83
515.27		69		446.27	
62% decrease		\$1,174.38		\$5,087.48	
Annualized: \$30,052.80					

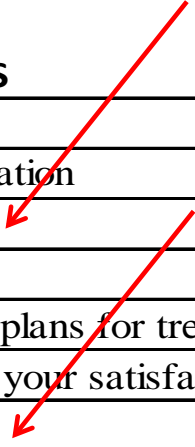
Clinic Overtime



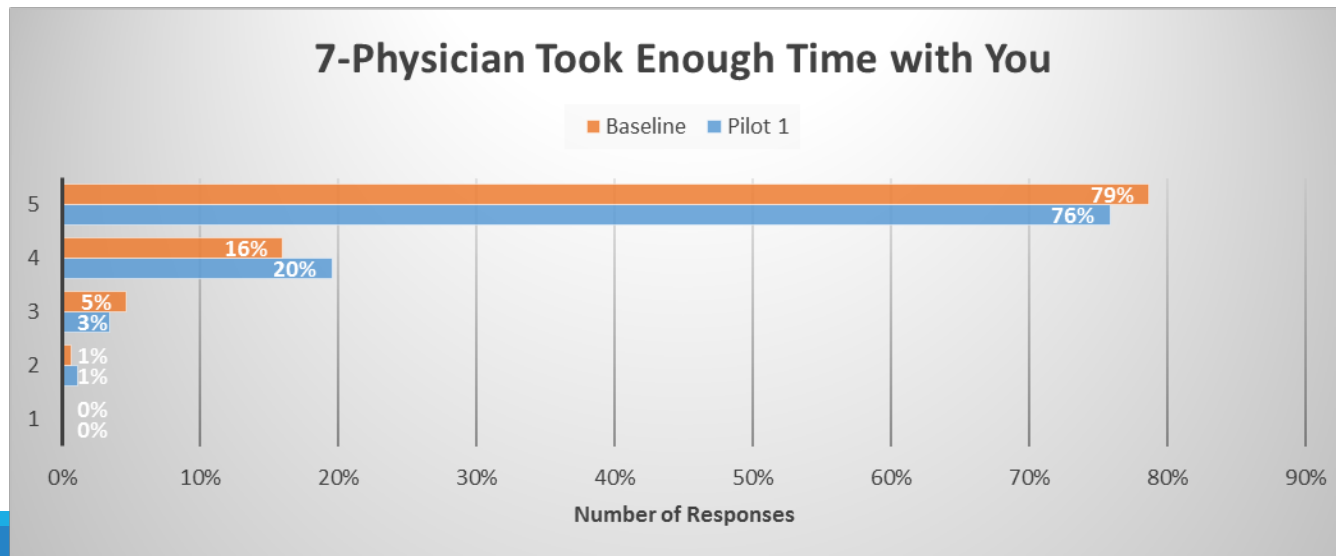
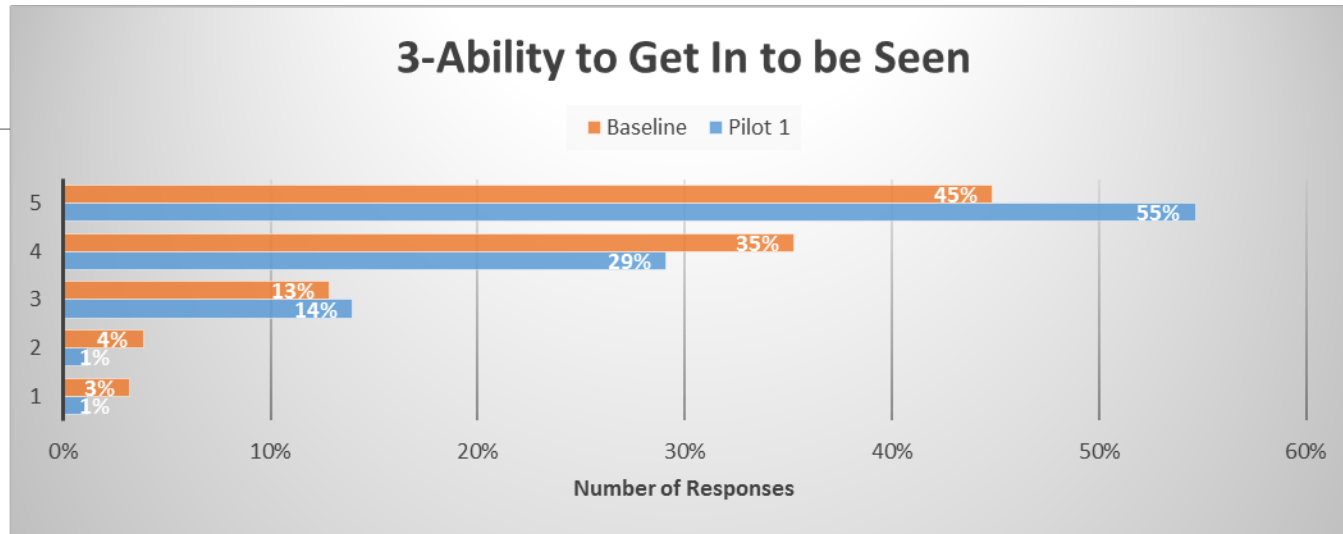
Patient Satisfaction Survey

SURVEY QUESTIONS

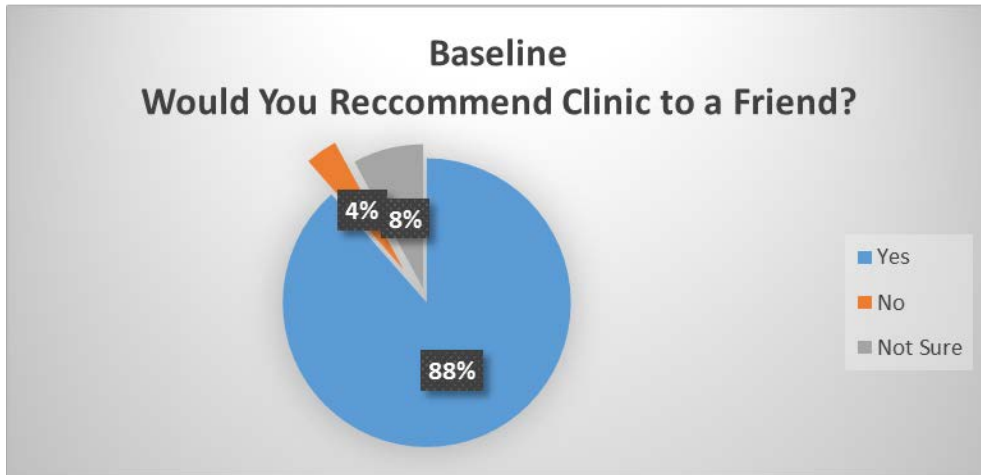
Ease of Getting Care	1	Hours center is open
	2	Convenience of center's location
	3	Ability to get in to be seen
Physician	4	Listened to your concerns
	5	Explained your problem and plans for treatment clearly and understandably
	6	Answered your questions to your satisfaction
	7	Took enough time with you
Nurses/MA's	8	Friendly and helpful to you
	9	Answered your questions
All others	10	Friendly and helpful to you
	11	Answered your questions
Facility	12	Neat and clean
Overall	13	Overall Quality of Care



Patient Satisfaction Survey

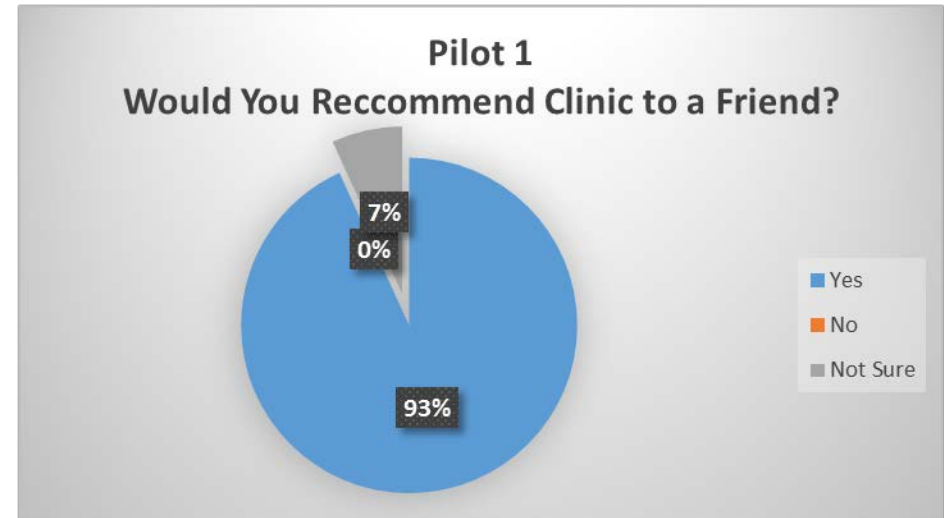


Patient Satisfaction Survey



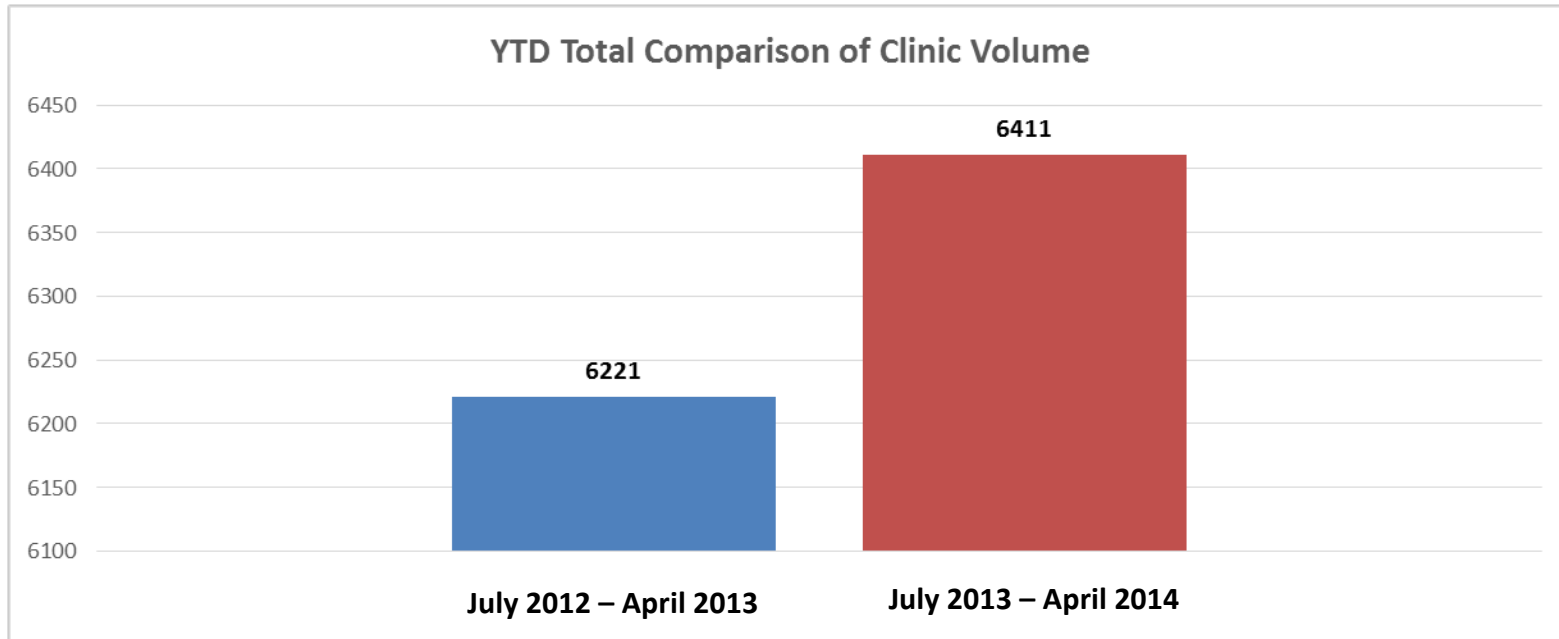
2/21-3/19
n = 162

4/15 - 4/22
n = 71



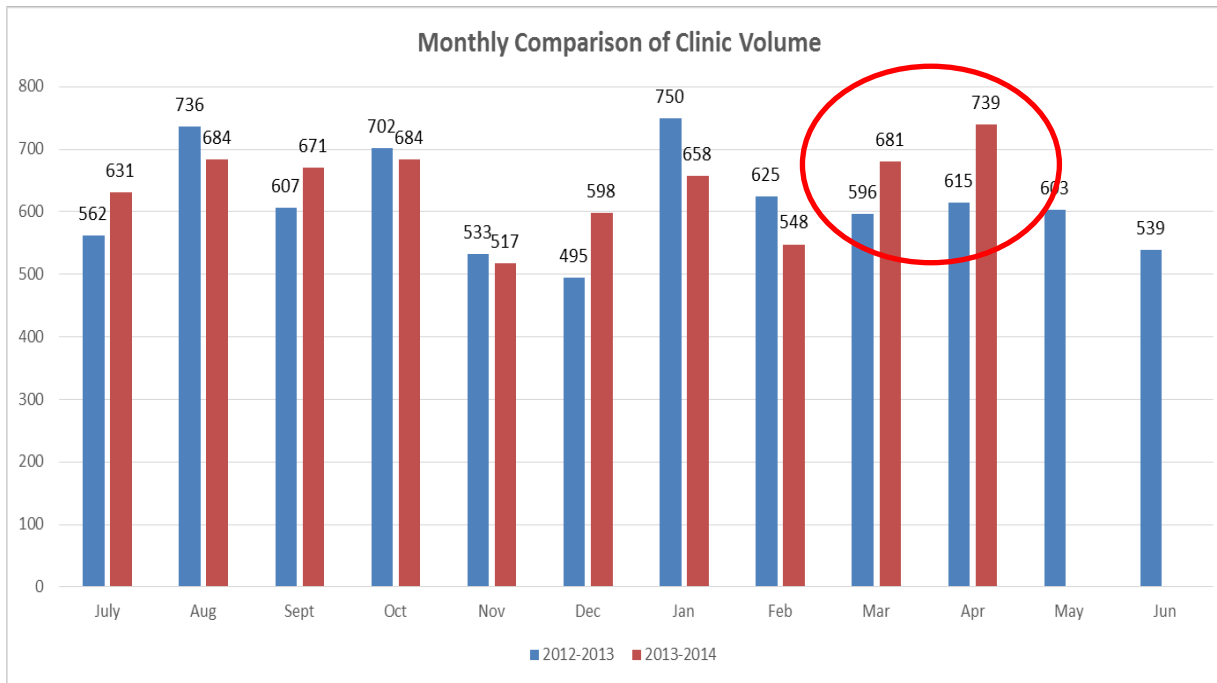
Thank you!

Return on Investment



3% increase (n = 190)
Total Net Revenue **\$15,127.80**

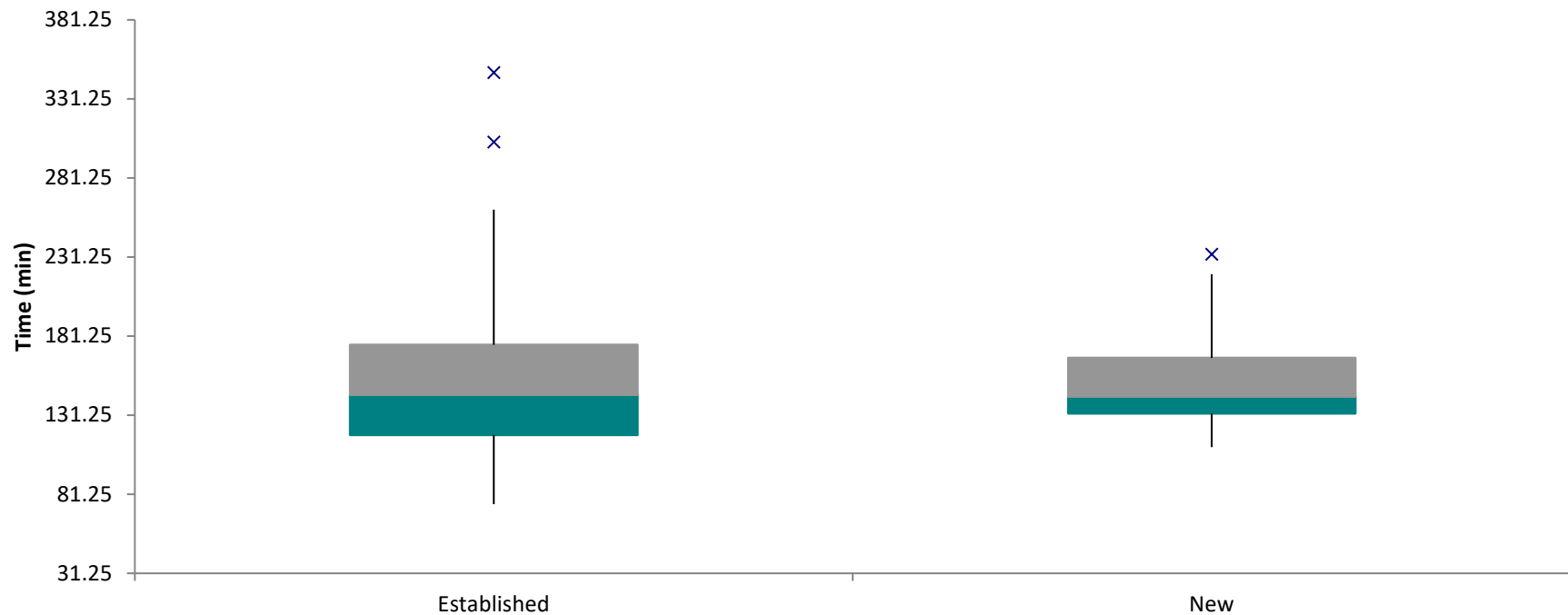
Return on Investment



METRICS	March	April
2012 -2013	596	615
2013 -2014	681	739
increase	85	124
% increase	14.3%	20.2%

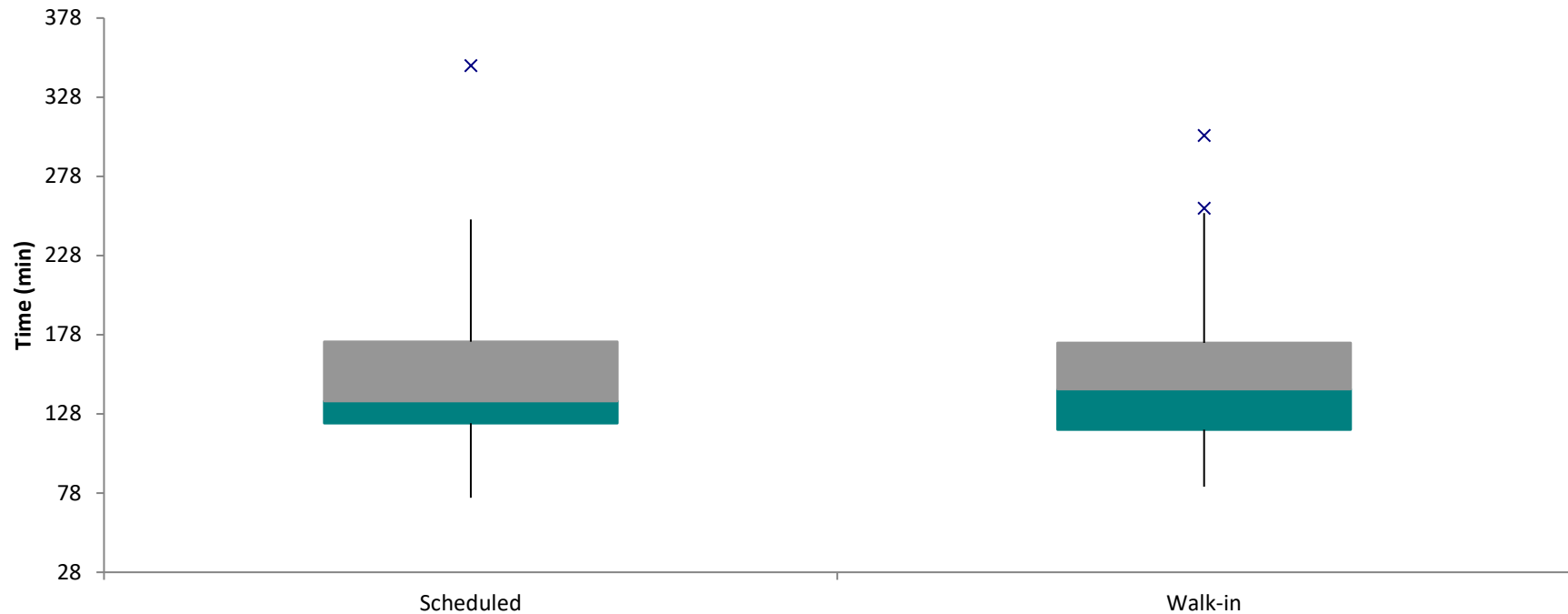
Established vs. New

Total Throughput Established vs. New Box Plot



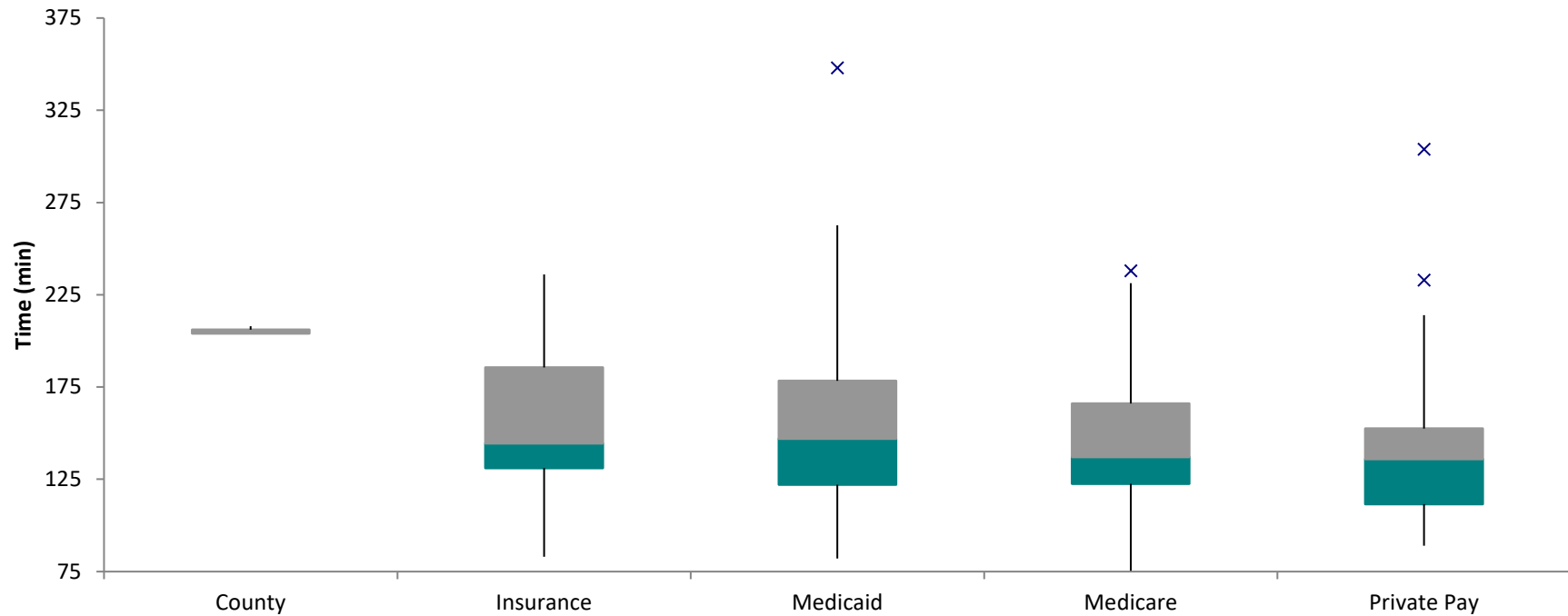
Scheduled vs. Walk-in

Total Throughput by Patient Status Box Plot



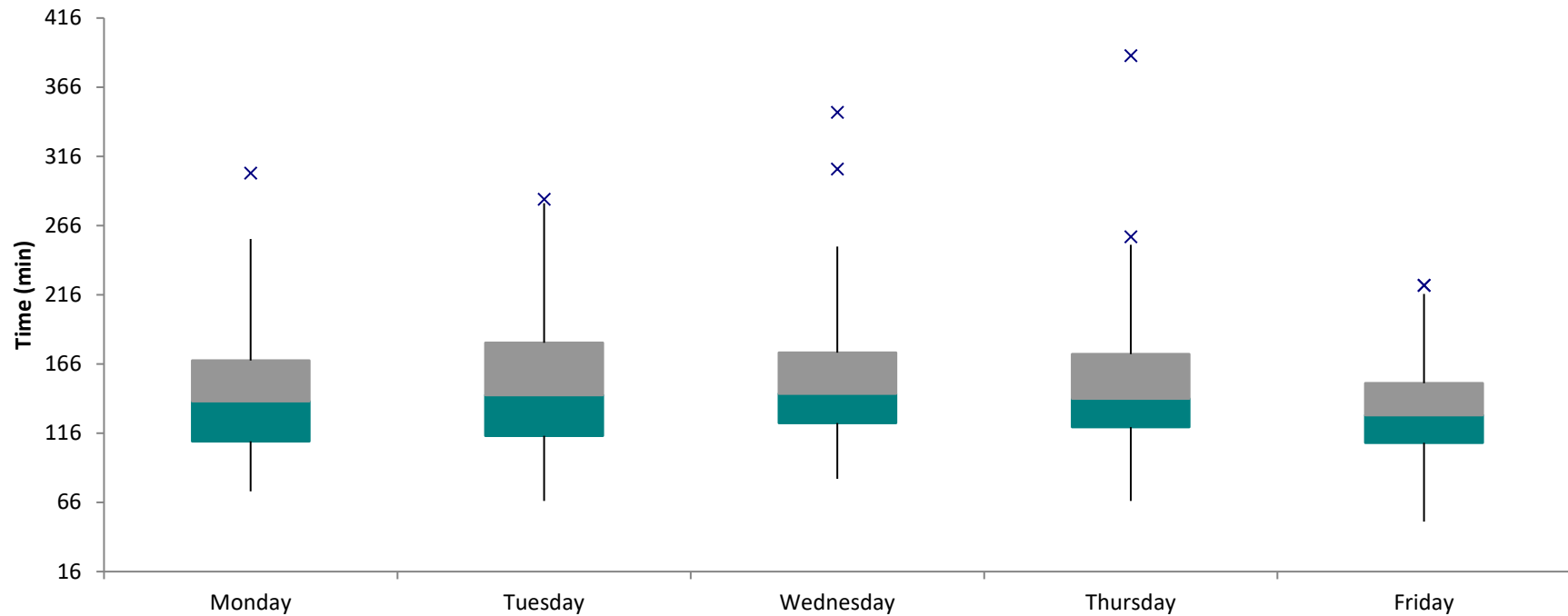
Payment Type

Total Throughput by Payment Type Box Plot



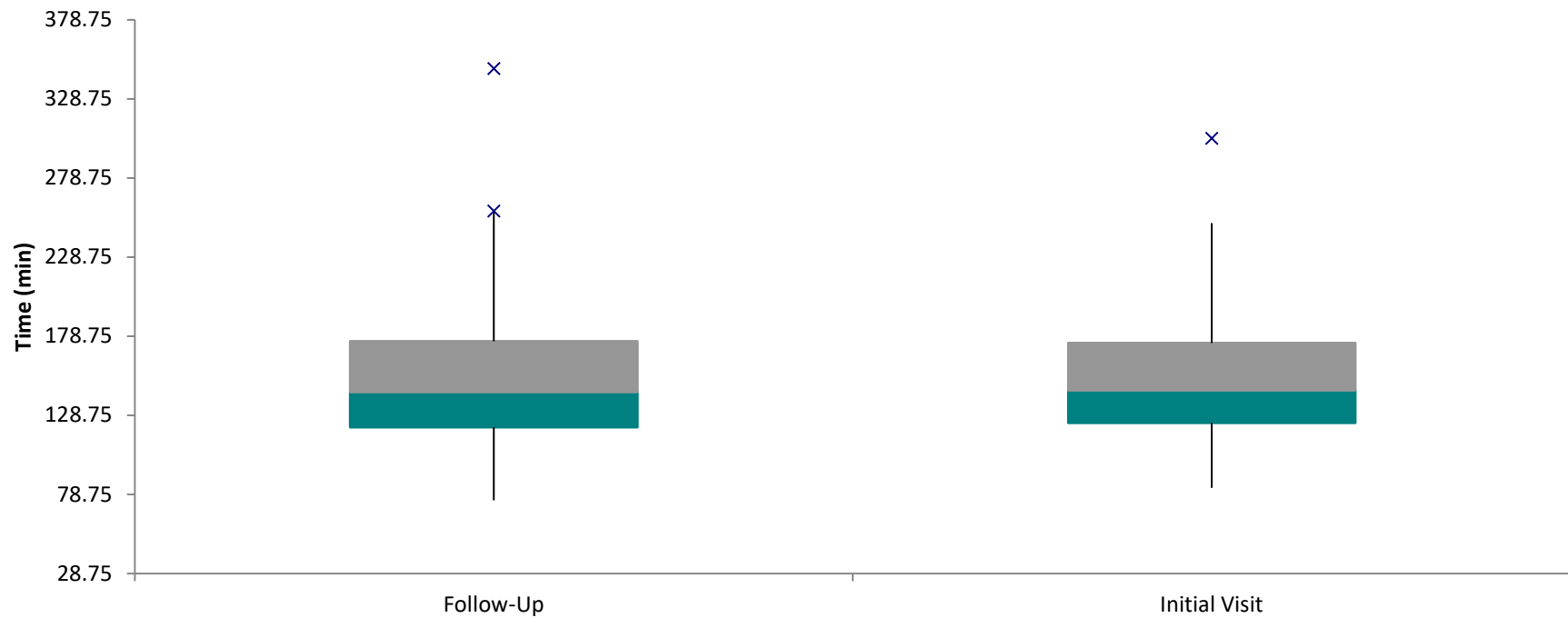
Day of Week

Total Throughput by Day of the Week Box Chart



Visit Type

Total Throughput by Visit Type Box Blot



Patients Seen by MD Classification

PGY	Beginning of Year – clinic pts / day	End of Year – clinic pts / day
3	16 - 20	24
2	6 - 8	10
1	4	6 - 8
Total	26 - 32	40 - 42

# Residents	Mon 11-Feb	Tues 12-Feb	Wed 13-Feb	Thurs 14-Feb	Fri 15-Feb	Tues 18-Feb	Wed 19-Feb	Thurs 20-Feb	Fri 21-Feb	Mon 24-Feb	Tues 25-Feb	Wed 26-Feb	Thurs 27-Feb	Fri 28-Feb	Total
PGY 1	1.5	1.5	0	1	1.5	1.5	0	1	1.5	1.5	1.5	0	1	1.5	
PGY2	1	1	2.5	1	1	1	2.5	1	1	1	1	2.5	1	1	
PGY3	2	2	2.5	2	1.5	2	2.5	2	1.5	2	2	2.5	2	1.5	
Pts Needed															
PGY 1	12	12	0	8	12	12	0	8	12	12	12	0	8	12	120
PGY 2	10	10	25	10	10	10	25	10	10	10	10	25	10	10	185
PGY 3	48	48	60	48	48	48	60	48	48	48	48	60	48	48	708
# patients needed	70	70	85	66	70	70	85	66	70	70	70	85	66	70	1013
Patients Seen															
PGY 1	8	0	2	3	3	14	0	11	14	10	4	0	4	6	79
PGY 2	7	10	5	7	5	8	6	5	10	10	10	21	8	8	120
PGY 3	6	6	10	12	15	8	15	12	15	16	15	18	19	12	179
# patients	22	24	20	24	28	40	28	28	40	38	30	41	31	27	421
% met	31%	34%	24%	36%	40%	57%	33%	42%	57%	54%	43%	48%	47%	39%	42%

Residents Scheduled vs. Patients Seen

# Residents	Mon	Tues	Wed	Thurs	Fri	Tues	Wed	Thurs	Fri	Mon	Tues	Wed	Thurs	Fri	Total
	11-Feb	12-Feb	13-Feb	14-Feb	17-Feb	18-Feb	19-Feb	20-Feb	21-Feb	24-Feb	25-Feb	26-Feb	27-Feb	28-Feb	
PGY 1	1.5	1.5	0	1	1.5	1.5	0	1	1.5	1.5	1.5	0	1	1.5	
PGY2	1	1	2.5	1	1	1	2.5	1	1	1	1	2.5	1	1	
PGY3	2	2	2.5	2	1.5	2	2.5	2	1.5	2	2	2.5	2	1.5	
Pts Needed vs. Actual*															
PGY 1	12	12	0	8	12	12	0	8	12	12	12	0	8	12	120
PGY 1*	8	0	2	3	3	14	0	11	14	10	4	0	4	6	79
% met	67%	0%		38%	25%	117%		138%	117%	83%	33%		50%	50%	66%
PGY 2	10	10	25	10	10	10	25	10	10	10	10	25	10	10	185
PGY 2*	7	10	5	7	5	8	6	5	10	10	10	21	8	8	120
% met	70%	100%	20%	70%	50%	80%	24%	50%	100%	100%	100%	84%	80%	80%	65%
PGY 3	48	48	60	48	48	48	60	48	48	48	48	60	48	48	708
PGY 3*	6	6	10	12	15	8	15	12	15	16	15	18	19	12	179
% met	13%	13%	17%	25%	31%	17%	25%	25%	31%	33%	31%	30%	40%	25%	25%