FLAGLER HOSPITAL
ST. AUGUSTINE

Patient Flow

Six Sigma Project:
Discharge Order to Patient Exit

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Decision Support Developer/Analyst

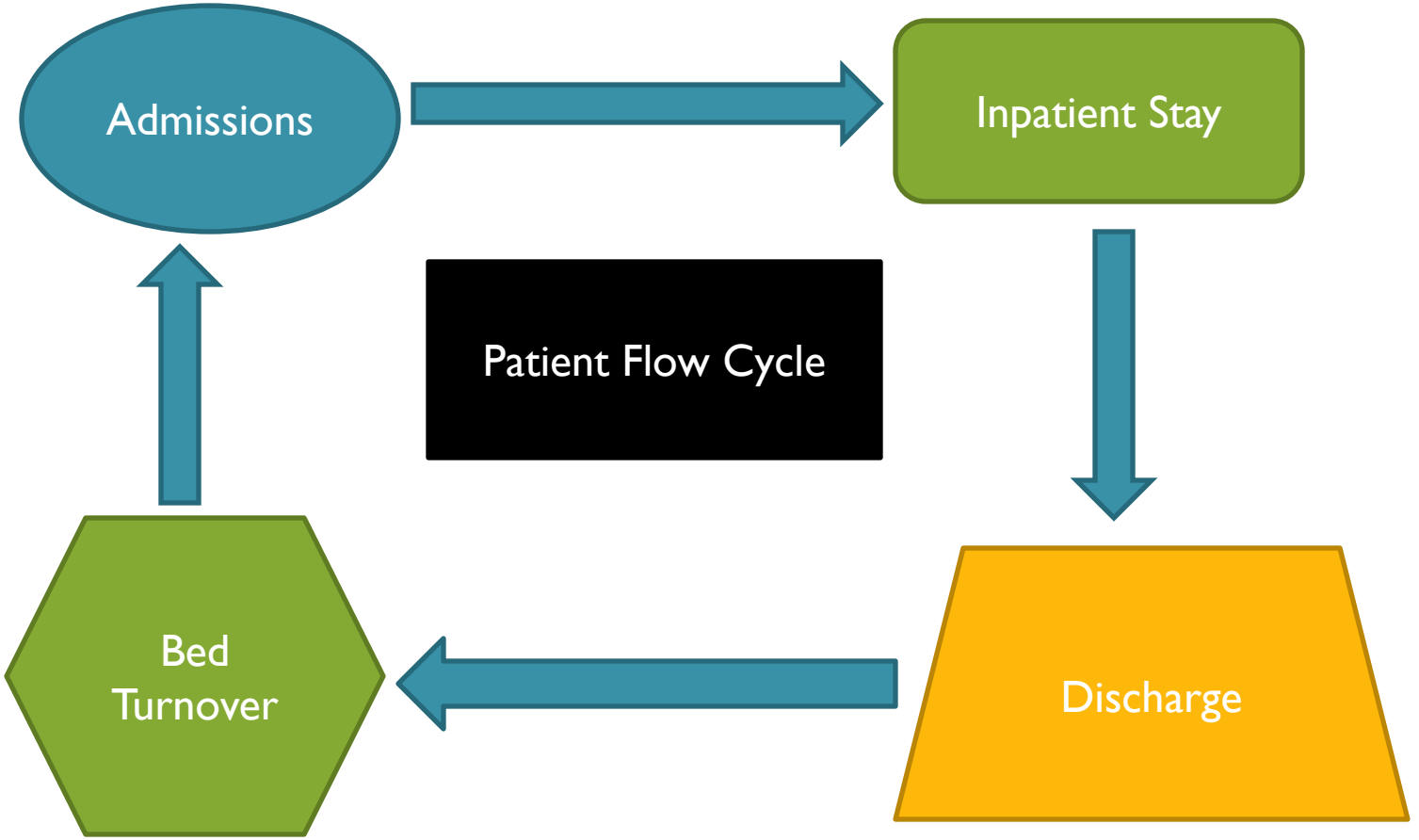
Agenda

- Patient Flow Initiative
  - Brief History
- Six Sigma Project
  - Discharge Time – Improve discharge time from the time a physician order is written to the time the patient leaves the unit

Patient Flow Initiative

- Launched in September 2009
- Key products since inception:
  - Daily flow huddles with representatives from social services, Utilization Management, ER, OR, and nursing departments
  - Establishment of an Admissions Unit
  - Creation of a Discharge Unit
  - Electronic bed board system
  - Six Sigma Project for improving discharge times
  - Six Sigma Project for improving admissions from the ER

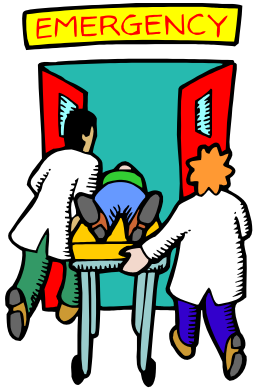
Patient Flow Cycle



Where are the wait opportunities?

- Incoming Patients (Front End)
  - Any place that can call to admit a patient!
    - ER, OR, Cath Lab, Special Procedures, Physician's Office, direct admissions
    - Around 60% of admissions come from the ER!
- Outgoing Patients (Back End)
  - Discharging patients
    - The sooner a bed is free, the sooner a new patient can get care!

Patient Flow By the Numbers



Inpatient Wait in the ER

- **Care Complete to ER Departure (inpatients)**
  - Goal: 60 minutes
  - 9% exit within one hour
  - Critical Care Average: 350 minutes (~6 hours)
  - Med Surg *including* the Admissions Unit: 237 minutes (~4 hours)

A few reasons cited for delays…

- Inpatient bed not available
  - Existing floor patients waiting for discharge
  - Staff not available to process admission to unit
  - Nurses not able to take report
  - Housekeeping
- Transport not being available
- Late discharges

Patient Flow By the Numbers

- Average admissions to units by day

Where are the patients going?

First IP Dept	%	Average Per Day
MED 5 EXP	16.91%	**7.06**
SURG 7 EXP	14.19%	**5.92**
SURG 8 EXP	12.73%	**5.31**
PSYCH EXP	8.43%	**3.52**
OB 2 EXP	8.25%	**3.44**
MED 4 EXP	8.22%	**3.43**
SICU EXP	5.61%	**2.34**
CDU 1 NORTH EXP	4.62%	**1.93**
MICU EXP	4.42%	**1.85**
PEDIATRICS EXP	3.35%	**1.40**
All others	13.27%	**5.54**
Total	**100.00%**	**41.75**

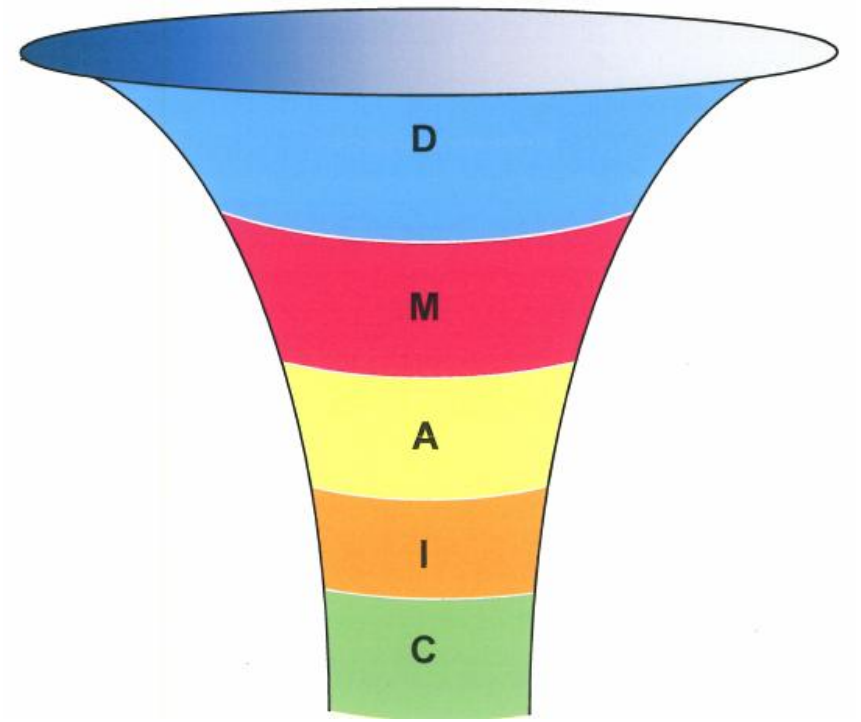
Six Sigma at Flagler Hospital

- In December 2009 a plan was developed to utilize Six Sigma methodologies toward process improvement projects

- Formalized Training
  - 2 weeks Green Belt Level
  - 2 weeks Black Belt Level
- Mentorship
  - Mike Hennessey – Master Black Belt

Six Sigma

- DMAIC Process
  - Define
  - Measure
  - Analyze
  - Improve
  - Control



Discharge Order Time to Discharge

Define

- **Project Charter**
  - **Start Date:** May 4, 2010
  - **Champion:** Jason Barrett, COO
  - **Description:**
    - 73.5% of patients sampled had a stay of longer than 2 hours past the time the physician had given the discharge order.
    - This drives lower patient satisfaction, increased operating costs and lower hospital capacity.
  - **Project "Y":**
    - Total Discharge time
    - Goal: 2 Hours
  - **Scope:** Patient discharges from the 5th Floor

Discharge Order Time to Discharge

Define

- **Multidisciplinary Team Members**
  - Mary Mantese – Nursing Administration
  - Sharon Smith – 5th Floor Director
  - Holly McDermott – 5th Floor Charge Nurse
  - Joseph Lai – Administrative Resident
  - Michael Hennessey – Six Sigma MBB
  - Keenan Brown – Discharge Planner
  - Billy Burns – Decision Support

Project Tracker

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Project Y: Time between order written and discharge

Define

Project Y Selected	Business Impact Link	Stakeholder Requirements	Project Charter
5/4/10	5/4/10	5/4/10	5/18/10

Measure

Kickoff Meeting	Process Map	C & E Matrix	Preliminary FMEA	Capability & MSA
5/18/10	5/27/10	6/1/10	6/8/10	6/22/10

Analyze

Initial FMEA	Multi-Vari Studies
7/13/10	7/27/10

Improve

DOE (or other tool)	Mistake Proofing	Final FMEA
8/5/10	9/12/10	10/19/10

Control

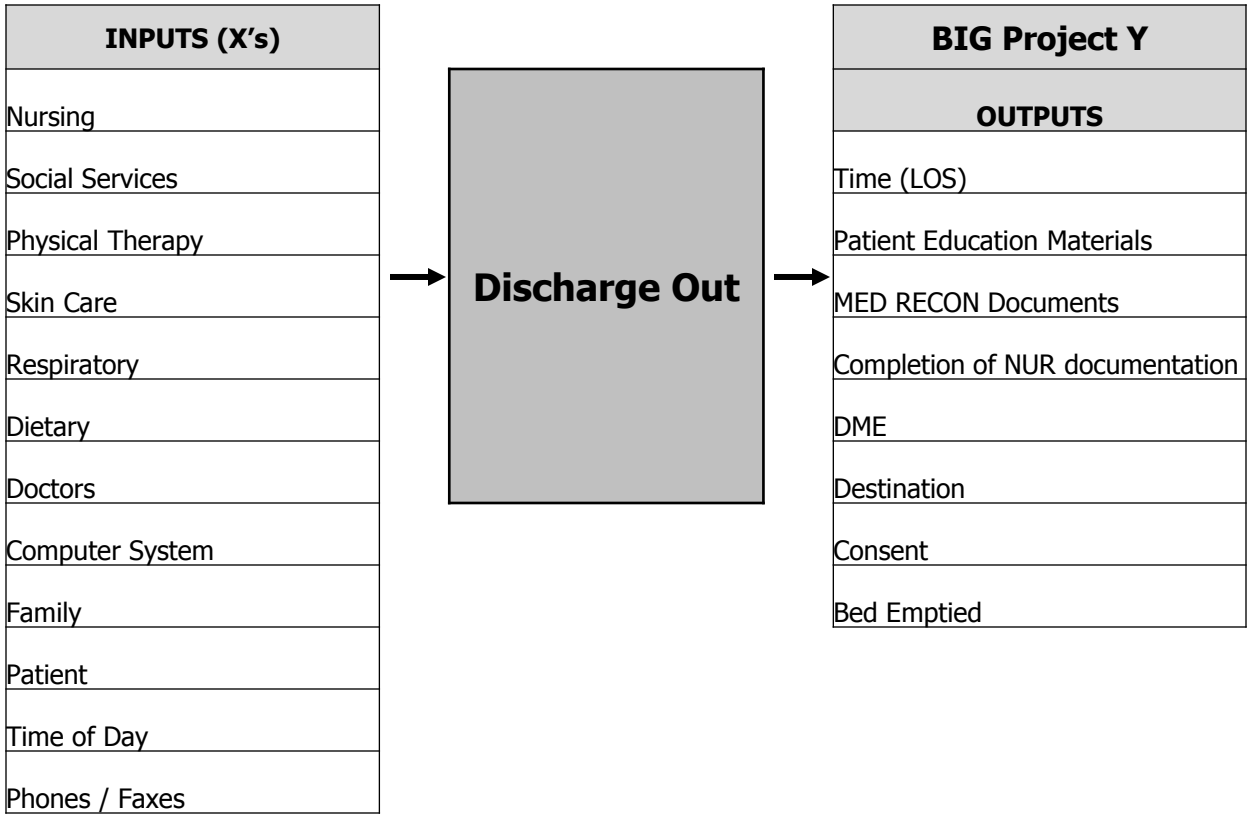
Control Plan	Hand Off Training	Final Capability	Owner Sign-off	Final Project Report
10/24/10	10/26/10	11/7/10	11/14/10	11/23/10

- Completed - On time
- Completed - Behind
- Started

Discharge Order Time to Discharge

Measure

- Process Mapping
  - High Level



Discharge Order Time to Discharge

Measure

Process Map – Low Level

Process Inputs (X)	Type	Process Step	Output (Y)
		Documenting Order (in MEDITECH) Find a terminal Navigate Screens Transcribe from paper	
Nurse	U		
Order Form	C		Special Equipment (wheel chair, walkers, O2, etc)
Order Information	C		Other Orders (Physical Therapy, Dietary, Echo, tests)
Computer Terminal	U		Date/Time
Computer Form	C		Physician Consults
Attending Doctor	U		Social Services
			Patient Destination

		Reviewing Nurse Documentation Review paper chart Review Computer Chart	
Nurses	U		Confirmation or Change of Discharge Order
Paper Chart	C		
Computer Chart	C		
Computer	U		
Discharge Order Information	C		
Discharge Order	C		

...

Nurse	U	**Patient Leaving**	
Discharge Instructions	C		
Family Members	U		Patient Has Left the Unit
Transport Company	U		
Patient	U		

Discharge Order Time to Discharge

Measure

- Cause and Effect Matrix

		Rating of Importance to Customer >>	10	8	7	9	
	Process Setp	Process Inputs	Minutes from Order to Exit	Number requiring additional social services	Number of other orders (PT, Dietary, Echo, Tests)	Number of additional physician consults	Total
6	Documenting Order in MEDITECH	Attending Doctor	9	3	3	9	216
20	Adding Physician Consult	Doctor	9	0	0	9	171
14	Communicating with Social Services	Social Worker	9	9	0	0	162
3	Documenting Order in MEDITECH	Order Information	9	3	1	3	148
11	Reviewing Nurse Documentation	Discharge Order Information	9	3	1	3	148
25	Following-up with any consulting physicians	Nurse	9	0	1	3	124
34	Filling additional orders	Ancillary Departments	9	1	3	0	119
43	Printing and Reviewing with Patient	Patient	9	3	0	0	114
45	Printing and Reviewing with Patient	Family Members	9	3	0	0	114
30	Filling additional orders	Nurse	9	1	0	0	98
42	Printing and Reviewing with Patient	Nurse	9	1	0	0	98

Discharge Order Time to Discharge

Measure

- Initial FMEA

Key Process Input	Potential Failure Mode	Potential Failure Effects	SEV	Potential Causes	OCC	Current Controls	DET	RPN
What is the Key Process Input?	In what ways does the Key Input go wrong?	What is the impact on the Key Output Variables (Customer Requirements) or internal requirements?	How Severe is the effect to the cusotmer?	What causes the Key Input to go wrong?	How often does cause or FM occur?	What are the existing controls and procedures (inspection and test) that prevent either the cause or the Failure Mode? Should include an SOP number.	How well can you detect cause or FM?	
Attending Doctor	Incomplete Form	Nurse has to call to clarify	5	Information selectivity	1	Nurse entering the data into MEDITECH	7	35
Attending Doctor	Incomplete Form	Nurse has to call to clarify	5	Information selectivity	1	Visual review of documents	7	35
Attending Doctor	Incomplete Form	Nurse has to call to clarify	5	Pages missing	0	Doctor filling out the form	2	0
Attending Doctor	Bad handwriting	Nurse has to call to clarify	5	Language	1	None	7	35

Discharge Order Time to Discharge

Measure

- FMEA Action Steps

Process Step	Key Process Input	Potential Failure Mode	Potential Failure Effects	SEV	Potential Causes	OCC	Current Controls	DET	RPN	Actions Recommended	Resp.
Communicating with Social Services	Social Worker	Nursing not accessing social services notes	Wait	10	Nursing does not know where the notes are	9	Education	8	720	Inservices with nursing staff.	Sharon Smith
Communicating with Social Services	Social Worker	Nursing not accessing social services notes	Wait	10	MEDITECH setup to store data in different places	9	Education	8	720	No MEDITECH action required. Education.	SS/HM
Communicating with Social Services	Social Worker	Patient is an existing nursing home patient	Wait	8	Transportation	3	Phone Call to transport co.	10	240	Data analysis	BB/MH
Communicating with Social Services	Social Worker	Patient is a new nursing home patient	Wait	8	Transportation	3	Phone Call to transport co.	10	240	Data analysis	BB/MH
Printing and Reviewing with Patient	Nurse	Workload	Wait	6	multiple demands from multiple patients	5	None	8	240	Data analysis / Trial Discharge Nurse	BB/MH/SS/MM

Discharge Order Time to Discharge

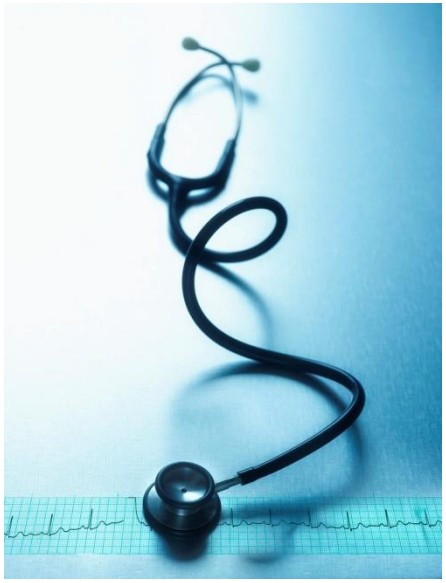
Measure

- Initial FMEA Action Steps
  - Education
    - Instruction on how nurses can view social services notes in the computer ✓
  - Nursing Home transportation
    - Of the sampled patients that need nursing home transportation, their waits are statistically the same as other patients ✓
  - Discharge Nurse Pilot ✓
    - Gather additional data on the process

Discharge Order Time to Discharge

Analyze

Printing and Reviewing with Patient	Nurse	Workload	Wait	6	multiple demands from multiple patients	5	None	8	240	Data analysis / Trial Discharge Nurse



Nursing Ratio: 1 nurse to 5 patients

Approval to trial a "discharge nurse" on the 5th Floor.

For discharges between 9:30 – 6:00, we were able to gather data for analysis via the discharge nurse.

Discharge Order Time to Discharge

Improve

After a two week trial period, did the discharge nurse make a statistical difference?

Mood Median Test: Minutes versus Pilot

```
Mood median test for Minutes
Chi-Square = 7.89    DF = 1    P = 0.005

                                 Individual 95.0% CIs
Pilot    N<=  N>  Median  Q3-Q1  ---+---------+---------+---------+---
After     89  64   120.0   112.5  (--*------------)
Before    52  74   149.0   117.0                   (---*-------------)
                                 ---+---------+---------+---------+---
                                  120       135       150       165

Overall median = 140.0


A 95.0% CI for median(After) - median(Before): (-39.0,-14.3)
```

Discharge Order Time to Discharge

Improve

- **Pilot a discharge nurse role**
- **Responsibilities:**
  - Work with charge nurse in discharge forecasting
  - Work existing discharge orders
  - Meet with patients and patient families to finalize discharge paper work
  - Work with social services and case management
  - Capture additional data for discharge process improvement.
  - Promote patient safety
  - Promote patient satisfaction and patient education

Discharge Order Time to Discharge

Improve

Analysis of pilot and pre-pilot data

From 1/1/2010 – 4/20/2010, the average time from discharge order to discharge for the 5th floor was 3 hours and 32 minutes.

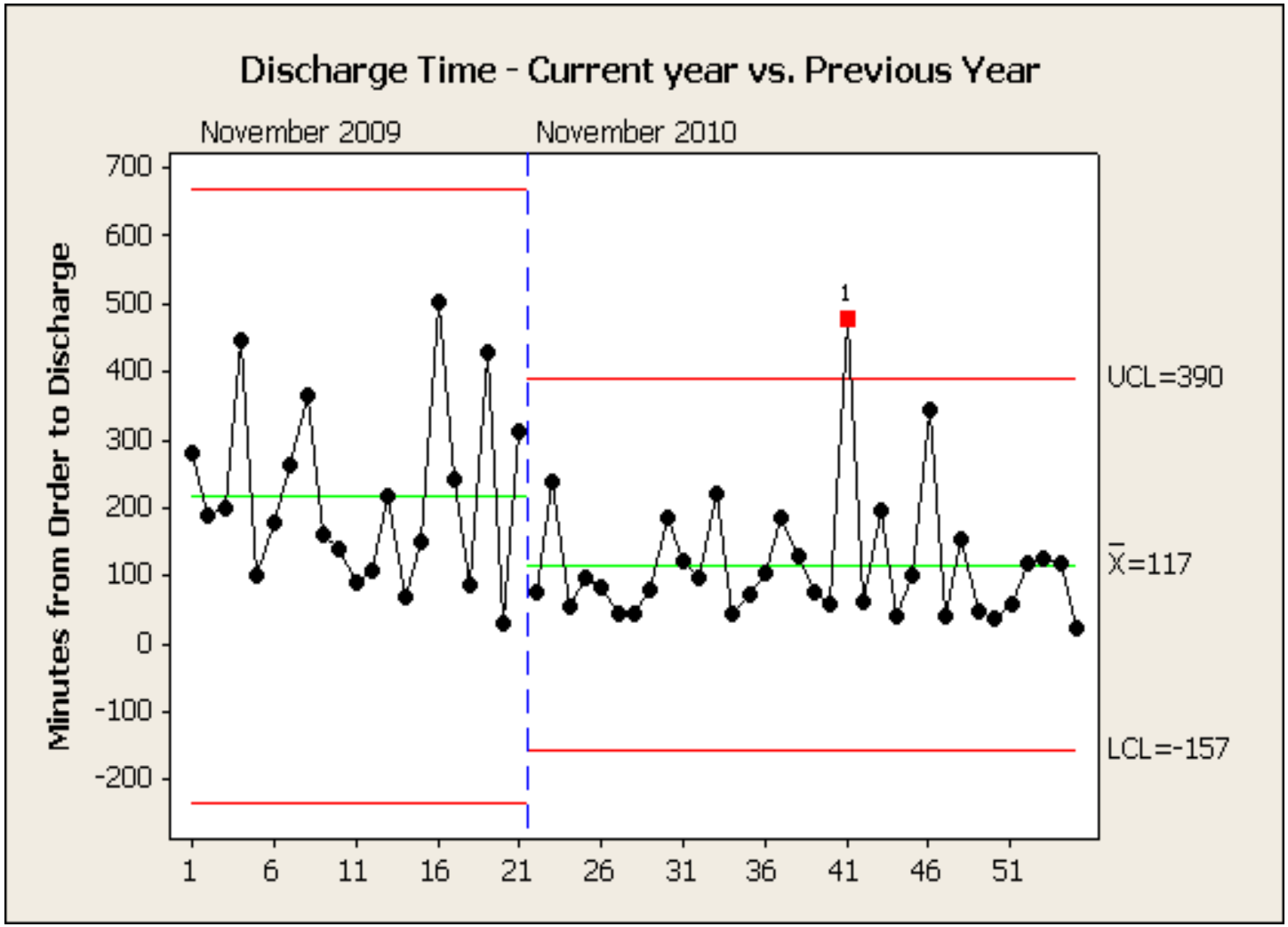
From 7/26/2010 – 8/20/2010, the average time from discharge order to discharge for the 5th Floor was 2 hours and 5 minutes.

Average *improvement* with the discharge nurse pilot:

1 Hour and 27 minutes per discharge

Discharge Order Time to Discharge

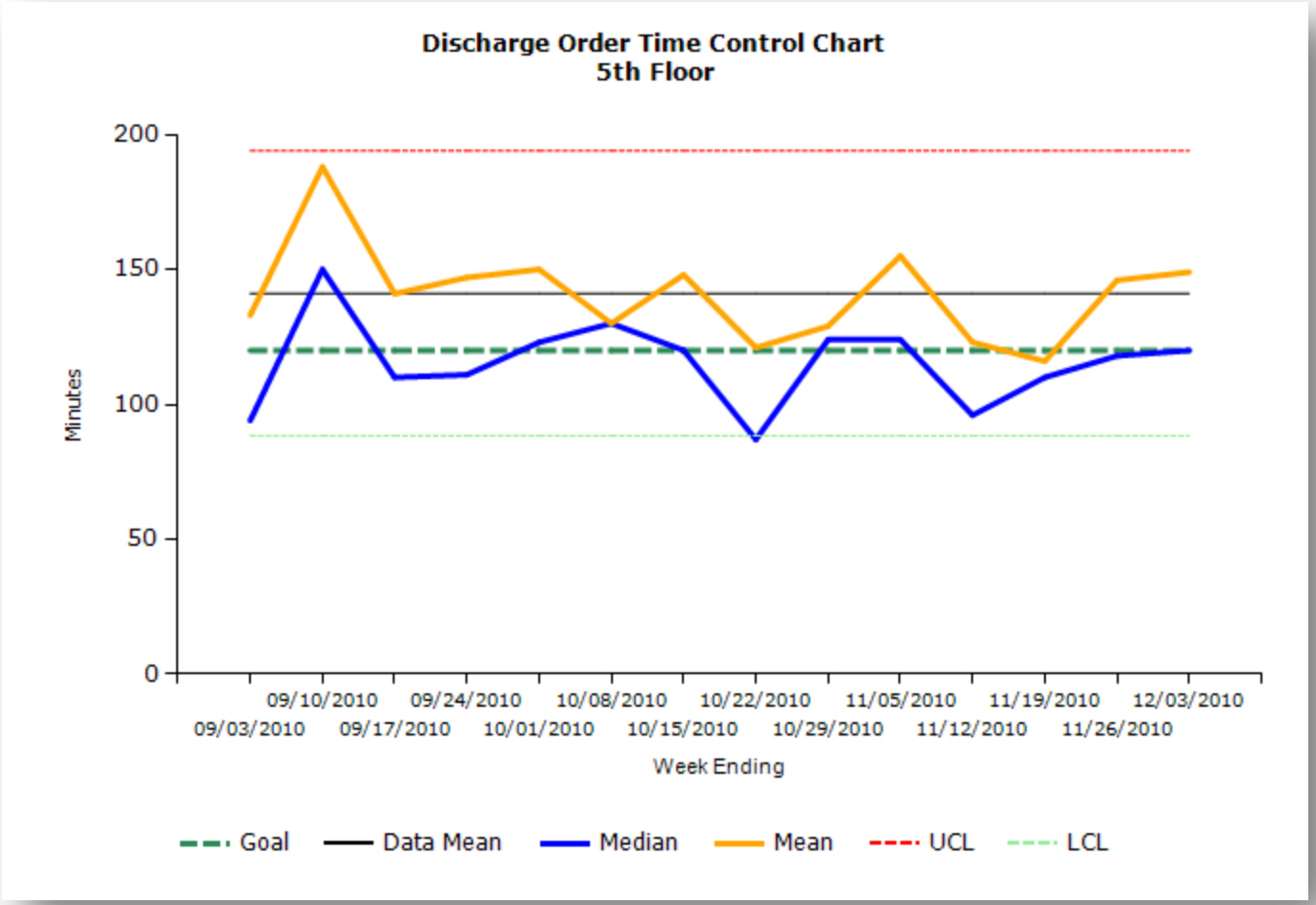
Control



Discharge Order Time to Discharge

Control

Ongoing monitoring via automated reporting



Discharge Order Time to Discharge

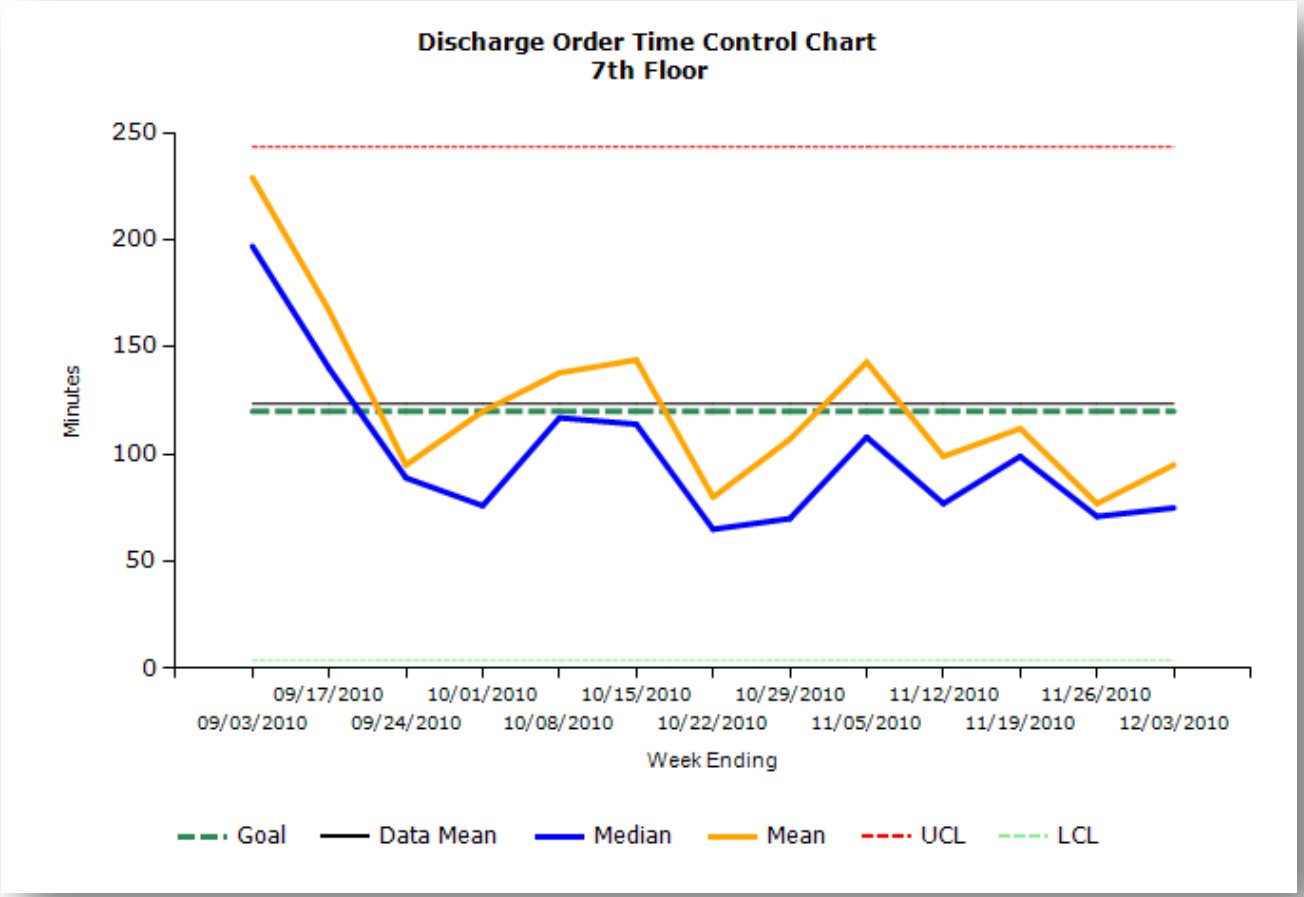
Control

- **Lessons Learned**
  - Higher compliance with medication reconciliation
  - Higher compliance with CHF discharge documentation
  - Increase in patient satisfaction (for those wanting a shortened discharge wait)
  - Increase in physician satisfaction
  - Change of physician rounding practices
- **Replication**
  - 7th Floor

7th Floor Replication

Control

1/1/2010 – 4/20/2010: 3 hours 36 minutes



What's next?

Control

- Weekly review of control reports
- Continual monitoring of the process
- Evaluate effectiveness for similar approach in other areas of the hospital