ASCO's Quality Training Program

Project Title: Standardizing early identification and treatment of Febrile Neutropenia (FN)

Presenter's Name:

Brian Byrne, MD
Patricia DeFusco, MD
Pat Montanaro, BSN MBA
Frederick Bailey III, MA PTA MBA

Institution: Hartford Healthcare Cancer Institute (HHC-CI)

Date: June 29, 2018

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Institutional Overview

Name: The Hospital of Central Connecticut (HOCC)

Location: New Britain, Connecticut

Patient Volume: 935 cancer patients per year

Practice Setting: Community Hospital

Med Onc: 6; Gyn-Onc: 2

- HHC-CI is an integrated delivery network comprised of 6 hospitals
- The Cancer Institute is a member of the Memorial Sloan Kettering Cancer Alliance through which clinical trials and quality improvement activities occur
- 6,000 analytic cancer patients are seen each year
- 25% of Connecticut's cancer population receives their care through HHC-CI

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Problem Statement

Patients undergoing treatment with chemotherapy are at risk for neutropenic fever which can lead to severe sepsis and death if not treated properly.

The goal of this project is to standardize the treatment of neutropenic fever in the first 48 hours at HOCC to reduce variation and improve outcomes.

The literature recommends a triage to antibiotic time of less than one hour in patients with neutropenic fever.

Team Members

Role	Name	Job Function
Project Sponsor#	Peter Yu, MD	Physician-In-Chief
Core Team Leader+	Brian Byrne, MD	Medical Oncologist
Core Team Operations Lead*	Fred Bailey	Director, East Region
Core Team Member*	Pat Montanaro	Director, IT Cancer Institute
Core Team Member*	Pat DeFusco, MD	Medical Oncologist
Nursing Site Lead Bradley Hospital	Regina Ali	Charge Nurse
Oncology Operations Lead	Stacey Barber	Oncology Operations Manager
Pharmacy Clinical Lead	Kelly Brennan	Pharmacist
Emergency Room Quality Physician	Michelle McDade, MD	Emergency Room
Emergency Services Site Lead	David Buono, MD	Physician, ED Lead
Inpatient Oncology Nursing Lead	Edwin Cordero	Oncology Nurse Manager
Pharmacy Administrative Lead	David Girouard	Senior Director
Clinical Specialist, Emergency Services	Ewelina Ledas	RN, Clinical Specialist
Epic Application Analyst, ASAP/ED	Michele Lefebvre	RN, Application Analyst
Oncology Account Support, Quest	Scott Osipiak	HHC Oncology Account Executive
Central Region Leadership	Kris Popovitch	Director of Oncology, Central Region
Emergency Services Nursing Lead	Shawnna Scirpo	Clinical Manager
CareConnect Lead – ASAP/ED	Beth Myers-Zern	ASAP Team Lead
QTP Improvement Coach	Holley Stallings	QTP team coach extraordinaire!

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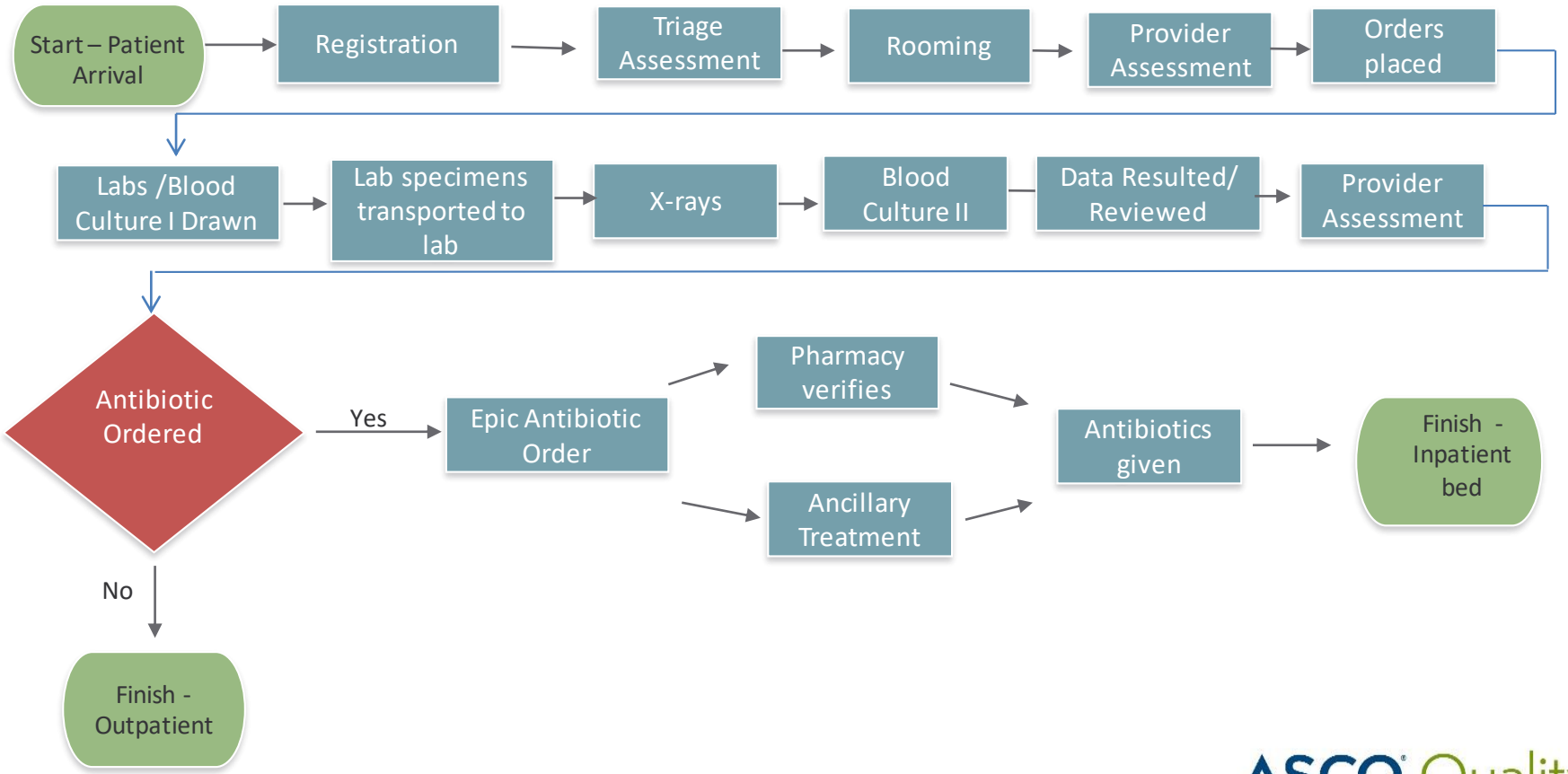
Process Map



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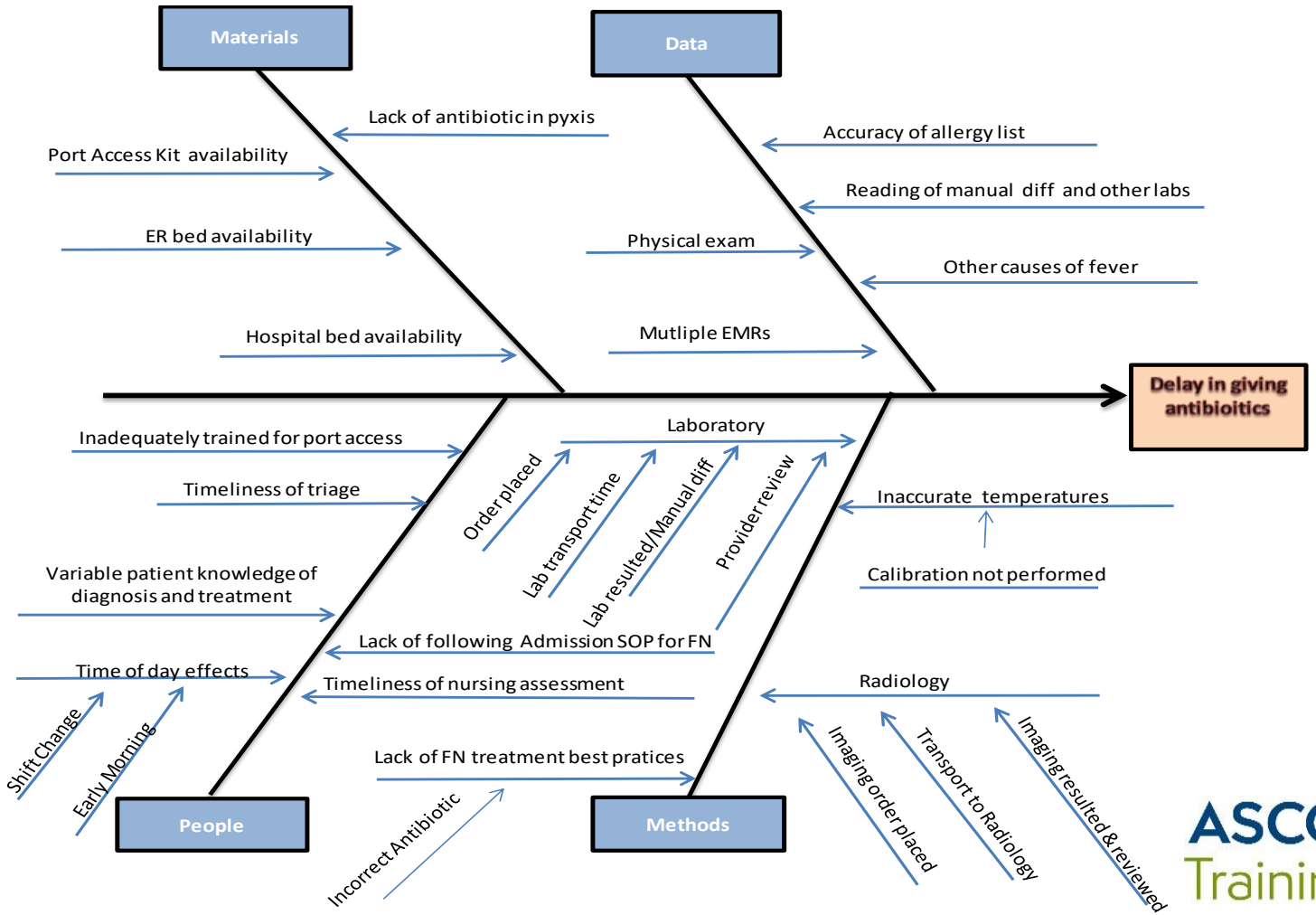
Cause & Effect Diagram



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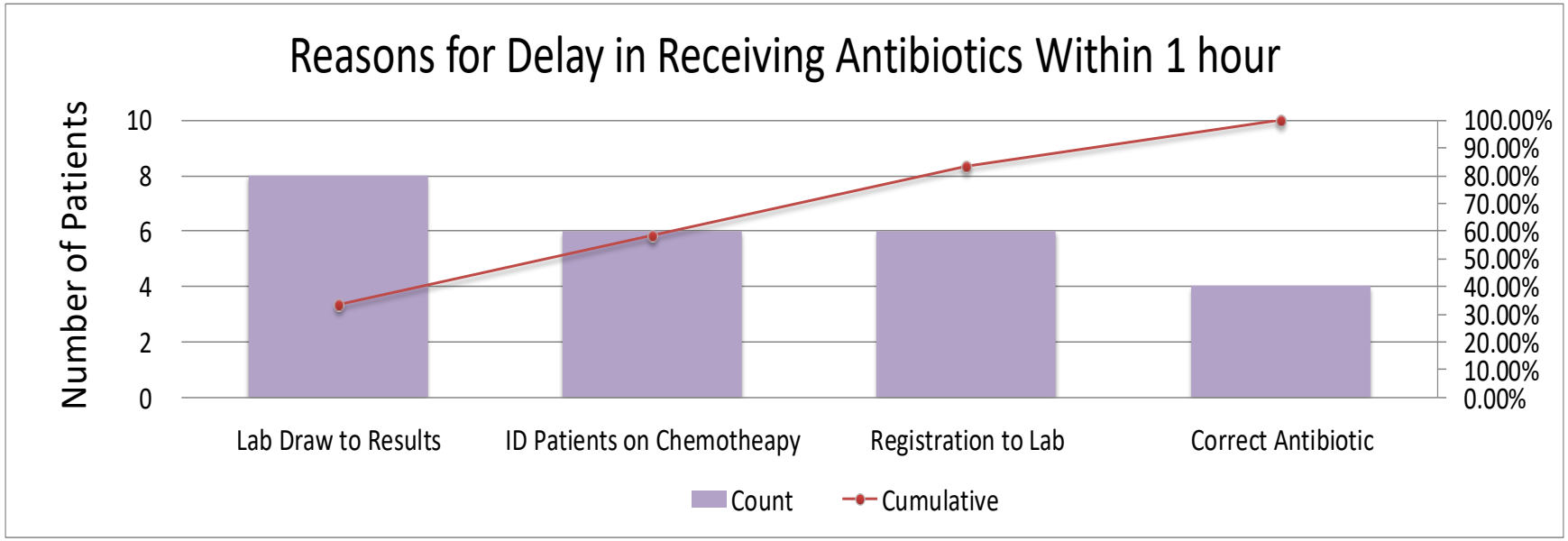
Diagnostic Data



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Aim Statement

By 12/1/2018, for patients undergoing chemotherapy in the outpatient setting who develop neutropenic fever, the objective is to reduce the time it takes to receive correct antibiotics from 176 to 120 minutes at HOCC.

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Measure 1

- Measure: Arrival time to antibiotic administration
- Patient population:
  - Outpatients on chemotherapy who present to Emergency Room with neutropenic fever
- Calculation methodology: Time of registration to time of antibiotics
- Data source: Epic
- Data collection frequency: Every 2 weeks
- Data quality (any limitations): Identifying all patients, Lack of definitive code

Measure 2

- Measure: Time of Lab Collection to Time Lab Resulted
- Patient population:
  - Outpatients on chemotherapy who present to Emergency Room with neutropenic fever
- Calculation methodology: Time from Lab draw to time of final result
- Data source: Epic
- Data collection frequency: Every 2 weeks
- Data quality (any limitations): Identifying all patients, Lack of definitive code

Measure 3

- Measure: Appropriate Antibiotic Prescribed*
- Patient population:
  - Outpatients on chemotherapy presenting to Emergency Room with neutropenic fever
- Calculation methodology: Patients who receive correct antibiotics divided by total patients who present to ER with neutropenic fever
- Data source: Epic
- Data collection frequency: Every two weeks
- Data quality (any limitations): Identifying all patients, Lack of definitive code

* As per NCCN Guidelines: https://www.nccn.org/professionals/physician_gls/default.aspx

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Measure 4

- Measure: Appropriate Antibiotic Prescribed and Administered within 2 hours*
- Patient population:
  - Outpatients on chemotherapy presenting to Emergency Room with neutropenic fever
- Calculation methodology: Time from arrival in ED to time of administration of correct antibiotic
- Data source: Epic
- Data collection frequency: Every two weeks
- Data quality (any limitations): Identifying all patients, Lack of definitive code

* As per NCCN Guidelines: https://www.nccn.org/professionals/physician_gls/default.aspx

Baseline Data

Arrival	Campus	Fever	Labs Collect	Labs Resulted	Cefepime	Time to Med	Comments
21:03	NBGH	21:08	22:06	23:43	00:03	3:00	Multiple delays
11:31	NBGH	11:37	12:37	13:16	No		No antibiotic
17:13	BMH	17:20	17:32	18:56	21:49	4:36	Wrong antibiotic 17:59
16:47	NBGH	16:56	17:37	18:38	No		No antibiotic
4:08	NBGH	4:51	5:20	7:00	9:28	5:20	Wrong antibiotic (Unasyn)
10:32	BMH	10:39	11:11	12:09	12:06	1:34	Wrong dose (1g)
10:18	NBGH	10:18	11:09	12:46	11:49	1:31	Came in with fever
13:02	BMH	13:14	13:31	14:58	16:11	3:09	Lab & med delay
13:58	NBGH	14:07	14:29	15:55	16:00	2:15	Wrong antibiotic (Vanco)
22:13	BMH	22:18	22:56	24:00	00:28	2:15	Vanco 1st, wrong Cefepime dose

Mean time to Antibiotics: 176 minutes

Mean lab time from collection to results: 77 minutes

Correct Antibiotic and dose: 5 out of 10 patients

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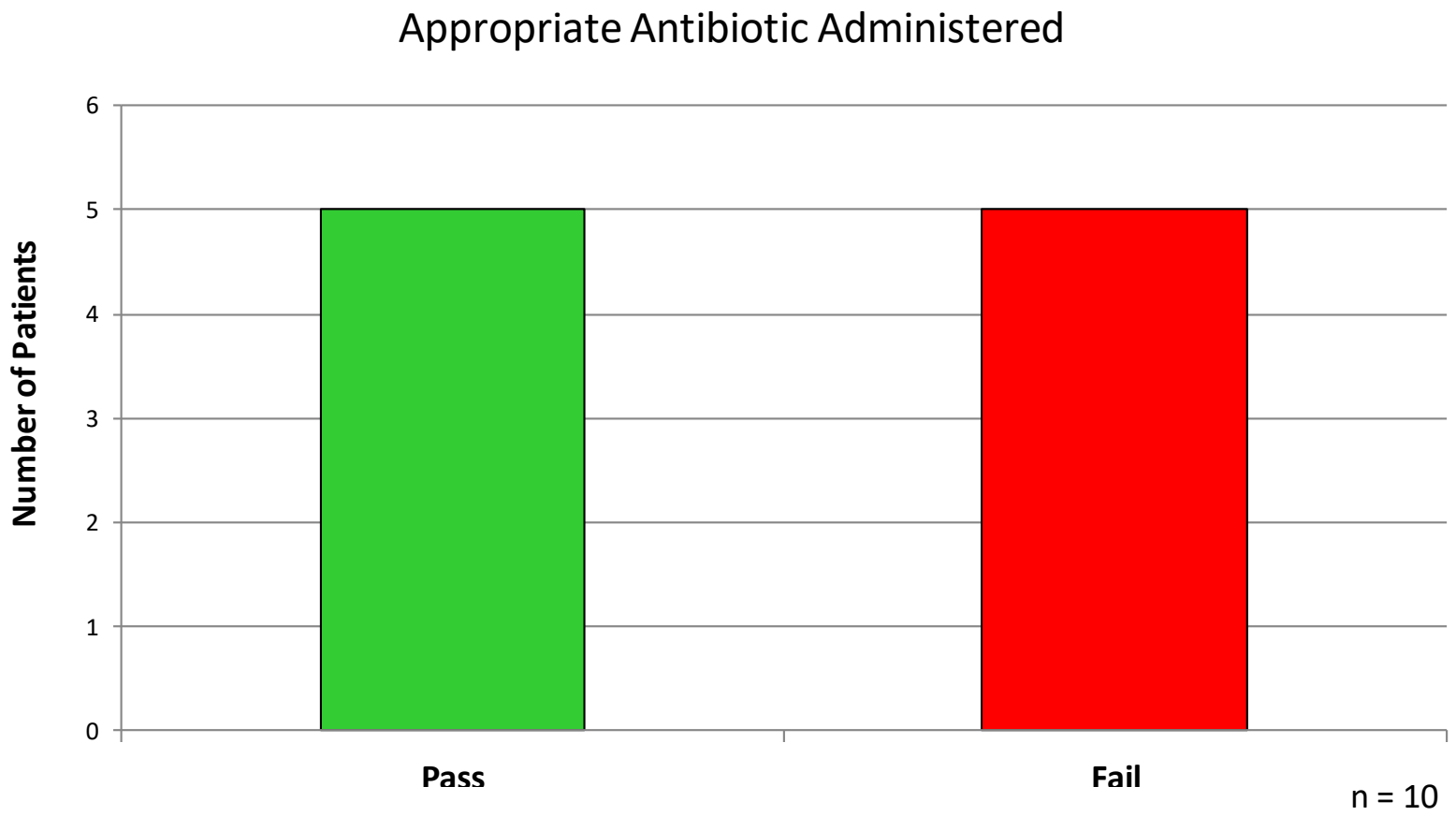
Baseline Data: Correct Antibiotic



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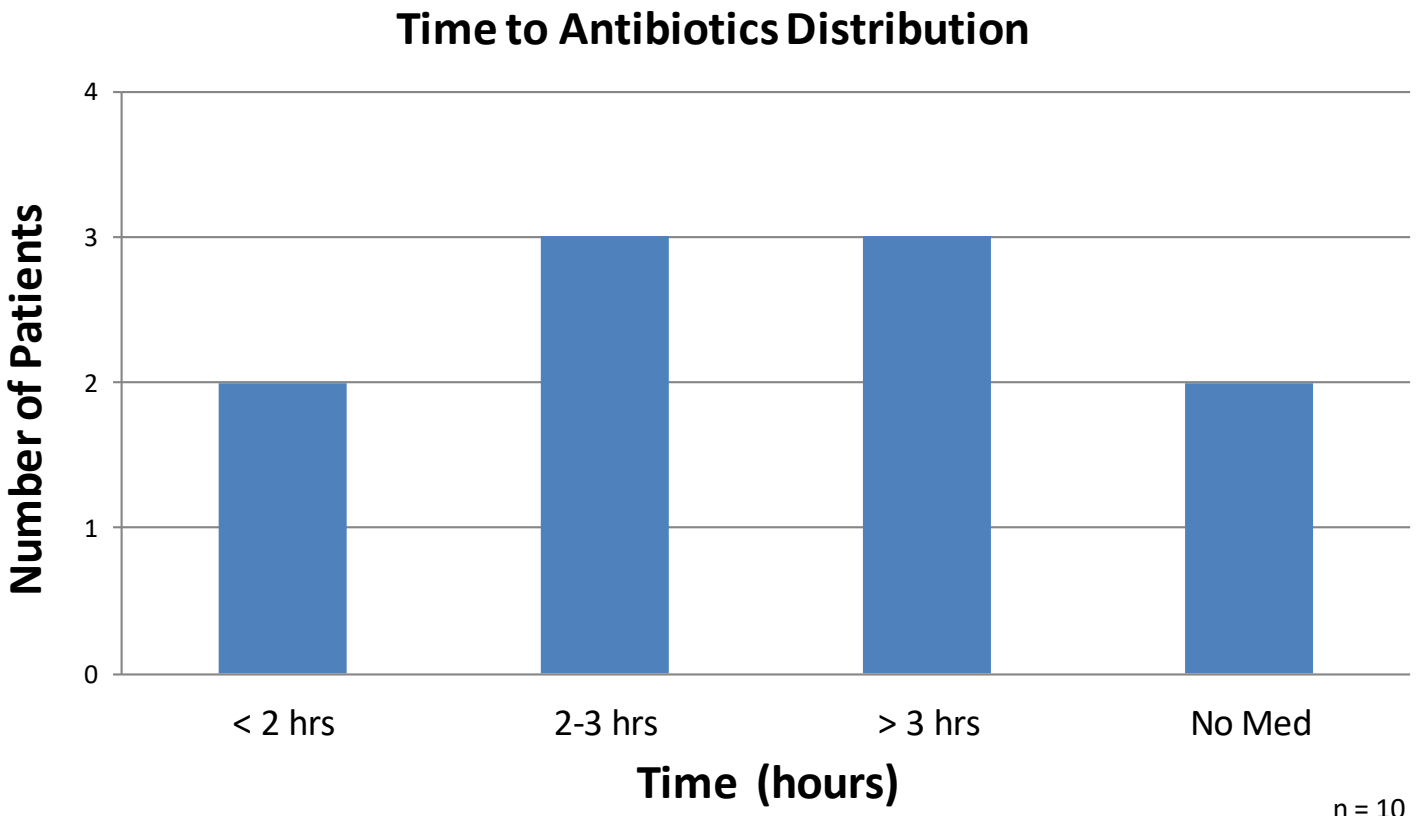
Baseline Data: Time to Antibiotic



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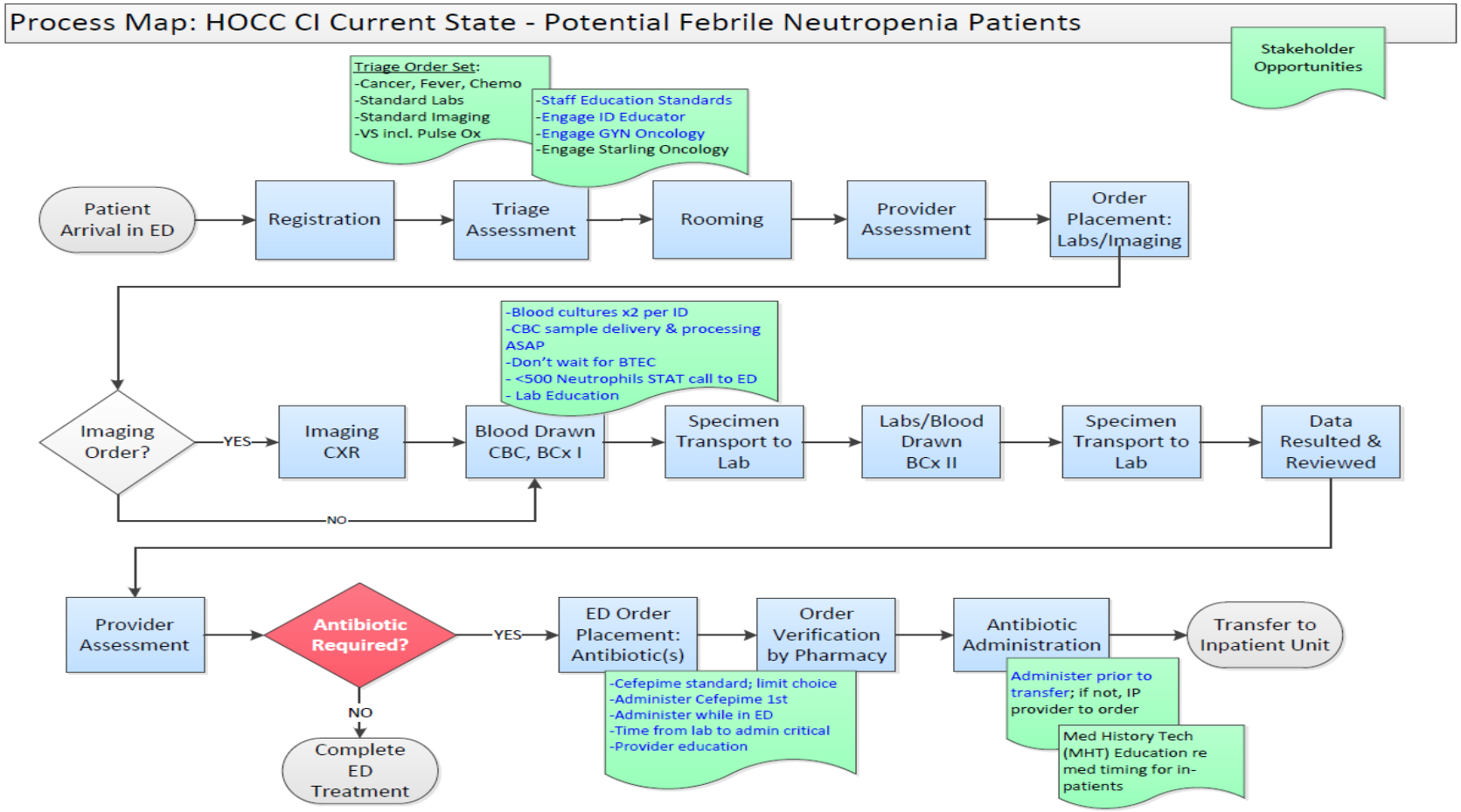
Process Map with Opportunities



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Prioritized List of Changes (Priority/Pay –Off Matrix)

Impact	Easy	Difficult

High	• Standardize Antibiotics: Cefepime/Pip-Tazo
	• Reduce time to lab draw
	• Reduce Turnaround Time (TAT) lab results to provider
	• **Review Lab manual diff policy**
	• Institute lab call to alert FN concern
	• Streamline Epic lab order sets
	
	PDSA#2 May 3, 2018
		• FN patient identified by MD
		• Create triage pathway to reduce time to ID potential FN
		• **Create FN triage order set**
		  • **Antibiotics**
		  • **LDH**
		
		PDSA#3 April 26, 2018

Low	• Lab result to ED: total WBC/MD to follow • Ensure antibiotics given in ED prior to transfer to floor • **Education on antibiotic ordering and administration start** **PDSA #1 April 25, 2018**	• Lab education: TAT for oncology patients • Registration education: Script for identifying oncology patients • Patient education: Key points to mention when patient presents at ED • Provider education: NCCN guidelines for appropriate antibiotics for FN • Enhance lab transport time **PDSA#2 May 3, 2108**

Ease of Implementation

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PDSA Plan (Test of Change)

Date of PDSA Cycle	Description of Intervention	Results	Action Steps
April 25, 2018	Education on antibiotic ordering and administration start	Staff education and Educational tip sheet	Brought problem to Nurse Educator & communicated best practice
April 26, 2018	Create FN triage order set	In process awaiting approval	Met with IT Team Collaborated with sepsis team
May 3, 2018	Review Lab Manual Diff Policy	Allowed release of preliminary CBC with Diff results	Discussion with Lab Leadership and Infectious Disease

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Educational Materials Developed

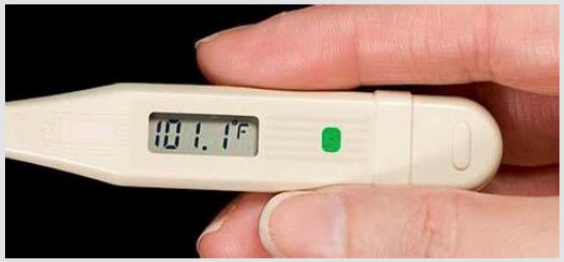
Neutropenic Fever ED Initiative

- **FACT:** If antibiotics are not administered within the first two hours of ED arrival, patients with neutropenic fever increase their length of stay by 8 hours for each hour that antibiotics are delayed

- **What does this mean?**
  - Antibiotics should be administered within the first **TWO** hours of arrival to the ED for patients with neutropenia and fever

- **How can we tell if a patient is neutropenic right away?**
  - We can't until the CBC is resulted but we must screen the patient at triage! If the patient has a **FEVER** and is receiving **CHEMOTHERAPY**, the patient must be placed in a room **immediately** and a work up must be initiated as these patients are high-risk. They should **NOT** wait in the waiting room.

- **FACT:** Two sets of blood cultures are still required prior to antibiotic administration for patients with neutropenic fever



- **What sites are appropriate for blood culture collection?**
  - One set **must** be obtained from a peripheral site
  - The other set **may** be obtained from a port-a-cath or second peripheral site

- **How are antibiotics administered?**
  - Cefepime should be administered **FIRST**, as gram negative coverage is most important, followed by any additional ordered antibiotics such as vancomycin

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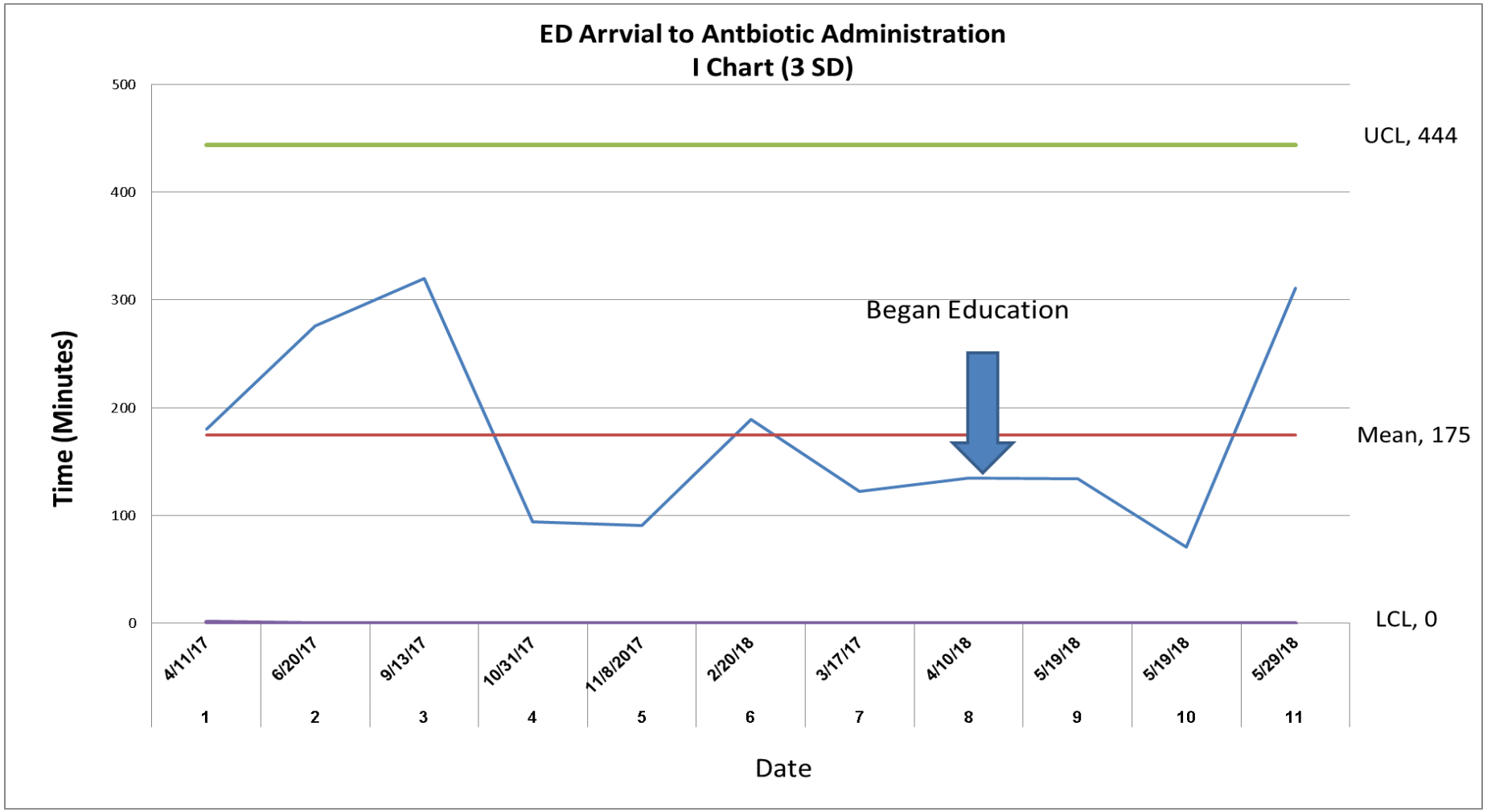
Change Data: Measure 1



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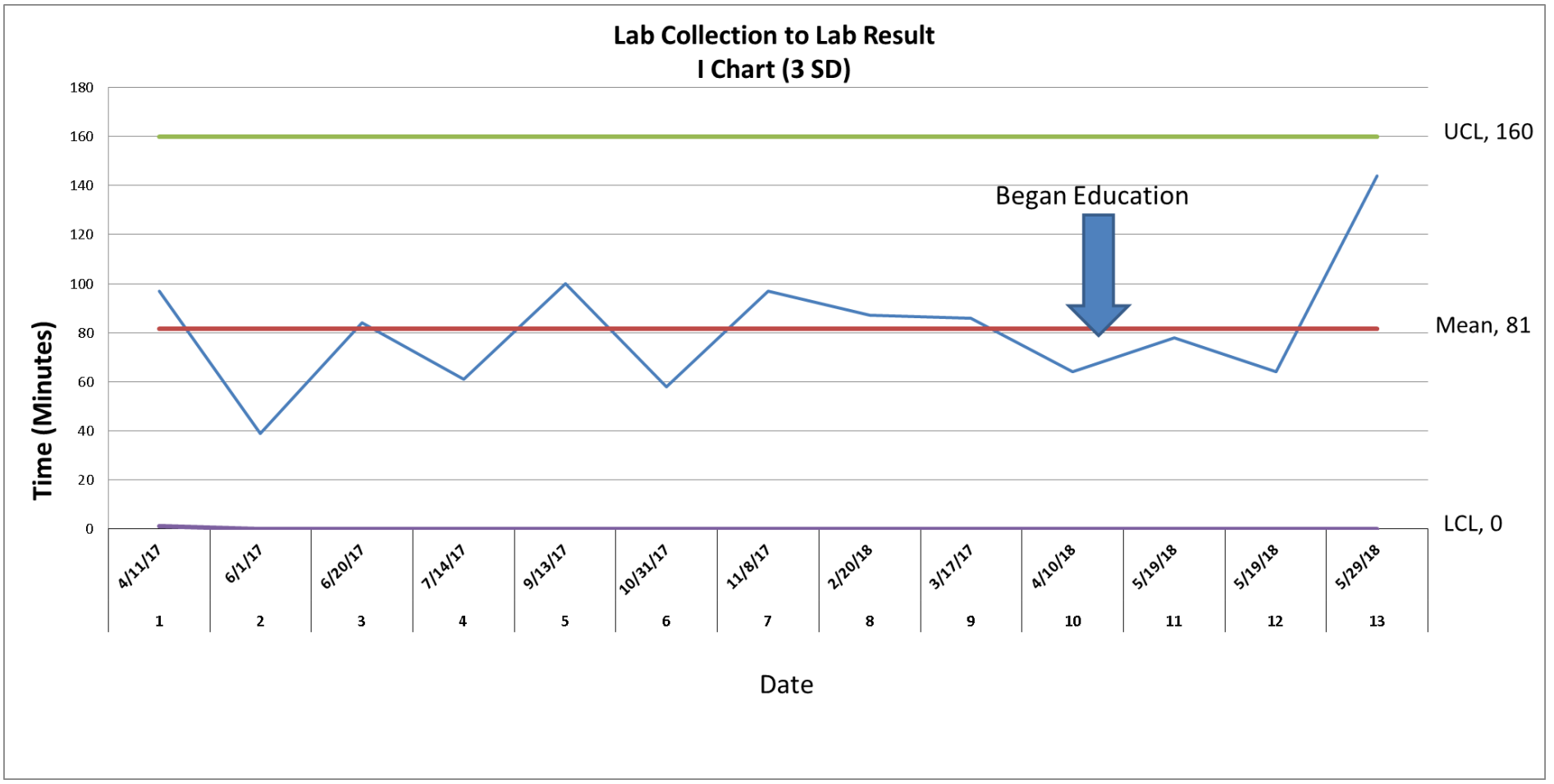
Change Data: Measure 2



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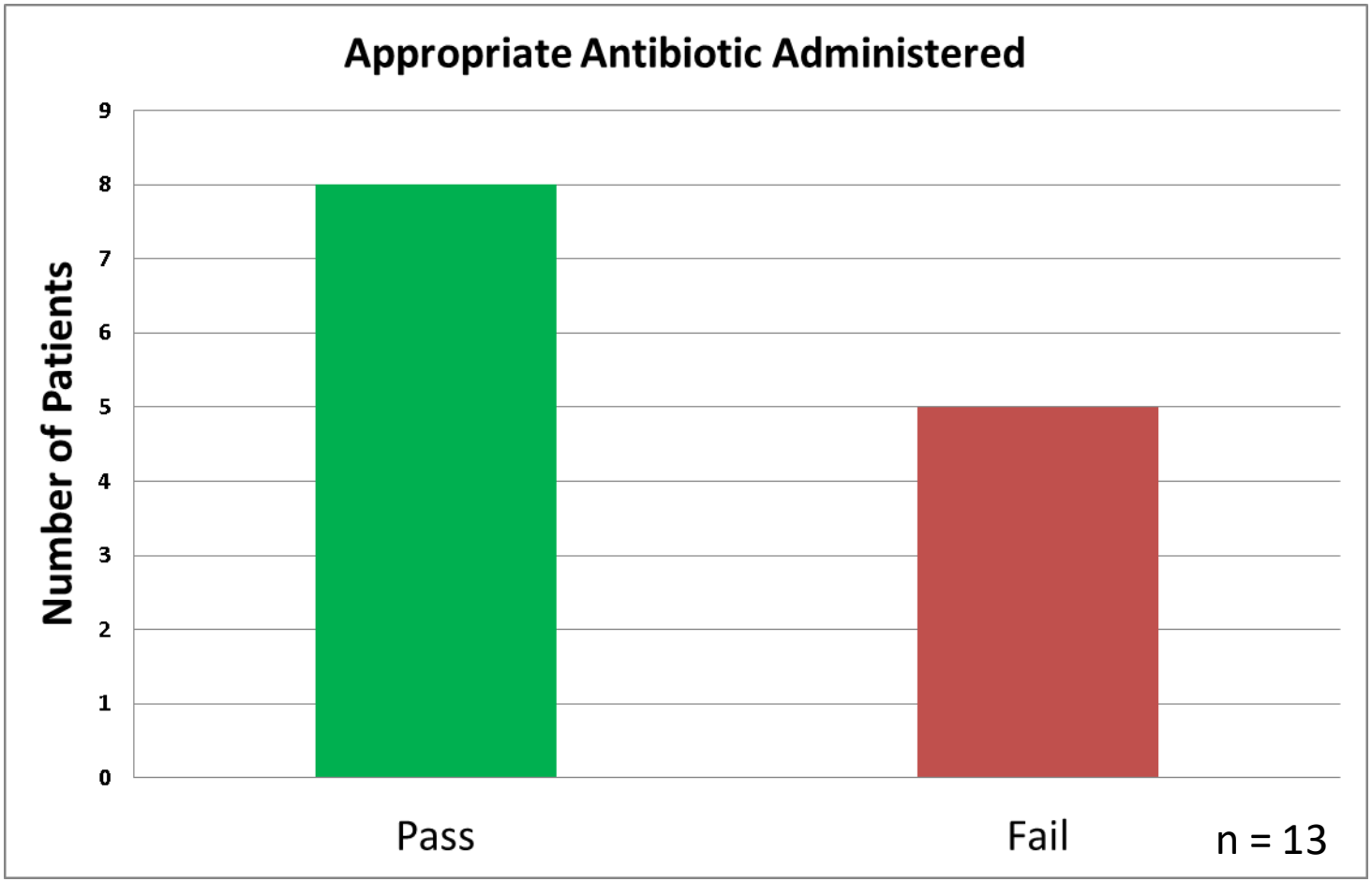
Change Data: Measure 3



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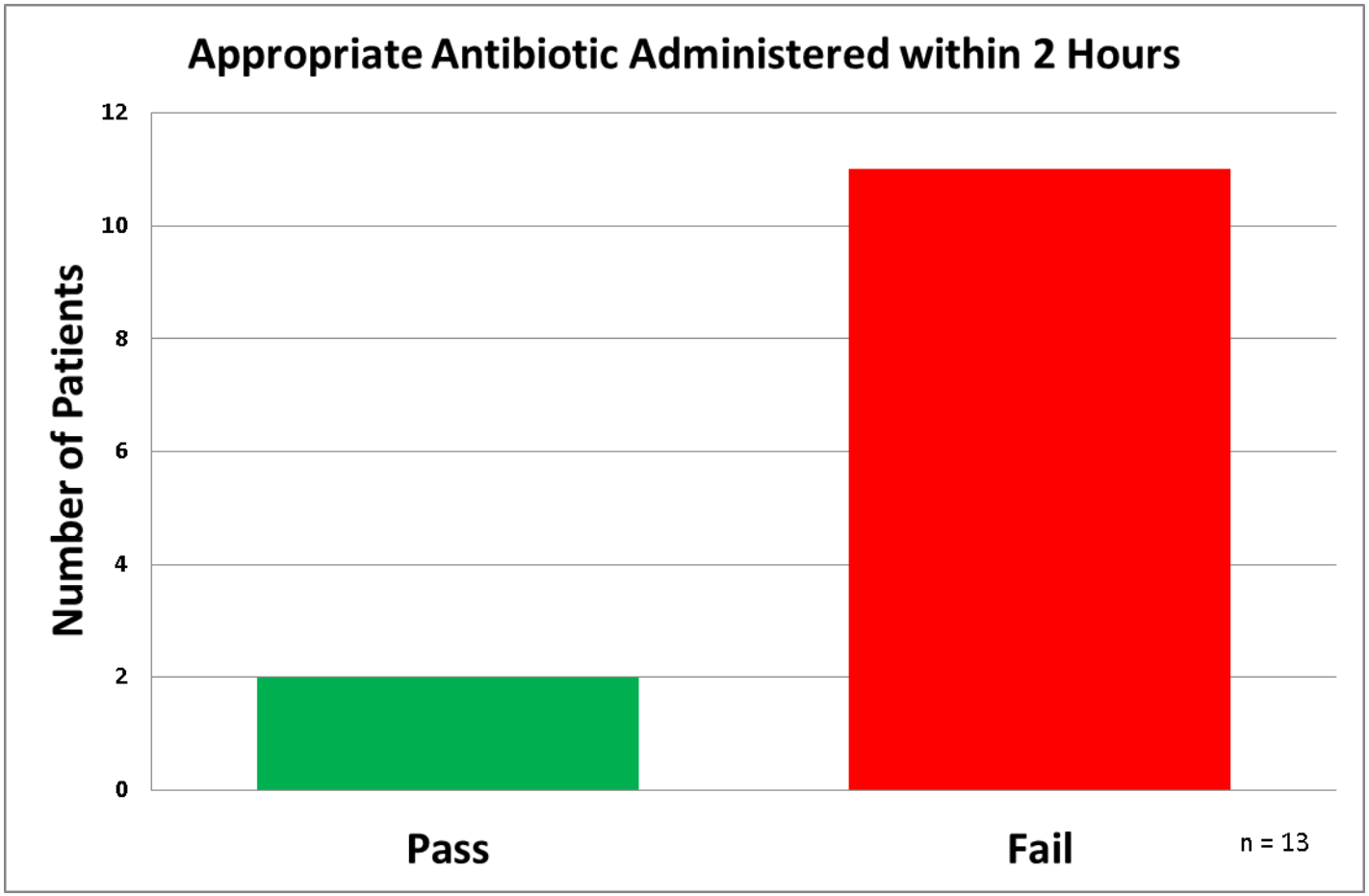
Change Data: Measure 4



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Conclusions

- Although we were able to introduce a new process for HOCC outpatient chemotherapy patients with FN, we did not attain our aim of reducing our average time from arrival in the ED to administration of cefepime to 120 minutes.
- Although our data set was limited, we went from 50% alignment with national guidelines for appropriate antibiotics to 100% following PDSA for this measure.
- We were able to educate the ED staff on the evidence-based process for the treatment of our target patient population, and developed a staff education tip sheet as of April 25, 2018.
- We did obtain a policy review, and received approval from the laboratory to release preliminary lab results in lieu of waiting for the manual differential as of May 3, 2018.
- An Epic order set for FN is in process with an anticipated launch in August 2018.
- We will continue to use the PDSA methodology to optimize targeted processes.

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Lessons Learned

- Difficult to navigate competing initiatives with limited resources
- Better access to relevant data following Epic implementation across the HHC-CI
- Earlier access to Epic report writing resources would have facilitated data analysis
- Although focusing on one HHC organization limited our data set, this enabled a manageable scope for introducing the QTP process – keep focus narrow

Next Steps/Plan for Sustainability

- Epic order set for FN
- Continued staff education; standard workflow
- Continued tracking of FN quality measures and utilization PDSA cycles with expanded team support
- Expand PDSA focus to include patient education
- Expand standard FN process across the HHC System
- Use results of this project to aid in development of predictive analytics for FN patients (active initiative between MIT and HHC-CI)

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Thank You!

Questions??

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