

ASCO's Quality Training Program

Project Title: Treatment of febrile neutropenia at the University of Virginia

Presenter's Name: Tri Le, MD, Tanya Thomas, RN, Michael Keng, MD

Institution: University of Virginia, Emily Couric Cancer Center

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Institutional Overview

- The University of Virginia (UVA) Department of Hematology-Oncology at the Emily Couric Clinical Cancer Center is an NCI-designated cancer center and a tertiary referral center located in Charlottesville, Virginia
- The UVA Cancer Center includes more than 130 researchers from 22 different academic departments
- Over 30,000 patient visits for fiscal year 2014
- Current clinical practice includes 7 attendings in malignant hematology, 3 in stem cell transplant, 3 in benign hematology, and 11 in oncology

Problem Statement

- Febrile neutropenia is a common complication in oncology patients and is associated with significant morbidity and mortality if untreated. Both national and international guidelines recommend the administration of appropriate antibiotics within one hour of a febrile neutropenic episode. Upon review of time-to-antibiotic administration for febrile neutropenia events at our institution, a significant percentage (~55% in 2012) were not administered antibiotics within 1-hour of event.

Team Members

Team Leader:

- Tri Le, MD (hematology-oncology fellow)

Team Members:

- Tanya Thomas, BSN, BA, RN, OCN (assistant nurse manager, oncology inpatient)
- Michael Keng, MD (hematology attending)
- Elizabeth Daniels, MSN, RN (nurse manager, oncology inpatient)
- Regina DeGennaro, DNP, RN, AOCN, CNL (oncology nursing)
- Stephanie Mallow-Corbett, PharmD (Director, Clinical Pharmacy Services)
- Joseph Moffett, RN (Medical Emergency Response RN)
- Costi Sifri, MD (Infectious Disease Attending, hospital epidemiology)
- Li Jin (Bioinformatics)
- Joshua Reuss (Internal Medicine Resident)

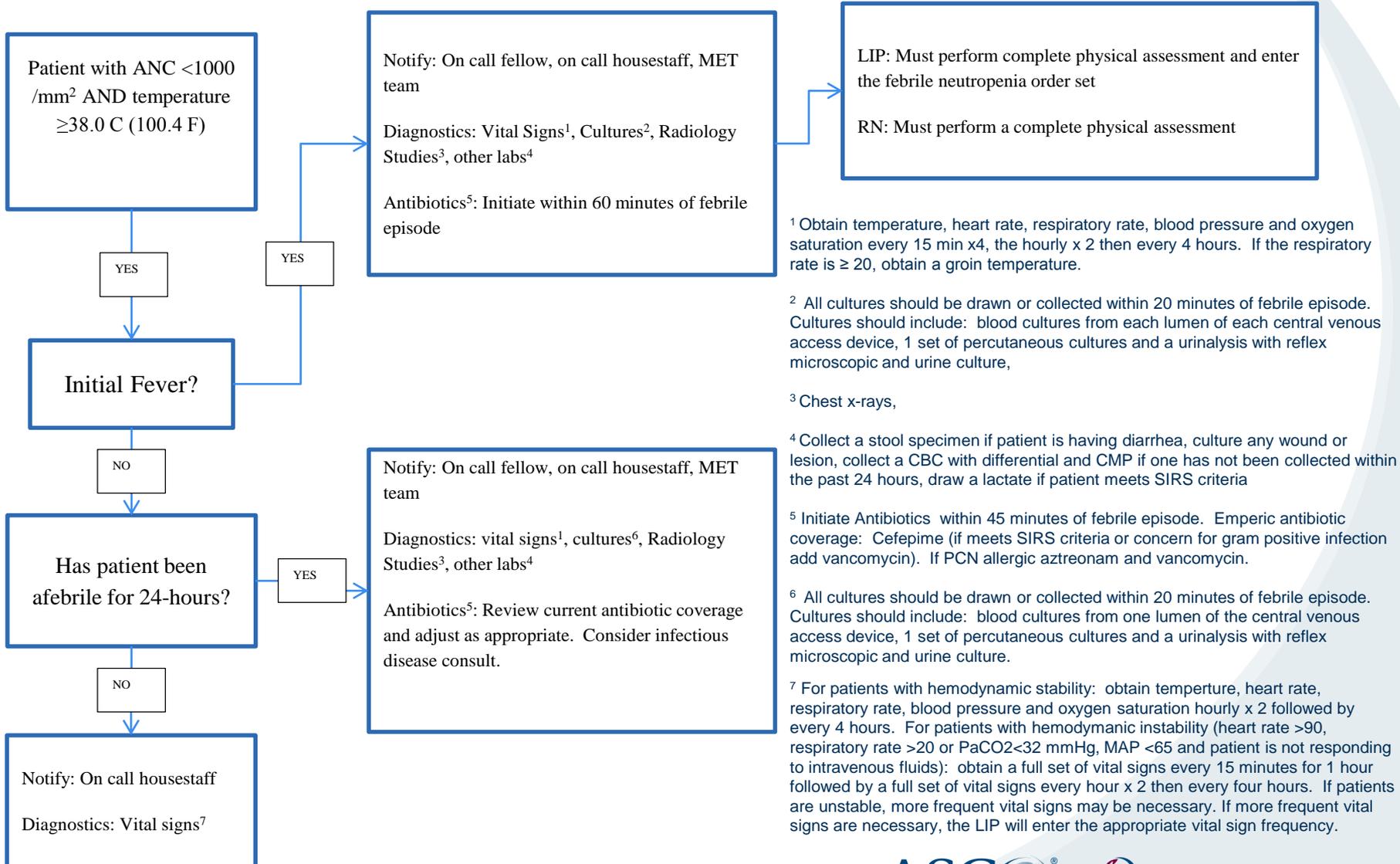
Project Sponsor:

- Michael E. Williams, MD (Hematology-Oncology division chair)

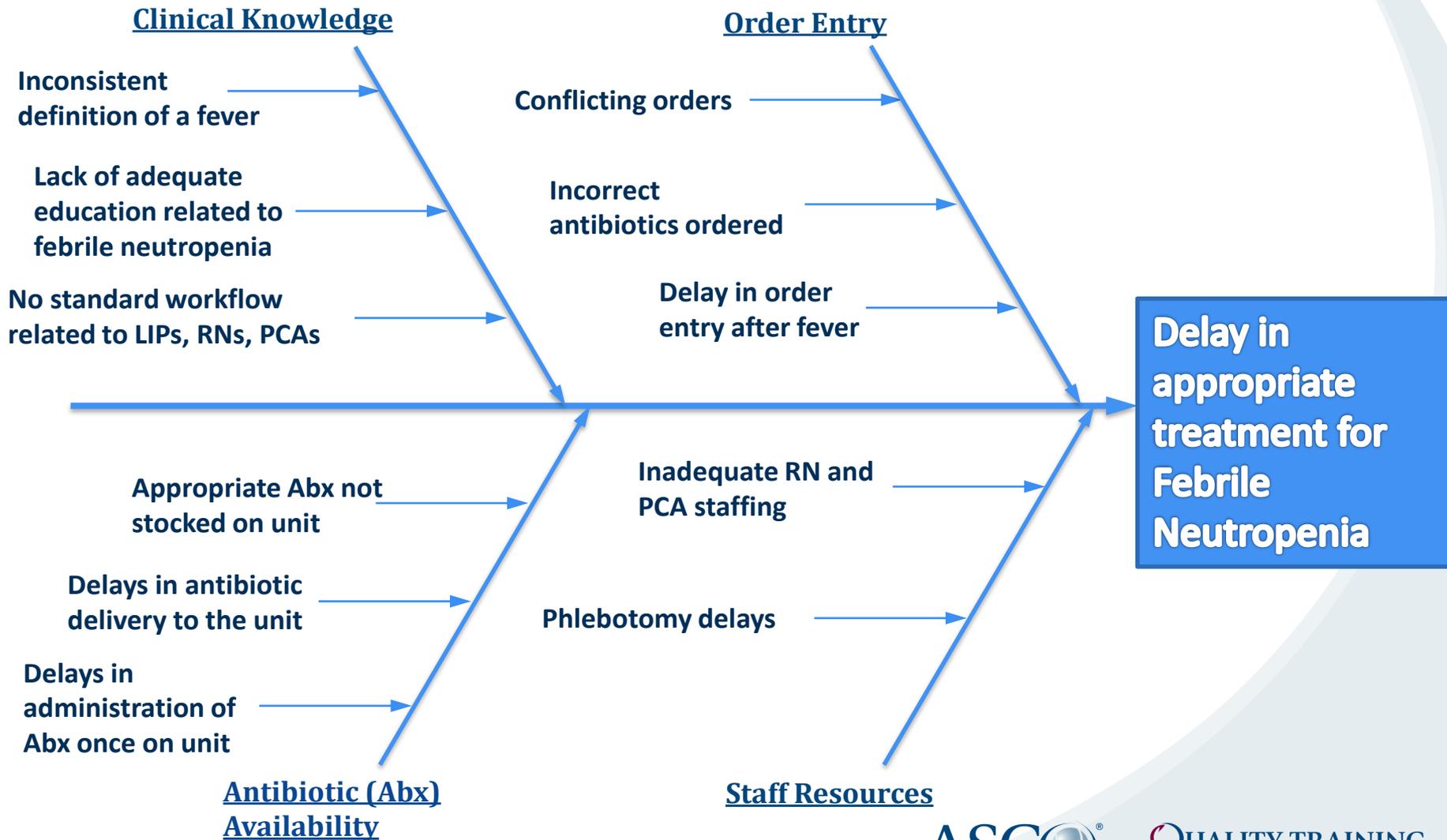
Improvement Coach:

- Amy E Guthrie RN, MSN, ACHPN, CPHQ

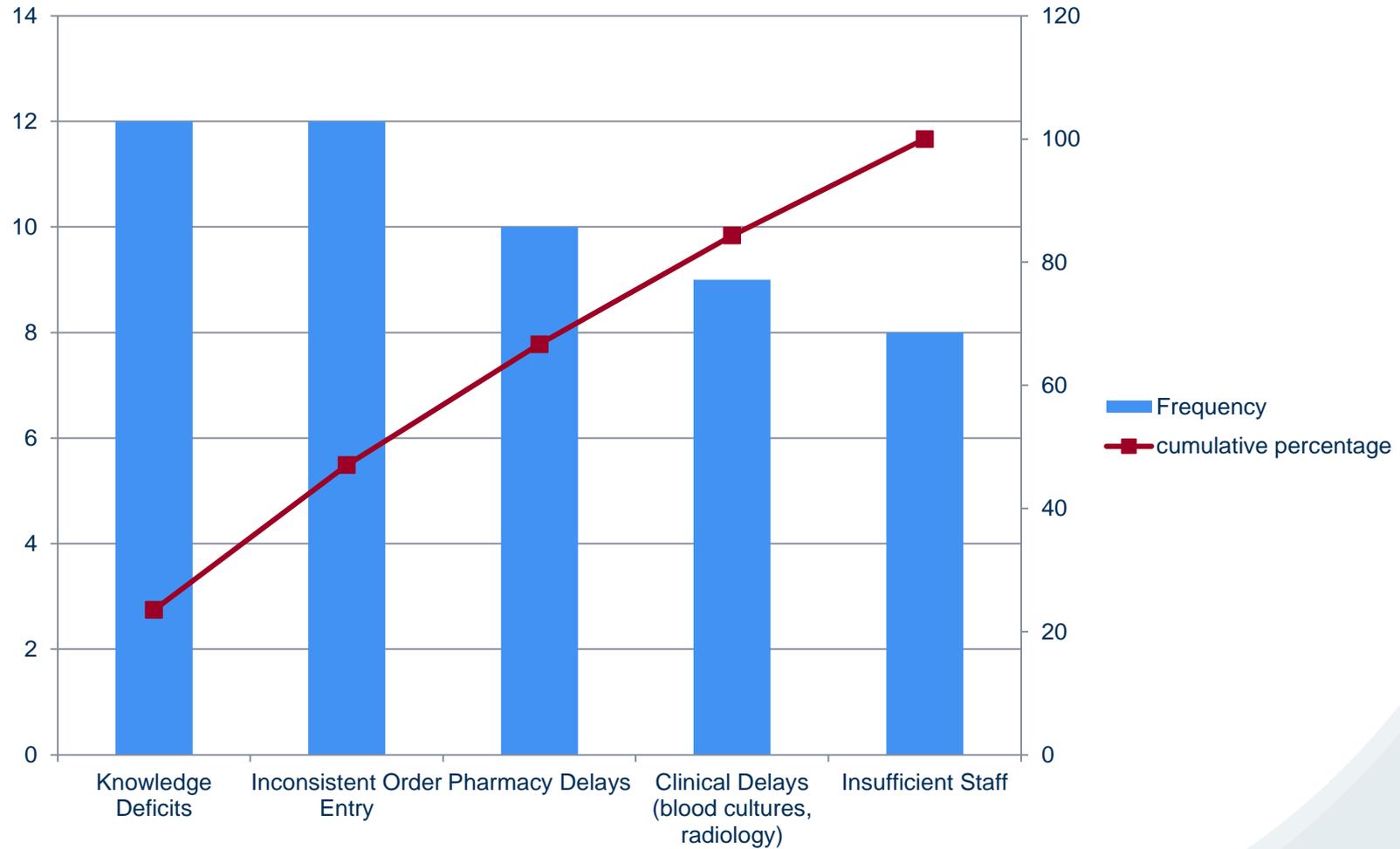
Process Map



Cause & Effect Diagram



Diagnostic Data



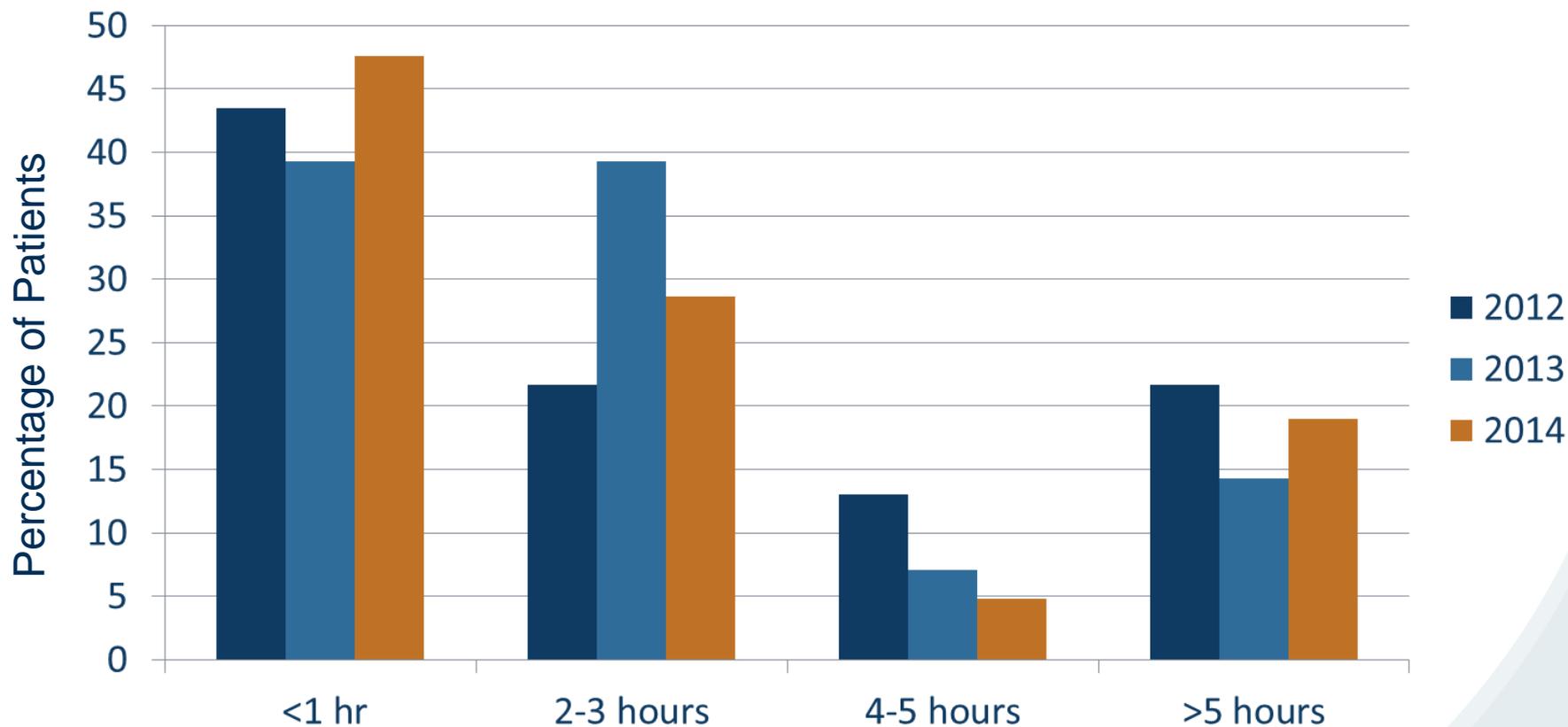
Aim Statement

- By year-end 2015, we aim to increase percentage of patients receiving antibiotics within one hour for the first episode of febrile neutropenia to 80% in the acute care setting at the University of Virginia.

Measures

- Measure: Time to antibiotic administration for patients with the first episode of febrile neutropenia.
- Patient population: All patients being treated for febrile neutropenia in the inpatient setting.
 - Exclusions (if any): Patient being treated in the Emergency Department, Infusion Center, or ICU's
- Calculation methodology:
 - Numerator & Denominator: Numerator: # of patients with first episode of neutropenic fever treated with antibiotics within one hour. Denominator: # of patients with first episode of neutropenic fever
- Data source: Clinical data repository, Epic, ICD Database
- Data collection frequency: Every 3 months
- Data quality (any limitations): Limits of our electronic patient database, inability to ensure that we are capturing all patients who present with febrile neutropenia.

Baseline Data



Time between Fever and Initial Antibiotic Administration by Year

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

Impact	High	<ul style="list-style-type: none">- Increasing staffing available during acute event- Make Abx available on floor- Creating an Epic order set- Creating Epic Alert	<ul style="list-style-type: none">- Implementation of staff educational program- Creation of an institutional clinical practice guideline- Increase overall staffing
	Low	<ul style="list-style-type: none">- Infectious diseases involvement with new cases	
		Easy	Difficult

Ease of Implementation

PDSA Plan (Tests of Change)

Date of PDSA cycle	Description of intervention	Results	Action steps
9/2013 - present	Clinical Practice Guideline - Includes order set, educational materials, expected training, workflow Epic Order set - antibiotics, VS, notification Clinical Workflow - Workflow notification, vitals, cultures, antibiotic administration	Correct antibiotics ordered for all febrile neutropenic patients. Increase in number of patients treated within 1-hour.	Modify clinical workflow based on LIP, RN, and PCA input. Include the neutropenic order set as an option for all patients admitted to the inpatient heme-onc setting

PDSA Plan (Tests of Change)

Date of PDSA cycle	Description of intervention	Results	Action steps
<p>Education 12/2013 - present</p>	<p>Computer Based Learning Modules - modules created for LIPs, RNs, PCAs/PCTs</p> <p>IPE Simulation sessions related to identification and treatment of febrile neutropenia.</p> <p>Reference sheets created for other acute care units.</p> <p>Inpatient lectures for LIPs.</p>	<p>Increased confidence and competence in caring for oncology patients with febrile neutropenia in the inpatient setting. This increase is demonstrated via pre- and post-simulation testing.</p>	<p>Revise the CBLs and include the CBLs as part of the required training for all newly hired clinicians.</p> <p>Expand the simulation sessions to include pharmacy and other inpatient units.</p>

PDSA Plan (Tests of Change)

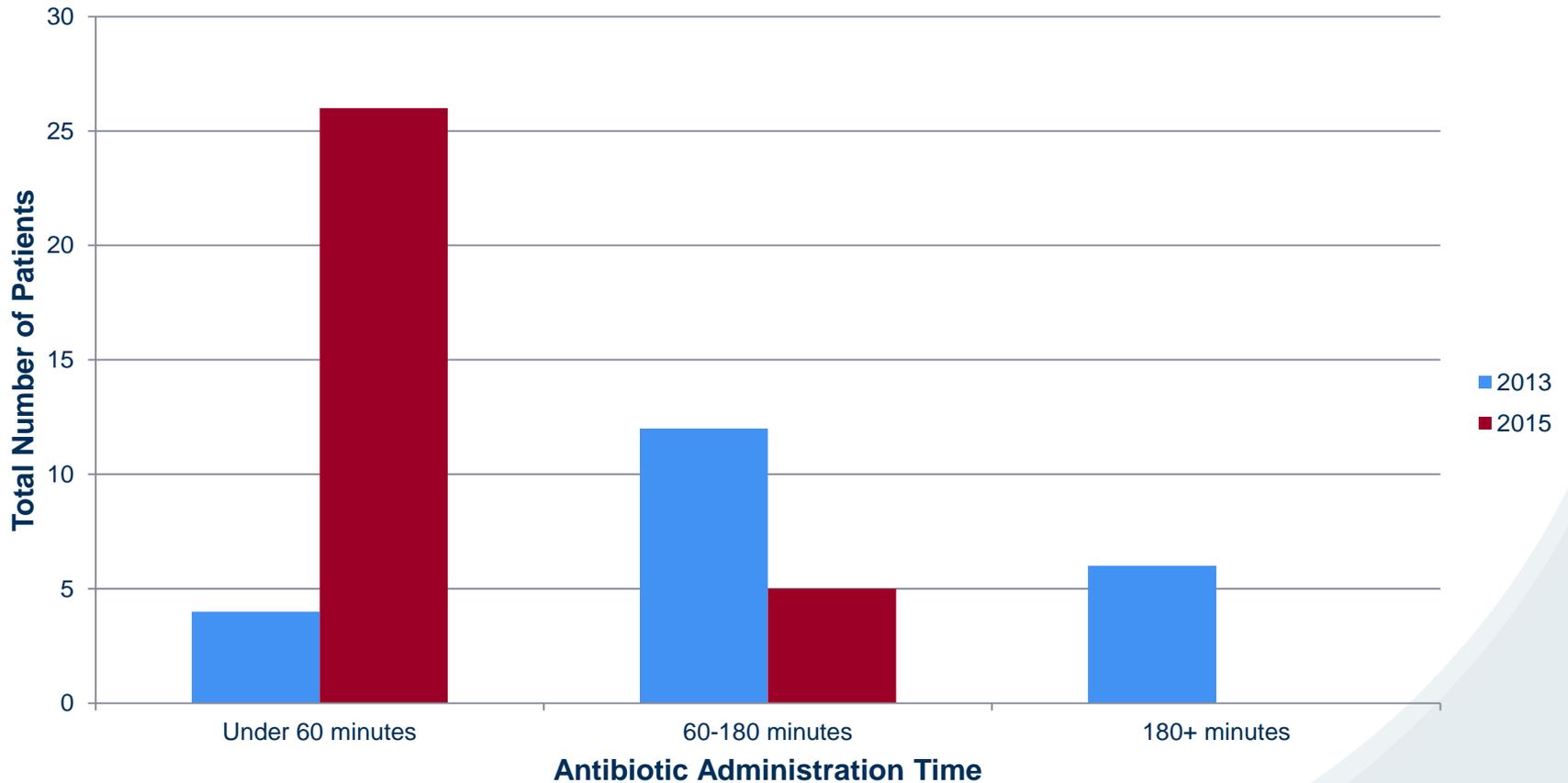
Date of PDSA cycle	Description of intervention	Results	Action steps
EPIC BPA 8/2015	Best Practice Advisory created to identify patients who meet the criteria for febrile neutropenia. The BPA will notify the LIP, pharmacy, RN, PCA when they open the patient's chart. A link to the order set will be included in the BPA notification.	Ongoing, BPA currently running in background, ensuring that correct patients are captured. Currently manually recording patients on 8-West to ensure proper BPA is triggered.	Anticipated late 2015 - Approval for the BPA to "Go-Live" for all patients in the inpatient setting.

Materials Developed

- Educational materials:
 - Simulation center training
 - Online learning modules
 - Monthly lecture given by inpatient fellow
- Established a new clinical practice guideline
 - Epic Order Set
 - New clinical workflow for floor staff
 - Automatic MET Nurse involvement

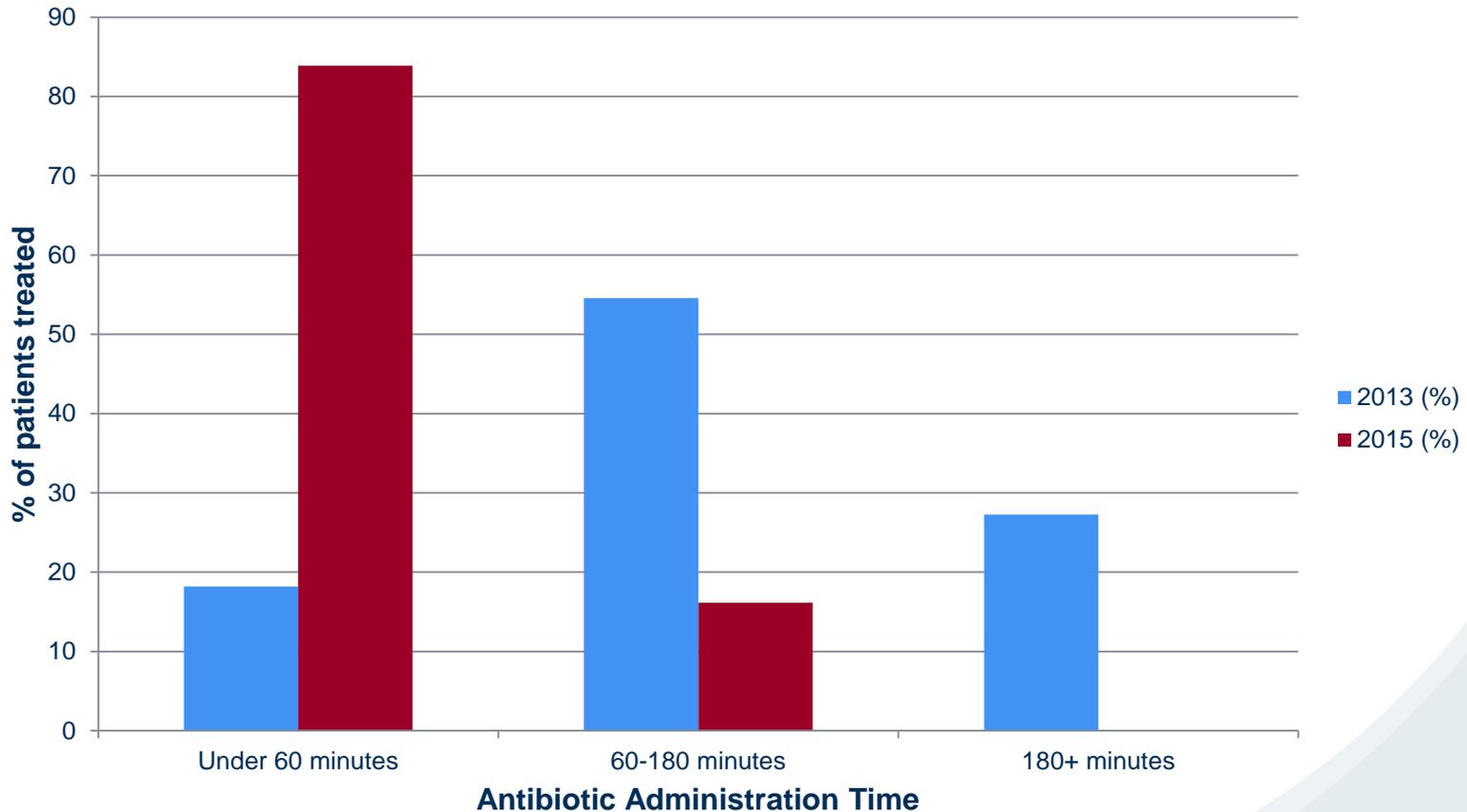
Time to Antibiotics

of patients treated within 60-min, 60-180 min, and 180+ min
2013 vs 2015



Time to Antibiotics

% of patients treated within 60-min, 60-180 min, and 180+ min
2013 vs 2015



Conclusions

- With the implementation of our clinical practice guideline and educational materials, we have substantially increased the % of patients treated with antibiotics in under 60-minutes (84% in 2015 versus 19% in 2013)
- We are continuing to collect data for 2015, and hope to meet our goal of 80% of patients treated within 60-minutes

Next Steps/Plan for Sustainability

- Implementation of the Epic BPA
- Continue to measure the post intervention compliance and adherence to the practice standards outlined in the CPG
- Continuing the educational program, including CBL's (updated yearly), simulation sessions, and monthly lectures
- **Collaborate with key stakeholders in the Emergency Department, Pediatrics and the outpatient infusion center clinics to develop processes for expansion of the febrile neutropenia standard work to these settings**