A QI Initiative to Reduce Time to Antibiotics in Oncologic Neutropenic Fever

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Problem Statement

Neutropenic fever (NF) (defined as temperature of 101° F on one occasion, or 100.4° F sustained over 60 minutes in a patient with an absolute neutrophil count (ANC) less than 500, or suspected drop below 500 within 48 hours) is relatively common oncologic emergency, particularly in hematologic malignancy patients. Expert consensus is that anti-pseudomonas gram-negative antibiotics (abx) should be administered within 60 minutes of detecting neutropenic fever.

At Thomas Jefferson University Hospital (TJUH), internal guidelines for time to treatment in neutropenic fever are in line with expert consensus - 60 minutes. We found that from July 1st – November 21st, 2018 our median time to abx in neutropenic fever cases was 117.5 minutes.

As a result we are proposing to implement a continuous process improvement initiative using PDSA (Plan-Do-Study-Act) cycles with the goal of reducing time to treatment for neutropenic fever.

Time to Antibiotics in Patients with Neutropenic Fever
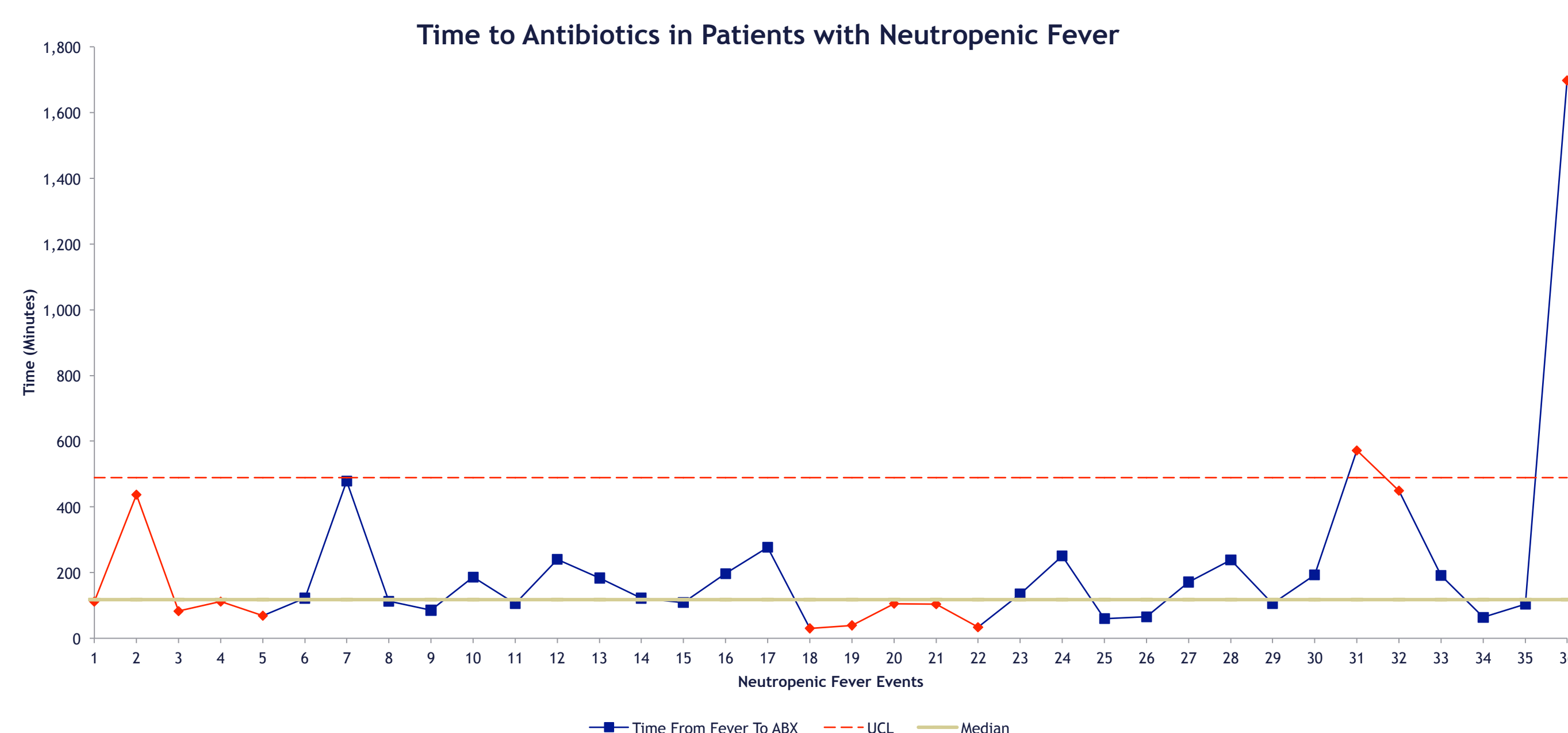
Aims For Improvement

- We Aim to reduce the TTA in hematologic malignancy patients with NF from a median of 117.5 minutes to a median of 60 minutes from 3/12/2019 to 4/30/2020 .

### Process Map for Neutropenic Fever
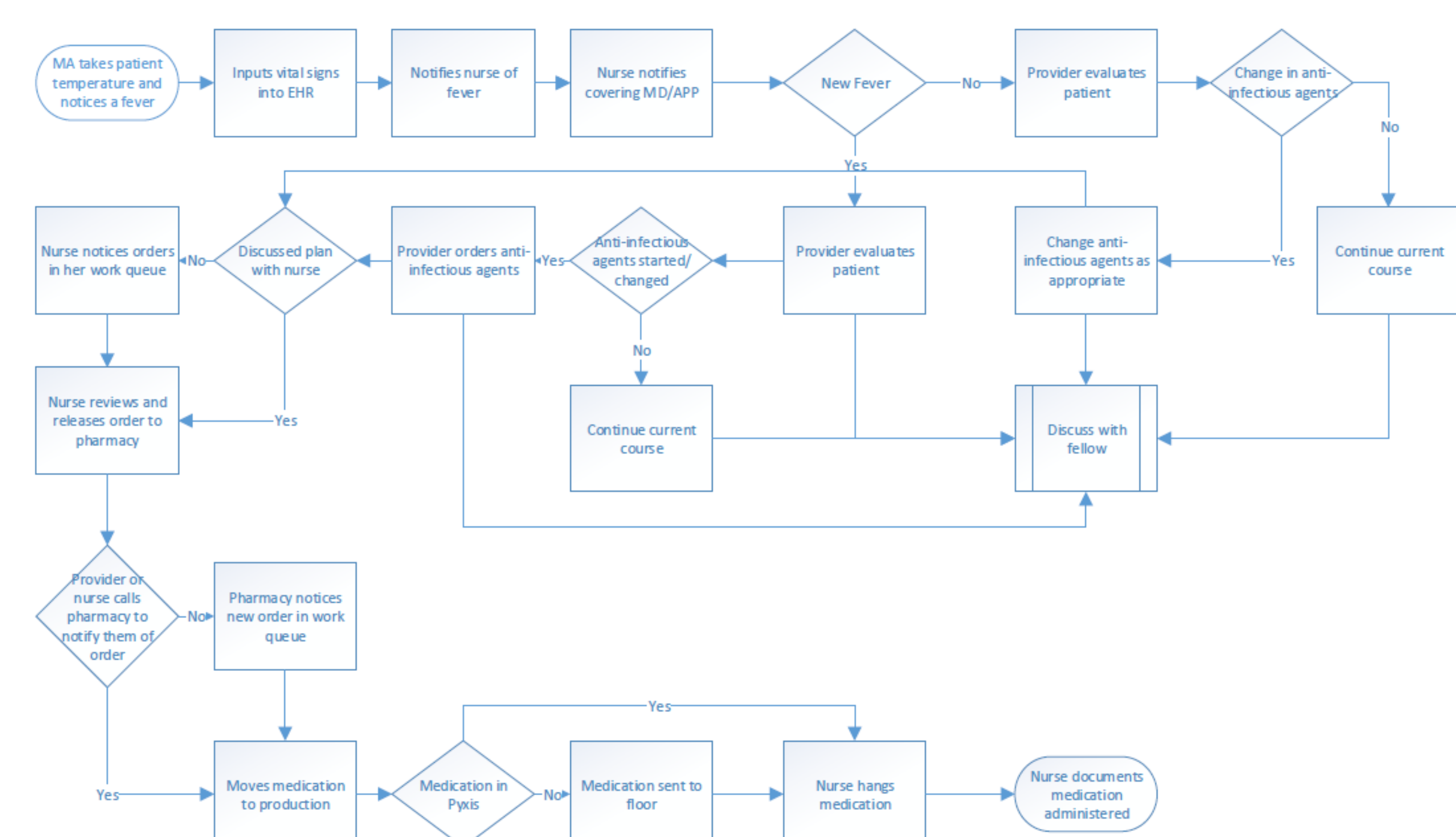
Proposed Interventions

1. Ensure that the pyxis on the oncology floors are fully stocked with abx required for initial treatment of neutropenic fever
2. Implement a nursing based order set for treatment of new NF cases.
3. Once NF guidelines are updated (currently in process), create and disseminate educational materials for house staff about treatment of neutropenic fever & oncologic emergencies

Initial Results

Data collected from the BMT unit from 3/13/19-5/22/19 after pilot implementation of our first intervention showed a median time to antibiotics for neutropenic fever cases post intervention was 70.2 minutes. **Notably, median time from order to administration for Cefepime was 36 minutes compared to 83 minutes during the baseline period.**

Interval Steps from Fever to Antibiotics Pre/Post Pilot Intervention on BMT Unit
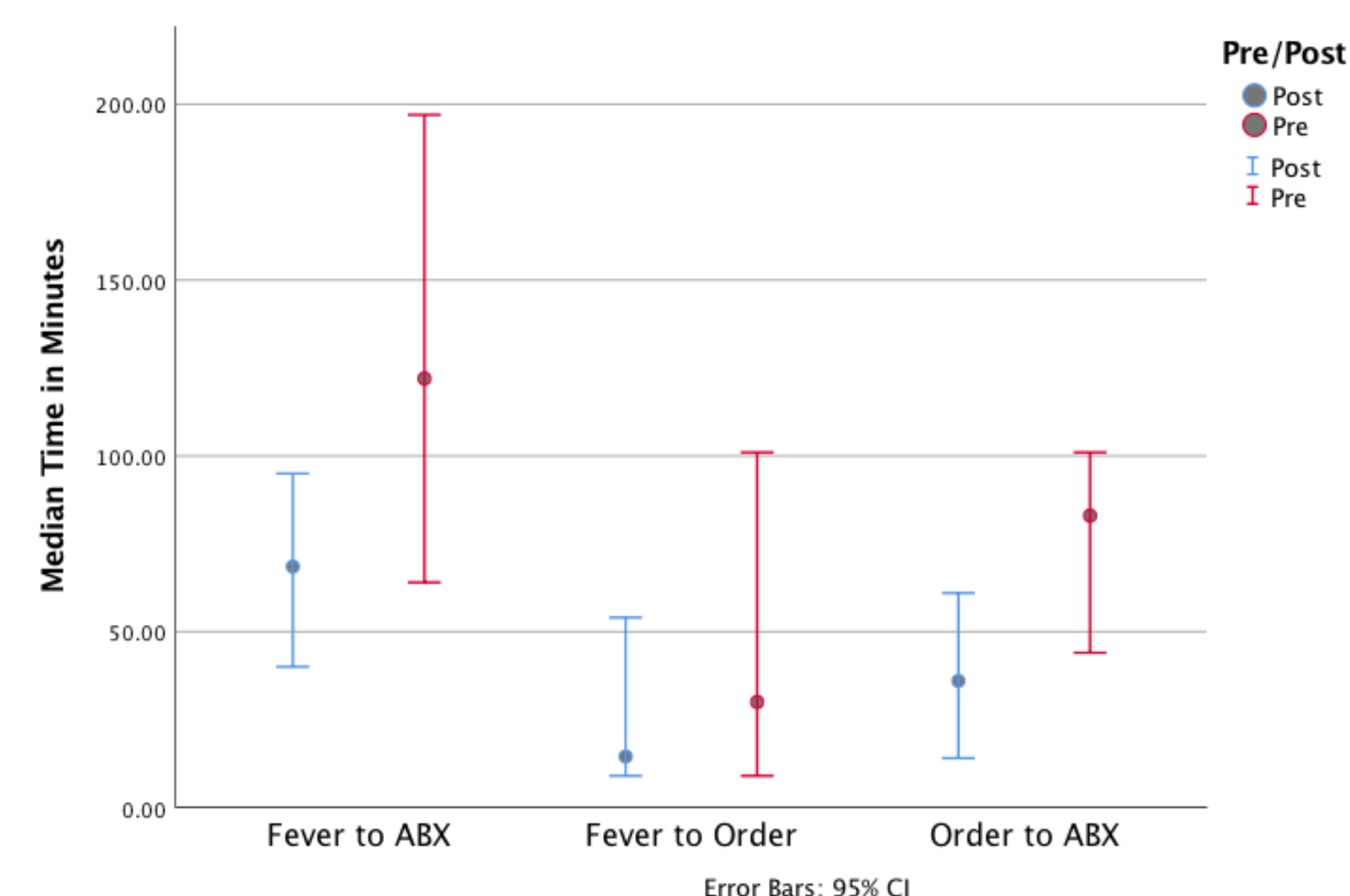
PICK Chart for Analysis of Interventions
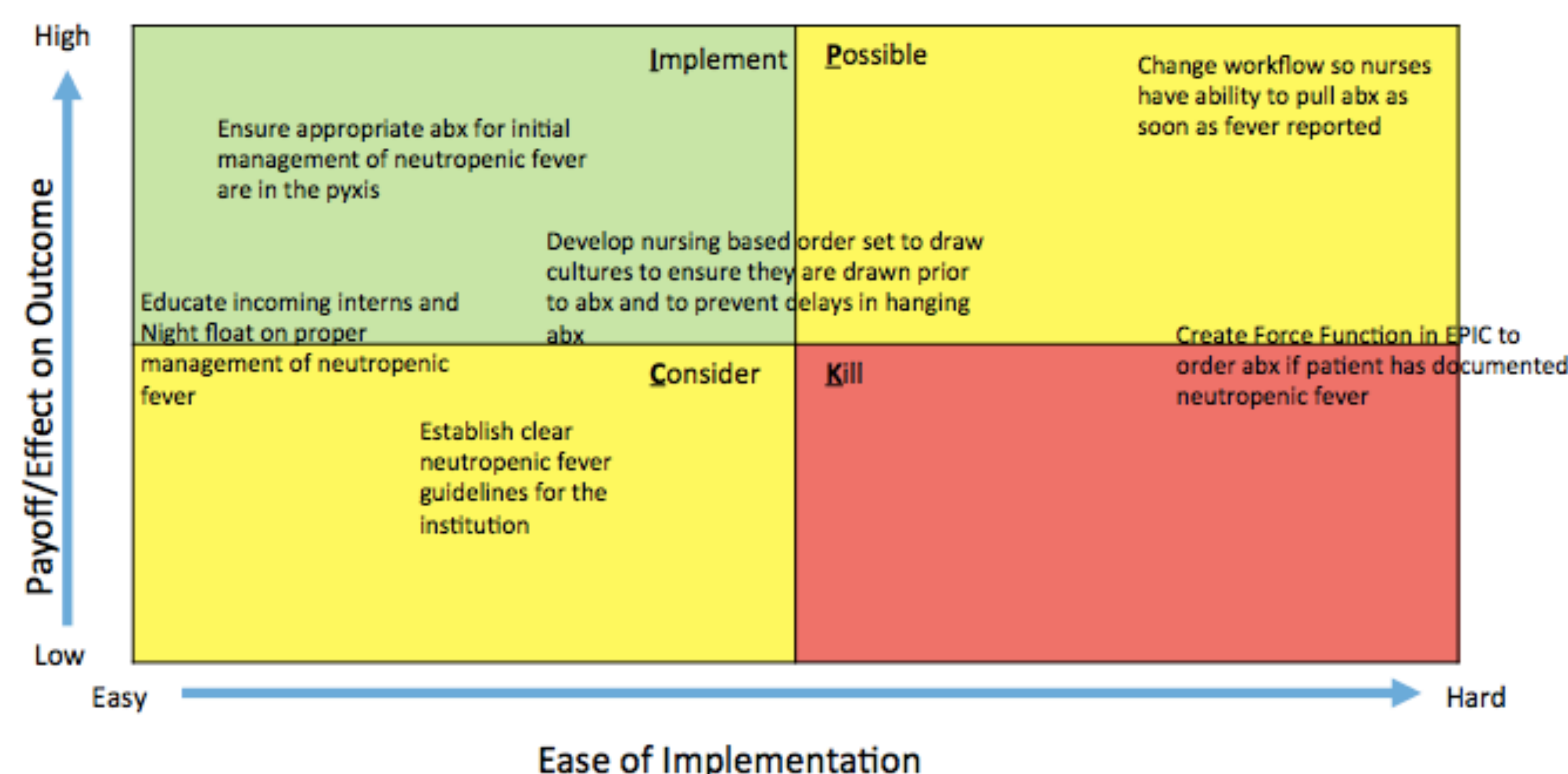
Methods and Measurement Strategy

- Initial evaluation of TTA in NF of was conducted using data collected from chart abstraction
- Additionally, we convened stakeholder focus groups with house staff, nursing, and pharmacy to provide input on drivers in the TTA process and conducted a fishbone analysis to identify elements driving delays.
- From these sources we identified key drivers in the process: time from fever to notification of physician, time from notification to ordering of abx, time from ordering of abx to delivery to the floor.
- We then developed interventions using identified drivers of the process and input from our stakeholder groups.

We plan to use PDSA cycles to assess the effectiveness of our interventions:
- Every 8 weeks, we will perform chart abstraction as well as stakeholder interviews/ focus groups to assess each intervention, at which time we will decide whether to adopt, modify, or stop the intervention in question.
- All information necessary to calculate TTA as well as time for process measures will be obtained via chart abstraction.

We will also measure the following outcomes to ensure interventions are not having negative consequences on other elements of care:
- Amount of antibiotics lost/wasted in pyxis.
- Percentage of of correct antibiotics given for a condition the first time.

Implementation Plan

- Intervention 1 began on 3/12/2019.
- Intervention 2 is proposed for 7/1/2019 as a pilot on the BMT unit
- Intervention 3 is scheduled for completion in Fall 2019. Following this, interventions will be applied across TJUH.
- Every 8 weeks, we will perform chart abstraction as well as stakeholder interviews/ focus groups to assess each intervention, at which time we will decide whether to adopt, modify, or stop the intervention in question.

Time From Ordering to Administering Antibiotics*
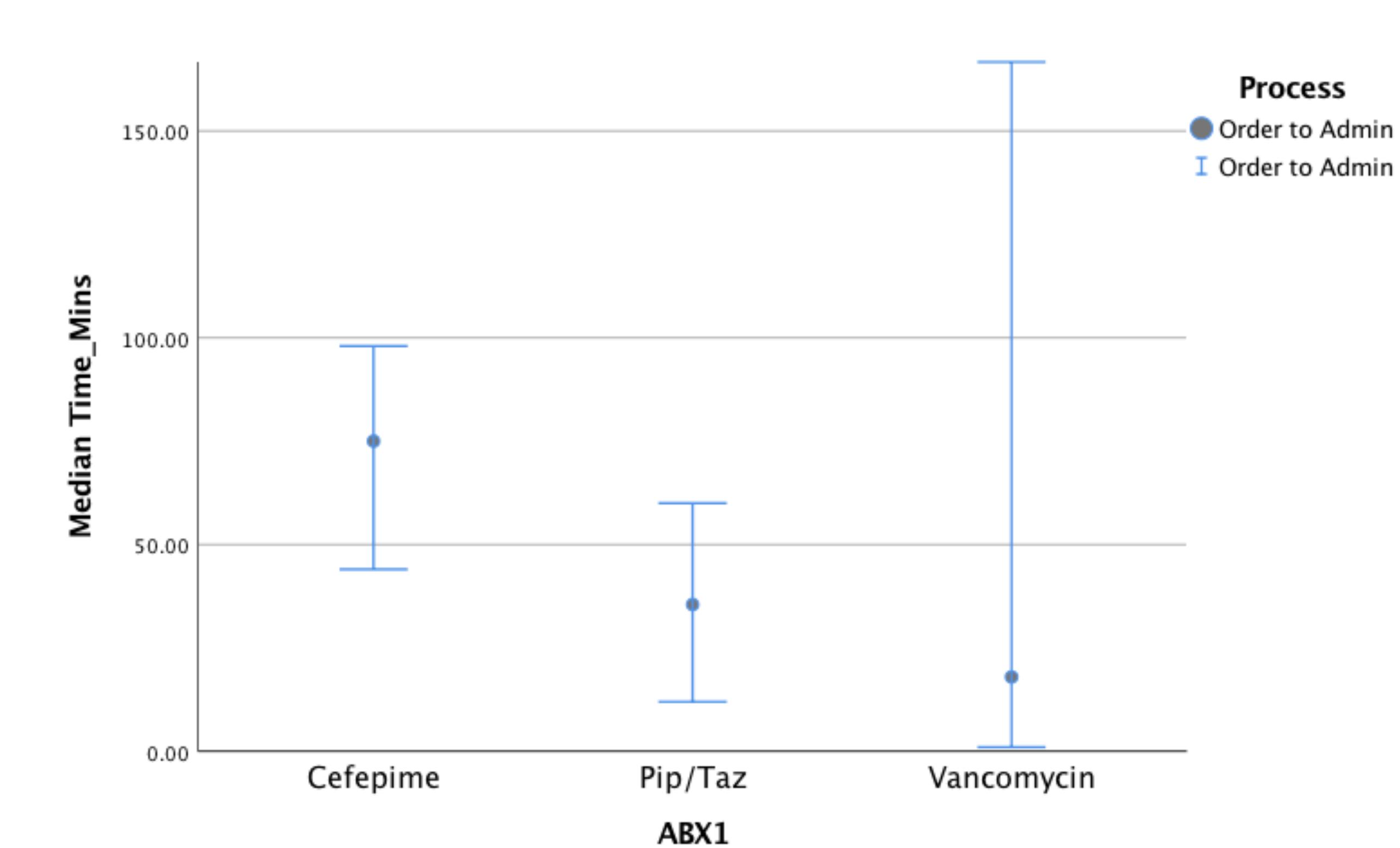
*Cefepime was not stocked in pyxis, but zosyn was stocked in pyxis at time of data collection

Error Bars: 95% CI