

Standardizing Treatment for Acute Exacerbations of COPD (AECOPD) at a Large Academic Hospital

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Background and Problem

AECOPD is a common problem faced by patients with chronic obstructive pulmonary disease (COPD).¹ Despite evidence of improved or non-inferiority outcomes and reduced cost with short oral regimens, steroid prescribing patterns remain variable.²⁻⁴ Furthermore, there is confusion regarding antibiotic choice that contributes to the problem. The variability in treatment plans for patients with AECOPD presents a health outcomes and economic problem for patients and hospital faculty.⁵ Data from 6/1/2021-5/31/2023 shows that AECOPD treatment at Clements University Hospital (CUH) has been variable despite the availability of evidence-based steroid and antibiotic treatment.

Quality Tools

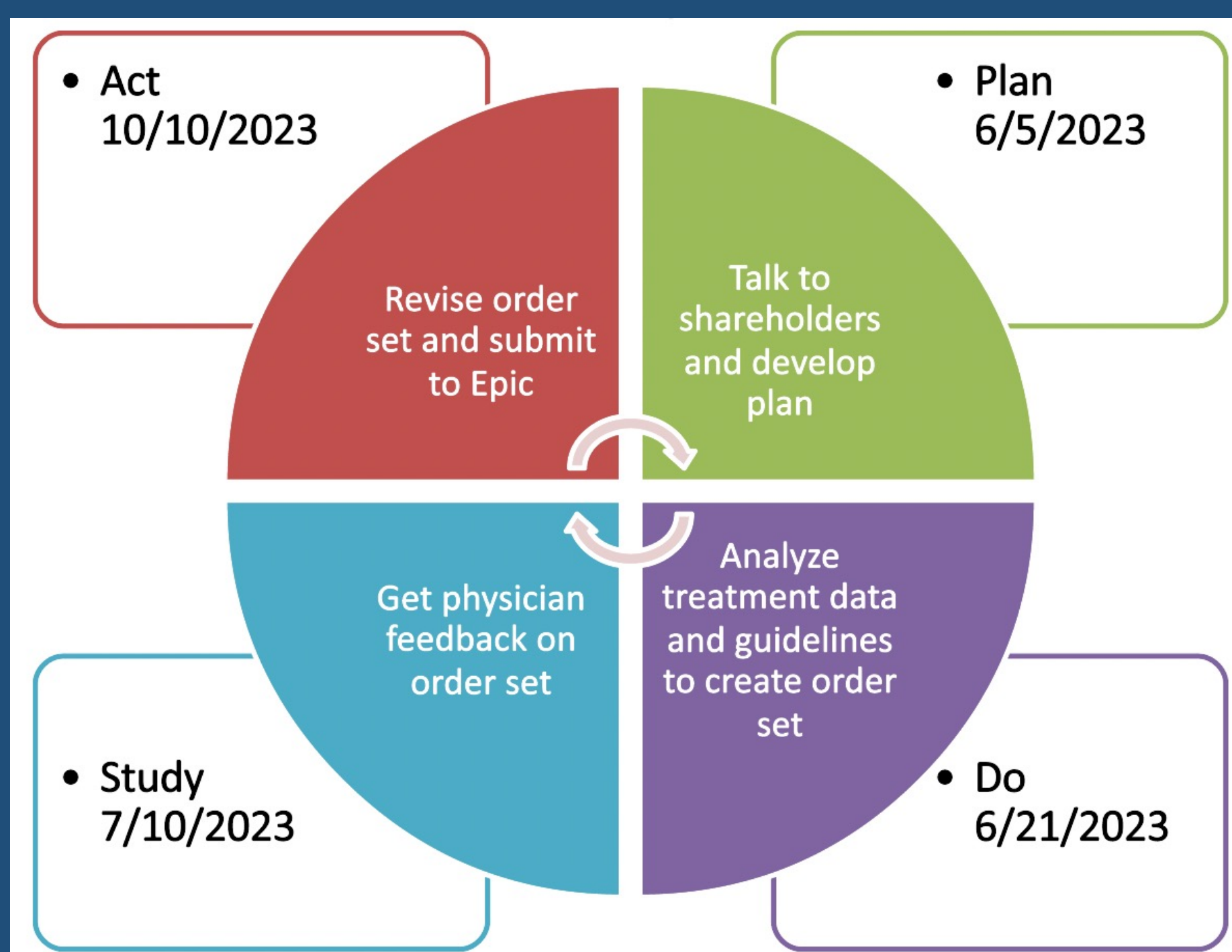


Figure 1: PDSA cycle to create an order set for AECOPD treatment 6/5/2023-10/10/2023

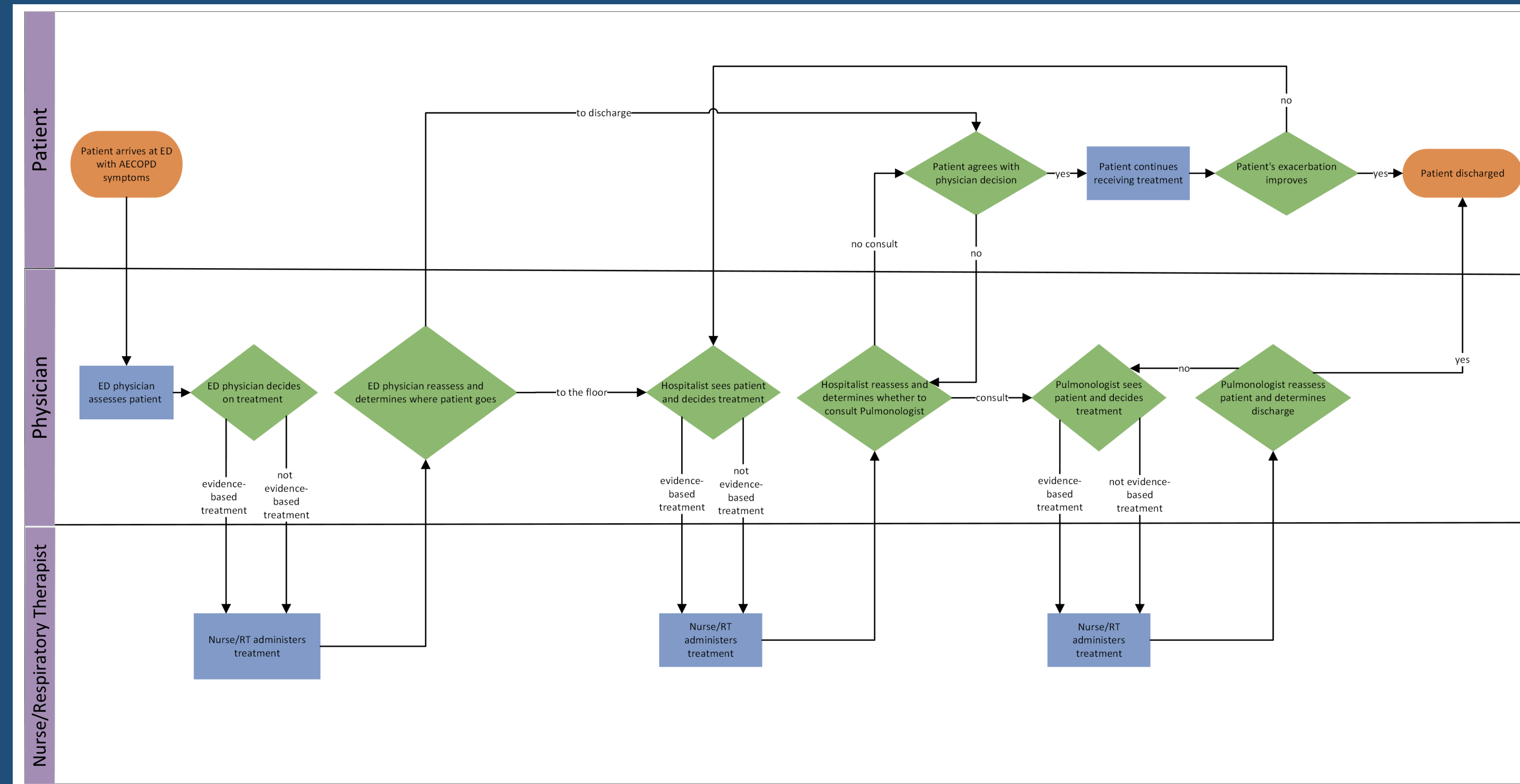


Figure 2: Swimlane process map showing the treatment process for an AECOPD patient at CUH

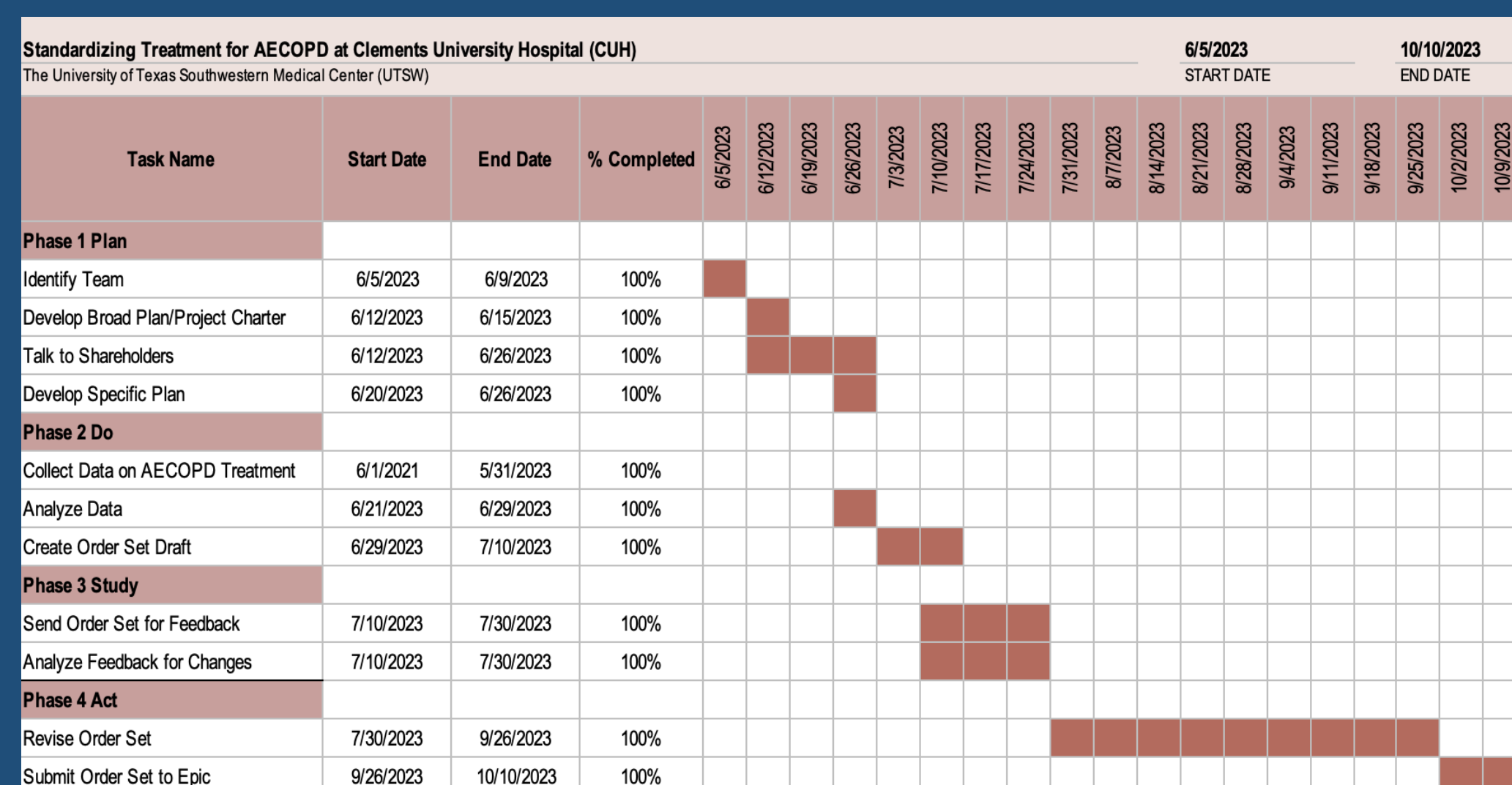


Figure 3: Gantt chart displaying the project timeline for the PDSA cycle 1

Steps in the Process	Failure Mode	Failure Causes	Failure Effects	Likelihood of Occurrence (1-10)	Likelihood of Detection (1-10)	Severity (1-10)	Risk Priority Number (RPN)	Actions to Reduce Occurrence of Failure
Patient taking medications after discharge	Nonadherence to medication	Patient lack of knowledge about medications	Worsening symptoms and increase in patient readmissions	7	6	7	294	Instruct patients on medications and give them brochure with information
Physician assessing patient and deciding treatment	Physician does not prescribe best medication	Physician error when assessing and nonadherence to evidence-based guidelines	Worse outcomes for patient	6	5	8	240	Order set in EHR with evidence-based medications
Patient given medication on floor of hospital	Patient receives wrong medication	Nurse/RT error when administering medication	Worsening symptoms for patient and potential adverse side effects	3	8	9	216	Two person authorization for medication administration
End of patient stay	Patient discharged too early	Physician did not assess properly and lack of physician and patient agreement on health status	Increased patient readmissions	5	4	7	140	Ensure patient and physician agreement with documentation in EHR
Physician assessing patient and deciding treatment	Patient given excess medications	Lack of adherence to evidence based guidelines leading to over prescription	Patients on medications for too long which can lead to decreasing improvements on medications and adverse side effects	4	5	7	140	Order set in EHR with evidence-based medications

Figure 4: FMEA showing potential failures in adherence to evidence-based treatment during the process of treating an AECOPD patient

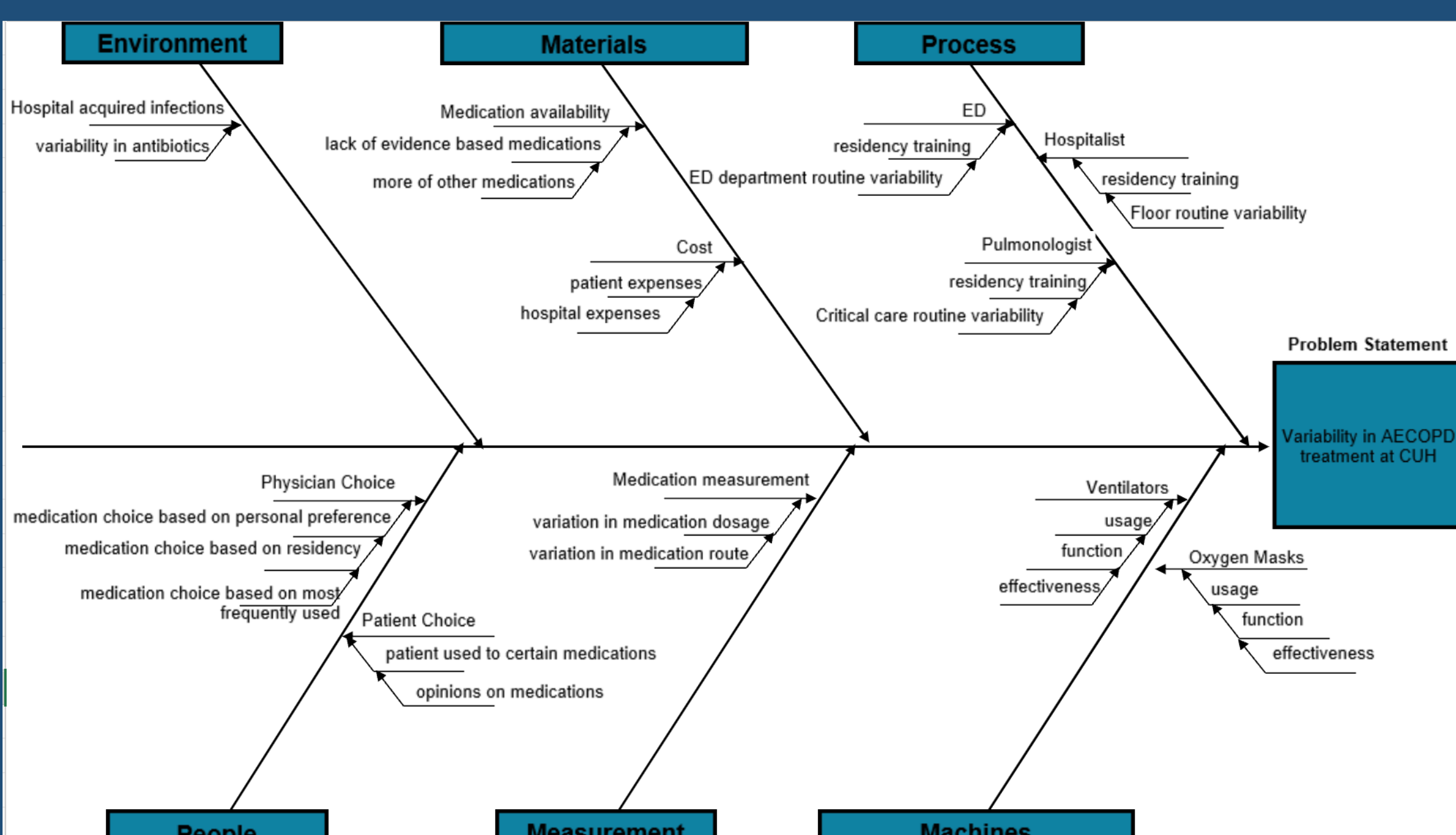


Figure 5: Fishbone diagram showing reasons that AECOPD treatment is variable

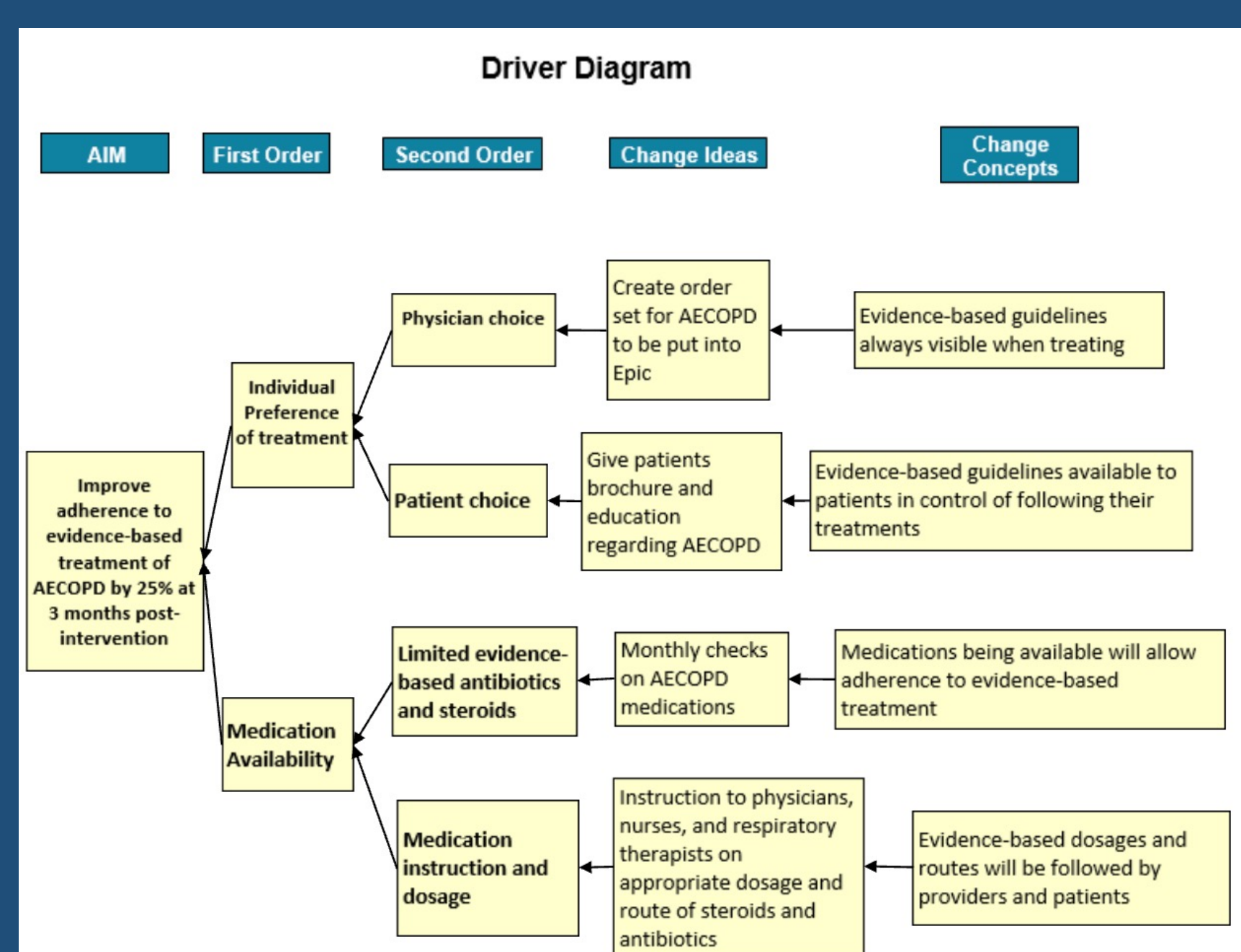


Figure 6: Driver diagram showing factors to target to improve adherence to evidence-based AECOPD treatment

Aim, Scope, and Intervention

- The aim of this project is to improve the process of adherence to evidence-based selection of steroids and antibiotics for acute exacerbations of chronic obstructive pulmonary disease (AECOPD) at Clements University Hospital (CUH) by 75% at 1 year after the intervention along with a 10% decrease in length of stay and readmissions.
- This process begins when COPD patients are admitted to CUH for AECOPD and ends when the patient is discharged.
- The intervention is an order set containing guidelines and treatment recommendations for AECOPD that can be implemented into Epic electronic health records (EHR) for physicians to follow.

Measures and Methods

Process	Outcome	Balancing
Percent of physicians using order set in Epic: $\frac{\text{number of physicians using order set}}{\text{number of physicians treating AECOPD patients}}$	Percent decrease in length of stay (LOS): $\frac{\text{average LOS after} - \text{before intervention}}{\text{average LOS before intervention}}$	Survey to gauge physician satisfaction with using the order set: $\frac{\text{average satisfaction rating of 7 or higher on a scale of 1-10 would indicate adequate satisfaction post-intervention}}{\text{average RA before intervention}}$
Number of AECOPD patients out of total AECOPD patients given evidence-based treatment: $\frac{\text{compare values before and after intervention}}{\text{average RA before intervention}}$		

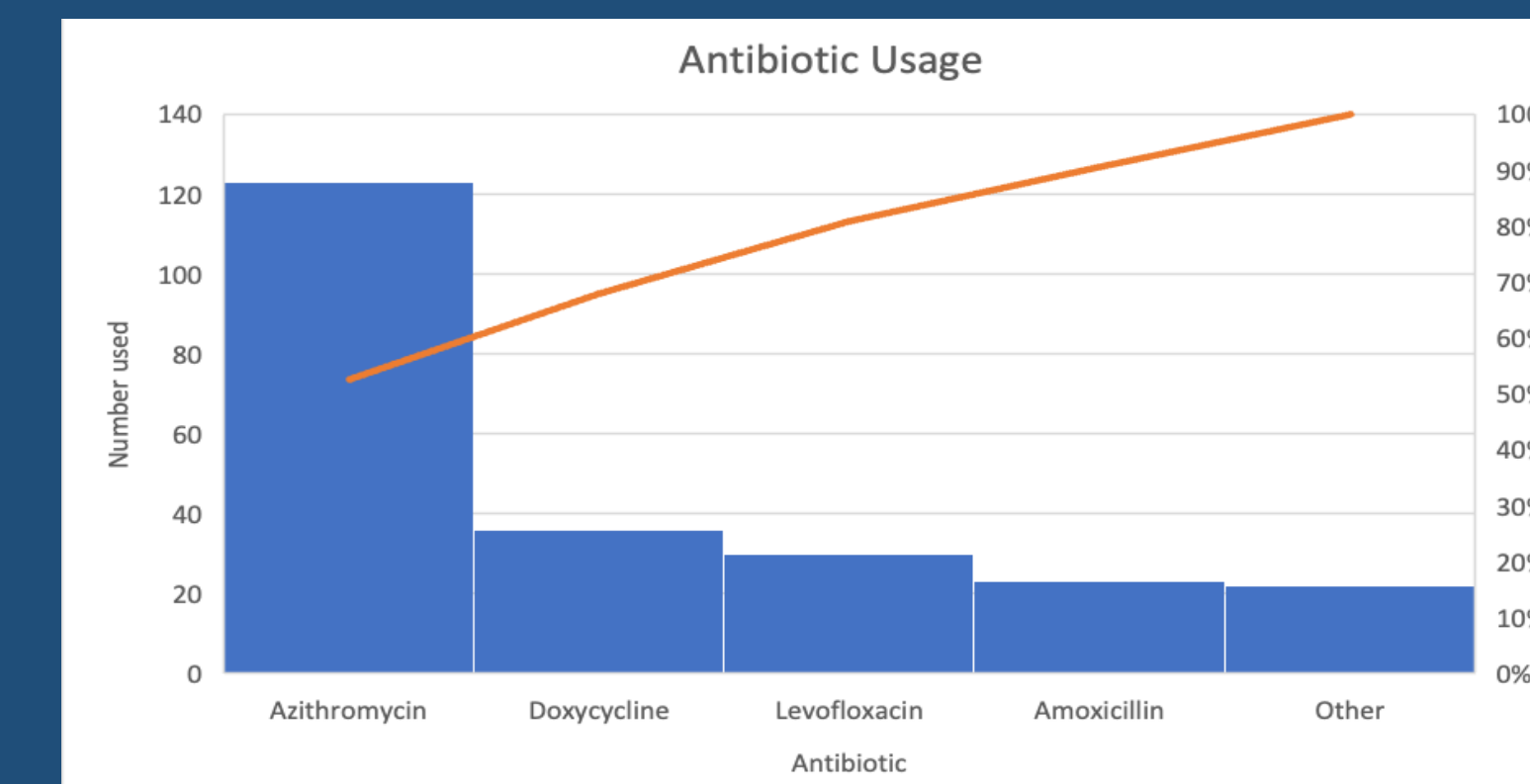


Figure 7: Pareto chart showing antibiotic usage for AECOPD at CUH from 6/1/2021-5/31/2023

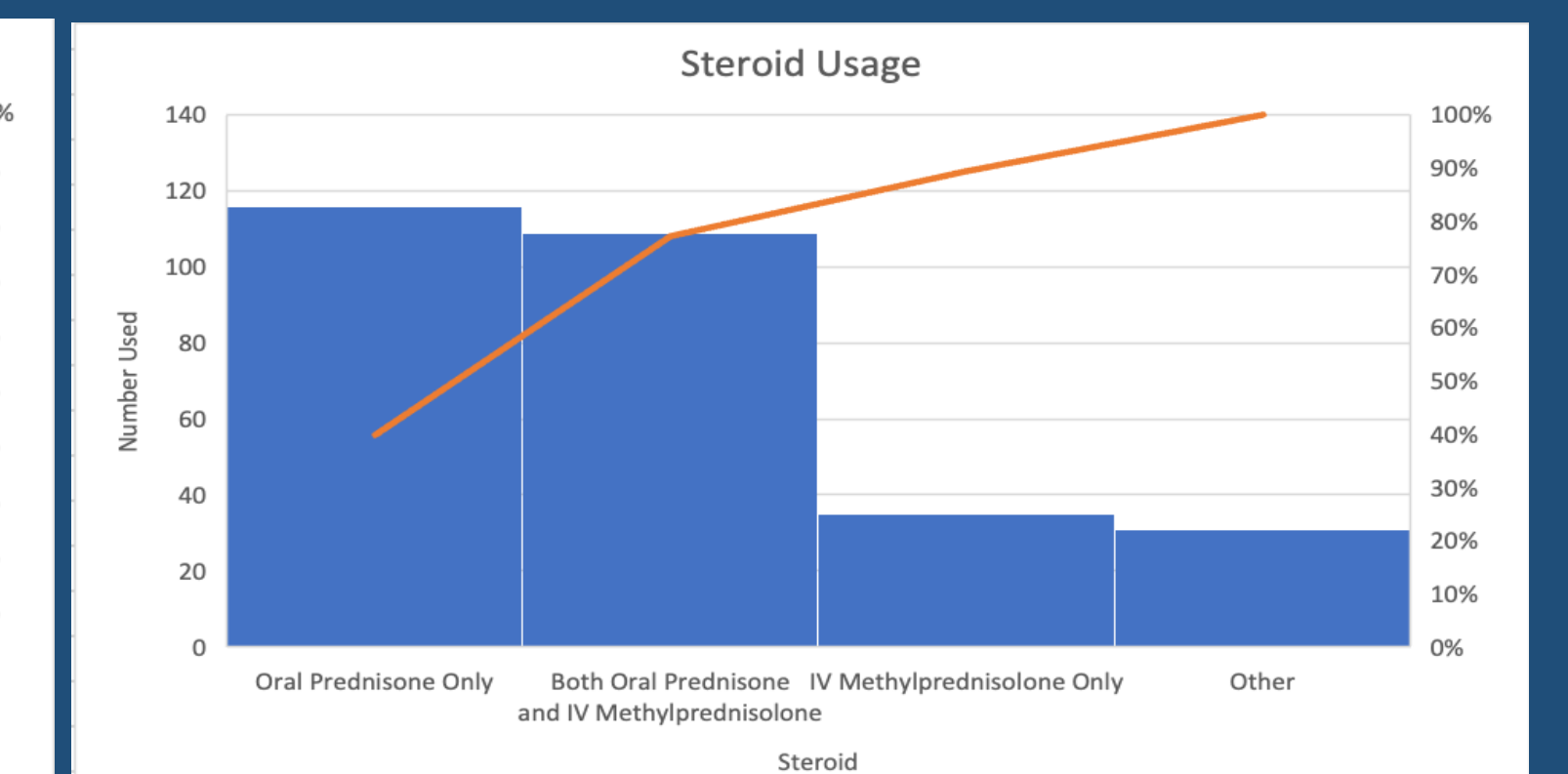
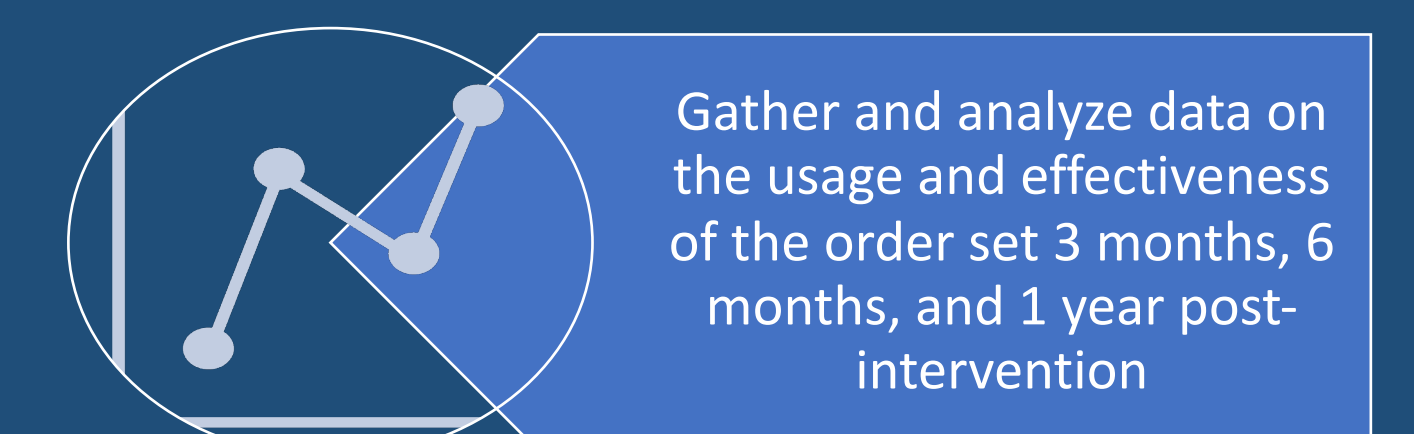


Figure 8: Pareto chart showing steroid usage for AECOPD at CUH from 6/1/2021-5/31/2023

Results and Next Steps

Outline of order set for AECOPD treatment:



Discussion and Conclusion

- AECOPD is a complex disease that can be treated with a variety of medications that can lead to the different outcomes for patients; the order set can provide physicians with a sustainable pathway to choose evidence-based medications and improve outcomes.
- Insight from emergency department physicians, hospitalists, pulmonologists, and respiratory therapists was helpful to understand treatment at different stages of the patient's journey.
- Lack of response from nurses prevented an understanding of their role and insight in AECOPD treatment.

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