

## BACKGROUND

- Order sets are clinical decision support tools that aim to help providers prescribe appropriate treatments using a pre-defined set of applicable drugs and recommended dosages, based off evidence-based guidelines.
- An addendum order set is a disease specific order set meant to be used with the general medical admission order set.
- Utility of order sets remains low among providers despite educational materials and reminders<sup>(1)</sup>.
- Previous studies have not found a significant difference in outcomes for patients who received treatment from the designated order sets compared to those who did not.<sup>(2)</sup>

## OBJECTIVES

- To evaluate the use of the medical or critical care admission sets compared to addendum order sets among various inpatient populations and provider groups.
- To evaluate the impact of using the medical or critical care admission set compared to addendum order sets, using length of stay as an outcome.
- To prompt providers to use appropriate order sets either through suggesting a set based on a diagnosis or creating super sets where addendums are nested within the medical admission set.

## METHODS

### Study design

- Retrospective, descriptive analysis
- Primary measure: length of stay in patients who got treated using the medical or critical care admission order set only vs those who treated with those sets and addendums in the pneumonia and heart failure populations.

### Study population

- patients >18 years old in the HSHS system.
- Patients whose final coded diagnosis was either pneumonia or heart failure.

### Study Measures

- Patient classification was based on admission dates for a 6-month period from 2/1/2021 to 7/31/2021.
- Final diagnosis code for pneumonia included those who presented with pneumonia and patients who developed pneumonia while inpatient.

### References

1. Wells, C., & Loshak, H. (2019). Standardized Hospital Order Sets in Acute Care: A Review of Clinical Evidence, Cost-Effectiveness, and Guidelines. Canadian Agency for Drugs and Technologies in Health.
2. Hulse, N. C., Lee, J., & Benuzillo, J. (2020). Exploring Different Approaches in Measuring EHR-based Adherence to Best Practice - A Case Study with Order Sets and Associated Outcomes. AMIA ... Annual Symposium proceedings. AMIA Symposium, 2019, 477-486.

## METHODS

### Data Analysis

- The Pneumonia and Heart failure addendum order sets were evaluated to ensure the medications included were appropriate according to recent guidelines.
- A third-party software (LogicStream Health©) that extracts data from EPIC was used to determine the final coded diagnosis among the selected study population.
- Using SQL, a report from EPIC was generated that detailed patient admission and discharge dates, medications ordered, order sets used etc.
- The data was analyzed using excel tools such as Vlookup and Pivot tables.
- The utilization of addendum order sets in pneumonia and heart failure populations was compared to how often the medical or critical care admission order set was used in the same population.

## RESULTS

**Table 1: Medical admission order set vs. addendum utilization in different patient populations**

from 2/1/2021 to 7/31/2021, age ≥ 18,		
Pneumonia population		
Order Set	Usage	% Pop Patient
HSHS IP MED MEDICAL ADMISSION	1858	64.9%
HSHS IP MED PNEUMONIA ADDENDUM	116	5.8%
Heart Failure Population		
Order Set	Usage	% Pop Patient
HSHS IP MED MEDICAL ADMISSION	2200	84.44%
HSHS IP CARD HEART FAILURE ADDENDUM	232	13.23%
COPD Population		
Order Set	Usage	% Pop Patient
HSHS IP MED MEDICAL ADMISSION	378	82.33%
HSHS IP PULM COPD ADDENDUM	33	11.28%
NSTEMI Coded		
Order Set	Usage	% Pop Patient
HSHS IP MED MEDICAL ADMISSION	1224	58.18%
HSHS IP ED CHEST PAIN GENERAL / UA / NSTEMI	115	7.06%
HSHS IP CARD CHEST PAIN UA NSTEMI ADMISSION	112	5.90%

## RESULTS

**Table 2: Comparison of Length of stay in the pneumonia and heart failure population**

Pneumonia population		
	Length of stay(hours)	No. of Patients
Medical admission set without Addendum	179:02:07	1055
Medical admission set + Addendum	171:09:42	91
Critical care set without addendums	0:00:00	0
Critical care set + addendum	244:22:55	11
Heart failure population		
	Length of stay(hours)	No. of Patients
Medical admission set without Addendums	139:02:17	1255
Medical admission set + Addendums	124:48:46	113
Critical care set without addendums	452:21:26	7
Critical care set with addendums	84:16:00	1

## DISCUSSION

- Both pneumonia and heart failure addendums were up to date with current guidelines. Despite being up to date, addendums were not as commonly used as the medical admission order set.
- When medication orderables were analyzed, patients in the pneumonia population were receiving appropriate therapy, which suggests providers order these medications a la carte.
- ICU patients were analyzed separately as they typically have long and complicated hospital stays which would have confounded the results.

## CONCLUSION

- Addendums are severely under-utilized in most populations despite having updated order sets for most disease states.
- Use of addendum order sets resulted in a shorter length of stay in both heart failure and pneumonia populations
- A possible solution is to suggest addendum order sets to users based on the medications they order by firing a BPA. With the merge option on, these sets could use merge functionality without any changes to their current build setup.