

# Evaluation of Factors Affecting Length of Stay in Pediatric Asthma

Eric Gray<sup>1</sup>, PharmD Candidate; Lisa Lubsch<sup>1,2</sup>, PharmD, BCPPS

## INTRODUCTION

Cardinal Glennon Children's Hospital (CGCH) uses a clinical scoring system to more quickly wean albuterol and reduce the length of stay in patients with a documented history of asthma experiencing acute asthma exacerbations. In spite of this, some patients on the existing protocol experience a length of stay greater than 48 hours.

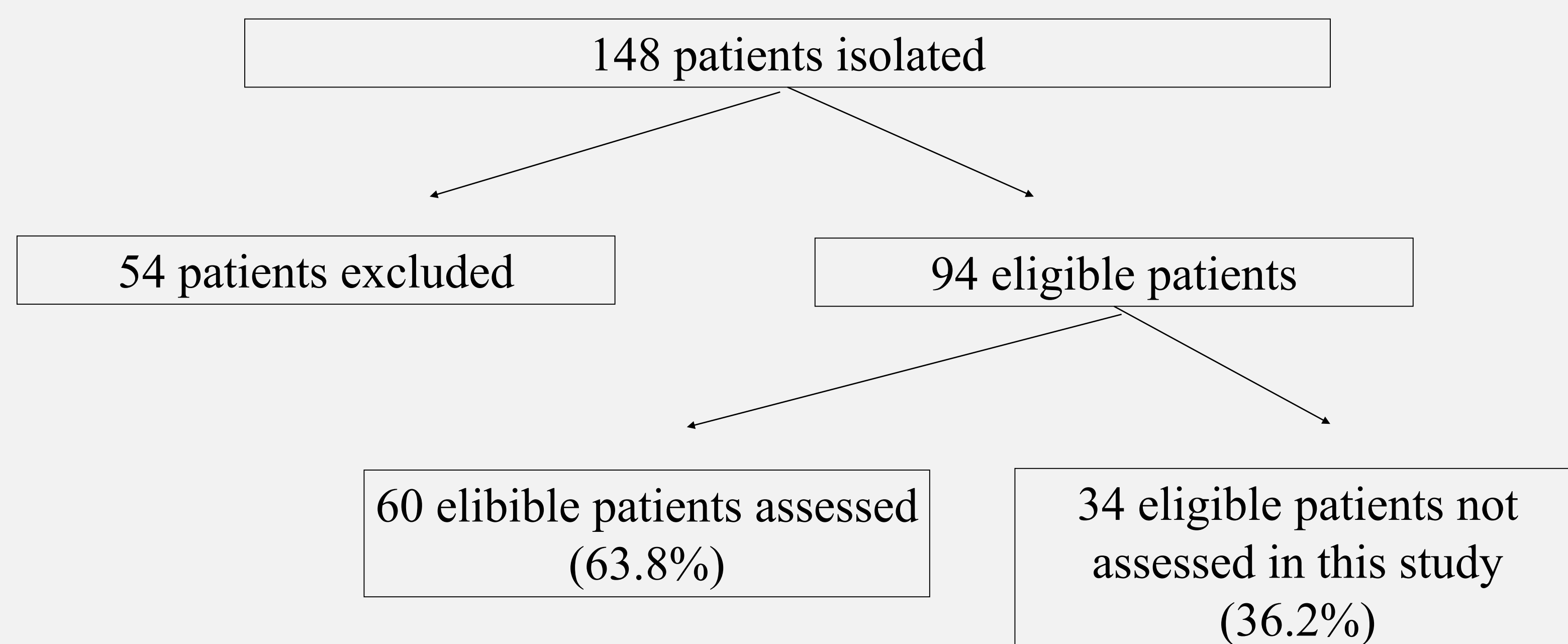
## PURPOSE

Evaluate co-occurring conditions and factors present in patients with a length of stay longer than 48 hours despite albuterol weaning per the CGCH Inpatient Asthma Care Pathway.

## METHODS

- Retrospective review of electronic medical record data.
- Data collected since implementation of current asthma care pathway in August 2012 to present.
- Data collection occurred in an Excel spreadsheet and was monitored by the investigator, Eric Gray.
- Dr. Lisa Lubsch functioned as a supervisor and had access to the data.
- The primary objective was to determine if there is a correlation between any patient-specific factors (i.e. concurrent infection) and an increased length of stay.
- Data collected: age, gender, BMI%, asthma step therapy on admission, hospital length of stay, hospitalization for asthma within past 30 days and within past year, comorbidities.
- Inclusion criteria:
  - Age ≤ 18 years that received albuterol with weaning per CGCH asthma care pathway.
  - Length of stay greater than 48 hours.
- Exclusion criteria:
  - Primary diagnosis not an acute asthma exacerbation.
  - PICU stay greater than 24 hours.

## RESULTS



## RESULTS CONT.

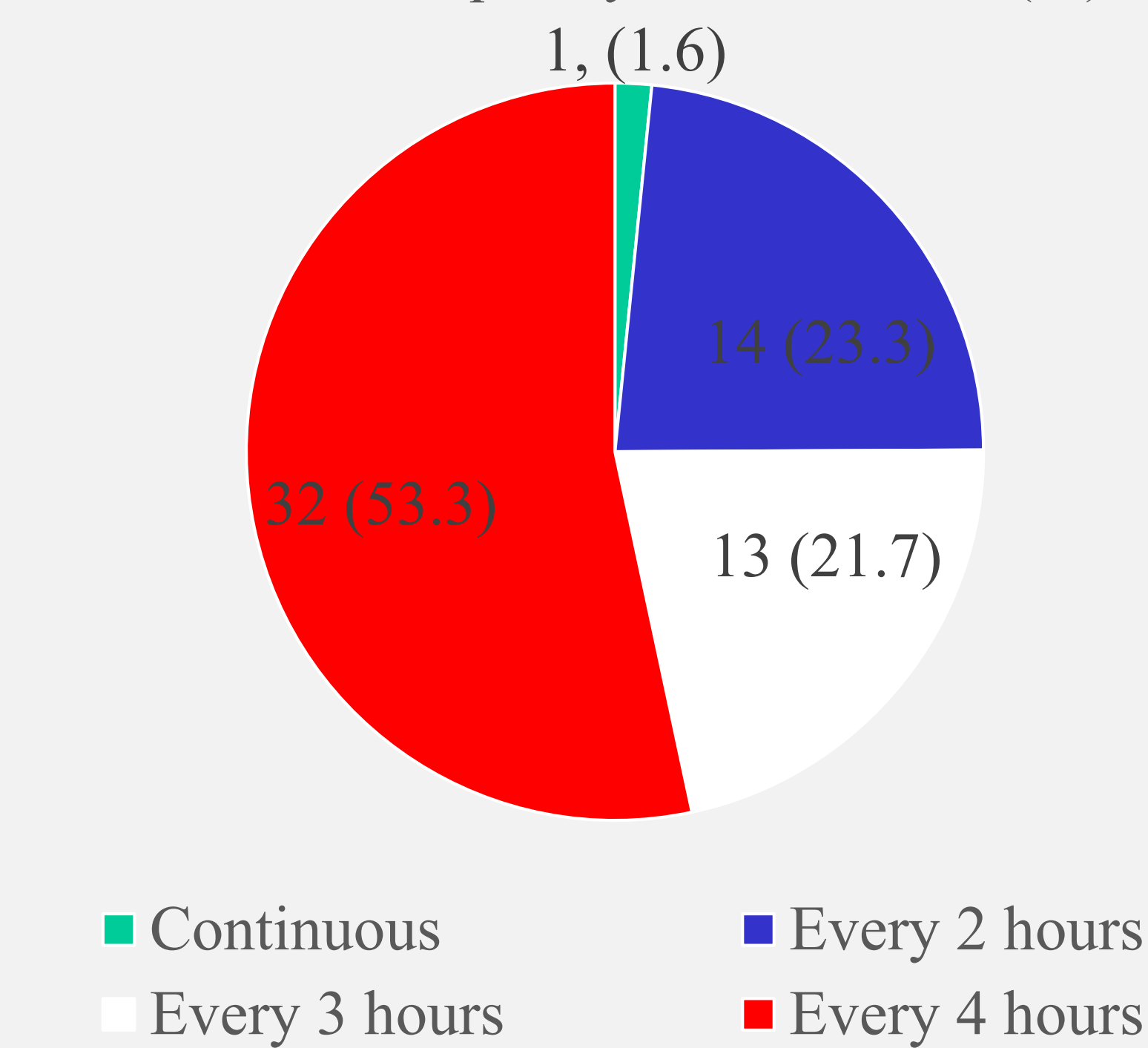
Demographics	N = 60
Age (years)	Range: 2 – 18.8 Mean: 8.7
Gender, n (%)	
Male	28 (46.7)
Female	32 (53.3)
Weight category, n (%)	
Underweight	2 (3.3)
Normal weight	23 (38.3)
Overweight	13 (21.7)
Obese	9 (15.0)
Unknown weight classification	13 (21.7)
Asthma step therapy, n (%)	
Step 1	0 (0)
Step 2	8 (13.3)
Step 3	14 (23.3)
Step 4	3 (5.0)
Step 5	6 (10.0)
Hospitalizations for asthma, n (%)	
Within last 30 days:	
None	47 (78.3)
1	6 (10.0)
3	2 (3.3)
Within last year:	
None	47 (78.3)
1	8 (13.3)
3	3 (5.0)
6	1 (1.7)
7	1 (1.7)

Table 1. Demographics

Characteristic	N = 60
Oral corticosteroid (OCS) within 30 min. of arrival, n (%)	8 (13.3)
OCS administration time (hours)	Range: 0.23 – 23.15 Mean: 15.43
Transfer from PICU, n (%)	32 (53.3)
Clinical asthma score (CAS) 44-52 hours after admission to emergency department, n (%)	
0	14 (23.3)
1	6 (10.0)
2	2 (3.3)
3	1 (1.7)
Not assessed within time frame	37 (61.7)
Placement on correct dose of 2 mg/kg or 60 mg of oral corticosteroid (OCS), n (%)	57 (95)
Patients on asthma pathway at 48 hours, n (%)	41 (68.3)
Pathway duration (hours)	Range: 0.3 – 105.5 Mean: 38.2
Length of stay (hours)	Range: 48.3 – 183.4 Mean: 63.6

Table 2. Asthma Course

Albuterol frequency at 24 hours, n (%)



Albuterol frequency at 48 hours, n (%)

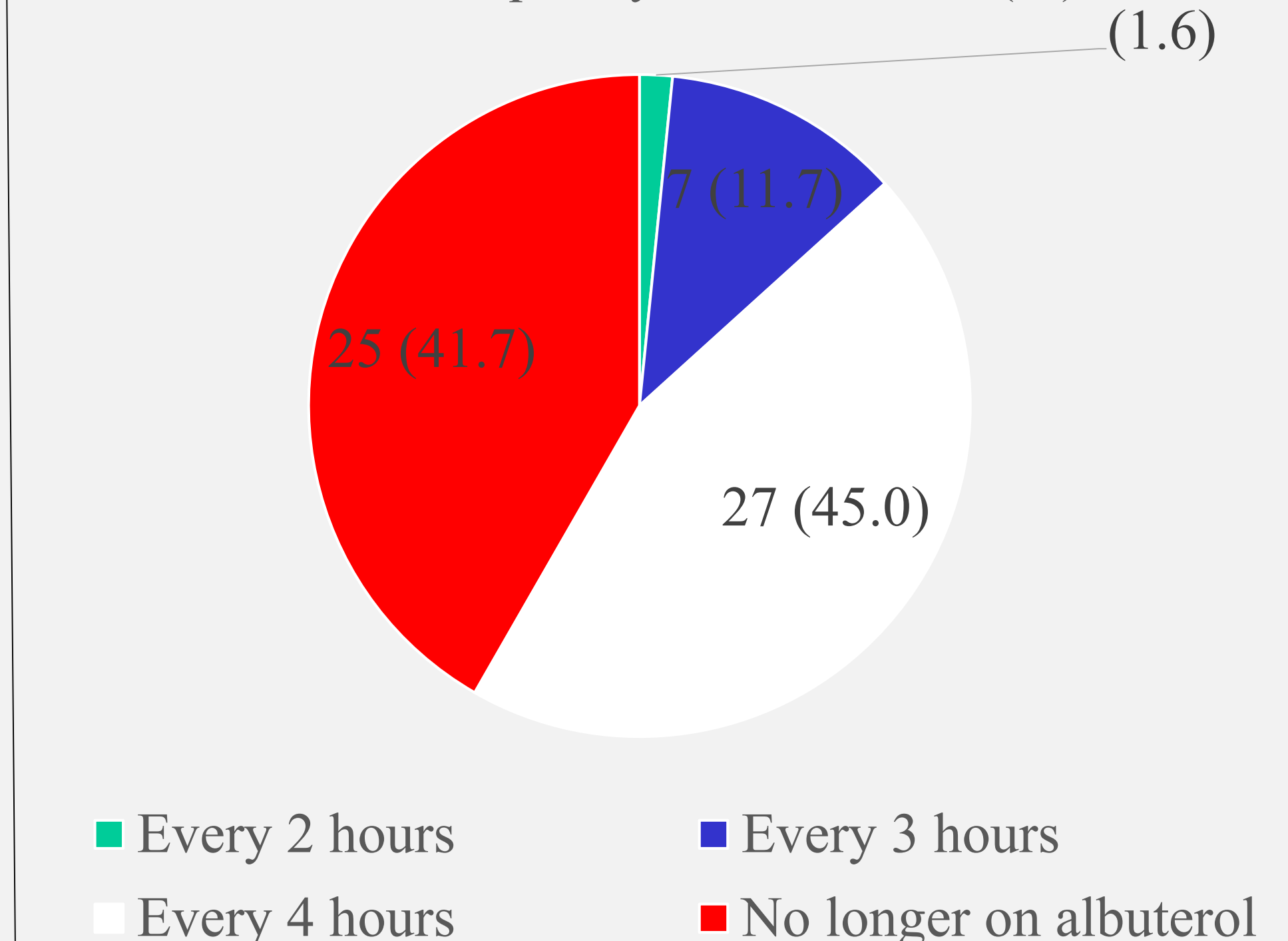


Figure 1. Albuterol Frequencies At 24 and 48 Hours

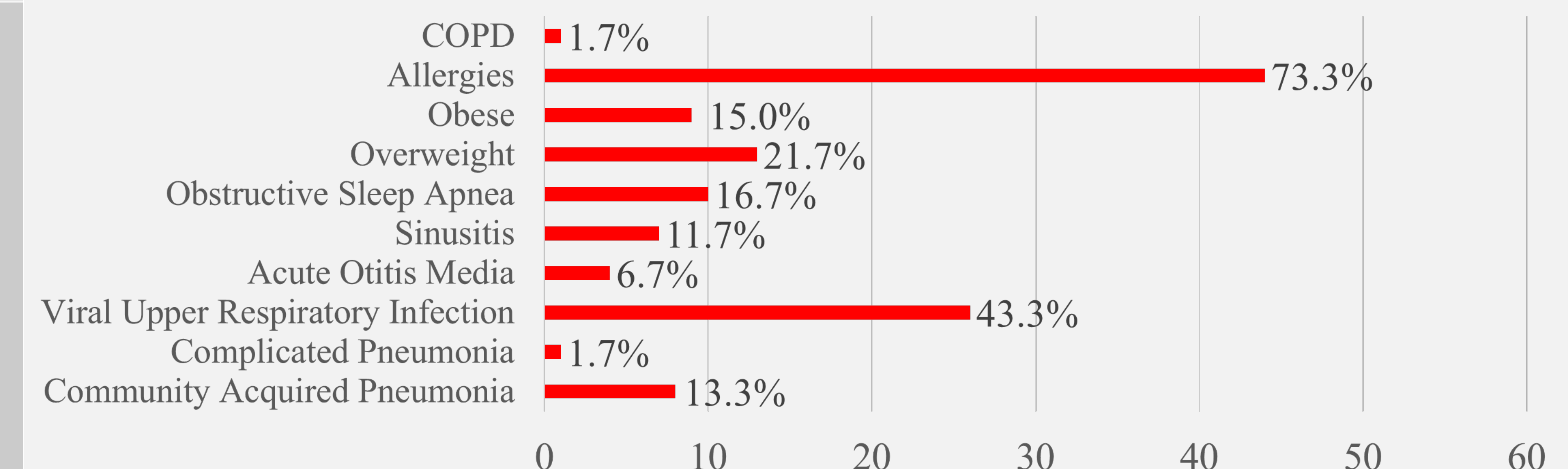


Figure 2. Counts of Patients With Comorbidities/Differential Diagnoses

## DISCUSSION

- Majority of patients with CAS scores within 44-52 hours scored 0, indicating extended lengths of stay likely due to concurrent comorbidities, suboptimal progression of the albuterol asthma pathway (i.e. timing of OCS), or both.
- Allergies and viral URIs are most common comorbidities in asthma exacerbation patients with extended length of stay. Other factors may play a role (see Figure 2).
- Limitations
  - Retrospective design with possible data discrepancies and inability to assess subjective information such as adherence reporting.
  - Did not account for CAS scores outside of allotted time frame, including multiple prior scores of 0.

## CONCLUSIONS

- Various comorbidities affect length of stay in asthma patients.
- Allergies and viral URIs appear to be most common contributors.
- Late timing of OCS administration may extend length of stay.
- Adequately addressing modifiable conditions is likely key to preventing exacerbations and/or reducing their duration.