



# Assessment of Off-Label Bronchodilator Use in the Intensive Care Unit at Burnaby Hospital



Anna Judson, B.Sc. (Pharm); Gloria Su, PharmD; Vincent Mabasa, PharmD; Darwin Chan, RRT

## Background

- Bronchodilator (BD) use in Intensive Care Unit (ICU) patients with an underlying diagnosis of asthma and/or chronic obstructive pulmonary disease (COPD) is well established
- In contrast, intubated ICU patients without evidence of airflow obstruction do not have a reliable response to BD therapy and the benefit of BDs in these patients is not clear
- BDs are often continued following resolution of critical illness without indication
- Interventions aimed at reducing BD use has resulted in a decrease in cost and did not increase rate of pneumonia or length of hospital or ICU stay
- Judicious use of salbutamol, and other BDs, is important especially in patients without a clear indication as the risks may outweigh the benefits in these patients
- We hypothesize that bronchodilators are being used in ICU patients and are continued upon discharge from ICU and/or the hospital, even if the patient has no clear indication for the bronchodilator
- The purpose of this study is to assess the use of off-label bronchodilators (OLBs) in the ICU at Burnaby Hospital and to examine whether or not these OLBs are being discontinued appropriately

## Objectives

### Primary

- Number of patients receiving bronchodilators in ICU
  - Admitted on or prescribed OLB therapy
  - Discharged from ICU with OLB
  - Discharged from ICU and hospital with OLB

### Secondary

- Types of OLBs used
- OLB dosing frequency patient is discharged on (as needed(prn) or regular)
- Cost of OLBs used in ICU
- Documented reason for OLB use

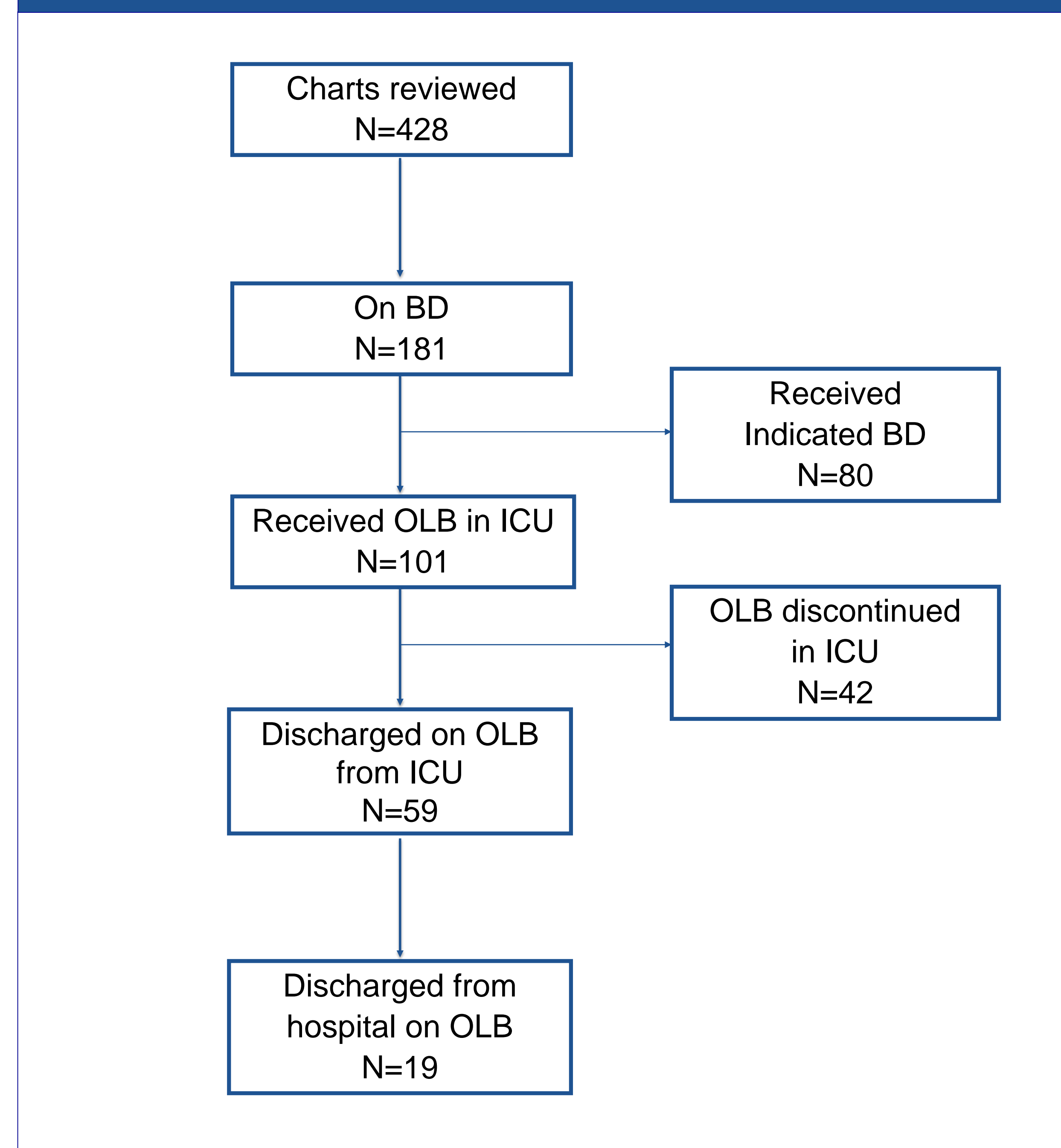
## Methods

- **Design:** Single-center, retrospective chart review
- **Population:**
  - *Inclusion:* Patients receiving bronchodilator therapy while in the ICU at Burnaby Hospital
  - *Exclusion:* Died during ICU stay, not discharged from ICU at time of data extraction
- Patients were only included once, based on their most recent ICU admission
- Sequential chart review until convenience sample of 100 OLB patients reached
- **Study Period:** June 2015 to May 2016

Table 1. Demographics and Clinical Characteristics

Characteristic	On OLB N=101 (56%)	Indicated BD N=80 (44%)
Age, years – mean (range)	65 (29-92)	70 (19-94)
Male sex – no. (%)	51 (50%)	42 (52%)
Reason for ICU Admission – no. (%)		
Respiratory Related	39 (39%)	52 (65%)
Non-Respiratory Related	58 (57%)	25 (31%)
Length of ICU stay – days	6	5.7
Required Ventilation	65 (64%)	26 (32%)
Required BiPAP	11 (11%)	29 (36%)
Relevant Comorbidities – no. (%)		
CHF	22 (22%)	28 (35%)
Atrial fibrillation	21 (21%)	23 (29%)
COPD	0 (0%)	67 (89%)
Asthma	0 (0%)	14 (17%)
History of Smoking – no. (%)		
Yes	28 (28%)	67 (84%)
No	64 (63%)	8 (10%)

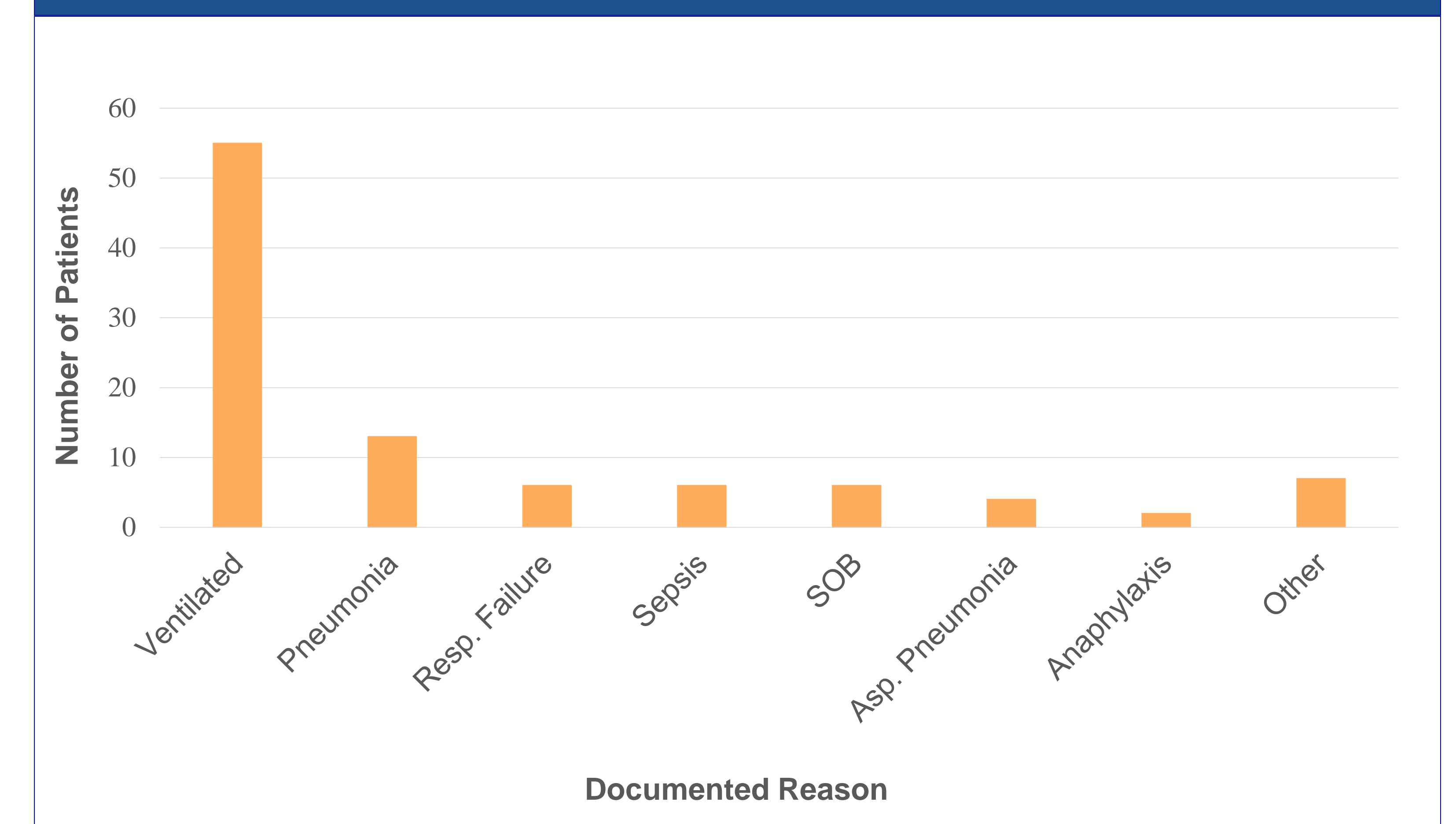
Figure 1: Flow Chart of Patients Continuing on OLB Therapy



## Results – Secondary Outcomes

- Types of OLBs used
  - Salbutamol (99%)
  - Ipratropium (89%)
  - Inhaled Corticosteroid (ICS)/Long Acting  $\beta$ -agonist (LABA) (<1%)
- Of patients discharged from hospital on OLB
  - 13 (68%) were discharged with prn OLB
  - 7 (37%) were discharged with regularly scheduled OLB
  - 10% had a Pulmonary Function Test (PFT) referral
- Cost of OLBs: \$782.92

Figure 2: Documented Reason for OLB Use



## Limitations

- No follow-up with Pharmanet to confirm if patients filled prescription for OLB as out-patient or if patient continued with the prescription
- Convenience sample only represents a “snap shot” of the ICU OLB use
- Asthma/COPD status determined from Meditech histories when PFT not available
- Cost analysis only considered medication costs, it does not take nursing time, spacers, etc. into consideration
- No patient cost burden analysis of OLBs post-discharge if OLBs continued

## Conclusions

- Over half of patients in ICU who received bronchodilators had no indication for use
- Opportunities for de-prescribing of OLBs in ICU patients
- Possible cost savings with judicious use of bronchodilators

References available upon request

