

# Pharmacist-Initiated Optimization of Inhalers in High-Risk, Older Adults with COPD

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## Background

In 2011, over 12 million Americans had a medical diagnosis of chronic bronchitis, a component of chronic obstructive pulmonary disease (COPD)<sup>1</sup>. Prevalence was highest among persons aged 65 years and older, at 64.2 per 1,000<sup>1</sup>. Several inhalers are available to treat COPD, many of which require multiple steps to correctly administer. Many studies have evaluated potential barriers to proper inhaler technique, including:

- **Advanced age** – estimated rate of 2.5 errors per older adult per inhaler<sup>2</sup>; greater technique failure versus younger patients<sup>3</sup>
- **Type of inhaler** – greater technique failure with use of pressurized metered dose inhalers<sup>3</sup>
- **Cognitive impairment** – decreased ability or inability of patients with moderate dementia (defined as a mini-mental test score [MTS] of 4 or 5) to learn inhaler techniques<sup>4</sup>
- **Poor hand-grip strength** – increased inability to use metered dose inhaler if hand-grip strength is less than 10 kg<sup>5</sup>
- **Poor vision** – misuse of Diskus<sup>®</sup> inhaler devices observed in patients with 20/50 vision in both eyes<sup>6</sup>

It is recommended to consider inhaler cost, device convenience, and patient preference for older adults with cognitive impairment, poor manual dexterity, and/or poor hand-grip strength<sup>7</sup>.

## Objectives

The primary objective of this study is to determine the impact of personalized inhaler selection in a pharmacist-run clinic of high-risk, older adults with COPD. The primary objective will be measured using the COPD Assessment Test (CAT), which evaluates symptoms of COPD. Secondary objectives include change in acute care utilization, rescue inhaler use, and patient-reported quality of life based on the SF-12 Health Survey.

## Clinical Practice

The primary investigator currently practices at the Program of All-Inclusive Care for the Elderly of Rhode Island (PACE-RI). Criteria for enrollment at PACE-RI includes the following:

- Age 55 years or older
- Resident of RI
- Meet nursing home level of care

PACE-RI is regulated by the Centers for Medicare and Medicaid Services, and provides comprehensive services and care using an interdisciplinary team approach. As of May 1, 2016, total enrollment at PACE-RI is 284.

## Study Design & Methods

This retrospective chart review was approved by the Institutional Review Board at the University of Rhode Island. Participants are included if they meet the following criteria: diagnosis related to COPD based on International Classification of Diseases (9<sup>th</sup> or 10<sup>th</sup> revision) diagnosis code(s) in the electronic health record (EHR), living in the community, and self-administration of inhalers. Participants are excluded if they are prescribed nebulizers only. Participants are divided into two groups: those who were seen by a clinical pharmacist twice in a three-month period for a COPD visit (Group 1), and those who were not seen at all (Group 2). Change in CAT score, SF-12 Health Survey score, acute care utilization, and rescue inhaler use from visit 1 to visit 2 will be compared for participants in Group 1. Acute care utilization, rescue inhaler use, and demographics will be compared between Groups 1 and 2.

The PI will review the EHR for the following demographic information: history of relevant comorbidities (visual deficits, arthritis, tremor, digit amputation, dementia or cognitive impairment); Montreal Cognitive Assessment (MoCA) score; hand-grip strength; tobacco use; primary language; age; vaccination status for influenza and pneumococcal.

## Preliminary Results

	Group 1 Participants (n=15)
Age, years (mean)	67
Female gender (%)	9 (60)
Comorbidities, no. (%)	
Visual impairment	4 (27)
Cognitive impairment	1 (7)
Arthritis or tremor	15 (100)
Current tobacco use, no. (%)	7 (47)
English-speaking, no. (%)	15 (100)
2015-16 influenza vaccination, no. (%)	12 (80)
Pneumococcal vaccination, no. (%)	12 (80)
CAT score	
Low < 10	5 (33)
Medium 10-20	4 (27)
High to Very High > 20	6 (40)
SF-12 Health Survey rating	
Good, Very Good, or Excellent	6 (40)
Fair or Poor	9 (60)
Correct use of all inhalers, no. (%)	9 (60)

## Preliminary Results (continued)

Participants with low CAT scores (n=5) rated their health as Very Good, Good, or Excellent. Eighty percent of these participants demonstrated correct inhaler technique. Fifty percent of participants with medium, high, or very high CAT scores demonstrated correct inhaler technique. The following inhaler technique errors were observed by the clinical pharmacist: lack of tight aperture, forgetting to shake and prime inhaler, inability to load Diskus<sup>®</sup> dose, forgetting to rinse and spit after use of inhaled corticosteroids, and difficulty depressing canister of metered dose inhaler. Further chart review will likely reveal more barriers and possible trends in proper inhaler technique. Recommendations were made to the medical team to change inhalers or add a spacer for three participants.

## Conclusions

Based on visit 1 information collected for Group 1 participants, lower CAT scores in this population may be correlated with better SF-12 Health Survey scores and a higher rate of correct inhaler technique. Evaluation of visit 2 information will reveal the impact of COPD visits with a clinical pharmacist on change in CAT and SF-12 scores. Further chart review may also reveal trends in barriers to correct inhaler technique based on type of inhaler.

## References

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