

# Results from a Community-Wide Pilot Program to Standardize COPD Education for Patients Across Healthcare Settings in Rhode Island

KIMBERLY PELLAND, MPH; ROUBA YOUSSEF, PhD; KATHLEEN CALANDRA, BSN, RN; JENNIFER CELLAR, MSN, APRN, CNP; JENNIFER THIESEN, MS, APRN, ACNP-BC; REBEKAH GARDNER, MD

## ABSTRACT

Chronic obstructive pulmonary disease (COPD) is associated with significant morbidity, decreased quality of life, and burdensome hospital admissions. Therefore, patients with COPD interact with clinicians in a number of healthcare settings. A coalition of healthcare practitioners in Rhode Island, in partnership with the local Quality Improvement Organization, designed and implemented a standardized, COPD education program for use across multiple healthcare settings. More than 60 organizations participated, producing 140 Master Trainers, who trained 634 staff members at their facilities from October 2015 through June 2016. Master Trainers were satisfied with the training, and we observed significant increases in knowledge scores post-training among all participants, which remained significant when stratified by setting. These results demonstrate that implementation of a community-based program to disseminate patient-centered, standardized COPD education in multiple healthcare settings is feasible. We hope this program will ultimately improve patient outcomes and serve as the foundation for expanding standardized education for other chronic conditions.

**KEYWORDS:** chronic obstructive pulmonary disease, patient education, self-management, quality of health care

## INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is a condition associated with significant morbidity, decreased health-related quality of life, and burdensome hospital admissions.<sup>1-4</sup> An estimated 700,000 COPD hospitalizations occur each year in the United States,<sup>5,6</sup> and about 20% of patients are readmitted to the hospital within 30 days.<sup>7</sup> In 2015, 23.9% of Rhode Island's Medicare beneficiaries with COPD were readmitted within 30 days.

Self-management, a patient's ability to oversee their own chronic conditions, can improve health outcomes, contribute to a better patient experience, and potentially lower costs.<sup>8</sup> COPD patients who have received self-management education have improved quality of life, improved adherence to medications, and lower rates of hospitalizations and readmissions.<sup>9-11</sup> Although prior work supports self-management education in COPD,<sup>12,13</sup> use of standardized educational materials across different healthcare settings, such as a hospital

and skilled nursing facility (e.g., cross-setting education), has not been studied. COPD patients seek medical care in multiple different settings, and if these settings provide self-management education using different tools and approaches, patients could receive conflicting advice and information.

This work attempts to fill the identified gap by assessing the feasibility of a cross-setting, standardized COPD education program implemented through a community coalition. The Greater Providence Community Coalition, facilitated by the regional Centers for Medicare & Medicaid Services' (CMS) Medicare Quality Innovation Network-Quality Improvement Organization (QIN-QIO), Healthcentric Advisors, developed and implemented a program to address the lack of standardization in COPD patient education across settings, with the ultimate goal of equipping patients to be fully engaged participants in their care.

## METHODS

### Settings and Participants

As the New England QIN-QIO, Healthcentric Advisors partners with providers to establish community coalitions. These coalitions address barriers to safe patient transitions and work to reduce unnecessary hospital readmissions. The Greater Providence Community Coalition is one such initiative, which includes a wide range of healthcare settings and providers, including leadership and staff from more than 50 healthcare organizations. The Coalition is based in Providence County, an area with seven hospitals, 57 skilled nursing facilities, and 18 home health agencies, serving nearly 75,000 of Rhode Island's 200,000 Medicare beneficiaries.

### Program Development

In early 2015, Coalition members discussed the challenges of teaching patients with COPD how to self-manage their condition, identifying a lack of standardized training materials as a key barrier. The Coalition and Healthcentric Advisors collaborated to develop and implement a cross-setting COPD education program, building on an existing CMS-sponsored initiative (Lung Talks).<sup>14</sup> The program goals were to engage patients and families in disease self-management; reduce hospital admissions for COPD patients; and improve the care of COPD patients by using consistent messaging across healthcare settings through standardized education.

Workgroups planned program content and delivery methods. Clinicians and quality improvement specialists performed a literature review, reviewed existing educational

resources, and then developed and adopted tools and materials, based on their knowledge of what would work best in the local community, engaging patients throughout the process.

Tools adopted for the program included the COPD Zone Tool and Action Plan and the Lung Talk booklets and videos. The COPD Zone Tool and Action Plan is a tracking system designed to allow patients to monitor and record their symptoms. It includes education about problem symptoms that require escalation and a section to document personalized action plans. This resource was translated into Spanish and Portuguese. Lung Talk booklets and videos<sup>14</sup> and additional content from the American Lung Association were adapted to structure and standardize the education delivered to patients.

### Program Delivery

We invited all Coalition members to a three-hour Master Trainer session taught by two clinical pharmacists and a nurse practitioner. Project staff also reached out to other healthcare organizations in the community to increase participation. Participants were instructed on the purpose of the program, basic pathophysiology and management of COPD, use of program materials, and how to deliver an effective training session at their own organizations. Demonstration inhalers were also used to stress proper inhaler administration. Core program components are in **Table 1**.

Participants who attended the Master Trainer session were tasked with training targeted front-line staff at their own organizations. We provided the curriculum and materials for the front-line staff training during Master Trainer sessions. Resources to implement training at individual facilities included: training manuals; pre- and post-tests with answer keys; the Lung Talk series; COPD Zone Tool

and Action Plans; slides on COPD treatment; instructions and tools for data collection; and demonstration inhalers. We also provided standardized educational resources for staff to use when working with patients. Participating organizations committed to submitting data monthly.

We administered the Lung Talk series' 20-item COPD knowledge test to Master Trainer participants and front-line staff. This test was administered before and after a training session to assess participants' baseline COPD knowledge and any change in that knowledge after a training session. Based on early feedback from Master Trainers, we reduced the knowledge test to 10 items for administration at individual facilities.

### Study Design and Data Analysis

To assess effectiveness and feasibility of the program, we tracked the number of participants who completed the Master Trainer sessions and the percentage of targeted staff they trained at their organizations. We compared the average aggregate Master Trainer pre- and post-test scores and the trained staff's pre- and post-test scores. We asked each organization to track the number of patients who received the COPD tools and education each month. We administered course evaluations after each Master Trainer session. Finally, we solicited any barriers to training staff at their organizations and to teaching patients with the provided tools and resources.

Data were collected from October 2015 to June 2016. Descriptive statistics were used to describe Master Trainer and trained staff characteristics. Pairwise t-tests were performed to test for significance in the difference between pre- and post-tests, overall and by setting. Test averages were used to account for the change in number of items on the pre- and post-tests during implementation. Statistical Analysis Software (SAS) Version 9.3 was used for all analyses.

**Table 1.** Components of Greater Providence Coalition Chronic Obstructive Pulmonary Disease (COPD) Program

Program Components	
Overview and Commitment	Program goals and focus on standardized education across settings Commitment to data collection to support measurement of the initiative
Standardized Materials	Lung Talk Book and videos for licensed clinicians and support staff* COPD Zone Tool and Action Plan designed to allow patients to self-monitor and record symptoms in real time
Evidence-Based Techniques for Educating Patients	Strategies to engage patients and families in disease self-management Strategies to reduce preventable hospital readmissions for COPD Motivational interviewing, teach back methods
Demonstration Inhalers	Instructions on assembly and delivery of the most commonly used inhalers Time to practice with the demonstration inhalers

\*Materials are available at: <http://www.qualidigm.org/our-work/lung-talk/>

## RESULTS

### Master Trainers

Healthcentric Advisors hosted five train-the-trainer sessions in two phases, from October 2015 to May 2016, producing 140 Master Trainers from 61 organizations. Almost 40% (n=53) of Master Trainers were from nursing homes, 15.0% (n=21) were from hospitals, 14.3% (n=20) were from home health agencies, and 10.7% (n=15) were from physician offices. Master Trainers' average pre-test score was 74.3% and their average post-test score was 86.9%, representing a mean absolute increase of 12.6 percentage points (p-value<0.001). Session evaluations completed by Master Trainers were positive; for each of the six learning objectives, more than 95% of Master Trainers indicated that the session met the stated goal. All were either satisfied or very satisfied with the presentations and collaborative learning that occurred, and all participants agreed the session was a valuable use of their time. Additional feedback solicited after Phase 1 demonstrated that the training manual was sufficient for conducting staff trainings, and Master Trainers

reported that the Lung Talk book and video materials were well received by their staff. They also noted that the demonstration inhalers were a valuable adjunct for teaching.

### Trained Staff

Master Trainers targeted a combined 981 staff at their respective organizations to receive the COPD training. Through June 2016, 634 (64.6%) of the targeted staff completed training in 77 total sessions. **Figure 1** shows reach of the program through the cumulative rate of training completion among targeted staff by month.

Among the staff members trained by Master Trainers, 37.4% (n=237) were from home health agencies, 36.1% (n=229) were from nursing homes, and 11.4% (n=72) were from hospitals. The remaining were from physician offices, behavioral health, payers, and medical equipment providers. More than 45% (n=292) of trained staff were registered nurses, 18.8% (n=119) were certified nursing assistants or medical technicians, and 16.6% (n=105) were rehabilitation professionals. The remaining were licensed practical nurses, physicians, nurse practitioners, respiratory therapists, or other support staff.

Approximately 92% (n=549) of trained staff completed pre- and post-learning tests. The pre-test average among trained staff was 67.0% and the post-test average was 83.0%, representing a mean absolute increase of 16.0 percentage

points (p-value<0.001). When stratified by setting, all mean score increases remained significant (**Figure 2**). Average baseline scores by setting ranged from 59.8% (nursing home) to 82.5% (behavioral health).

### DISCUSSION

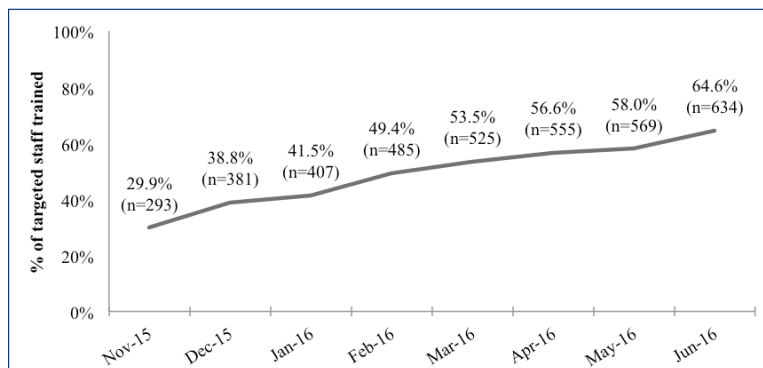
Our results demonstrate the feasibility of a standardized, community-based approach to COPD patient education and self-management strategies. The process and curriculum were applicable to and practical for a wide range of health-care venues.

In Coalition discussions, we learned that clinician training on how to educate patients about COPD self-management strategies is inconsistent. This lack of uniformity, along with use of conflicting educational materials and tools, may limit patients' ability to learn self-management techniques, even if they desire to do so.<sup>15</sup> Coalition members' common goal to address this gap drove support and interest in the program. Successful adoption and rollout was also likely due to collaboration facilitated by a neutral convener (the QIN-QIO). Fragmented healthcare systems and competing interests can prohibit shared strategies and approaches; a neutral platform allowed potential competitors to develop a uniform approach. Finally, payer and pharmaceutical company involvement further strengthened the work through encouraging participation and by offsetting costs of training materials. Inhalers are essential in controlling COPD exacerbations, yet a majority of patients use inhalers incorrectly.<sup>16-18</sup> Therefore, obtaining demonstration inhalers at no cost facilitated teaching participants how to demonstrate use to patients.

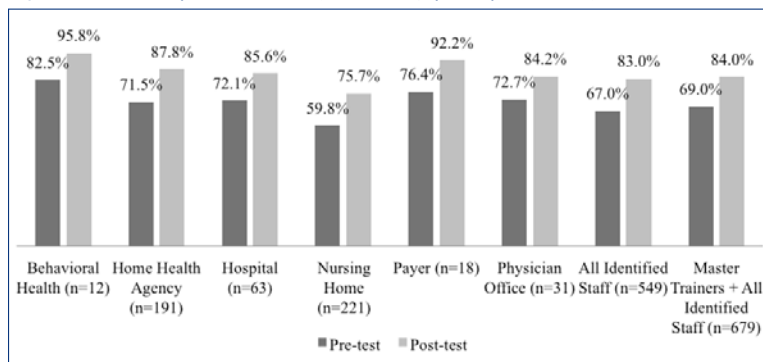
We compared program expenses to anticipated costs to better evaluate feasibility. Time spent on program development and training was the largest expense. Using mean hourly wage information<sup>19</sup> and the distribution of participating staff, we determined that each Master Trainer session cost \$553.38 for the staff running the training and \$110.22 for each participant, resulting in \$18,276.90 combined for five sessions. Master Trainers then spent 77 hours leading training sessions at their organizations, at a cost of \$2,828.92. Staff at the organizations spent 634 hours attending these sessions, at a cost of \$22,982.03. Combined, the 1,176 hours represent an estimated \$44,087.85 in personnel time. Minimal costs were expended on materials (\$1,062). Therefore, program expenses totaled \$45,149.85, reflecting a per-trainee cost of \$58.33. Avoiding four COPD readmissions would more than pay for the cost of this intervention, based on an average cost of \$12,133 for a 30-day Medicare COPD readmission.<sup>20</sup>

Our work has several limitations. First, as a pilot in one area of the state, generalizability to other

**Figure 1.** Cumulative rate of training completion among targeted staff (N=981)



**Figure 2.** Pre- and post-test average scores by participant setting (N=679)



\*The difference between each setting's pre-test and post-test scores was statistically significant at the p<0.0001 level, except for Behavioral Health (p=0.0046).

regions may be limited. Second, we did not assess the quality of the training delivered by Master Trainers to targeted staff at their facilities, which could have impacted knowledge scores and satisfaction. Finally, the impact on patients is not quantified. During this pilot project we learned about data collection challenges faced; availability of resources and time were the two common barriers shared by Coalition members.

These results demonstrate that implementation of a community-based program to disseminate high quality, patient-centered, standardized COPD education in multiple settings is feasible. Next steps include identifying a reliable way for organizations to collect patient-level data and to measure program impact on patient self-management skills, knowledge, and clinical outcomes. We hope that ultimately this program will improve patient outcomes, decrease avoidable utilization of medical services, and serve as the foundation for standardized, patient-centered education for more chronic conditions.

### Acknowledgments

We thank all of the Coalition members and Healthcentric Advisors' Care Transitions team members for their contributions to program development and implementation.

### Disclaimer

The analyses upon which this report is based were performed under IDIQ contract number HHSM-500-2014-QIN014I, Task Order Number HHSM-500-TMA01, funded by the Centers for Medicare & Medicaid Services, an agency of the U.S. Department of Health and Human Services. The content of this publication does not necessarily reflect the views or policies of the Department of Health and Human Services, nor does mention of trade names, commercial products, or organizations imply endorsements by the U.S. Government. The author assumes full responsibility for the accuracy and completeness of the ideas presented.

### References

1. Brown DW, Croft JB, Greenlund KJ, Giles WH. Trends in hospitalization with chronic obstructive pulmonary disease—United States, 1990-2005. *COPD*. 2010;7:59-62.
2. Centers for Disease Control and Prevention. Chronic Obstructive Pulmonary Disease (COPD), Data and Statistics; 2014. <http://www.cdc.gov/copd/data2.html>
3. Hynninen KM, Breivte MH, Wiborg AB, Pallesen S, Nordhus IH. Psychological characteristics of patients with chronic obstructive pulmonary disease: a review. *J Psychosom Res*. 20015;59(6): 429-443.
4. Engström CP, Persson LO, Larsson S, Sullivan M. Health-related quality of life in COPD: why both disease-specific and generic measures should be used. *Eur Respir J*. 2001;18(1): 69- 76.
5. Ford ES, Croft JB, Mannino DM, Wheaton AG, Zhang X, Giles WH. COPD surveillance—United States, 1999-2011. *Chest*. 2013;144(1): 284-305.
6. Stein BD, Charbeneau JT, Lee TA, Schumock GT, Lindenauer PK, Bautista A, et al. Hospitalizations for acute exacerbations of chronic obstructive pulmonary disease: How you count matters. *COPD*. 2010;7:164-171.
7. Jencks SF, Williams MV, Coleman EA. Rehospitalizations among patients in the Medicare fee-for-service program. *N Engl J Med*. 2009; 360:1418-1428.
8. Hibbard JH, Greene J. What the evidence shows about patient activation: better health outcomes and care experiences; fewer data on costs. *Health Aff*. 2013;32: 207-214.
9. Rice KL, Dewan N, Bloomfield HE, Grill J, Schult TM, Nelson DB, et al. Disease management program for chronic obstructive pulmonary disease: a randomized controlled trial. *Am J Respir Crit Care Med*. 2010;182(7): 890-896.
10. Effing T, Monninkhof EM, van der Valk PD, van der Palen J, van Herwaarden CL, Partidge MR, et al. Self-management education for patients with chronic obstructive pulmonary disease. *Cochrane Database Syst Rev*. 2007;17(4): CD002990.
11. Sari N, Osman M. The effects of patient education programs on medication use among asthma and COPD patients: a propensity score matching with a difference-in-difference regression approach. *BMC Health Services Research*. 2015; 15: 332.
12. Horton R. Reducing emergency room utilization in end-stage COPD - feasible or fantasy? *Chron Respir Dis*. 2013; 10(1): 49-54.
13. Bischoff EW, Hamd DH, Sedeno M, Benedetti A, Schermer TR, Bernard S, et al. Effects of written action plan adherence on COPD exacerbation recovery. *Thorax*. 2011; 66: 26-31.
14. Qualidigm. Living with COPD. <http://www.qualidigm.org/our-work/lung-talk/>
15. Wortz K, Cade A, Menard JR, Lurie S, Lykens K, Bae S, et al. A qualitative study of patients' goals and expectations for self-management of COPD. *Prim Care Respir J*. 2012; 21(4): 384-391.
16. Arora P, Kumar L, Vohra V, Sarin R, Jaiswal A, Puri MM, et al. Evaluating the technique of using inhalation device in COPD and bronchial asthma patients. *Respir Med*. 2014; 108: 992-998.
17. Ganguly A, Das AK, Roy A, Adhikari A, Banerjee J, Sen S. Study of proper use of inhalational devices by bronchial asthma or COPD patients attending a tertiary care hospital. *J Clin Diagn Res*. 2014; 8: HC04-7.
18. Lavorini F, Magnan A, Dubus JC, Voshaar T, Corbetta L, Broeders M, et al. Effect of incorrect use of dry powder inhalers on management of patients with asthma and COPD. *Respir Med*. 2008; 102: 593-604.
19. Rhode Island Department of Labor and Training. Statewide Occupations, All Industries - Alphabetical Order; 2015. <http://www.dlt.ri.gov/lmi/oes/statealpha.htm>
20. Barrett ML, Wier LM, Jiang HJ, Steiner CA. All-Cause Readmissions by Payer and Age, 2009-2013. HCUP Statistical Brief #199 2015. Agency for Healthcare Research and Quality, Rockville, MD. <http://www.hcup-us.ahrq.gov/reports/statbriefs/sb199-Readmissions-Payer-Age.pdf>

### Authors

- Kimberly Pelland, MPH, Associate Scientist, Healthcentric Advisors, Providence, RI.
- Rouba Youssef, PhD, Health Information Analyst, Healthcentric Advisors, Providence, RI.
- Kathleen Calandra, BSN, RN, Senior Program Administrator, Healthcentric Advisors, Providence, RI.
- Jennifer Cellar, MSN, APRN, CNP, Nurse Practitioner, Medical Associates of Rhode Island, Bristol, RI.
- Jennifer Thiesen, MS, APRN, ACNP-BC, Director of Care Transitions, Lifespan, Providence, RI.
- Rebekah Gardner, MD, Senior Medical Scientist, Healthcentric Advisors, Providence, RI; Associate Professor of Medicine, Department of Medicine, Alpert Medical School of Brown University, Providence, RI.

### Conflict of Interest

The authors declare that they have no conflict of interest.

### Correspondence

Kimberly Pelland, MPH  
235 Promenade Street, Suite 500, Box 18  
Providence, RI 02908  
P 401-528-3272 F 401-528-3210  
[kpelland@healthcentricadvisors.org](mailto:kpelland@healthcentricadvisors.org)