Education-Based Interventions Effects on 30-day Readmission Rates for Patients with COPD

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Education-Based Interventions Effects on 30-day Readmission Rates for Patients with COPD

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30-DAY COPD READMISSION RATES

Abstract

Purpose: This Quality Improvement (QI) project evaluated the impact of an existing education-based program for Chronic Obstructive Pulmonary Disease (COPD) and its effect on 30-day readmission rates in one hospital in rural Missouri.

Method: A retrospective chart review was completed on 493 patients with an inclusive diagnosis of COPD from June 1, 2018, to March 31, 2019, using a cohort study design and a two-sample t-test analysis. Additional variables were analyzed to determine if there were predictive factors of an elevated risk of readmission.

Results: The two-sample t-test reveals there is no statistically significant difference between the rates of readmission for patients who participated in the COPD education program (n=9, 12.33%) when compared to the rates of readmission of patients who did not participate in the program (n=59, 14.08%) (t=-0.3996, df=490, p-value=0.6896) (See Appendices A-D, Figures A1-D1).

Conclusion: Although primary outcomes data found no statistically significant difference in readmission rates for patients who did and did not participate in the COPD education program, other variables such as smoking, patients’ motivation for participation, socioeconomic status and timing of the data collection may have been factors in the outcome of the study. These variables may have influenced who participated and how they utilized the information they received from the program. Also, the addition of pulmonary rehabilitation to the existing COPD education program should be considered as evidence suggests it improves outcomes of patients with COPD (GOLD, 2018).

Keywords: chronic obstructive pulmonary disease, COPD, decreasing 30-day readmission, intervention, education
Introduction

Chronic obstructive pulmonary disease (COPD) refers to a group of diseases such as emphysema and bronchitis that cause difficulty breathing due to airflow blockage (CDC, 2018). As the disease progresses, patients often need to be hospitalized for an acute exacerbation. An acute exacerbation of chronic obstructive pulmonary disease (AECOPD) is defined as a change or worsening of the patient’s respiratory status that includes increasing shortness of breath, cough, and sputum production that requires either a change in medication, a visit to the Emergency Department (ED) or an admission to the hospital (Bartels, et al., 2018). An AECOPD is associated with an increase in morbidity and mortality, a lower reported quality of life, and a hastening in the decline of lung function (Bartels, et al., 2018).

Description of the Problem

Chronic obstructive pulmonary disease affects one in 10 people globally and 15 million people in the United States (U.S.) (Shah et al., 2016). As of 2012, COPD has become the third leading cause of death in the U.S. (Agee, 2017). Approximately 10 million provider office visits and 700,000 hospitalizations occur annually in the U.S. with a primary diagnosis of COPD along with 1.5 million visits to the emergency department (Krishnan et al., 2015; Lau, et al. 2017; Willard et al., 2016). Having a disease that increases the frequency of hospitalizations leads to loss of productivity, including time away from work, an inability to perform activities of daily living, and an increased burden of care placed on the patient’s family or caregivers (Willard et al., 2016).

The disease is costly, not only from a quality of life perspective, but from a financial perspective as well. Hospitalizations for acute exacerbations of COPD
30-DAY COPD READMISSION RATES

(AECOPD) account for $13.2 billion of the nearly $50 billion in annual direct costs in the U.S. (Agee, 2017; Shah et al., 2016). Twenty-one percent of patients are readmitted within 30 days of discharge for AECOPD and the cost of those admissions is 18% higher than the initial admission (Kangovi & Grande, 2014). Payers will reduce reimbursement for admissions that take place within 30 days of discharge from the initial admission. Bashir et al. (2016) and Shah et al. (2016) report that 10-70% of readmissions for AECOPD may be preventable. Data analysis reveal the factors that correlate with AECOPD but do not consistently define specific factors that will decrease these events (Amalakuhan et al., 2012).

Because of the high number of projected preventable readmissions, COPD was included as a condition under the Medicare Hospital Readmissions Reduction Program (HRRP) in 2014, incentivizing hospitals to reduce excess all-cause, 30-day readmissions after AECOPD to avoid a three percent penalty on all Medicare revenues (Agee, 2017). Several factors that influence the 30-day readmission rate of patients with COPD have been identified such as being a minority and/or of lower socioeconomic status; but a consistent, comprehensive list remains unclear (Bashir et al., 2016; Braman, 2015; Lloyd & Garside, 2018). Research also indicates that methods and interventions used to reduce 30-day readmission rates for patients with COPD have been identified but more research is needed (Agee, 2017; Amalakuhan et al. 2012; Lloyd & Garside, 2018; Shah et al., 2016). New approaches are needed to curb the growth in cost as well as patient morbidity and mortality. Healthcare providers, especially advanced practice registered nurses (APRNs), are challenged to meet this need. Due to the uniqueness of the nurse-patient relationship, APRNs play an integral role in the recognition of patients with worsening
30-DAY COPD READMISSION RATES

signs and symptoms of COPD. APRNs understand the importance of additional patient education to decrease readmissions from this chronic, progressive disease as well as how to improve the overall health in this patient demographic (Goodridge, 2006).

Purpose of the Project

A small, not-for-profit, 148 bed hospital located in a rural Missouri community was experiencing an increase in 30-day readmissions for patients with COPD. The hospital serves patients from five counties, and there are two pulmonologists employed by the hospital. The number of patients diagnosed with COPD in this community is approximately 3,100. The number of patients being readmitted within 30 days of discharge with a diagnosis of COPD was 14.7% in 2017 but, in 2018, the rate trended closer to the national average of 21%. The primary purpose of this Quality Improvement project was to evaluate the impact of an existing education-based program for COPD and its effect on 30-day readmission rates.

Project Objectives

The question asked in this project was, after participating in an education-based intervention, how does the 30-day readmission rate for patients diagnosed with COPD compare to patients who do not participate in the intervention. In other words, what was the rate of patients readmitted within 30 days of discharge who participated in the COPD education program compared to patients who do not participate in the intervention? Secondary variables measured by the project included smoking status, gender, employment status, and marital status due to their potential to confound the relationship of interest between participation in the program and readmission.

Review of the Literature
A comprehensive literature review was completed using CINAHL, Medline and PubMed databases and the keywords chronic obstructive pulmonary disease, COPD, decreasing 30-day readmission, intervention, and treatment. The search returned 450 peer-reviewed, scientific articles from 2012-2018. The articles chosen focused on intervention-based approaches to reducing 30-day readmission rates for patients with COPD. Articles excluded did not focus on COPD, were completed outside of the US, and lacked an intervention-based approach. Eighteen articles were included in the final analysis.

10-70% of readmissions after an “index” or original admission for AECOPD may be preventable (Bashir et al., 2016; Shah et al., 2016). Several variables were found to be important predictors of having at least two COPD exacerbations within one year of discharge. These included employment, body mass index, number of previous surgeries, admission albumin level and administration of azithromycin, ceftriaxone, and moxifloxacin (Amalakuhan et al., 2012). Many factors are thought to contribute to early readmission including: lack of utilization of care protocols based on the Global Initiative for Chronic Obstructive Lung Disease (GOLD) guidelines, premature discharge from the hospital for the index admission, poor discharge medication reconciliation, lack of education on proper use of inhalers, lack of standardized patient and family education on disease management, and lack of communication and coordination with outpatient providers who will be assuming future care (Agee, 2017; Shah et al., 2016).

The literature reveals several different approaches that decrease 30-day readmission rates for patients with COPD. These include utilizing a multidisciplinary team approach focused on implementing evidence-based strategies including
30-DAY COPD READMISSION RATES

standardized hospital admission protocols and orders based on the GOLD guidelines, standardizing patient education materials, educating the patients and hospital staff on the proper use of inhalers, educating patients on how to recognize a change in or worsening symptoms, the importance of obtaining treatment for a change in symptoms, planned coordination of care for patients to follow up with primary care providers, education on smoking cessation, utilization of motivational based health coaching, and referral to pulmonary rehabilitation when appropriate (Agee, 2017; Benzo et al., 2016; GOLD, 2018; Ko et al., 2014; Shah et al., 2016; Zafar et al., 2017). Lalmolda et al. (2017) report a comprehensive disease management (CDM) program that incorporates an exercise-based pulmonary rehabilitation program reduces admissions for patients with COPD.

Agee (2017) suggests that there are at least two or more interventions that can decrease the rate of readmissions for patients with COPD, but the author did not identify which interventions might have the most significant impact. Educating the patient on self-care management, instituting COPD care pathways, utilizing the GOLD guidelines, enrolling the patient in pulmonary rehabilitation and establishing social service support in the community after discharge were highlighted as being effective in decreasing readmissions for patients with COPD. A patient’s lack of understanding of the diagnosis of COPD and how to care for themselves also appear to lead to higher rates of readmission (Agee, 2017).

As stated previously, Kangovi and Grande (2014) report that 21% of patients with COPD are readmitted within 30 days of discharge and that these readmissions are 18% more expensive than the initial admission. The authors state readmissions for COPD may be influenced by factors that may not be under the patient’s control such as whether they
30-DAY COPD READMISSION RATES

have health insurance, limited income, and other existing comorbid conditions.

Engagement of the discharged patient with COPD in a transitional care management (TCM) plan can improve post discharge care coordination and continuity of care (Kangovi & Grande, 2014). Teaching patients and families self-care skills, developing an adequate plan of care to address the comorbidities, evaluating any adverse events that occur when attempting to reduce readmissions within this patient population and connecting with other groups who are working to decrease readmissions for patients with COPD can help to reduce readmissions for patients with COPD (Krishnan et al., 2015). Other possible interventions that may decrease readmission from COPD include providing health education, comprehensive nursing intervention (CNI) and tele-monitoring (Yang, 2017).

Limitations of the research reviewed include limited sample sizes and limited non-randomized controlled trials. Few studies focused on similar interventions. The consensus from several studies is that larger, randomized, controlled trials are needed (Amalakuhan et al., 2012; Bashir et al., 2016; Benzo et al., 2016; Ko et al., 2014; Saunier, 2017).

Theoretical Framework

The Plan Do Study Act (PDSA) framework is an approach to quality improvement that best supports this project. The PDSA process will guide purposeful action and promote learning through evaluation. The PDSA process provides a pathway for understanding the effects of the project, when and how to evaluate it, and any revisions that should be implemented along the way (Hickey & Brosnan, 2017).

Method
30-DAY COPD READMISSION RATES

Design

This was a quality improvement project using a retrospective chart review, cohort study design.

Setting

The project took place in a 148 bed, not-for-profit hospital located in rural Missouri. The community has a population of approximately 200,000 with a median household income of $54,024 (U.S. Census Bureau, 2017). According to the U.S. Census Bureau (2017), 12.72% of the population lives just at or below the federal poverty level. The U.S. Census (2017) bureau also reports that 88.4% of the population have graduated from high school and 22.1% have a bachelor’s degree or higher. The hospital is the largest employer in the community.

Sample

This project involved a retrospective chart review of a convenience sample of all patients who were discharged from the hospital between June 1, 2018, and March 31, 2019, with a diagnosis of COPD. The patients must have been discharged with a diagnosis that is inclusive of Chronic Obstructive Pulmonary Disease including Pneumonia, Bronchitis, Respiratory Infections, Pneumothorax, and Respiratory Failure. These diagnoses were chosen using the Optum One data analytic tool, that identified the likelihood of a COPD related hospitalization within six months of the initial admission. The Optum One tool was provided by the hospital for this project. The Diagnosis Related Grouping (DRG) code for the diagnoses are listed in Appendix H, Figure H1.

Consent was not required as this was a retrospective chart review of a convenience sample of patients. The final sample size was 492 patients. A power analysis
30-DAY COPD READMISSION RATES

was completed before the data collection and the sample size goal was at least 100
patients. All patients’ charts with identified diagnosis, discharged in this timeframe, were
evaluated. Thirty-day readmission rates of those participating in the COPD education
program were compared with those who did not complete the program.

Approval Processes

Formal, written approval was obtained from the quality improvement team at the
hospital as well as from the hospital’s Institutional Review Board (IRB) on March 18, 2019. IRB approval was obtained from the University of Missouri- St. Louis (UMSL) on
February 22, 2019. Although patient data were de-identified, a breach of confidentiality
was a risk associated with the project. The benefits of the project were to evaluate
whether the COPD Educational Program was effective in reducing 30-day readmission
rates for patients with COPD. There were no known ethical concerns.

Data Collection/Analysis

Data on inpatients with included DRG codes were collected by the hospital
statistician and de-identified before being sent to Project Director for review. The master
list with the identification codes was kept only by the statistician. The data contained a
unique patient identifier, patient’s age, gender, marital status, employment status, and
patient smoking status. The data were sent via a secured email system that both sent and
stored the data. The data were not saved on any device. See Appendix G, Figure G1 for
an example of the COPD Education Project data collection tool.

A two-sample t-test analysis was performed to measure the primary outcomes of
the study. Descriptive statistics such as frequency and percentage of occurrence were
obtained on the secondary variables to determine if there may be predictive factors of an
30-DAY COPD READMISSION RATES

elevated risk of readmission. The data were reviewed for patients who participated in the intervention and compared to those who did not participate.

Procedures

Phase one of the program was started by the Quality Improvement (QI) team at the hospital in 2017. The QI team began by looking at the current state of 30-day readmission rates for patients with COPD. After determining that the 30-day readmission rates for this patient population were trending up from 14.7%, a multidisciplinary team developed an education-based program in an attempt to decrease the 30-day readmission rates.

The COPD education program begins with a referral by the patient’s primary physician, advanced practice registered nurse (APRN), physician assistant (PA), hospitalist or pulmonologist. Once referred, the goal is to complete the education-based COPD intervention within one week of discharge. An appointment is made as soon as possible.

The appointment for the COPD education program consists of a one-hour meeting with a Registered Respiratory Therapist (RRT). During the appointment, the patient and their family are educated about COPD and the best ways to manage their disease including the signs and symptoms of COPD exacerbation, triggers and ways to avoid them. Smoking cessation programs and how stopping smoking can significantly improve the patient’s health are highlighted. Medication reconciliation, adherence to the appropriate medication regime, correct use of inhalers, spacers and nebulizers are also discussed. The RRT also explored how to help the patient find alternatives to expensive medications via enrollment in Patient Assistance Programs (PAP) if appropriate.
30-DAY COPD READMISSION RATES

The RRT also explores if the patient is a candidate for pulmonary rehabilitation, requires nutritional counseling or care management, assesses the patient’s immunization status and connects the patient to any available social service resources if necessary. The final step in the appointment is to ensure the patient has a follow up appointment with their primary care provider and pulmonologist. The program began in April of 2018. See Appendices I-L for Figures II-L1 for examples of teaching tools used for educating a patient.

Phase two of the program, and the purpose of this project, was to evaluate the efficacy of the education-based intervention that was started by the Quality Improvement team in phase one. In phase two, a retrospective chart review was conducted on all patients with an inclusive diagnosis of COPD who were discharged from the hospital between June 1, 2018, and March 31, 2019. Thirty-day COPD readmission rates were compared between the patients who completed the COPD education program and those who did not. Additional descriptive variables were analyzed to determine if there were predictive factors of an elevated risk of readmission.

The data were obtained by a statistician at the hospital, de-identified and sent to the Project Director for analysis. See Appendix G, Figure G1 for the data collection tool used for this project. A t-test to identify whether there is a statistically significant difference of means between the samples that did and did not participate in the COPD education program was completed for the primary outcomes and descriptive statistics were obtained on the secondary variables that were measured.

Results
The final sample size included 492 patients who met the inclusion criteria. Of the 492 patients, 73 patients completed the education program with nine readmissions to the hospital within 30 days. Four hundred and nineteen patients did not participate in the education program and 59 of those patients were readmitted within 30 days of the initial hospital discharge. The two sample t-test reveals there is no statistically significant difference between the rates of readmission for patients who participated in the COPD education program (n=9, 12.33%) when compared to the rates of readmission for patients who did not participate in the program (n=59, 14.08%) (t=-0.3996, df=419, p-value=0.6896) (See Appendices A-D, Figures A1-D1).

Descriptive variables of age, gender, marital status, smoking status, and employment status were also measured. The mode reported age in both groups was 66-75 years (34.3% in participants, 23.9% in non-participants). The mode reported gender in both groups was female (63.0% in participants, 57.0% in non-participants). The mode reported marital status in both groups was married (52.1% in participants, 43.4% in non-participants). The mode reported smoking status in both groups was former (80.8% in participants, 53.0% in non-participants). The mode reported employment status in both groups was employed (11.0% in participants, 10.3% in non-participants) (See Appendices A&B, Figures A1 & B1).

Discussion

Primary outcomes data from phase two of this project found no statistically significant difference in readmission rates for patients who did and did not participate in the COPD Education program. This project was a retrospective chart review of a convenience sample. Therefore, there was no randomization of who participated or who
30-DAY COPD READMISSION RATES
did not participate in the program. To determine if a lack of randomization of the
participants was a contributing factor in the lack of statistical significance, a data analysis
was also completed using a matching algorithm called coarsened exact matching. This
algorithm matches patients who participated in the program with patients who did not
participate based on their matching descriptive statistics. This was done to ensure a
comparison of characteristics that differed only by their participation status. A probit
regression model was then completed to determine if participation, weighted by matching
scores, had a significant effect on the likelihood of readmission. This analysis also
revealed no statistical significance between the patients who participated in the program
and the patients who did not (Coefficient -0.0132, SE 0.218, p 0.952) (See Appendix F,
Figure F4).

Although completion of the program did not reveal a statistically significant
difference in readmission rates for patients who participated in the COPD education
program compared to those who did not, other variables such as smoking, a patient’s
level of education, patients’ motivational level to participate, timing of the study, and
socioeconomic status may have been factors in who chose to participate. Of those who
participated in the COPD education program, 80% were former smokers where of those
who did not participate, 53% continued to smoke (See Appendix A, Figure A1). Former
smokers, having already made the decision to stop smoking, may have been more
invested in learning about interventions to improve or lessen the impact of their disease.
Perhaps patients who continue to smoke may have avoided participation in a program
that would strongly encourage smoking cessation because they were not yet ready to
30-DAY COPD READMISSION RATES
address this difficult topic. Tobacco use disorder can be a challenge for many patients to overcome (Benowitz, 2010).

Patients’ abilities to process information and apply it to the treatment of their disease may be tied to their level of education. Their existing level of health literacy may be a factor in the way they process the information received about their health. Paasche-Orlow et al. (2005) report that inadequate health literacy can be “associated with worse health status and higher rates of hospitalization” (p 980). As this was an education-based intervention, this may have been an influential factor but health literacy level was not measured.

Another variable to consider is that patients who chose to participate may have been more motivated to do so because their COPD was more severe than patients who chose not to participate. They could have been actively seeking ways to improve their COPD. By participating in the education program, patients were making a choice to invest their time and efforts into actively improving their quality of life (QoL). Understanding what motivates patient to participate could lead to improved marketing of the program. Their motivation for participating or not participating in the program was also not measured for the project.

The retrospective chart review for the study took place between June 1, 2018, and March 31, 2019, which eliminated the time between April and May 2018. The peak spring allergy season often occurs during those two months. Consequently, excluding patients admitted during this timeframe may have impacted findings as admission rates and severity of exacerbations might have increased during this time.
30-DAY COPD READMISSION RATES

Patients’ socioeconomic status may also have been a contributing factor in the outcome of the study. Eisner et al. (2011) reported that lower level of household income was “consistently related to greater disease and severity, poorer lung function and greater physical limitations” (p 26). Socioeconomic status was not measured for this project.

Several studies report the greatest improvement in patients with COPD occurs when they participate in a pulmonary rehabilitation program (GOLD, 2018, Maltais, et al., 2008, and Puhan, et al., 2011). Unfortunately, this program did not include pulmonary rehabilitation. Subsequently, the outcomes may reflect how important including pulmonary rehabilitation would be to the success of the program.

Limitations of the Project

The data collection process may have been a limitation of the study as no data were collected on patients’ level of education, what motivated patients to participate in the study (or not participate in the study), their socioeconomic status or if they participated in a pulmonary rehabilitation program (in addition to the education program). The timing of the retrospective chart review may also have been a limitation, as excluding patients from April and May 2018 may have overlooked changes in disease severity related to seasonal change.

Recommendations

Given the findings from the data analysis, several recommendations can be made. First, data should be collected on patients’ highest level of education. This may help to determine their level of health literacy, how they process information they receive, and their ability to apply the learning to self-management of the disease. Data should also be collected on the patients’ motivators for choosing to participate (or not participate in the
30-DAY COPD READMISSION RATES

study). This will help providers understand the reasons patients wish to learn and improve their health. Next, data should be collected on the patients’ socioeconomic status to determine any financial barriers that may prevent participation in the program and/or in meeting their health care needs. Completion of a pulmonary rehabilitation should also be a requirement of the program to ensure the patient has the best outcomes. Finally, a retrospective chart review should be repeated for a full year’s period of time to capture any seasonal related outcomes.

Conclusion

Chronic obstructive pulmonary disease is costly from both a quality of life and financial perspective. With a national average hospital readmission rate of 21% for patients with COPD, providers must find a way to improve patient outcomes and reduce cost by preventing readmission. Although this project did not conclude that this education-based approach reduced 30-day readmission rates for patients with COPD, more investigation, including a more comprehensive chart review with a focused variable analysis and the inclusion of a more intensive pulmonary rehabilitation component, may provide a better understanding of the impact of education on this patient population.

References
30-DAY COPD READMISSION RATES


30-DAY COPD READMISSION RATES
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30-DAY COPD READMISSION RATES


30-DAY COPD READMISSION RATES

obstructive pulmonary disease. Annals of Internal Medicine, 149, 869-878. doi: 0.7326/0003-4819-149-12-200812160-00006


Appendix A

Figure A1

COPD Education Program: Descriptive Comparison of Participants and Non-Participants

Note. Superscript 1 – Modes and percentages used for each group.
Appendix B

Figure B1

Participated in COPD Education Program

18-25: 19%
26-35: 16%
36-45: 34%
46-55: 25%
55-65: 0%
66-75: 0%
76-85: 1%
86+: 4%

Figure B2

Did Not Participate in COPD Education Program

18-25: 23%
26-35: 21%
36-45: 24%
46-55: 17%
55-65: 9%
66-75: 4%
76-85: 2%
86+: 0%

Appendix C
Figure C1

Readmission Totals by Participation Status
30-DAY COPD READMISSION RATES

Appendix D

Table D1

Readmission Rates by Frequency

<table>
<thead>
<tr>
<th>Readmission Rates of Participants</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>9</td>
<td>12.33</td>
</tr>
<tr>
<td>No</td>
<td>64</td>
<td>87.67</td>
</tr>
<tr>
<td>Total</td>
<td>73</td>
<td>100.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Readmission Rates of Non-Participants</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>59</td>
<td>14.08</td>
</tr>
<tr>
<td>No</td>
<td>360</td>
<td>85.92</td>
</tr>
<tr>
<td>Total</td>
<td>420</td>
<td>100.00</td>
</tr>
</tbody>
</table>
## Appendix E

### Table E1

Two-sample t-test analysis for difference of means with equal variances

<table>
<thead>
<tr>
<th>Readmission Rate</th>
<th>Participant in COPD Education</th>
<th>Non-Participant in COPD Education</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12.33% (9 of 73)</td>
<td>14.08% (59 of 419)</td>
</tr>
</tbody>
</table>

\[ t = -0.3996, df = 490, p\text{-value}=0.6896 \]
## 30-DAY COPD READMISSION RATES

### Appendix F

**Table F1**

Probit Regression Analysis

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient (Standard error)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participated in COPD Education Program</td>
<td>-0.0132 (0.218)</td>
<td>0.952</td>
</tr>
<tr>
<td>Intercept</td>
<td>-1.207 (0.097)</td>
<td>0.000</td>
</tr>
</tbody>
</table>
# Appendix G

## Figure G1

### COPD Education Project Data Collection Tool Template

<table>
<thead>
<tr>
<th>Pt. ID</th>
<th>Admission to the Hospital for Inclusive Diagnosis</th>
<th>Readmitted to the Hospital Within 30-days of Discharge for Any Cause</th>
<th>Readmitted to the Hospital Within 30-days of Discharge for Inclusive Diagnosis</th>
<th>Referred to COPD Education Program by Pulmonologist</th>
<th>COPD Education Program Completed within One Week of Discharge</th>
<th>COPD Education Program</th>
<th>Age</th>
<th>Gender</th>
<th>Marital Status</th>
<th>Smoking Status</th>
<th>Employment Status</th>
<th>DRG Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1=Yes</td>
<td>1=Yes</td>
<td>1=Yes</td>
<td>1=Yes</td>
<td>1=Yes</td>
<td>1=Yes</td>
<td>1&lt;25</td>
<td>1=F</td>
<td>1=M</td>
<td>1=Current</td>
<td>1=Employed</td>
<td>1=MS177</td>
</tr>
<tr>
<td>2</td>
<td>1=Yes</td>
<td>2=No</td>
<td>1=Yes</td>
<td>1=Yes</td>
<td>2=No</td>
<td>2=No</td>
<td>25&lt;35</td>
<td>1=M</td>
<td>2=D</td>
<td>3=Former</td>
<td>2=Unemployed</td>
<td>2=MS178</td>
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<tr>
<td>3</td>
<td>1=No</td>
<td>1=No</td>
<td>1=Yes</td>
<td>2=No</td>
<td>1=No</td>
<td>2=No</td>
<td>35&lt;45</td>
<td>1=O</td>
<td>3=W</td>
<td>2=Never</td>
<td>3=Employed</td>
<td>3=MS1999</td>
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<tr>
<td>4</td>
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<td>2=No</td>
<td>2=No</td>
<td>2=No</td>
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<td>2=No</td>
<td>45&lt;55</td>
<td>1=O</td>
<td>3=N</td>
<td>3=Never</td>
<td>4=Not Employed</td>
<td>4=MS1999</td>
</tr>
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### 30-DAY COPD READMISSION RATES

**Appendix H**

**Figure H1**

Diagnosis Related Grouping Codes

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<td>MS208</td>
<td>Respiratory System Diagnosis W Ventilator Support ≤ 96 Hours</td>
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30-DAY COPD READMISSION RATES

Appendix I

Figure II

COPD Education Center Introductory Letter

COPD Education Center

Hello, my name is Randy Sweet. I am a Registered Respiratory Therapist working with your Mercy Clinic primary care physician or hospitalist.

Your doctor has placed an order and highly recommends for you to come see me for COPD education. My office will be contacting you in a few days to schedule an appointment for us to meet, or you can call 636-390-1771.

The visit is completely free of charge. I have decades of experience in treating patients with COPD. My goal is to provide you with the education and resources you need to function better with COPD. Since this education began in September of 2017, 99 percent of the patients I have met have changed the way they manage their COPD.

The free services I can provide for you include:

- Complete written educational materials and 1-hour discussion regarding your COPD
- Review your home respiratory medications and daily regimen. Make necessary recommendations to your doctor, including the most cost-effective drugs for you
- Identify your health-care goals and create an Action Plan to help you achieve them
- Offer disease management recommendations and information approved by your doctor
- Provide resources to make positive lifestyle changes, such as smoking cessation or becoming more active
- Communicating with your primary care provider and other health-care professionals.

I am available by appointment only with locations in Washington, Sullivan and Eureka. When the COPD Education Center representative calls to schedule your appointment, we can determine the best location to meet your needs.

I look forward to working together and helping you live a better life with COPD.

Sincerely,

Randy Sweet, BS, RRT
COPD Education Center Educator
636-390-1771
Appendix J

Figure J1

COPD Education Center Checklist

Checklist: COPD

- Only choose 1 or 2 things from the list you feel sure you could do over the next 2 weeks.
- After you’ve done those 2 things, you can choose what to work on next.

☐ Ask my doctor for a spacer
☐ Use my inhaler in front of my doctor, nurse, or pharmacist
☐ Get a flu shot
☐ Ask my doctor if I need a pneumovax shot
☐ Ask my doctor about things that can help me quit smoking
☐ Choose a quit-smoking date (1–2 weeks away)
☐ Stop using sprays and aerosols
☐ Start taking my medication as directed (not just when I don’t feel well)
☐ Use oxygen as directed
☐ Eat better (fruits, vegetables, whole grains, lean meats)
☐ Ask my doctor if I should drink special COPD nutritional shakes
☐ Start walking regularly (ask doctor for guidance)
☐ Ask my doctor for the Nebulizer Emmi program so I understand how to use it
☐ Talk to my doctor about feeling anxious, overwhelmed, angry, or depressed

Signature: ___________________________ Date: ________________

To get a copy of this form, go to: www.my-emmi.com/emmiassets/checklists/cl_copd_ip.html
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Appendix K

Figure K1

COPD Education Center Use of Inhaler with/without Spacer
Appendix L

Figure L1

COPD Education Center Proper Use of Inhaler

**DIRECTIONS FOR USE:**

1. Shake the MDI hard up and down five times. Take the mouthpiece cover off.
2. If the MDI is **new or has not been used for a week,** spray 4 puffs into the air first.
3. Push the MDI into the spacer so that it fits snugly.
4. Sit up straight or stand up. Put the mouthpiece of the spacer in your mouth between your teeth. Close your lips around the mouthpiece. Keep your tongue out of the way of the mouthpiece.
5. Press down on the canister of the inhaler **ONE time.**
6. SLOWLY breathe in through your mouth. (If you hear a whistle, slow your breathing down!)
7. Hold your breath for 5-10 seconds. You want to fill your lungs with medicine for this long. Repeat steps for each ordered puff.
ONCE-A-WEEK CLEANING OF YOUR MDI

It is very important to keep the plastic "boot" (actuator) clean so that you get all of your medicine. The medicine can block the opening of the sprayer head in the boot if you do not clean it each week.

Follow these steps.

1. Remove the medication canister from the "boot".
2. Never get the medication canister wet.

For the Boot:

3. Use warm running water, hold one end of the plastic boot under the stream of water for 30 seconds. Turn it around to the other end. Run warm water through it for another 30 seconds.*

4. Look to make sure that any medicine build-up on the nozzle inside the boot is gone. Repeat warm water rinse if needed.

5. Shake out extra water. Let air dry overnight on clean towel.

6. When boot is all-the-way dry, put medicine back into boot. Spray one spray of medicine into the air to make sure that it is ready for your next use.

CLEANING YOUR SPACER

1. Spacers should be washed in warm soapy water only when the clear plastic looks like it is coated with powder (your medicine).

2. The soft plastic end will peel off. Wash, scrub out powder, shake out extra water, and allow to air dry overnight on towel. **Do not dry with cloth.**