Self-Management of Dyspnea in Chronic Obstructive Pulmonary Disease Patients.

Juliet Marcia Farrell, jfarrellhcc@yahoo.com

University of Massachusetts Amherst

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Self-Management of Dyspnea in Chronic Obstructive Pulmonary Disease Patients.

Juliet Marcia Farrell

University of Massachusetts, Amherst

College of Nursing

DNP Final Project Chair: Dr. Terri Black

Mentor: Dr. Mohammad Bajwa MD PC

Date of Submission: April 9, 2019
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Abstract

**Background:** Patients with chronic obstructive pulmonary disease (COPD) exacerbation are reported to have a decreased quality of life relating to their health. In 2015 it was reported that over three million COPD patients died as a result of their disease. Although COPD patients are receiving medication, they still struggle with dyspnea as they carry out their daily activities.

**Purpose:** To implement an evidence based educational program to assist COPD patients in self-management of dyspnea. **Methods:** The DNP student obtained consent from prospective participants and assigned a unique identifier, which included his or her first and last initial and three digits. A total of 15 participants completed the project. The evidence based educational tools included inhaler technique, assessment of medication adherence using the Four-point Morisky Adherence Scale (MMA-4), the Modified Borg Scale for patients to assess the severity of their dyspnea, and the St George Respiratory Questionnaire-C for self-reporting of their quality of life. A booklet entitled “What You Can Do About a Lung Disease called COPD” was used for information and as a visual aid for inhaled medications, nebulizers and inhalers.

**Results:** The results indicate that the expected outcomes were met with the exception of the Activity score on the SGRQ-C which had an average of 75 (poorer health). **Conclusion:** An evidence based educational program that covered topics such as COPD, smoking cessation, medication adherence, inhaler techniques, and a written action plan for acute exacerbation is effective in avoiding dyspnea symptoms Bourbeau et al., 2017). The development of a Medical Home Model is highly recommended and would be beneficial to COPD patients who are elderly and or too ill to leave their homes.

**Keywords:** chronic obstructive pulmonary disease (COPD), dyspnea, self-management, educational programs.
Self-Management of Dyspnea in Chronic Obstructive Pulmonary Disease Patients

Introduction

Chronic obstructive pulmonary disease (COPD) is the fourth leading cause of disability and death worldwide and is the third leading cause of death in the United States (Agency for Healthcare Research and Quality [AHRQ], 2011; Choi, Chung & Han, 2013). The World Health Organization (WHO) (2017) reported that in 2015 there were 3.2 million deaths as a result of COPD (WHO, 2017). In 2015 the number of patients who were hospitalized in the United States due to COPD amounted to 700,000 (Krishan et al., 2015). One in five patients, 40 years and older are admitted to the hospital in the United States as a result of COPD as the principal diagnosis, with subsequent hospitalization lasting approximately 4.8 days and a cost amounting to an aggregate of 6.1 billion dollars (AHRQ, 2011; Krishan et al., 2015).

Although people are receiving pharmacologic treatments due to their diagnosis of COPD, they still struggle with dyspnea as they carry out their day to day activities (Nguyen et al., 2008). The time constraints on physicians and nurses have been a factor in the inability to spend more time educating patients on the self-management of dyspnea. The focus on implementing an educational tool for self-management of dyspnea can help to alleviate the difficulties that people face and improve their quality of life.

Background

Although COPD patients receive optimal medication management, they may still experience dyspnea as a result of lack of adequate self-management. COPD patients may have increased dyspnea due to improper use of their inhaler and difficulty with their self-management programs (Nguyen et al., 2008; Tiep, Carlin, Limber & McCoy, 2015). COPD is associated with
high morbidity and mortality and is the fourth leading cause of disability and death worldwide (Choi et al., 2013; Han, Dansfield & Martinez, 2016). Nearly one in four individuals may seek treatment for a diagnosis of COPD during his or her lifetime. COPD causes a worldwide economic burden resulting in an annual per capita healthcare cost which doubles that of those without a respiratory disease (Choi et al., 2013).

Of the now more than 6.4% of adults in the United States who have been diagnosed with COPD, many could benefit from one or more of these self-management programs (Centers for Disease Control and Prevention [CDC], 2012). Short or long term self-management programs that are designed for COPD patients have proven to be effective in decreasing symptoms of dyspnea (Jonsdottir et al., 2015; Nguyen et al., 2008).

The United States Census Bureau projects that by 2050 the older adult population will have increased from 43.1 million to 83.7 million (United States Census Bureau, 2015). In 2014, 6.4% of adults in the United States were diagnosed with chronic obstructive pulmonary disease by their healthcare providers (CDC, 2012). The prevalence of COPD in adults is worldwide, requiring treatments that are very costly with the majority of expenditures going towards those needing treatments due COPD exacerbations (Choi et al., 2013). Patients with COPD exacerbation are reported to have a decreased quality of life relating to their health and an increased financial burden (Bourbeau et al., 2017). Research shows that individuals who adhere to their treatment plan have less complications and disabilities, better quality of life and increased life expectancy (Choi et al., 2013). In a study by Bourbeau et al. (2017). Results showed that patients who participated in educational programs had significant improvement in self-management skills (Bourbeau et al., 2017).
Problem Statement

Risk of decreased quality of life among adult COPD patients is indicated by worsening dyspnea, the inability to perform activities of daily living (ADLs), and results from inadequate self-management of dyspnea and poor adherence to treatment regimens due to the need for further education. The DNP project helped to improve quality of life by increasing an individual’s knowledge of the disease process and improving medication adherence and overall self-management of dyspnea for older adult patients with COPD. The St. George’s Respiratory Questionnaire for COPD patients (SGRQ-C) (P. Jones, personal communication, February 28, 2018) and the teach back method are evidenced based tools that were used to assist in solving this problem (Appendix A; Appendix B).

Organizational “Gap” Analysis of Project Site

This project took place in a pulmonology office in Western Massachusetts and included participants age 40 years and older. Physicians and nurses attempted to educate COPD patients based on recent guidelines, however; they were limited with respect to time. These patients were often seen in the office for post hospital visits due to chronic obstructive pulmonary disease exacerbations. Studies show that patients can benefit from self-management strategies such as proper use of their inhalers, smoking cessation and adherence to a COPD action plan to avoid dyspnea symptoms (Bourbeau et al., 2017; Choi et al., 2013).

Review of the Literature

A review of literature was done to find evidence-based educational tools for self-management of dyspnea. The databases were selected for peer reviewed research studies. The primary sources that were used through the University of Massachusetts Amherst’s databases included: the Cumulative Index of Nursing and Allied Health Literature (CINAHL), PubMed
and Science Direct and internet websites of nationally recognized organizations such as the National Institute of Health (NIH), The World Health Organization (WHO), The United States Census Bureau and the Agency for Health Care Research and Quality (AHRQ). The terms “COPD,” “COPD and self-management dyspnea,” “COPD self-management,” and “dyspnea and COPD” were used for the search. The search yielded 281 articles of which 13 were included because of their relevance and range from level one to level three evidence.

Inclusion criteria focused on high quality evidence with relevance to nursing practice, and evidenced based research on adults with COPD. Some abstracts were reviewed prior to retrieving the full text articles. Exclusion criteria focused on articles that were written more than 5 years ago, articles that were in a language other than the English language and were not evidence based. The framework for how to read and critique a research study (Kaplan, 2013) and the John Hopkins Nursing Evidence-Based Practice Rating Scale (Newhouse, Dearholt, Poe, Pugh, & White, (2005) were used to evaluate the research articles.

The articles chosen were 3 Randomized control trial (Nyguen et al., 2008; Oliveira-Filho, et al., 2014, Wu & Moser, 2014), 1 Pragmatic randomized control trial (Jonsdottir et al., 2015), 1 Cross-sectional descriptive study (Choi et al., 2013), 1 observational – pre/posttest (Paneroni et al., 2013), 1 experimental (Bourbeau et al., 2017), 4 Systematic review studies (Clini & Crisafulli, 2010; Harrison et al., 2015, Krishan et al., 2015, Tiep et al., 2015), 1 qualitative study (Orij, Vassileva & Mandryk (2012) and 1 two-arm parallel single blind, randomized controlled trial (Bourne et al., 2017). During the implementation of the project additional research was done to find evidenced based research articles that showed the use of a Peak flow meter as an effective tool for screening patients prior to doing a spirometry test. The articles chosen were 1 cross-sectional controlled clinical study (Batrawy & Elassal, 2014), 1 cross-sectional survey
(Mahboub, et al., 2014) and 1 case finding study (Ronaldson, et al., 2018). These evidence-based articles were chosen because they met all the inclusion criterias.

The majority of the articles that the DNP student reviewed focused on educational tools that were designed to help patients with chronic obstructive pulmonary disease. Many of the articles showed that the programs positively impact the patients, resulting in a decrease in the number of respiratory related unscheduled visits to the clinic and acute care hospitals (Bourbeau et al., 2017; Bourne, 2017). Some of the articles showed that although the programs are designed to teach self-management of dyspnea, physicians and nurses are limited to the time that can be spent during an office visit (Harrison, 2015; Huong, 2016). Specific needs were addressed based on the individual needs. In a non-randomized control trial that was conducted by Yu, Guo and Zhang (2014), the goal was to determine if COPD patients who received self-management education were positively affected with respect to their quality of life (p. 53). Results showed that patients who participated in simple, structured self-management educational programs experienced quality of life improvements (Yu et al., 2014). Yu et al. (2014) suggested that there were many ways to educate patients with COPD on the self-management of symptoms (p. 54).

There were two studies that evaluated the effect of self-management programs for COPD patients. In the one year study by Bourbeau et al. (2017), the objective was to determine whether or not a COPD self-management educational program taught by case managers improved patient outcomes and resulted in practice changes. Results showed that the educational program helped to reduce unscheduled visits to the clinic and resulted in better self-management and increased knowledge. The patient’s forced expiratory value 1 (FEV1) and forced vital capacity (FVC) values prior to using a bronchodilator had improved. At the end of the program the number of patients who were using their inhaler accurately increased from three patients (6%) to 45 (83%)
an indication of the importance of education and self-management skills (Bourbeau et al., 2017; Paneroni et al., 2013). Smoking cessation was still a challenge for many COPD patients (Bourbeau et al., 2017).

Spirometry test is the gold standard for diagnosing patients who are suspected of having COPD (Mahboub, et al., 2014). In a study conducted by Mahboub, et al., (2014) participants 40 to 80 years-old were asked to complete a questionnaire regarding their smoking history and other socio-demographics. A peak expiratory flow rate (PEFR) test was done followed by a spirometry test on each participant to determine if the air flow was limited which would be a sign of COPD. The results showed that PEFR alone identified patients with symptoms of COPD with an 80% specificity and 73.5% sensitivity (Mahboub, et al., 2014). It was recommended that peak flow measurement and a screening questionnaire could be used to screen suspected COPD patients instead of a pre and post BD spirometry test (Mahboub, et al., 2014).

There were two other studies that looked at the use of a peak flow meter, spirometry test and a symptom questionnaire when assessing COPD patients. The goal was to determine if the peak flow meter was an effective alternate tool that could be used instead of the standard spirometry test. One study looked at early identification of COPD patients while the other looked at patients six months after they recovered from recent COPD exacerbation (Batrawy & Ellassal, 2014; Ronaldson, et al., 2018). Results by Ronaldson, et al., (2014) indicated that the peak flow meter was an effective tool with specificity of 68% and a sensitivity of 86% in identifying COPD patients in the primary care setting (p. 492). In addition, only those with a positive peak flow measurement were required to do a spirometry test (Ronaldson, et al., 2014). The use of a symptom questionnaire and a peak flow meter are easy and inexpensive tools for identifying
patients with COPD prior to doing a spirometry test (Batrawy & Ellassal, 2014; Mahboub, et al., 2014; Richardson, et al., 2018).

In another study, Choi et al. (2013) gathered information on COPD patients regarding their level of pulmonary function, number of emergency room visits, patient’s knowledge of the disease, and health related quality of life (HRQoL) based on COPD action plan (AP). Patients who adhered to their COPD action plan had less emergency room visits, anxiety and depression. The strength of this plan was that it was designed specifically to help patients with COPD (Choi et al., 2013).

The articles noted that some of the interventions that were used to test the effectiveness of dyspnea self-management were internet-based programs in addition to face-to-face. The results showed that both programs were effective in the reduction of dyspnea. For example, in a six month self-management program with 26 internet users and 24 that were face-to-face, participants from both groups reported that the programs were successful. The strength of both programs was that one study looked at the efficacy and safety of the program and the other used the St George’s Respiratory Questionnaire. The strength of the evidence for both programs is Level 1 and the quality is Class A based on the John Hopkins Nursing Evidence-Based Practice Rating Scale (Bourne et al., 2017; Newhouse, et al., 2015; Nyguen, et al., 2008).

Some of the articles reviewed discussed the importance of educating patients in order to improve medication adherence and inhaler technique. Based on their findings interventions were put in place after administering the Morisky adherence scale to allow patient to self-report. Medication adherence intervention programs are sometimes costly, and the articles suggest implementing low-cost intervention in an effort to improve medication adherence (Morisky, 2013; Oliveira-Fiho et al., 2014).
Evidence Based Practice: Verification of Chosen Option

The DNP student used an evidence based educational program that covered topics such as COPD, smoking cessation, medication adherence, inhaler techniques and a written action plan for acute exacerbation (Bourbeau et al., 2017). The St. George’s Respiratory Questionnaire for COPD patients (SGRQ-C) (P. Jones, personal communication, February 28, 2018) and the teach back method are evidenced based tools that were also used in the project (Appendix A; Appendix B).

Theoretical Framework/Evidence Based Practice Model

Hochbaum, Rosenstock and Kegels first proposed the Health Belief Model (HBM) in the 1950’s because of the United States Public Health Services’ tuberculosis (TB) Health screening program which failed even though the services were free or at a decreased cost. The focus was to determine an individual’s attitudes towards disease prevention or screening tests, and be able to predict his or her behavior (Appendix C; Rosenstock, 1974).

The HBM is applicable to the DNP Final Project because of its usefulness in predicting why patients take certain actions to control or prevent illnesses (Appendix C, Rosenstock, 1974). There are six parts to the HBM framework namely risk susceptibility, risk severity, benefits to action, barriers to action, self-efficacy and cues to action (National Institute of Health [NIH], 2013; Yue, Li, Weilin, & Bin, 2015). This Health Belief Model Framework is from Bandura’s social learning theory (British Council Project, 2014). It is the belief that a person has the ability to participate in behaviors that are needed to achieve a desired outcome (British Council Project, 2014).

Risk susceptibility is the likelihood that an individual believes that he or she may contract a health condition that is concerning. Patients with COPD are at risk of increased dyspnea which
can negatively affect their activities of daily living. This quality improvement project has the potential to increase their self-management of dyspnea. Risk severity is the individual’s perception of the consequences as a result of contracting the health condition of concern. Patients with COPD exacerbation may be hospitalized or make frequent office visits resulting in an increased financial burden, and time away from home and or family. Benefits of action are the individual’s perception that positive things could happen as a result of exhibiting certain behaviors. COPD patient who voluntarily participate in the quality improvement project may benefit from the knowledge gained regarding self-management of dyspnea. Barriers to action, refers to an individual’s perception of the difficulties and or cost that may be encountered while attempting to undertake such actions. COPD patients may be hesitant to participate in quality improvement programs because of their inability to pay the cost of attendance or a lack of transportation to attend. Self-efficacy refers to an individual’s level of confidence in his or her ability to perform new health behaviors. COPD patients who have benefited from the educational tools will have increased self-management of dyspnea thereby improving their quality of life. Lastly, cues to action refer to an individual’s exposure to various factors (Orij, Vassileva, & Mandryk, 2012). This quality improvement project helped COPD patients to be more aware of the actions to take to prevent symptoms or exacerbations of their symptoms.

This framework was applicable to the DNP project because it allowed for an initial assessment of the patient’s health perception. The DNP student was able to inquire about the possible barriers that could prevent the patient from being an active participant in the project. A determination was made as to whether or not it was costly to the patient. The Health Belief Model Framework was also applicable to this project in that it helped to determine if the patient was able to learn new ways of improving his/her health.
Goals, Objectives and Expected Outcomes

The overarching goal of this project was to assist COPD patients in the self-management of their dyspnea through the use of an evidenced-based educational program.

The objective of this project was to evaluate the effectiveness of the educational program that the DNP student used in an attempt to improve the knowledge and medication adherence of patients with COPD. The DNP student was able to determine if teaching patients the proper use of their inhalers resulted in decreased dyspnea and improved quality of life. Patients were assessed at the start of the project, at one month and at three months. The office nurse obtained a baseline measurement of the patient’s Forced Expiratory Volume in One Second (FEV1) and Forced Volume Capacity (FVC) during the initial and final assessment. Follow-up phone calls were made by the DNP student to each participant one week after the initial assessment, and two weeks after the second assessment to inquire if he or she had questions or concerns.

At one month after the start of the project, the expected outcome was that greater than 75% of participants would report increased knowledge of their disease process. It was also expected that 60% or more of patients would report improved medication adherence and proper use of their inhalers by the end of the first month. By the end of the third month the overall expected outcome was that 75% or greater of patients would demonstrate proper usage of inhalers, report increased medication adherence and decreased dyspnea. Also, 75% or more of patients would report increased knowledge of their disease process, and an improvement in their quality of life.

Project Design

This quality improvement project was accomplished by the use of an educational intervention designed to assist patients in improving their self-management of dyspnea. The
program was designed to help patients get an understanding of their disease process and methods by which to self-manage their dyspnea. The educational tool that was used was a book entitled “What You Can Do about a Lung Disease Called COPD” (Appendix D). It was prepared by the Holyoke Medical Center for use in their respiratory department and is “based on the Global Strategy for the Diagnosis, Management, and Prevention of Chronic Obstructive Lung Disease, Global Initiative for Chronic Obstructive Lung Disease (GOLD)” (Goldcopd.org, 2017, p. 5; Holyoke Medical Center, 2012, p. 1).

**Project Site and Population**

The project took place at a pulmonology office in Western Massachusetts. Although the patient population included adults from ages 22 and older, the project only included patients ages 40 years and older who made frequent visits to the office or who were recently hospitalized. This age range was selected because according to the National Institute of Health (2015) most people start exhibiting symptoms of COPD at age 40 years old (NIH, 2015).

The pulmonologist serves a community which included 13 towns in Hampshire and Hampden counties with a population of approximately 323,993 (Verite’ Healthcare Consulting, LLC 2013). Hampden county cities and towns include Holyoke, Chicopee, West Springfield, Springfield and Westfield. Hampshire county towns include Easthampton, Amherst, Belchertown, South Hadley, Southampton and Northampton. The pulmonologist serves a diversified community that includes older adults regardless of their financial status. Both male and female patients of any race or ethnicity that are 40 years and older who were previously hospitalized for COPD exacerbation, visited the medical office frequently due to dyspnea, and/or did not required an interpreter were included as participants. Patients under age 40 years and
those whose COPD is controlled were excluded from the project. The project included patients who had scheduled appointments during the months of September through December 2018.

The project site included a pulmonologist who was affiliated with a major hospital where he saw COPD patients who were hospitalized. The staff also included one nurse and a medical assistant who assisted with notifying the DNP student whenever participants were scheduled for their office visits. The patients who visited this site included COPD patients with increased dyspnea and/or those who were hospitalized with COPD exacerbation. The DNP student interacted with the patients both in person and via telephone.

**Setting facilitators and barriers.** The nurse and medical assistant expressed their willingness to help and showed a positive attitude towards the DNP student’s project. The pulmonologist who was also the external mentor for the DNP student supported staff coordinating their efforts with the DNP student with respect to identifying patients who were appropriate for inclusion in the project sample. The pulmonologist’s office provided the equipment for testing the participants’ FEV1 and FVC measurements. He also provided the spacer for use with the demonstration of inhaler techniques.

Some of the challenges that the DNP student experienced included difficulty getting some of the participants to wait for the initial spirometry test while the nurse was occupied with another patient. Others refuse to do the initial spirometry test because of an acute respiratory illness, and were not able to return shortly thereafter for the test. Some of the elderly participants were unable to return for the final spirometry test three months after the start of the project. The reasons that were given by participants included but not limited to a lack of transportation, inclement weather, reports of feeling too ill to drive and hospitalization. Others returned between three and four months for the spirometry test after cancelling their scheduled appointments on
more than one occasions. One participant left for the winter vacation one month after the project started and did not return, therefore was not included in the project.

**Implementation**

The preintervention included phone calls to the participants reminding them of the meeting with the DNP student. The DNP student organized pamphlets, inhaler charts, measurement scales and questionnaires that were used for the project. The FEV1 testing was done by the nurse in a room that was assigned for that purpose. The education intervention took place after the patient was seen by the pulmonologist on the day of his or her appointment. The DNP student spent approximately thirty minutes with each patient. There was a total of fifteen participants and each was assigned a code using his or her first and last initial and 3 digits as unique identifiers, for example JF001, JF002, JF003, and so on.

Participants were initially interviewed in person by the DNP student to determine their baseline knowledge of COPD, medications and reason for prescription, medication adherence and proper use of inhalers. The 4-question Morisky Scale was used to assess for medical adherence (Appendix E). Inhaler technique was reviewed using the teach back method which included a return demonstration of inhaler use by the patient (Appendix B). According to the Agency for Health Research and Quality (AHRQ) (2015), the teach back method can be used to assess participants’ understanding by asking them to repeat in their own words what they should know or do with respect to managing their health. It helped to determine if they were able to follow specific instructions such as how to use their inhaler correctly. Patients were reminded to rinse their mouth after using inhaled corticosteroids.

The SGRQ-C was reviewed with the patients, then they were asked to complete it. Those who requested to complete the form at home were given a self-address stamped envelope in
which to return the completed form within a week. The SGRQ-C questionnaire was designed to measure the impact of COPD on an individual’s overall health, daily life and how he or she perceived living with COPD (Appendix A, Jones, 2018). A follow-up phone call was made to the patients one week after the initial assessment and two weeks after the second assessment.

The post education included a final interview with patients to determine if there was improvement to COPD knowledge and medication adherence. Prior to the final interview, patients were asked to complete another copy of the SGRQ-C to and return it via mail or at their final interview (Appendix A). A final FEV1 test was done for those who returned to the office. The Four-Item Morisky Medication Adherence Scale and the scoring algorithm for the SGRQ-C were used to calculate the results (Appendix E; Appendix I).

**One Modification of Plan**

The post education plan included a final interview with the participants to determine if there was improvement to COPD knowledge and medication adherence. Participants should have had a repeated FEV1 test at the final interview to determine if their expiratory volume had increased or decreased in comparison to the initial test. Some of the participants were unable to return to the office for their final test therefore the DNP student made one modification in order to have complete data for the analysis.

The project was modified to include the use of a peak flow meter to measure the pre and post intervention peak expiratory flow rate to determine if there were improvements. All of the participants had a peak flow measurement at their initial interview as a part of their routine assessment. In order to obtain a final peak flow measurement from the participants who were not able to return to the office for a final spirometry test the DNP student did home visits. The External Mentor provided a peak flow meter with disposable mouthpieces. In addition, a final
peak flow measurement was also obtained from the participants who returned to the office for their spirometry test. A comparison was made between the pre and post-intervention peak flow results to determine if there were improvements. The results were shared with the external mentor, Capstone Chair, nurse and medical assistant.

**Measurement Instruments**

In order to evaluate the outcome of the DNP Project the following instruments were used:

- The 40-item St George Respiratory Questionnaire-C to measure the health status (quality of life) in patients with COPD. Permission was received from Dr. Jones in London (Appendix A).
- Information was used from the booklet entitled “What you can do about lung disease called COPD”, pages 18 to 25. This was published by the Holyoke Medical Center. It was used as a visual aid for inhaled medications, nebulizers and inhalers (Appendix D).
- The Four-Item Morisky Medication Adherence Scale (MMAS) was used to identify participants who practice medication adherence or non-adherence with their prescribed medication (Oliveira-Fiho, 2014) (Appendix E). This scale has the most outstanding validity and reliability for patients with COPD and is the most consistent (Yin & Fresco, 2015; Wu & Moser, 2014). The MMAS provides 93 % sensitivity and 53 % specificity along with outstanding validity and reliability in patients who were diagnosed with chronic diseases. It was the most highly accepted and recommended tool to self-report measurement of medication adherence (Yin & Fresco, 2015).
- The teach back method was used to ensure that the patient understands the information. According to the AHRQ (2015) the teach back method was done by asking patients to
repeat in their own words what they were supposed to do. (Appendix B). According to Bourbeau et al. (2017), this method had proven to be effective

- The Modified Borg Scale was given to the patients to rate their perception of their dyspnea. This was a severity scale of zero to ten with 10 being maximum breathlessness. This scale was developed by Gunnor Borg in the 1970s to assess perceived shortness of breath and fatigue during activity. The Borg scale was widely validated and adopted for the assessment of patients with chronic respiratory disease (Crisafulli & Clini, 2010) (Appendix F).

- A preintervention and post intervention questionnaire was used to assess patients’ knowledge of COPD (Appendix G).

- The preintervention questionnaires and scales were used post intervention to determine if the patient’s self-management skills have improved. Patients were asked post intervention to complete the SGRQ-C questionnaire to determine if there was reported improvement in their quality of life. The expected outcome was that 75% or greater of patients would report improved self-management skills.

- A hand held Peak flow meter with a disposable mouthpiece was used to measure the patients’ peak expiratory flow rate. A home visit was done to obtain the peak flow measurement from participants who were unable to return to the office for the final test.

**Data Collection Procedures**

The external mentor, pulmonologist, assigned the patients to be contacted by the DNP student regarding participation in the project. Patients were asked to sign a consent form for inclusion in the project (Appendix H). They were then interviewed in person at the initial visit during their scheduled visit at the pulmonologist’s office. Their health information was obtained
from their chart with the help of the office staff. The DNP student did not use any identifiable information for the patients. The patients’ response to medication adherence and the result of the FEV1 testing were filed in the office for use during the project. The responses to the SGRQ-C questionnaire were mailed to the office where they were filed with the other documents for the project. Follow-up calls were made to those who did not return their SGRQ-C form. All information were handled according to the Health Insurance Portability and Accountability Act (HIPAA) policy. The information was analyzed at preintervention, intervention and post intervention. An excel spreadsheet was used to document the progression and results of each participant throughout the process.

Data Analysis

A comparison was made between the preintervention, intervention and post intervention assessment of knowledge, medication adherence and inhaler technique. The responses to the SGRQ-C were scored using the item weights and the Excel scoring algorithm outlined in the manual that was designed for this purpose (Appendix I). The items on the questionnaire were grouped into three components namely symptoms, activity and impacts. Each component was scored separately. The total score was also calculated using a similar formula (Appendix I). A comparison was made between the pre and post intervention for the medication adherence using an Excel’s descriptive statistics tool. All results were expressed as percentages.
Figure 1: Gender of patients who participated in DNP project.

Results

The results of the Medication Adherence scale, COPD Pre and Post Intervention Questionnaire, Pre and Post Modified Borg Scale results, Pre and Post SGRQ-c scores, FEV1 percentages and peak flow meter measurements are described in the below figures and tables.

A total of 15 participants were recruited for the study. Three participants were excluded due to their inability to have the FEV1 tests completed. The participant who left for vacation was also excluded. An additional four participants were recruited to replace those who were excluded. Ten women and five men completed the study (Figure 1). The age of participants ranges from 52 to 81 years-old with a mean age of 63 and a standard deviation of 8.70 (SD 8.70). Participants of the DNP project were from the following geographical locations: one was from Amherst, eight from Chicopee, two from Holyoke, one from Granby, two from South Hadley and one from Springfield. With respect to their smoking history one participant was a nonsmoker, four were smokers and ten were exsmokers.

The medication adherence scores from the 15 participants in this project were interpreted based on the Morisky Medication Adherence Scores (MMAS) tool which gave one point for a
“yes” response and “0” for a “no” response (Appendix E). The percentages were calculated using an excel descriptive statistics tool. The results showed that 86.67% (n=13) of participants responded “no” to questions 1 (Do you ever forget to take your prescription drugs?) during the pre-intervention compared to 100% (n=15) during the post-intervention. The result for question 2 (Are you careless at times about taking your drugs?) showed 93.33% responded “no” during the pre-interventions compared to 100% during the post intervention. The result for question 3 (Do you sometimes stop taking your drugs when you feel better?) showed that 86.67% responded “no” compared to 93.33% during the post intervention. The result for question 4 (Do you sometimes stop taking your drugs if they make you feel worse?) showed that 80% answered “no” during the pre-intervention compared to 93.3% during the post-intervention. Table 1 gives a breakdown of the scores for the individual questions.

Table 1: Morisky Medication Adherence Scale. A comparison of the Pre and Post intervention Results.

<table>
<thead>
<tr>
<th>MMAS-4</th>
<th>Pre-intervention: n=15</th>
<th>Post-intervention: n=15</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Do you ever forget to take your prescription drugs?</td>
<td>n=2 13.33%</td>
<td>n=13 86.67%</td>
</tr>
<tr>
<td>Are you careless at times about taking your drugs?</td>
<td>n=2 13.33%</td>
<td>n=13 86.67%</td>
</tr>
<tr>
<td>Do you sometimes stop taking your drugs when you feel better?</td>
<td>n=1 6.67%</td>
<td>n=14 93.33%</td>
</tr>
<tr>
<td>Do you sometimes stop taking your drugs if they make you feel worse?</td>
<td>n=3 20%</td>
<td>n=12 80%</td>
</tr>
</tbody>
</table>

(Yin & Fresco, 2015; Wu & Moser, 2014).
The knowledge results comparison were determined by calculating the percentage of participants who showed improvement based on the COPD pre and post intervention questionnaire (Appendix G).

Participants were asked to rate their perception of their dyspnea using The Modified Borg Scale (Figure 3).

The SGRQ-C was completed by the participants pre and post intervention regarding their COPD symptoms, activity and impact. The SGRQ-C scores range from 0 to 100 with the higher numbers indicating that the patient has poorer health. The pre-intervention symptoms scores
range from 6 to 94 with a mean score of 64. The male participants had the highest symptom scores ranging from 68 to 100 with an average of 83. The activity scores range from 0 to 100 with a mean of 66. Both male and female participants had high activity scores. The impact scores range from 10 to 85 with a mean of 50. The impact component had some of the lowest scores for both male and female (Table 2). The pre-intervention peak flow measurement had a range of 110L to 400L/minute and a mean of 242L/min (table 2). Table 3 includes the FEV1 % predicted and FVC for the seven participants who had a pre and post-intervention spirometry test.

Table 2. Pre-intervention SGRQ-C scores and Peak flow in COPD patients

<table>
<thead>
<tr>
<th>n</th>
<th>Age - years</th>
<th>Peak flow</th>
<th>Symptoms Score</th>
<th>Activity Score</th>
<th>Impacts Score</th>
<th>Total Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>63 range 52 - 81</td>
<td>242L (110 – 400)</td>
<td>64 (6-94)</td>
<td>66 (0-100)</td>
<td>50 (10-85)</td>
<td>57 (12-87)</td>
</tr>
</tbody>
</table>

Professor Paul Jones, 2016

Table 3: Pre-intervention SGRQ-C scores, FEV1 % Predicted and FVC results in COPD patients

<table>
<thead>
<tr>
<th>n</th>
<th>Age - years</th>
<th>FEV1</th>
<th>FVC</th>
<th>Symptoms Score</th>
<th>Activity Score</th>
<th>Impacts Score</th>
<th>Total Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>63 range 52 - 81</td>
<td>57 (24-86)</td>
<td>67 (42-99)</td>
<td>64 (6-94)</td>
<td>66 (0-92)</td>
<td>50 (10-85)</td>
<td>57 (12-87)</td>
</tr>
</tbody>
</table>

Adapted from Professor Paul Jones, 2016

The results of the post-intervention average SGRQ-C symptoms scores remains the same, the impact scores improved and the activity scores had decreased.

Table 4: Post-intervention SGRQ-C scores and peak in COPD patients

<table>
<thead>
<tr>
<th>n</th>
<th>Age - years</th>
<th>Post-intervention Peak Flow</th>
<th>Symptoms Score</th>
<th>Activity Score</th>
<th>Impacts Score</th>
<th>Total Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>63 range 52 - 81</td>
<td>256L (175 – 500)</td>
<td>64 (38-93)</td>
<td>75 (37-100)</td>
<td>48 (9-83)</td>
<td>59 (29-87)</td>
</tr>
</tbody>
</table>
The results of the peak flow measurement indicated that 53% of participants had improved, 33% were unchanged and 13% had decreased measurements (Figure 3).

Figure 3: Pre and Post-intervention Peak Flow Measurements

<table>
<thead>
<tr>
<th>Initial Peakflow Initial</th>
<th>Final Peakflow Final</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>150</td>
<td>150</td>
</tr>
<tr>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>250</td>
<td>250</td>
</tr>
<tr>
<td>300</td>
<td>300</td>
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<td>350</td>
<td>350</td>
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<td>400</td>
<td>400</td>
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<tr>
<td>450</td>
<td>450</td>
</tr>
<tr>
<td>500</td>
<td>500</td>
</tr>
</tbody>
</table>

**Budget**

The DNP student coordinated with the pulmonologist and staff to conduct the educational program which included phone calls to the participants, written information, and questionnaires. The DNP student spent a minimal budget for implementation of the project.

**Timeline**

The timeline for implementing, evaluating, analyzing and disseminating of the DNP project was from September 2018 to April 2019 (Appendix K).

**Ethical Considerations/Protection of Human Subjects**

The University of Massachusetts, Amherst (UMass) Internal Review Board (IRB) approval was obtained prior to initiating the DNP project. The official IRB Determination Form was submitted as soon as the proposal was approved.
The DNP student did not include any identifiable information in order to be compliant with the Health Insurance Portability and Accountability Act (HIPAA) to protect the patients. The DNP student provided the required standard of care to all the patients during the implementation of the evidence based educational program.

The patients’ information was kept confidential according to the Health Insurance Portability and Accountability Act (HIPAA). HIPAA’s Privacy Rule requires that patients’ identifiable health information be protected. Participants in the DNP project were assigned a code which included first and last initial and 3 digits as unique identifiers for example, JF001. HIPAA’s Security Rule required that the confidentiality, integrity and availability of the electronic records be protected. All of the participants’ information were kept in a secured area in the external mentor’s office. It also ensured that the health information of all individuals were kept secured while they were being used to improve their health and well-being. (U S Department of Health and Human Services, 2017). The DNP student, project mentor, nurse and staff had access to the information.

**Discussion**

The purpose of this DNP project was to teach COPD patients how to self-manage their dyspnea in order to decrease the number of unscheduled visits to the emergency room and or physician offices. This was done with the use of evidenced based tools namely, the Morisky Medication Adherence Scale (MMAS-4), The Modified Borg Scale, SGRQ-C and a COPD Pre and Post intervention questionnaire and a book entitled What You Can do About a Lung Disease called COPD. The expected outcome was that 60% of participants would report improved medication adherence and greater than 75% would report increased knowledge of their disease process. The results far exceeded the expected outcome for improvement to COPD medication
adherence (Table 1) and there was significant (100%) improvement for the post-intervention knowledge results (Figure 2). Inhaler technique was done using the teach back method (Appendix B). Participants were asked to demonstrate how they use their inhalers. Sixty percent of the participants demonstrated proper use of their inhalers.

The book entitled “What You Can Do About a Lung Disease Called COPD” was the most effective educational tool (Appendix D). Participants expressed their appreciation for the knowledge that they had gained. At the final interview one participant commented, “I have been practicing everything that I was told by you and I have been feeling much better. Previously I had shortness of breath after using my snow blower, today I shoveled at my own pace to avoid the fumes from the snow blower and here I am! I feel great.” This participant’s final peak flow measurement was 500L and his spirometry test results had also improved. During the DNP student’s home visits participants expressed appreciation for the educational information and indicated that they have “noticed an improvement” since the educational session. The teach back method was a valuable tool that was used to help participants improve their understanding of inhaler technique and adherence to medication adherence (AHRQ, 2015). One patient who was having shortness of breath took out her inhaler and took four quick puffs. The teach back method was very effective with this patient who later expressed gratitude “showing me how to use it.”

The SGRQ-C was valuable in obtaining information from patients about how COPD symptoms affects his or her life. In response to questions 11 (in part 2) “my cough or breathing is embarrassing in public” 73% of participants responded “yes.” Also 80% of participants answered “true” to the question “I get afraid or panic when I cannot catch my breath” (Appendix A). The responses in the questionnaire helped the DNP student to focus on areas where the participant needed the most help or reassurance. For example, those who responded that they panic
whenever they cannot catch their breath and or that their cough or breathing was embarrassing in public. In addition, the book entitled “What You Can Do About a Lung Disease Called COPD” was very useful in addressing some of the concerns of the respondents (Appendix D). Many of them reported back to the DNP student the pursed lip breathing was very helpful with their shortness of breath (Appendix D). It is important to note that participants were asked to rate their current health prior to completing the SGRQ-C and their responses were correlated with the result on their spirometry test. The results of the project proved that an evidence based educational program that covered topics such as COPD, smoking cessation, medication adherence, inhaler techniques, and a written action plan for acute exacerbation can be effective in avoiding dyspnea symptoms (Bourbeau et al., 2017).

The strengths of the DNP project were the opportunity to work with a pulmonologist and his staff during the entire process and having access to available equipments that were needed for the project. Other strengths of the project included the use of a short PowerPoint presentation which allowed patients to visualize the difference between the healthy lung and the lung that was affected by COPD. The teach back method was very useful in having patients demonstrate how they use their inhaler. The book entitled “What You Can Do About a Lung Disease Called COPD” was the most effective educational tool (Appendix D). Another strength was the SGRQ-C which gives the DNP student valuable information about how the participants symptoms affect their daily lives. It allowed the DNP student to focus on areas where the participant needed the most help or reassurance. For example, those who responded that they panic when they could not catch their breath and or their cough or breathing was embarrassing in public.

Limitations of this project included the age of the participant and the use of a spirometry test to assess the FEV1 percent predicted. Many of the participants did not drive or
were not willing to drive during inclement weather, therefore they were not able to return for their scheduled visit. Some of the elderly participants reported that they scheduled multiple visits to their doctors and would reschedule all if one was cancelled. Also a participant may chose not to do the FEV1 test because he or she was feeling ill but will agree to do the peak flow measurement.

**Recommendation**

The DNP student recommends a repeat of the project with a larger sample size, participants of the same age group, and with follow-up assessments at one month, four months and one year. These time frames fall within the range of scheduled medical appointments for the elderly. The DNP student recommends obtaining a peak flow measurement at the pre and post-intervention for comparison instead doing a spirometry test. Although the spirometry test is the Gold standard for diagnosing COPD, the use of a peak flow meter would be cost effective and easier for screening patients (Batrawy & Ellassal, 2014; Mahboub, et al., 2014; Richardson, et al., 2018). The DNP student recommends that the project include a provision for possible home visits with the elderly and or ill participants who are not able to return to the office for their final assessment. In addition, there needs to be a Medical Home Model which would be applicable to the elderly and or sicker patients who are unable to leave their homes for follow-up appointments. These patients would greatly benefit from the COPD educational intervention.

**Conclusion**

COPD is the fourth leading cause of disability and death worldwide. The time constraints on physicians and nurses have been a factor in the inability to spend more time educating patients on self-management of dyspnea. It is the belief that a person has the ability to participate in behaviors that are needed to achieve the desired outcome (British Council Project, 2014).
COPD patients could benefit from the implementation of an evidence based educational program to improve self-management of dyspnea (Choi, et al., 2013).

The overarching goal of the DNP project was to assist COPD patients in the self-management of their dyspnea through the use of an evidenced-based educational program. The results of the project proved that an evidence based educational program that covered topics such as COPD, smoking cessation, medication adherence, inhaler techniques and a written action plan for acute exacerbation can be effective in avoiding dyspnea symptoms. The expected outcome was that 60% of the fifteen participants would report improved medication adherence. The results showed that 93% to 100% reported improved COPD medication adherence.

The number of participants who reported improvement in their knowledge of COPD was 100%. At the end of the project participants who completed the SGRQ-C to self-report their COPD symptoms, activity and impact on their daily lives had an average score of 64 (symptoms), 75 (Activity) and 48 (Impact). As mentioned previously, the SGRQ-C scores range from 0 -100 with the higher scores indicating poorer health. The positive results of the project indicates that the implementation of dyspnea self-management tool at the clinical site can be beneficial to the patients with COPD resulting in improvement in their health outcome. The development of a Medical Home Model is highly recommended and would be beneficial to COPD patients who are elderly and or too ill to leave their homes.
References


Holyoke Medical Center. (2012). What You can Do About Lung Disease Called COPD. Available from the Respiratory Therapy Department at 413-534-2556

Jones, P. (2018). St George’s Respiratory Questionnaire for COPD Patients (SGRQ-C). Request permission by email: vforde@s gul.ac.uk or Tel +44(0)208 725 5371


Appendix A

St. George’s Respiratory Questionnaire for COPD patients

27 February 2018

To Whom It May Concern:

This is to confirm that St George’s, University of London (St George’s Hospital Medical School) has given permission for Juliet Farrell, University of Massachusetts, USA to use the St George’s Respiratory Questionnaire (SGRQ) and the St George’s Respiratory Questionnaire-C (SGRQ-C) in a quality improvement capstone project.

Professor Paul Jones, PhD FRCP
Professor of Respiratory Medicine
ST. GEORGE’S RESPIRATORY QUESTIONNAIRE
for COPD patients

(SGRQ-C)

This questionnaire is designed to help us learn much more about how your breathing is troubling you and how it affects your life. We are using it to find out which aspects of your illness cause you most problems, rather than what the doctors and nurses think your problems are.

Please read the instructions carefully and ask if you do not understand anything. Do not spend too long deciding about your answers.

ID: ____________________

Date: _______ / _______ / _______ (dd/mm/yy)

Before completing the rest of the questionnaire:
Please check one box to show how you describe your current health:

Very good

Good

Fair

Poor

Very poor
### St. George’s Respiratory Questionnaire

#### PART 1

**Questions about how much respiratory trouble you have.**

Please check (✓) ONE box for each question:

<table>
<thead>
<tr>
<th>Question</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question 1. I cough:</td>
<td>most days a week □ a, several days a week □ b, only with respiratory infections □ c, not at all □ d</td>
</tr>
<tr>
<td>Question 2. I bring up phlegm (sputum):</td>
<td>most days a week □ a, several days a week □ b, only with respiratory infections □ c, not at all □ d</td>
</tr>
<tr>
<td>Question 3. I have shortness of breath:</td>
<td>most days a week □ a, several days a week □ b, not at all □ c</td>
</tr>
<tr>
<td>Question 4. I have attacks of wheezing:</td>
<td>most days a week □ a, several days a week □ b, a few days a month □ c, only with respiratory infections □ d, not at all □ e</td>
</tr>
<tr>
<td>Question 5. How many respiratory attacks did you have during the last year?</td>
<td>3 or more attacks □ a, 1 or 2 attacks □ b, none □ c</td>
</tr>
<tr>
<td>Question 6</td>
<td>How often do you have good days (with few respiratory problems)?</td>
</tr>
<tr>
<td>-----------</td>
<td>---------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>no good days............................................... a</td>
</tr>
<tr>
<td></td>
<td>a few good days........................................... b</td>
</tr>
<tr>
<td></td>
<td>most days are good........................................ c</td>
</tr>
<tr>
<td></td>
<td>every day is good........................................... d</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question 7</th>
<th>If you wheeze, is it worse when you get up in the morning?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No................................................................. a</td>
</tr>
<tr>
<td></td>
<td>Yes............................................................... b</td>
</tr>
</tbody>
</table>
St. George’s Respiratory Questionnaire
PART 2

8. How would you describe your respiratory problems?

Please check (✓) ONE:

- Cause me a lot of problems or are the most important physical problem I have: □ a
- Cause me a few problems: □ b
- Cause no problems: □ c

9. Questions about what activities usually make you feel breathless.

For each statement please check (✓) in the box that applies to you these days:

<table>
<thead>
<tr>
<th>True</th>
<th>False</th>
</tr>
</thead>
<tbody>
<tr>
<td>Washing or dressing yourself: □ a</td>
<td>□ b</td>
</tr>
<tr>
<td>Walking around the house: □ c</td>
<td>□ d</td>
</tr>
<tr>
<td>Walking outside on level ground: □ e</td>
<td>□ f</td>
</tr>
<tr>
<td>Walking up a flight of stairs: □ g</td>
<td>□ h</td>
</tr>
<tr>
<td>Walking up hills: □ i</td>
<td>□ j</td>
</tr>
</tbody>
</table>

continued...
### St. George’s Respiratory Questionnaire
**PART 2**

#### 10. Some more questions about your cough and breathlessness.

For each statement please check (√) in the box that applies to you these days:

<table>
<thead>
<tr>
<th>Statement</th>
<th>True</th>
<th>False</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coughing hurts.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coughing makes me tired.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am short of breath when I talk.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am short of breath when I bend over.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>My coughing or breathing disturbs my sleep.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I get exhausted easily.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### 11. Questions about other effects that your respiratory problems may have on you.

For each statement please check (√) in the box that applies to you these days:

<table>
<thead>
<tr>
<th>Statement</th>
<th>True</th>
<th>False</th>
</tr>
</thead>
<tbody>
<tr>
<td>My cough or breathing is embarrassing in public</td>
<td></td>
<td></td>
</tr>
<tr>
<td>My respiratory problems are a nuisance to my family, friends or neighbors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I get afraid or panic when I cannot catch my breath.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I feel that I am not in control of my respiratory problems.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have become frail or invalid because of my respiratory problems.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exercise is not safe for me.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Everything seems too much of an effort.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
St. George's Respiratory Questionnaire

14. How do your respiratory problems affect you?

Please check (✓) ONE.

☐ a. They do not stop me from doing anything I would like to do.

☐ b. They stop me from doing one or two things I would like to do.

☐ c. They stop me from doing most of the things I would like to do.

☐ d. They stop me from doing everything I would like to do.

Thank you for completing this questionnaire.

Before you finish, would you please make sure that you have answered all the questions.
St. George’s Respiratory Questionnaire
PART 2

12. These are questions about how your activities might be affected by your respiratory problems.
For each statement please check (✓) in the box that applies to you because of your respiratory problems:

<table>
<thead>
<tr>
<th>True</th>
<th>False</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>☐</td>
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</tr>
</tbody>
</table>

My breathing makes it difficult to do things such as walk up hills, carry things up stairs, light gardening such as weeding, dance, bowl or play golf.

My breathing makes it difficult to do things such as carry heavy loads, dig in the garden or shovel snow, jog or walk briskly (5 miles per hour), play tennis or swim.

13. We would like to know how your respiratory problems usually affect your daily life.
For each statement please check (✓) in the box that applies to you because of your respiratory problems:

<table>
<thead>
<tr>
<th>True</th>
<th>False</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐</td>
<td>☐</td>
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<tr>
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<td>☐</td>
</tr>
</tbody>
</table>
Appendix B

Teach-back Technique

How to use the teach-back technique with your patients; check off the strategies you will use.

1. What To Say …

___Explain things clearly using plain language and avoid using medical jargon and vague directions. …

___Make sure your patients know your goal is to check how well you explained the health information—not to test their knowledge. …

___Encourage your patients to use their own words, rather than copying you or others on your clinical team.

___Ask open-ended questions that start with “what” or “how” and avoid questions that result in “yes” or “no” answers. …

___When appropriate, ask your patients to show you how to do something, such as how to check their blood pressure or use their inhaler.

2. How To Say It …

___Speak slowly and make eye contact.

___Allow your voice and facial expressions to show genuine interest.

___Use relaxed body language.

3. When To Use Teach-Back

___Use teach-back whenever you explain an important concept—such as treatment options, participation in a clinical trial, weighing benefits and risk, or adherence to a treatment plan. …

___Check for comprehension after main points and repeat these points throughout the visit.

Adapted from Agency for Health Care Research and Quality (2014).
Appendix C

The Health Belief Model

- Modifying Variables
- Perceived Seriousness
- Perceived Susceptibility
  - Perceived Benefits vs. Perceived Barriers
  - Perceived Threat
    - Likelihood of Engaging in Health-Promoting Behavior
      - Self-Efficacy
      - Cues to Action
What You Can Do About a Lung Disease Called COPD

Adults may have COPD if they have trouble breathing or a cough that will not go away.

Based on the GLOBAL STRATEGY FOR THE DIAGNOSIS, MANAGEMENT, AND PREVENTION OF CHRONIC OBSTRUCTIVE LUNG DISEASE, Global Initiative for Chronic Obstructive Lung Disease (GOLD) Available at www.goldcopd.org
Appendix E

Medication Adherence Assessment Tool

Explanation

The Morisky Scale is a simple tool used to help identify barriers to medication adherence. The tool can help healthcare providers detect/predict patient behavior and appropriately tailor patient education and treatment strategies.

Interpretation/Scoring

Score 1 point for every YES answer

- 0 points = high adherence
- 1-2 points = intermediate
- 3-4 points = low adherence
DO YOU TAKE YOUR MEDICATIONS THE RIGHT WAY?

Do you ever forget to take your prescription drugs?
Yes ☐  No ☐

Are you careless at times about taking your drugs?
Yes ☐  No ☐

Do you sometimes stop taking your drugs when you feel better?
Yes ☐  No ☐

Do you sometimes stop taking your drugs if they make you feel worse?
Yes ☐  No ☐

Adapted from Morisky et al.
Appendix F

Modified Borg Scale

Modified Borg Scale - Rating of Perceived Dyspnea

Purpose: to encourage a standardized approach to identifying subjective perception of dyspnea (rating of perceived dyspnea)

[Scale may also be used to identify subjective perception of exertion (rating of perceived exertion), OR subjective perception of fatigue (rating of perceived fatigue)]

Use:
The patient is asked to rate their perception of the severity level of their dyspnea.
When asking patients to rate their breathlessness, also note the following:
1. Is their voice breathy, or seem out of breath?
2. Are their sentences short or choppy?
3. Is there audible wheezing or coughing?

<table>
<thead>
<tr>
<th>SCALE</th>
<th>SEVERITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No Breathlessness at all</td>
</tr>
<tr>
<td>0.5</td>
<td>Very Very Slight Breathlessness (Just Noticeable)</td>
</tr>
<tr>
<td>1</td>
<td>Very Slight Breathlessness</td>
</tr>
<tr>
<td>2</td>
<td>Slight Breathlessness</td>
</tr>
<tr>
<td>3</td>
<td>Moderate Breathlessness</td>
</tr>
<tr>
<td>4</td>
<td>Somewhat Severe Breathlessness</td>
</tr>
<tr>
<td>5</td>
<td>Severe Breathlessness</td>
</tr>
<tr>
<td>6</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Very Severe Breathlessness</td>
</tr>
<tr>
<td>8</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Very Very Severe Breathlessness (Almost Maximum)</td>
</tr>
<tr>
<td>10</td>
<td>Maximum Breathlessness</td>
</tr>
</tbody>
</table>

*Note: the word “breathlessness” added for clarification. When used to rate exertion, substitute “exertion” for “breathlessness” When used to rate fatigue, substitute “fatigue” for “breathlessness”

References for tool:

Modified Borg Scale – Rating of Perceived Dyspnea
"Best Practices for Improvement in Dyspnea"
© OASIS ANSWERS, Inc. 2005
Appendix G

COPD Preintervention Questionnaire

What Do I Know About My Diagnosis (COPD)?

Select the best answer:

1. What is chronic obstructive pulmonary disease (COPD)?
   A. A chronic lung disease
   B. Acute lung disease
   C. Both A and B
   D. None of the above

2. Cigarette smoking is the most common cause of COPD?
   A. True
   B. False

3. What are some symptoms of COPD?
   A. Blueness of the lips or fingernail beds.
   B. Shortness of breath, wheezing, cough and sputum production.
   C. Sweating
   D. Both A and B

4. How does COPD affects the Lungs?
   A. The air sacs no longer bounce back to their original shape
   B. The airways can also become swollen or thicker than normal
   C. It is difficult for air to get out of the lungs because the airways are blocked.
   D) All of the above
Appendix H

From: Juliet Farrell
Date: 
To: 
Cc: Dr.

Subject: Invitation to participate in a quality improvement project.

Dear

My name is Juliet Farrell and I am a student in the Doctor of Nurse Practice (DNP) program at the University of Massachusetts Amherst. I am writing to invite you to participate in my quality improvement project titled “Self-Management of Dyspnea in Chronic Obstructive Pulmonary Disease Patients (COPD).” You were selected to participate in this project because you have a diagnosis of COPD.

The purpose of this quality improvement project is to help to increase patients’ knowledge of their disease process, improve medication adherence and overall self-management of dyspnea (shortness of breath). The project will include the following:

- A spirometry test will be done by _____ at the start and end of the project.
- A pre and post intervention questionnaire consisting of 4 questions regarding COPD.
- A take-home questionnaire to be completed and returned within one week.
- A medication assessment questionnaire consisting of 5 questions.
- A demonstration on the proper use of inhalers
- You will be asked to rate your perception of dyspnea (shortness of breath) on a scale of 0 to 10 with 0 = no breathlessness and 10 = maximum breathlessness.
- There will be a 5 to 10 minute presentation on the definition of COPD, symptoms and causes, risk factors and how to prevent complications of COPD.
- There will be time allotted for you to ask questions.

The project will take place at the office in Western MA immediately after your scheduled appoint with Dr. ______ Your participation is completely voluntary and you can withdraw at any time. You are encouraged to answer all the questions on the questionnaire however you are free to skip any question that you choose. The session will take about 15 to 30 minutes.

Should you have any questions, please feel free to contact me at 413-531-6169. Your participation in this project is greatly appreciated.

Thank you.

Sincerely,

Juliet Farrell, DNP Student
University of Massachusetts Amherst

By signing this document below you are agreeing and indicating that you are at least 40 years old, have read and understood this consent form and agree to participate in this quality improvement project.

Participant Signature ________________________________

Date:
Appendix I

ST GEORGE’S RESPIRATORY QUESTIONNAIRE FOR COPD PATIENTS (SGRQ-C)

MANUAL

Professor Paul Jones
Division of Clinical Science
St George’s, University of London
London SW17 0RE
UK

Paul W. Jones
Yvonne Forde
Tel +44 (0) 208 725 5371
Fax +44 (0) 208 725 5665
Email: yforde@sgul.ac.uk

Version No.1.3
March 2010

List of available languages updated 23 June 2014
1. THE SGRQ

The SGRQ-C was developed from the SGRQ which was designed to measure health impairment in patients with asthma and COPD. The SGRQ is also valid for use in bronchiectasis and post tuberculous and has been used successfully in patients with kyphoscoliosis, sarcoidosis. It is not suitable for cystic fibrosis. It is in two parts. Part 1 produces the Symptoms score, and Part 2 the Activity and Impacts scores. A Total score is also produced.

2. SGRQ-C: DIFFERENCES FROM THE SGRQ

The SGRQ-C is a shorter version derived from the original version following detailed analysis of data from large studies in COPD. The intention was to remove the items with the weakest measurement properties in the original instrument, but at the same time ensure that its scores are directly comparable with the original SGRQ. A full description of the process and validation studies has been published in Chest (Meguro et al. Chest 2005;132: 456-463). The accompanying on-line supplement gives additional details concerning its development and the differences from the original).

http://chestjournal.chestpubs.org/content/132/2/456.full.html

The SGRQ-C has been developed using COPD data only, so is valid for this disease. The validity for its use in other conditions has yet to be established, but it is unlikely to perform very differently from the SGRQ.

The principal differences are:

1. Smaller number of items (40 compared with the original 50);
2. In a small number of items there is a reduction in the number of response categories.
3. Change in the wording of Part 1. No specific recall period is used except for one item.

3. STRUCTURE OF SGRQ

Part 1 (Questions 1-7) addresses the frequency of respiratory symptoms. It is not designed to be a precise epidemiological tool, but to assess the patient’s perception of their recent respiratory problems.

Part 2 (Questions 8-14) addresses the patient’s current state (i.e. how they are these days). The Activity score measures disturbances to daily physical activity. The Impacts score covers a range of disturbances of psycho-social function. Validation studies for the original SGRQ showed that this component relates in part to respiratory symptoms, but it also correlates quite strongly with exercise performance (6-minute walking test), breathlessness in daily life (MRC breathlessness score) and disturbances of mood (anxiety and depression). The Impacts score is, therefore, the broadest component of the questionnaires, covering the whole range of disturbances that respiratory patients experience in their lives.

Note: the general scale on the front page is not part of the SGRQ or SGRQ-C, but some investigators find it useful as an additional global measure.
4. ADMINISTRATION

The questionnaire should be completed in a quiet area, free from distraction and the patient should ideally be sitting at a desk or table. Explain to the patient why they are completing it, and how important it is for clinicians and researchers to understand how their illness affects them and their daily life. Ask him or her to complete the questionnaire as honestly as they can and stress that there are no right or wrong answers, simply the answer that they feel best applies to them. Explain that they must answer every question and that someone will be close at hand to answer any queries about how to complete the questionnaire.

It is designed for supervised self-administration. This means that the patients should complete the questionnaire themselves, but someone should be available to give advice if required. It is designed to elicit the patient’s opinion of his/her health, not someone else’s opinion of it. family, friends or members of staff should not influence the patient’s responses. If the spouse or partner has accompanied the patient they should be asked to wait in a separate area. Similarly, do not allow patients to take the SGRQ-C home to be completed since you cannot be sure that it will be completed without the help of family or friends. A recent study of the use of surrogates to complete the questionnaire has shown small but significant differences in scores obtained from the patients themselves (Santeri et al Respiratory Medicine (2007) 101, 439-445).

Once the patient has finished, it is very important that you check the questionnaire to make sure a response has been given to every question. If they have missed an item return it to the patient for completion, before they leave.

Telephone administration of the SGRQ has been validated (Anie et al J Clin Epidemiol 1996;49:653-5), as has computer based presentation (Meguro and Jones, unpublished), but postal administration has not. It is recommended that patients have a copy of the SGRQ-C to hand by the telephone so that they can read it at the same time as they are interviewed.

Responding to a patient’s queries regarding completion of the questionnaire

If a patient asks for help with a question, do not provide an answer for them. The questionnaire is designed to get an understanding of how the patient views his or her illness. It is appropriate to clarify a question but not to provide an answer. Questions may be read aloud if patients have difficulty with reading, but the responses must be theirs alone. If a patient gives an answer you disagree with it is not appropriate to challenge their response or to query it. It is their view of their condition we are interested in — no matter how strange the response!

The following are notes that may help you explain to patients what is required

1. In Part 1 of the questionnaire, emphasise to patients that you are interested in how much chest trouble they have recently. The exact period is not important. We are looking for an impression or perception of health.

2. An attack of chest trouble (Part 1, Question 5) is any episode of worse symptoms that constitutes an attack in the patient’s own judgement. Not just severe attacks as judged by medical staff.
5. ITEM WEIGHTS

Each questionnaire response has a unique empirically derived 'weight' (Quirk et al Clin Sci 1990;79:17-21; Quirk et al Eur Respir J 1991;4:167-71). The lowest possible weight is zero and the highest is 100. Note that, in cases where two response options to an item in the original SGRQ were combined in the SGRQ-C, the weight for the new response option was calculated from the mean of the two that were combined.

(Note: the wording is abbreviated from that used in the questionnaire.)

<table>
<thead>
<tr>
<th>Question 1: I cough:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Most days</td>
<td>80.6</td>
</tr>
<tr>
<td>Several days</td>
<td>46.3</td>
</tr>
<tr>
<td>With chest infections</td>
<td>28.1</td>
</tr>
<tr>
<td>Not at all</td>
<td>0.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question 2: I bring up phlegm (sputum):</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Most days</td>
<td>78.8</td>
</tr>
<tr>
<td>Several days</td>
<td>47.0</td>
</tr>
<tr>
<td>With chest infections</td>
<td>30.2</td>
</tr>
<tr>
<td>Not at all</td>
<td>0.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question 3: I have shortness of breath:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Most days</td>
<td>87.2</td>
</tr>
<tr>
<td>Several days</td>
<td>50.3</td>
</tr>
<tr>
<td>Not at all</td>
<td>0.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question 4: I have attacks of wheezing:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Most days</td>
<td>88.2</td>
</tr>
<tr>
<td>Several days</td>
<td>71.0</td>
</tr>
<tr>
<td>A few days</td>
<td>45.8</td>
</tr>
<tr>
<td>With chest infection</td>
<td>38.4</td>
</tr>
<tr>
<td>Not at all</td>
<td>0.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question 5: How many attacks of chest trouble have you had</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3 or more</td>
<td>80.1</td>
</tr>
<tr>
<td>1 or 2 attacks</td>
<td>52.3</td>
</tr>
<tr>
<td>None</td>
<td>0.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question 6: How often do you have good days (with little chest trouble)?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>93.3</td>
</tr>
<tr>
<td>A few</td>
<td>78.6</td>
</tr>
<tr>
<td>Most are good</td>
<td>38.5</td>
</tr>
<tr>
<td>Every day</td>
<td>0.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question 7: If you have a wheeze, is it worse in the morning?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>0.0</td>
</tr>
<tr>
<td>Yes</td>
<td>62.0</td>
</tr>
</tbody>
</table>
3. COPD can vary day-to-day. Part 2 is concerned with the patient's current state (i.e., on average over 'these days'), not necessarily just today.

4. For Part 1 Question 6, emphasise that you are interested in the number of good days that they have had.

5. In Part 2, Questions 8 and 14 require a single response, but Questions 9 to 13 require a response to every question. It may be worth emphasising this to the patient.

6. Many patients do not engage in physical activity. It is important to determine whether this is because they do not wish to (in which case the answer would be 'False') or cannot engage in these activities because of their chest trouble (in which case the answer would be 'True').

7. Responses to Questions 12 and 13 concern limitations due to breathing difficulties and not any other problems. If the patient does not engage in an activity for another reason, they should tick 'False'.
PART 2

Question 8: How would you describe your chest condition?
The most important problem I have 82.9
Causes me a few problems 34.6
Causes no problem 0.0

Question 9: Questions about what activities usually make you feel breathless.
Getting washed or dressed 82.8
Walking around the home 80.2
Walking outside on the level 61.4
Walking up a flight of stairs 78.1
Walking up hills 75.1

Question 10: More questions about your cough and breathlessness.
My cough hurts 81.1
My cough makes me tired 79.1
I get breathless when I talk 84.5
I get breathless when I bend over 78.8
My cough or breathing disturbs my sleep 87.9
I get exhausted easily 84.0

Question 11: Questions about other effects your chest trouble may have on you.
My cough or breathing is embarrassing in public 74.1
My chest trouble is a nuisance to my family, friends or neighbours 70.1
I feel afraid or panic when I cannot get my breath 87.7
I feel that I am not in control of my chest problem 80.1
I have become frail or an invalid because of my chest 89.9
Exercise is not safe for me 75.7
Everything seems too much of an effort 84.5

Question 12: Questions about how activities may be affected by your breathing.
I take a long time to get washed or dressed 74.2
I cannot take a bath or shower, or I take a long time 81.0
I walk more slowly than other people, or I stop for rests 71.7
Jobs such as housework take a long time, or I have to stop for rests 70.8
If I walk up one flight of stairs, I have to go slowly or stop 71.6
If I hurry or walk fast, I have to stop or slow down 72.3
My breathing makes it difficult to do things such as walk up hills, carry things up stairs, light gardening such as weeding, dance, play bowls or play golf 74.5
My breathing makes it difficult to do things such as carry heavy loads, dig the garden or shovel snow, jog or walk at 5 miles per hour, play tennis or swim 71.4
Question 13: We would like to know how your chest trouble usually affects your daily life.
I cannot play sports or games 64.8
I cannot go out for entertainment or recreation 79.8
I cannot go out of the house to do the shopping 81.0
I cannot do housework 79.1
I cannot move far from my bed or chair 94.0

Question 14: Tick the statement which you think best describes how your chest affects you.
It does not stop me doing anything I would like to do 0.0
It stops me doing one or two things I would like to do 42.0
It stops me doing most of the things I would like to do 84.2
It stops me doing everything I would like to do 98.7
6. SCORING ALGORITHM

A Total and three component scores are calculated: Symptoms; Activity; Impacts.
Each component of the questionnaire is scored separately.

6.1 Sum the weights for all items with a positive response

SYMPTOMS COMPONENT

This consists of all the questions in Part 1. The weights for Questions 1-7 are summed. A single response is required to each item. If multiple responses are given to an item, the weights for the multiple positive responses should be averaged then added to the sum. This is a better approach than losing the data set and this technique was for calculating scores used in the original validation studies for patients who gave multiple responses. (Clearly a better approach is to prevent such multiple responses occurring).

ACTIVITY COMPONENT

This is calculated from the summed weights for the positive responses to items Questions 9 and 12 in Part 2 of the questionnaire.

IMPACTS COMPONENT

This is calculated from Questions 8, 10, 11, 13, 14 in Part 2 of the questionnaire. The weights for all positive responses to items in Questions 10, 11, 13 are summed together with the responses to the single item that should have been checked (ticked) in Questions 8 and 14. In the case of multiple responses to either of these items, the average weight for the item should be calculated.

TOTAL SCORE

The Total score is calculated by summing the weights to all the positive responses in each component.

6.2 Calculate the score

The score for each component is calculated separately by dividing the summed weights by the maximum possible weight for that component and expressing the result as a percentage:

\[
\text{Score} = 100 \times \frac{\text{Summed weights from all positive items in that component}}{\text{Sum of weights for all items in that component}}
\]

The Total score is calculated in similar way:

\[
\text{Score} = 100 \times \frac{\text{Summed weights from all positive items in the questionnaire}}{\text{Sum of weights for all items in the questionnaire}}
\]

Sum of maximum possible weights for each component and Total:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Symptoms</td>
<td>566.2</td>
</tr>
<tr>
<td>Activity</td>
<td>962.9</td>
</tr>
</tbody>
</table>

List of available languages updated 23 June 2014
6.3 Handling missing items

It is better not to miss items and any missing items are the fault of the investigator, not the patient. We have examined the effect of missing items and recommend the following methods:

General rules
You can calculate a Total score in the presence of missing data, but only if the domains meet their ‘missing items’ rules (see below). If one domain exceeds its permitted number of missed items, then a total score cannot be calculated.

Symptoms (Questions 1-7)
The Symptoms component will tolerate a maximum of 1 missed item. The weight for the missed item is subtracted from the total possible weight for the Symptoms component (566.2) and from the Total weight (3201.9).

Activity (Questions 9 and 12)
The Activity component will tolerate a maximum of 3 missed items. The weight for the missed item is subtracted from the total possible weight for the Activity component (982.9) and from the Total weight (3201.9).

Impacts (Questions 8, 10, 11, 13, 14)
The Impacts component will tolerate a maximum of 5 missed items. The weight for the missed item is subtracted from the total possible weight for the Impacts component (1652.6) and from the Total weight (3201.9)

6.4 When two responses have been given to one question

Add the weights of the two checked responses and divide by two. If more than three responses are checked, treat the item as missing.

6.5 Converting SGRQ-C scores to be comparable to SGRQ scores

Scores for SGRQ-C, calculated as described above, need a small arithmetic adjustment to make them directly comparable to those obtained with the SGRQ.

The adjustment is:

- **Symptoms**: SGRQ score = (SGRQ-C x 0.99) + 0.94 units
- **Activity**: SGRQ score = (SGRQ-C x 0.87) + 7.01 units
- **Impacts**: SGRQ score = (SGRQ-C x 0.88) + 2.18 units
- **Total**: SGRQ score = (SGRQ-C x 0.90) + 3.10 units

*List of available languages updated 23 June 2014*
7. **EXCEL-BASED SCORING SYSTEM**

For information on the calculator, send an email to: sgrq@agul.ac.uk

8. **SGRQ SCORES IN HEALTHY SUBJECTS**

Means (95% confidence intervals) for SGRQ scores in normal subjects with no history of respiratory disease

<table>
<thead>
<tr>
<th>N</th>
<th>Age-years</th>
<th>FEV1 as % predicted</th>
<th>Symptoms Score</th>
<th>Activity Score</th>
<th>Impacts Score</th>
<th>Total Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>74</td>
<td>46 range 17-80</td>
<td>95 (91-99)</td>
<td>12 (9-15)</td>
<td>9 (7-12)</td>
<td>2 (1-3)</td>
<td>6 (5-7)</td>
</tr>
</tbody>
</table>

A full range of normative values for a general population studied in Spain can be found in Ferrer et al Eur Respir J 2002;19:405-413.

9. **CLINICALLY SIGNIFICANT DIFFERENCE IN SGRQ SCORE**

The threshold for a clinically significant difference between groups of patients and for changes within groups of patients is four units. Note this is an indicative value (the threshold is not 4.0). As with all measurements there is biological variation, sampling error and measurement error. Four units is an average value obtained in different groups of patients. Estimation of clinical thresholds, their use and implications are discussed in much greater detail in Jones P.W. Eur Respir J 2002;19:398-404 and Jones P.W. Journal of COPD 2005;2:75-79.

Note: A responder analysis using the 4 unit threshold may be suitable in some analyses. Such estimates, including the Number Needed to Treat (NNT), appear to be relatively insensitive to small differences in the value used for the threshold for clinical significance. (Jones P.W. Eur Respir J 2002;19:398-404 and Norman et al Med Care 2001;39:1039-47).
Appendix J

BUDGET TABLE

<table>
<thead>
<tr>
<th>Description</th>
<th>Estimated Cost</th>
<th>Responsible for Payment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office staff assistance with scheduling patients</td>
<td>No cost</td>
<td>Approved by External mentor</td>
</tr>
<tr>
<td>Mailing of questionnaires</td>
<td>$7.50</td>
<td>Paid by DNP student</td>
</tr>
<tr>
<td>Project supplies</td>
<td>$50.00</td>
<td>Paid by DNP student</td>
</tr>
<tr>
<td>Supplies for inhaler demonstration by DNP student</td>
<td>$0.00</td>
<td>Provided by External mentor</td>
</tr>
<tr>
<td>Inhalers for patient use</td>
<td>$0.00</td>
<td>Patients will be asked to bring their own inhalers.</td>
</tr>
<tr>
<td>Initial and follow-up phone calls to patients</td>
<td>$0.00</td>
<td>DNP student &amp; Volunteer by Staff</td>
</tr>
<tr>
<td>Booklet from Holyoke Hospital (HH)</td>
<td>$0.00</td>
<td>Donated by H H Respiratory Department.</td>
</tr>
<tr>
<td>Incentive to each participant = $5.00</td>
<td>$75.00</td>
<td>Paid by DNP student</td>
</tr>
<tr>
<td>Total</td>
<td>$57.50</td>
<td>Paid by DNP student</td>
</tr>
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</table>
## Appendix K

### Timeline

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<th>Event</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recruitment of eligible participants</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
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<td>Intervention Evaluation Toolkit</td>
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<td>X</td>
<td>X</td>
<td>X</td>
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<td></td>
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<td>Post-test and Analysis of outcomes</td>
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<td>X</td>
</tr>
</tbody>
</table>
Appendix L

Tool Kit Contents

Pre-Presentation questionnaire

- How well do you know your diagnosis (COPD)?

Objectives

- To be able to define COPD
- Know the symptoms and causes of COPD
- To know the risk factors of COPD
- To know ways to prevent COPD
- To know how to stay fit
- To know your COPD medication
- To know how to use your medical devices, example: inhalers

What is chronic obstructive pulmonary disease

- Chronic Obstructive Pulmonary Disease, or COPD, refers to a group of diseases that cause airflow blockage and breathing-related problems. It includes emphysema, chronic bronchitis, and in some cases asthma.
- (Centers for Disease Control and Prevention, 2018, n,1)

How does COPD affect your breathing?
How does COPD affect your breathing?

- As you breathe in, air travels down your windpipe into your lungs through two large tubes called bronchi. These tubes resemble tree branches and have smaller tubes with tiny air sacs (alveoli). The oxygen in the air you breathe enters into these blood vessels and enters your bloodstream. At the same time, carbon dioxide—a gas that is a waste product of metabolism—is exhaled. Your lungs rely on the natural elasticity of the bronchial tubes and air sacs to force air out of your body. If you have COPD, you lose this elasticity and the air will get trapped in your lungs when you breathe out (exhale).


Symptoms and causes of COPD

**Symptoms include**

- Shortness of breath, especially during physical activity.
- Breathing, cough, and phlegm production, chest tightness.
- The flare or Flare Kit is used to identify this condition.

**Cause include**

- Long-term exposure to irritant gases such as ammonia and bleach.
- Tobacco smoke which is the most common cause of COPD.


Risk factors of COPD

- Exposure to tobacco smoke.
- People with asthma who smoke.
- Occupational exposure to dusts and chemicals.
- Exposure to fumes from burning fuel.
- Age.
- Genetics.


What are some complications of COPD?

- Respiratory infection attacks cells, lung and pneumonia.
- Emphysema affects the lungs and air passages.
- Heart problems—increased risk of heart disease, reduced ability to exercise that reduces your risk.
- Lung cancer: People with COPD have a higher risk of developing lung cancer. Quitting smoking may reduce this risk.
- High blood pressure in your arteries: COPD may cause high blood pressure in the arteries.


How to prevent COPD

- The best way to prevent COPD is to never smoke—or to stop smoking now.
- If you're a longtime smoker, keep trying to quit.
- Try to find a tobacco cessation program that can help you quit for good.
- It's your best chance for preventing damage to your lungs.


How to keep your body fit

- Practice proper breathing technique
- Exercise
- Proper nutrition
Medication/Medical Devices

- Know the medications that are prescribed by your doctor.
- Know how to use your medical devices such as inhalers and spacers.

Reference

Appendix M

September 4, 2018

University of Massachusetts
IRB
Amherst, MA

RE: Juliet Farrell
Quality Improvement Project

Dear Sir/Madame:

Please be advised that the Capstone project is a quality improvement project for which the data will be used for the site’s purposes rather than for research.

The office staff, site and I are all in support of this project.

Any questions, please contact me at: [Redacted]

Sincerely,

[Redacted]

M.D.

Cc: Juliet Farrell, DNP student