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An Evaluation of Provider Adherence to Acute Bronchitis Quality Measures in Adults

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Final DNP Project Report

An Evaluation of Provider Adherence to Acute Bronchitis Quality Measures in Adults

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Dedication

To my mother, I cannot thank you enough for all of your love and support. You are such a positive role model and have influenced me to work hard to achieve my goals. Thank you for showing me so much love and allowing me to call you multiple times a day. I have learned a great deal from you, including your kindness and ability to be humble.

To my father, thank you for always being supportive and answering my calls before my exams. I am very thankful for everything you have done to help me through my education.

To my brother, thank you for always listening to me when I need to talk. I am grateful for our close bond and am glad we can spend time with each other.

To my gram and late grandad, thank you for always pushing me to continue my education and inspiring me to join the nursing profession. I am so blessed to have spent so much time with you and appreciate of you being so active in my life.

I love all of you very much and I am so grateful for your support and love.

Table of Contents

List of Tables

List of Figures

Abstract

Background: Acute bronchitis management continues to be mistreated. Evidence based practice guidelines do not support antibiotic therapy for the treatment of acute bronchitis. Providers are encouraged to prescribe antitussives, suppressants and inhaler medications for the treatment of acute bronchitis symptoms, including cough.

Objective: The overall objective of this project is to evaluate the management of adults diagnosed with acute bronchitis in a limited services clinic.

Methods: A retrospective chart review was conducted on patients in a limited services clinic. The chart review assessed patients aged 18-64 with a diagnosis of acute bronchitis from July 1, 2016- June 30, 2017.

Results: Of adult patients with acute bronchitis, 31% of adults aged 18-64 were not prescribed an antibiotic (N=10/32) and 68% were prescribed at least one antibiotic. Various medication classes were prescribed to patients with acute bronchitis, including analgesics, bronchodilators, antihistamines, antibiotics, corticosteroids, cough/cold/allergy medications, nasal agents and mouth/throat agents.

Conclusions: Antibiotic therapy was highly prescribed for patients with the diagnosis of acute bronchitis. However, 34% of adults with a diagnosis of acute bronchitis had at least one comorbid condition, such as chronic smoker, asthma or COPD. Among those with a comorbid condition, 82% (N=11; 9/11) were prescribed an antibiotic.

An Evaluation of Provider Adherence to Acute Bronchitis Quality Measures in Adults

Introduction

Acute bronchitis is one of the most common conditions encountered in clinical practice in adults. Approximately 100 million (10%) ambulatory care visits in the United States are related to a diagnosis of acute bronchitis (Harris, Hicks & Quaseem, 2016). Acute bronchitis is caused by a respiratory virus, such as an upper respiratory virus, cold or the flu. Symptoms of acute bronchitis include a cough lasting at least five days, coughing with mucus, a runny or stuffy nose, fever and wheezing (American Lung Association, 2018). Risk factors for acute bronchitis include a current smoker, or second hand smoke exposure. Furthermore, close contact with someone that has acute bronchitis is another risk factor (American Lung Association, 2018).

Acute bronchitis is often a diagnosis that is not treated appropriately. Antibiotic use is not recommended for individuals diagnosed with acute bronchitis (Kinkade & Long, 2016); however, many providers continue to prescribe antibiotics. The Merit-based Incentive Payment System (MIPS) of the Centers for Medicare & Medicaid Services (CMS) Quality Payment Program focuses on rewarding providers for high quality of care.

The Merit-based Incentive Payment System (MIPS) pays for Medicare Part B items and services. Clinicians may receive an increase or decrease on their payments, based on their performance. MIPS was designed to link payments to quality of care, improve health outcomes and reduce the cost of care (US Department of Health and Human Services [USDHHS], 2016). The Centers for Medicare & Medicaid Services (CMS) is a division of the US Department of Health and Human Services, and developed the MIPS measures. One of the quality measures of MIPS is avoidance of antibiotic treatment in adults with acute bronchitis (UHSDHHS, 2016).

The criteria for the measure includes adults aged 18-64 years, a diagnosis with acute bronchitis and antibiotics not prescribed during the patient encounter. Moreover, patients with a comorbidity, such as, chronic obstructive pulmonary disease or chronic bronchitis, are excluded from the MIPS measure (USDHHS, 2016).

The overall objective of this project was to evaluate the management of adults diagnosed with acute bronchitis in a limited services clinic. A retrospective chart audit was completed for patients diagnosed with acute bronchitis from June 30, 2016 through July 1, 2017.

Background

Acute bronchitis is a clinical condition characterized by a cough, with or without sputum production lasting at least five days and typically resolving within one to three weeks (Kinkade & Long, 2016). It is characterized by inflammation of the trachea and large airways of the respiratory tract and is most commonly due to viral infections. Appropriate management and treatment for acute bronchitis is imperative to prevent complications from antibiotic use.

Treatment for acute bronchitis includes patient education and discussing the course of the illness with the patient. Symptom control for patients experiencing a cough should be part of the treatment (Kinkade & Long, 2016). Common therapies for symptom management include antitussives, expectorants, inhaler medications and alternative therapies, such as the use of echinacea, pelargonium and honey (Albert, 2010); however, antibiotics are not recommended for the treatment of acute bronchitis (McKay, Mah, Law, McGrail & Patrick, 2016). Providers are encouraged to discuss the risks of antibiotic overuse for patients seeking antibiotic treatment. Antibiotics can increase adverse effects and cause severe complications such as Clostridium

difficile (American Board of Internal Medicine, 2017; Malesker, Callahan-Lyon, Ireland & Irwin, 2017; Smith, Fahey, Smucny, & Becker, 2017).

Research studies have shown antibiotics do not provide a benefit for patients with acute bronchitis (Harris, Hicks & Qaseem, 2016; Irwin, French, Chang, & Altman, 2018; Little, Rumsby, Kelly, Watson, Moore, Warner, Fahey & Williamson, 2005; Smith, Fahey & Becker, 2017). Little et al., (2005), conducted a randomized controlled trial to evaluate patients diagnosed with acute bronchitis, and whether antibiotics made a difference in symptoms. They found no difference in symptoms severity in adults treated with amoxicillin in comparison to those taking a placebo (Little et al., 2005). Antibiotic use has been associated with increased adverse effects when compared to those taking a placebo. Antibiotic use has been associated with increased adverse effects such as nausea, vomiting, diarrhea, rash, headaches and vaginitis (Little et al., 2005; Smith et al., 2017). A cohort study identified increased complication rates associated with antibiotic use in patients with acute cough lasting <3 weeks without evidence of pneumonia. Complications included hospital admission and death (Little et al., 2017). Unnecessary antibiotic use can also cause antibiotic resistant organisms that can harm the patient and the community (Khanna & Tosh, 2014; Langdon, Crook & Dantas, 2016).

In an effort to improve patient care delivery and reward clinicians for providing quality patient care, the Centers for Medicare & Medicaid Services (CMS) implemented the Quality Payment Program in 2017. The program encourages providers to focus on quality of care and making patients healthier. The Quality Payment Program was implemented by the Centers for Medicare & Medicaid Services (CMS) in 2017 and focuses on quality of care and rewarding provider's high-value patient centered care for Medicare patients. One of the tracks of the Quality Payment Program is the Merit-based Incentive Payment System (MIPS). Avoidance of

antibiotic treatment in adults with acute bronchitis is a quality measure from the MIPS Quality Payment Program. The measure is met if the percentage of adults 18-64 years of age, with a diagnosis of acute bronchitis, were not prescribed an antibiotic. This is considered a high priority measure within MIPS Quality Payment Program (USDHHS, 2016).

The current recommendation for adults age 18-64 years for acute bronchitis from The American College of Chest Physicians (2018) include routine treatment with antitussives, suppressants and inhaled medications (Irwin et al., 2018). Antibiotics are not justified treatment and should not be offered to patients. In addition, thorough explanations and education should be offered to patients, as they may expect to receive antibiotics based on previous experiences and public expectation (Irwin et al., 2018).

The purpose of this project was to evaluate the management of acute bronchitis in adults ages 18-64 in a limited service clinic in a small southern town. The results of this evaluation will provide information regarding the degree of adherence to the MIPS quality measure related to acute bronchitis and will help to determine if interventions are needed to encourage adherence to these quality initiatives.

Purpose

The purpose of this project was to use the MIPS quality measure as a reference to evaluate the management of acute bronchitis in adult's ages 18-64 years in a limited services clinic. Objectives include 1) determine the percentage of patients not receiving and antibiotic, 2) identify all medication prescribed, 3) summarize presenting symptoms and existing comorbid conditions, among adults aged 18 to 64 with a diagnosis of acute bronchitis between July 1, 2016 and June 30, 2017.

Methods

Study Design

A retrospective chart review was utilized to gather data. A descriptive study design was used to evaluate medical management of adult patients diagnosed with acute bronchitis in a limited services clinic. All subjects were seen between June 30, 2016 through July 1, 2017 at a limited services clinic. This timeframe was selected to capture all patients diagnosed with acute bronchitis within a whole calendar year. The University of Kentucky's Center for Translational Sciences extracted data from medical records based on the project objectives. Institutional Review Board (IRB) approval was obtained through the University of Kentucky IRB through an expedited review. De-identified information of personal health identifiers was obtained.

Study Population

The setting was a rural, limited service clinic. A limited services clinic is a walk in healthcare center staffed by nurse practitioners trained to diagnose and treat patients with common illnesses. The clinic is staffed by nurse practitioners and serves a diverse patient population across the lifespan.

The population of interest included patients aged 18 through 64, with a diagnosis of acute bronchitis. This age was captured in relation the MIPS recommendation for monitoring patients aged 18-64. Exclusions were made for patients less than 18 years of age. There were no exclusions based on race, ethnicity or gender.

Procedure and Sample

A retrospective chart review of patients at a limited services clinic, ages 18 through 64 with a diagnosis of acute bronchitis (ICD-10 code: J20.0-J20.9) was obtained. The health records were obtained through the University of Kentucky Center for Clinical and Translational Sciences, Biomedical Informatics Group, and stored in RedCap. All records were deidentified to maintain patient confidentiality. The sample consisted of 32 patients with a medical visit between June 30, 2016 through July 1, 2017). Of the 32 patients, there were 10 males and 22 females diagnosed with acute bronchitis. Data extracted included age, gender, ICD 10 diagnosis code, diagnosis name, medications, comorbidities and problem list.

Statistical Analysis

Data analysis was performed using SPSS, version 24. Analysis of extracted data entailed descriptive statistics, including frequency distributions or means and standard deviations, and were used to summarize study variables. The Fisher's exact test was utilized to show among those with a comorbid condition, if antibiotics were prescribed. An alpha of .05 was used to determine statistical significance.

<div align="center">

Results

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During the study period, 32 patients were diagnosed with acute bronchitis by six different providers all of whom were Family Nurse Practitioners. The average age of patients was 38 years (SD=10.30; see Table 1). Of the 32 patients, there were 10 males and 22 females diagnosed with acute bronchitis. The most common presenting symptoms documented in the chart was a cough 56% (N= 5; 5/11) . Of patients with at least one comorbid condition 82% (N=11; 9/11), the most common condition was asthma (31%), (N=10), followed by current smoker (25%), (N=8).

The percentage of adults ages 18-64 with a diagnosis of acute bronchitis who were not prescribed an antibiotic was 31% (*N*=10; 10/32). The percentage of adults that received one antibiotic was 59% (*N*=19; 19/32). Adults prescribed two antibiotics were 9% (*N*=3; 3/32) of the patients (Table 2). The most common antibiotic classes prescribed were penicillin and macrolides. For patients prescribed two antibiotics, the following antibiotic class combinations were prescribed—cephalosporin and penicillin, macrolide and penicillin, and penicillin and penicillin. Cold, cough and allergy medications were the most commonly prescribed medications (Table 3 and Figure 1). Various medication combinations were prescribed for patients diagnosed with acute bronchitis (Table 4).

Of the 32 patients in the study, (28%) 9 patients presented with symptoms. The presenting symptoms for adults diagnosed with acute bronchitis included cough, cough with productive purulent sputum, persistent cough and other respiratory symptoms. Of the 9 patients that had symptoms documented, five patients presented with a cough (Figure 2).

Of the 32 patients in the study, (34%) 11 patients had at least one underlying comorbidity. The following comorbidities were identified from the participants: asthma, chronic obstructive pulmonary disease (COPD), current smoker, former smoker. The most common comorbidity was asthma, followed by current smoker (Table 5 and Figure 3).

Among those patients with a comorbid condition, 82% (*N*=11; 9/11) were prescribed an antibiotic. The Fisher's exact test of association was not significant (p=.32), therefore, statistically there was not an association between having a comorbid condition and antibiotic prescription.

Discussion

The limited services clinic did not practice similar antibiotic prescribing for patients diagnosed with acute bronchitis, when compared to The American College of Chest Physicians (2018) clinical practice guideline recommendations (Irwin et al., 2018). The CHEST Expert Panel (Malesker, Callahan-Lyon, Ireland & Irwin, 2017) identified 65-80% of patients diagnosed with acute bronchitis are being prescribed antibiotics. This is true for the sample in this study, as 68% of patients diagnosed with acute bronchitis were prescribed antibiotics. Antibiotic treatment should not be offered for patients with acute bronchitis and prescribing antibiotics should be limited for this population (Braman, 2006; Harris, Hicks & Qaseem, 2016; Little, Rumsby, Kelly, Watson, Moore, Warner, Fahey & Williamson, 2005; Smith, Fahey & Becker, 2017).

Several patients that were diagnosed with acute bronchitis had multiple comordities. Additionally, it was difficult to identify how many days patients had symptoms before seeking medical care. Treatment for acute bronchitis includes symptom control, as well as pharmacological medications including antitussives, expectorants and inhaler medications (Albert, 2010). The statistics above identify a need to focus on the management for acute bronchitis within the clinic in reducing the amount of antibiotics prescribed with a diagnosis of acute bronchitis. Antibiotic use is permitted in patients with a comorbidity, as patients with a comorbidity that are prescribed antibiotics are excluded from the MIPS measure.

Implications for Practice

Education for providers is key in meeting the MIPS recommendations. There are several resources and tools that can be used for providers and patients on when antibiotics should be prescribed and alternative medications or treatments that can be used instead. The *Choosing Wisely* campaign is a great resource and provides brochures on addressing antibiotic overuse and recommendations for providers on when antibiotics should be prescribed. The *Choosing Wisely* campaign seeks to advance a national dialogue on avoiding unnecessary treatments and medical tests (Advancing Medical Professionalism, 2015). Moreover, the Centers for Disease Control and Prevention (CDC), offers printable antibiotic prescription pads and interactive tools to prevent unnecessary treatment with antibiotics with their *Be Antibiotics Aware* campaign. This campaign is formerly known as the *Get Smart about Antibiotics* campaign. The campaign is to promote a national effort to help fight antibiotic resistance and improve antibiotic prescribing use (Centers for Disease Control and Prevention, 2018).

Implications for Future Study

Implications for future practice include aggregating data over several years to obtain a larger sample size. Moreover, implementing the *Choosing Wisely Campaign* or the *Be Antibiotics Aware* campaign would be helpful for providers and patients. In addition, it would be interesting to see if providers coded "bronchitis," of "J40" instead of acute bronchitis, and did not specify acute or chronic. Identifying evidence-based strategies in delayed prescribing would also be of interest. Finally, appropriateness of antibiotic prescription for patients with comorbidities is key.

Limitations

There were several limitations identified with this study. The University of Kentucky Center for Clinical and Translational Sciences, Biomedical Informatics Group was operating under one staff member while retrieving the data for this project. Due to having one employee working on this project, the staff member duplicated data.   After conversing with the data extractor, he recommended deleting the duplicative data. In addition, the staff member was new and needed to reach out to my advisor and other departments for assistance when collecting the data. Secondly, being a retrospective study, information may have been inputted inaccurately within the electronic health record, resulting in the data to be misconstrued. Finally, data was collected from one facility, limiting generalization of the study.

Conclusion

Antibiotic treatment was utilized in this clinic for the treatment of acute bronchitis, despite evidence based practice guidelines. Among those without a comorbidity, 62% (N=13; 13/21) received antibiotics. Among those with a comorbidity, 82% (N=11; 9/11) received antibiotics. Without taking the comorbidities into account, it is crucial to identify patients with acute bronchitis and treat patients appropriately with non-pharmacological medications, including tea and honey. Moreover, pharmacological treatment is useful for symptomatic patients with a cough, which include expectorants, inhaled medications and antitussives. As a result, providers need to be aware of the MIPS recommendation of not prescribing antibiotic therapy for patients diagnosed with acute bronchitis. Further education is needed for treatment guidelines for acute bronchitis and comorbidities.

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Table 1: Age, Comorbidities, and Antibiotics

	n (%)
Age, Mean (SD)	37.59 (10.30)
Comorbidity	
Yes	11 (34%)
No	21 (66%)
Prescribed antibiotic:	
Yes	22 (68.76%)
No	10 (31.25%)

Table 2: Number of Antibiotics Prescribed

# of Antibiotics Prescribed	Frequency	Percent
0	10	31.25%
1	19	59.38%
2	3	9.38%

Table 3: Medications Prescribed by Class

Medication Class	Frequency	Percentage
Analgesics - Anti-inflammatory	1	1.28
Antiasthmatic And Bronchodilator Agents	21	26.92
Antihistamines	2	2.56
Cephalosporins	1	1.28
Corticosteroids	6	7.69
Cough/cold/allergy	20	25.64
Fluoroquinolones	2	2.56
Macrolides	10	12.82
Mouth/Throat agents	1	1.28
Nasal Agents	2	2.56
Penicillins	10	12.82
Tetracyclines	2	2.56

Table 4: Medication Combinations Prescribed for Acute Bronchitis

Combination Medications by Class Prescribed	Frequency	Percent
Analgesics-Anti-inflammatory/Antiasthmatic And Bronchodilator Agents/Antihistamines/Macrolides/Penicillins	1	3.13
Antiasthmatic And Bronchodilator Agents	2	6.25
Antiasthmatic And Bronchodilator/Macrolides	1	3.13
Antiasthmatic And Bronchodilator Agents/Antihistamines/Corticosteroids/Macrolides	1	3.13
Antiasthmatic And Bronchodilator Agents/Cephalosporins/Corticosteroids Cough/Cold/Allergy/Penicillins	1	3.13
Antiasthmatic And Bronchodilator Agents/Corticosteroids/ Cough/Cold/Allergy/Tetracyclines	1	3.13
Antiasthmatic And Bronchodilator Agents/Corticosteroids/Mouth/throat/dental Agents	1	3.13
Antiasthmatic And Bronchodilator Agents/Cough/Cold/Allergy	4	12.52
Antiasthmatic And Bronchodilator Agents/Cough/cold/allergy/Macrolides	1	3.13
Antiasthmatic And Bronchodilator Agents/Cough/cold/allergy/Penicillins	1	3.13
Antiasthmatic And Bronchodilator Agents/Fluoroquinolones	1	3.13
Antiasthmatic And Bronchodilator Agents/Macrolides	3	9.38
Antiasthmatic And Bronchodilator Agents/Penicillins	1	3.13
Antiasthmatic And Bronchodilator Agents/Tetracyclines	1	3.13
Corticosteroids/Cough/cold/allergy/Nasal Agents - Systemic And Topical	1	3.13
Corticosteroids/Penicillins	1	3.13
Cough/cold/allergy	2	6.25
Cough/cold/allergy/Macrolides	1	3.13
Cough/cold/allergy/Fluoroquinolones	1	3.13
Cough/cold/allergy/Macrolides	1	3.13
Cough/cold/allergy/Nasal Agents - Systemic And Topical/Penicillins	1	3.13
Cough/cold/allergy/Penicillins	1	3.13
Macrolides	1	3.13
Penicillins	2	6.25

Table 5: Comorbidities

Comorbidities	Frequency	Percent
Asthma	10	31
COPD (chronic obstructive pulmonary disease)	2	6
Current Smoker	8	25
Former Smoker	4	13

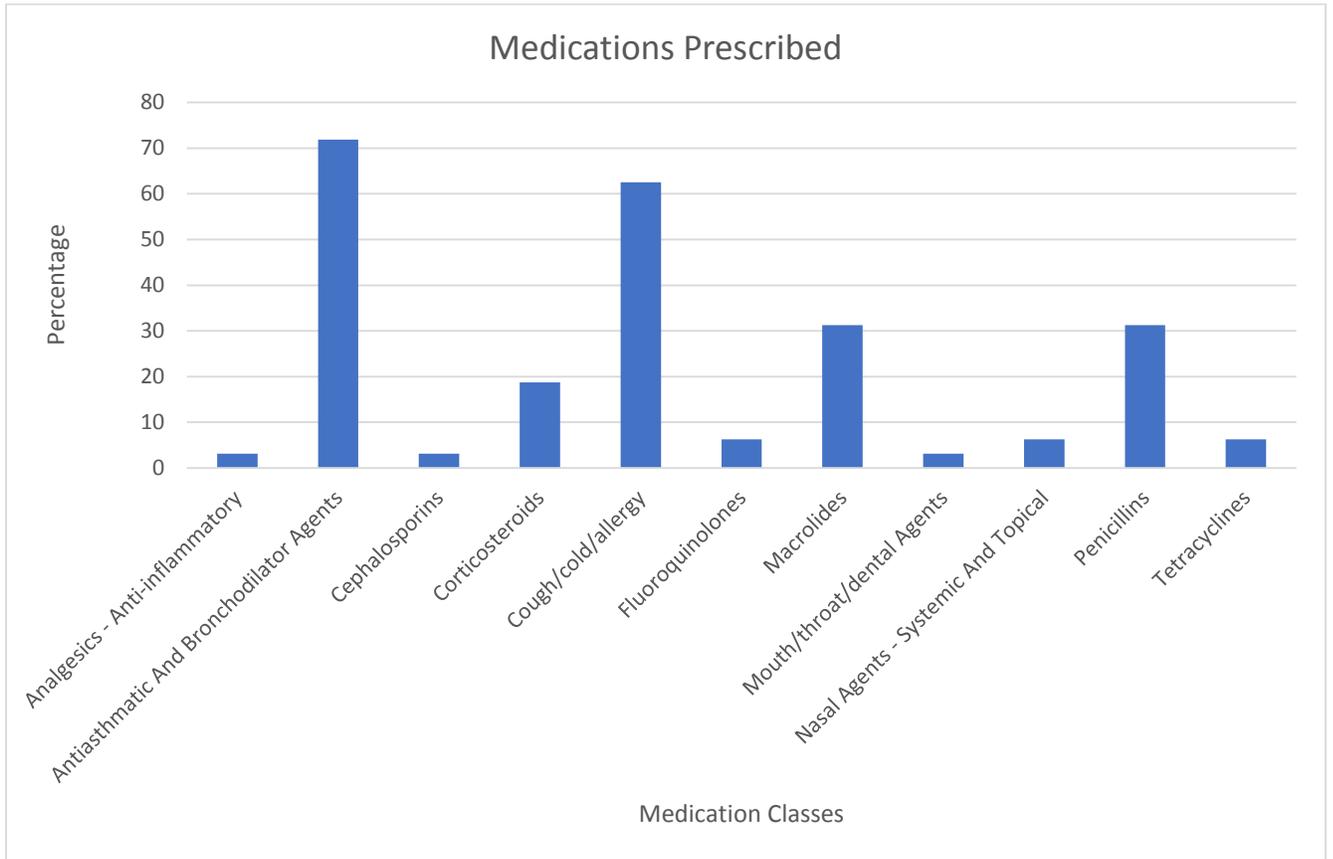Figure 1: Medication Class and Number of Medications Prescribed Including Antibiotics

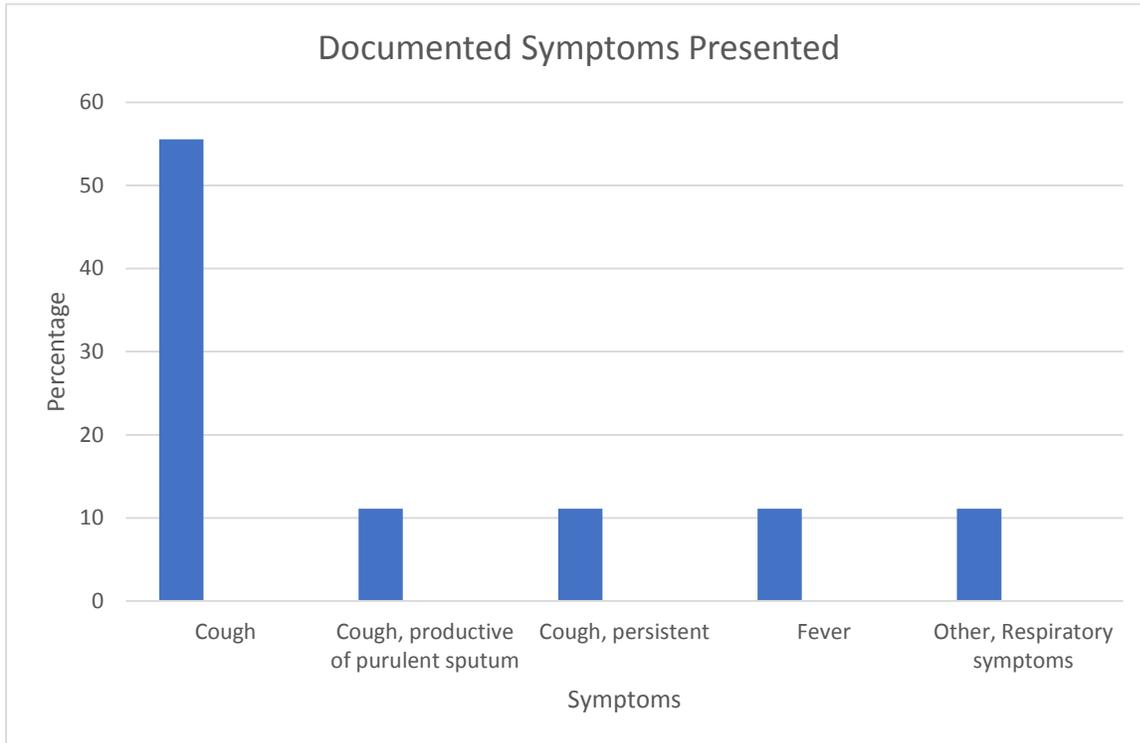Figure 2: Documented Symptoms Presented

Figure 3: Comorbidities