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Antibiotic Resistance: Use of Delayed Prescriptions for Viral Syndromes in Urgent Care

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By

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Submitted in partial fulfillment of the Requirements for the degree of

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Seton Hall University

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Dedication

I would like to thank my children, Jaime Hansen and Joseph Hansen, for their on-going supportive attitude and love when my studies took me away from their everyday lives at times. It was a long journey and without their encouragement and support, I would not have completed this goal.

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Abstract

Purpose: Widespread use of antibiotics leads to a development of antimicrobial resistance, an increasing global problem. The rise of antibiotic-resistant bacterial strains represents a serious threat to the public. The Centers for Disease Control and Prevention (CDC) estimates at least two million illnesses and 23,000 deaths are caused by antibiotic resistant bacteria in the United States (CDC, 2014). The strategy of delayed antibiotic prescribing, sometimes called “wait and see” prescriptions, may reduce antibiotic use for viral syndromes in primary care settings. The overall purpose of this scholarly project is to explore delayed prescriptions used by providers in two urgent care settings, with a potential to reduce the amount of antibiotics consumed by patients for viral syndromes. These diagnoses include influenza, upper respiratory infection (URI), pharyngitis, sinusitis, acute bronchitis, acute otitis media (AOM).

Significance of the Project: There have been numerous studies in the past addressing the importance of reducing antibiotic use. The need to slow the emergence of resistant bacteria by judicious use of antibiotics in healthcare and agricultural settings will require the cooperation and engagement of healthcare providers, healthcare leaders, pharmaceutical companies, and patients. Providers are well aware of the dangers of prescribing antibiotics for viral syndromes and have strict requirements as to which patients they will issue delayed prescriptions.

According to the American College of Emergency Physicians (ACEP), antibiotics are given to patients with acute bronchitis 65% to 80% of the time, acute pharyngitis visits receive antibiotics 60% of the time, and acute sinusitis receives antibiotics 80% of the time out of 4 million annual outpatient visits (Radecky, 2014).

Using antibiotics for conditions that have only a marginal, self-limiting or no clinical effect has been labelled *unnecessary* or *inappropriate* antibiotic use or antibiotic *overuse* or *misuse* (Hoye,

Gjelstad, & Lindbaek, 2013). Factors contributing to overuse of antibiotics could include patient demand, lack of information on viruses and antibiotics, perceived ideas of duration of illness, uncertainty of diagnosis and inability to spend time with patients due to volume. According the Journal of Urgent Care Medicine (JUCM), 52.9% of visits to urgent care centers in 2014 were for viral syndromes, otitis media, URI, coughs, and 1.6% influenza visits (JUCM, 2015). There is evidence that the majority of patients believe that antibiotics are an appropriate treatment for these diagnoses.

Methods: Urgent care centers have been around for about a decade and considered new models of healthcare in the niche between primary care offices and emergency departments. Urgent care centers have extended hours and envisioned as functioning as low-acuity emergency departments with extended services such as Radiology, and Lab testing. They mainly have emergency board certified physicians, but some may have primary care providers on duty. Generally urgent care centers are open selected hours seven days a week.

This project was conducted in two urgent care centers in two different counties, with a combined patient volume of 16,000 yearly. The urgent care centers used in this project are affiliated with a major hospital system in central New Jersey. The providers currently work at both urgent care centers on a rotational basis, as well as the emergency department of the main hospital. The physicians were asked to participate and welcomed the project. With the diagnosis of viral syndrome, the provider would recommend a delayed prescription for an antibiotic. At discharge, the nurse would explain the dangers of antibiotic resistance using patient handouts from the CDC's "*Get Smart about Antibiotics*" (CDC, 2014). The patient was asked to wait four days and if the symptoms were not better, they would be able to begin their antibiotic instead of returning

for another visit. A phone survey was conducted on day five -post visit to determine if the patient filled or did not fill the prescription.

Project Outcomes: Through patient education and the use of handouts, this project proved that educating patients at time of discharge could increase the likelihood of the patient's decision not to fill their delayed prescription. Of sixty-eight patients surveyed by phone, thirty-four did not fill their antibiotic prescriptions and thirty-four patients did fill their antibiotics within the five-day range. There was a significant difference in who filled their prescriptions and who did not, by whether the provider or the nurse handed out the education packet to the patient. The nurse given the education packet had a better response to patients not filling their antibiotic. Though the cumulative percentage of patients who did not fill their prescriptions was slightly greater than 50%, the outcome has the potential to decrease the amount of antibiotics the public consumes with delayed prescriptions and education at discharge.

Clinical Significance: The practice of overprescribing of antibiotics has contributed to an increase in resistance and treatment failures for bacterial illnesses. Patient satisfaction has become a large part of the healthcare system and was taken into consideration in this project.

Patients are requesting antibiotics for diagnosed viral infections due to their lack of education, the proper use for antibiotics, and dangers from misuse such as allergic reactions, abdominal pain and most common, diarrhea and vomiting. Healthcare providers can help lower the prescription rates of antibiotics with educational information as well as using delayed prescriptions.

Increasing knowledge about antibiotic misuse can be statistically significant in demonstrating that adding education can decrease the use of antibiotics when not needed. Time with the patient at discharge and patient education proved to be significant therefore beneficial to not filling the delayed antibiotic prescription.

Antibiotic Resistance: Use of Delayed Prescriptions for Viral Syndromes in Urgent Care

Section 1 - Background

Antibiotic abuse and antimicrobial resistance are global problems. Antibiotics save millions of lives each year in the United States and around the world. The rise of antibiotic-resistant bacterial strains represents a serious threat to the public health. Antibiotics can be a tremendous value to the community but misuse can lead to antibiotic resistance and death globally.

Unnecessary use of antibiotics causes millions to die each year from resistance to antibiotics due to over use and tolerance. The CDC launched an initiative designed to categorize drug resistant infections called “superbugs” and estimated that 2 million people a year were infected with “superbugs” with 23,000 deaths (Ross Johnson, 2014). URI’s in children were found to account for more than 75% of all antibiotics prescribed under the age of twelve (Ross Johnson, 2014).

Although research shows that bacterial infections are only responsible for 38% of acute rhino sinusitis, 6% to 18% of acute respiratory infections (ARI) and 5% to 15% of pharyngitis, 53% of patients are prescribed antibiotics (Legare, Labrecque, Godin, LeBlanc, Launer and Grimshaw, 2011). According to the American College of Emergency Physicians (ACEP), antibiotics are given to patients with acute bronchitis 65% to 80% of the time, acute pharyngitis visits receive antibiotics 60% of the time, and acute sinusitis receives antibiotics 80% of the time (Radecky, 2014). Resistance for individuals is of concern, but the public health issue of the overall community population resistances has major public health concerns.

The Centers for Disease Control and Prevention (CDC) estimates at least two million illnesses and 23,000 deaths are caused by antibiotic-resistance bacteria in the United States (CDC, 2014). The need to slow the emergence of resistant bacteria by judicious use of

antibiotics in healthcare and agricultural settings will require the cooperation and engagement of healthcare providers, healthcare leaders, pharmaceutical companies, and patients.

Approximately one-third to one-half of all antibiotics used in outpatient settings is either unnecessary or incorrectly prescribed (Ault, 2015). The CDC (2014) states that patient satisfaction related to acute bronchitis, is most dependent on the doctor-patient communication as to whether it is appropriate for an antibiotic to be prescribed or not. The CDC also reports that purulent secretions of the nares and throat are not indicative of bacterial infections. The common cold and flu can cause symptoms of sore throat, nasal congestion, and cough for up to fourteen days (CDC, 2014). These viral syndromes can be long and uncomfortable episodes, but antibiotics are not the answer.

An expert review by Sipani (2008), describing the “Economics of Antibiotic Resistance”, suggests that for improving antibiotic usage, strategies such as guidelines, control committees, and treatments for all patients to be treated with the most effective, least toxic, and least costly antibiotic for optimal use. Alternative treatment options such as education of health professionals and patients regarding infection control measures can be incorporated (Sipani, 2008). Pharmaceutical companies have also slowed the development of manufacturing new antibiotics due to the low profits and the antiquated models of the FDA approvals (Sipani, 2008).

Aside from resistance to antibiotics from overuse, allergic reactions, abdominal pain, diarrhea, vomiting and even death from anaphylaxis, has cause major concerns for many patients and parents. The widespread use of antibiotics has led undesirable consequences such as yeast infections in women and more serious, Clostridium difficile (C-Diff) from changes in the normal

microbial flora (Antibiotic Overuse: The influence of Social Norms, 2008). The side effects of antibiotics can be worse than the illness.

In an interview on ABC News, Dr. Thomas Schwenk said, “More than 142,000 people are rushed to the emergency room each year from adverse reactions to antibiotics, according to a 2008 article in *Clinical Infectious Diseases*, and an estimated 70,000 of those cases may be a result of unnecessary antibiotic prescriptions” (Hasan, 2010). Most physicians are confronted with their patients asking for antibiotics and subsequently their symptoms improve from the virus being self-eliminated, but the patients believe it is from the antibiotic. This pattern will make all future visits difficult as the patient incorrectly associates the antibiotics with the cure (Sipahi, 2008).

Delayed prescribing or “wait and see” prescribing, is a strategy where providers give patients a prescription for antibiotics together with advise to wait for a certain amount of time before deciding to start the antibiotic or not. Usually the provider explains the criteria that should govern the patient’s decision, most likely if the symptoms get worse within a certain period. The strategy is usually given in cases of potentially self-limiting infections, most commonly URIs. This saves the patient a return visit if not feeling better and is a plus for patient satisfaction.

Approximately, greater than 52% of patient visits to urgent care centers are for viral syndromes, such as flu, otitis media, URI, and coughs (JUCM, 2015). There is evidence that the majority of patients feel that antibiotics are an appropriate treatment for these diagnoses. A delayed prescription for viruses is a strategy that may reduce the use of antibiotics. Patient satisfaction can be met through delayed prescription coupled with informative patient handouts from the CDC’s “*Get Smart about Antibiotics*”, in addition to advice about pain, fever

management, use of steroids and over the counter decongestants. The plan of handouts at discharge and delayed prescriptions may lead to a long-term sustainability.

Description of Project

The goal of this implementation project was to decrease antibiotic use in the urgent care setting by way of using a “wait and see” prescription plan for patients with viral syndromes, including Acute Otitis Media (AOM), in children and adults, influenza, sore throats and upper respiratory infections (URI). According to the Journal of Urgent Care Medicine 2015, URI’s were 52.6% of all visits to urgent care center and AOM at 9.2% and influenza at 1.6% of visits” (JUCM, 2015, pg. 40).

The project began with the providers making a diagnosis of viral syndrome including all the above-mentioned diagnoses, between October 1, 2015 and October 31, 2015 in two urgent care centers in New Jersey. All providers are board certified in emergency medicine. After the provider’s diagnosis of viral symptoms, the nurse brought all necessary handouts, utilizing the CDC’s “Get smart about antibiotics” program. The information from the CDC consisted of posters in each room, brochures, and viral RX prescriptions all describing the dangers of antibiotic misuse. The nurse educated the patient and/or parent about the dangers of taking antibiotics for illnesses that do not require antibiotics. Questions were answered at time of discharge, along with a prescription for a “wait and see” antibiotic. The patient and /or parent was asked to wait four days to fill the prescription. If on the fourth day if no better or worse, they have the prescription and option to get it filled at the pharmacy. In no way was it suggested that the patient should not get the prescription filled.

Call backs to the patients and/or parents were made on the day following the office visit to reiterate the plan and answer additional questions. A final call back was made on day five to see how the patient was feeling and if or when they filled the prescription.

Purpose of the Project

During November of every year, the CDC observes the annual “Get Smart about Antibiotics” week during the month of November, to improve antibiotic stewardship in communities, healthcare facilities, and primary care offices. This one-week observance raises awareness of the threat of antibiotic resistance (CDC, 2014). This annual observance helps to support state, local, and coalitions to implement a communication strategy to increase awareness of the importance of antibiotic misuse. Education of antibiotics encourages communication between patients and healthcare professionals, as well as bringing awareness of the dangers of antibiotics if not taken properly. The long-term goal is to decrease the occurrence of death due to antibiotic resistance (CDC, Get Smart About Antibiotics, 2014). As people get older they develop resistance to antibiotics and they will no longer be of any help to fend off disease in later life.

The purpose of this project was to decrease unnecessary prescribing of antibiotics for upper respiratory symptoms and viral syndromes by dispensing a “wait and see” prescription along with education to the patient or caregiver upon discharge in an urgent care setting. The key messages emphasized, that antibiotics do not treat viral illnesses, and that your body can fight off these viruses given time. Inappropriate use of antibiotics may lead to unnecessary and sometimes dangerous side effects such as upset stomach, vomiting, diarrhea and allergic reactions that can make patients feel worse. The urgent care centers are already using providers and staff to educate the community, without additional equipment or expense.

Goals and Objectives

The first objective of this project involved patient and parent teaching about antibiotic resistance dangers. The provider decided whether the patient's diagnosis warranted a "wait and see" antibiotic after the examination. The nurse discussed with the patient or parent the viral syndrome diagnosed by the provider. Education regarding the use of antibiotics in viral illnesses and the literature packet from the CDC was given to the patient. Any questions or concerns were answered at time of discharge. The patient left with information about antibiotic resistance, over the counter analgesic information and a "wait and see" antibiotic prescription. The patients were asked to wait three to four days before filling the prescription, and if on the fourth day, they were feeling worse or developed a fever, they had the prescription and can get it filled.

The second objective was to evaluate whether the patient filled the antibiotic within the four days requested, or did not fill the prescription at all. A follow up call the next day after the patient visit to reiterate any concerns the patient may have, and again on the sixth day to find out if the prescription was filled. There was a short phone survey (Appendix A) given to the patient determining whether the educational teaching and materials helped in any way with their decision to fill or not fill the prescription. Documentation of when the prescription was filled was recorded.

The goal of this project was to educate patients about the dangers of antibiotic abuse and resistance. In addition, to educate patients about viruses and possible side effects of antibiotics. Patients were encouraged to wait before running to the pharmacy to get that antibiotic. In addition to the benefits of less antibiotic use, the community gains a much more cost-effective option of fewer antibiotics when seeking medical care.

Significance of the Project

Antibiotics were developed to kill microorganisms. The problem is that microorganisms develop and disseminate resistance as a reaction to antimicrobials in accordance with the laws of evolution; for every action, there is an equal and opposite reaction (Sipahi, 2008). Antibiotic resistance can lead to significant morbidity, longer hospital stays, excess costs, and mortality (Sipahi, 2008).

According to *Morbidity and Mortality Weekly Report* (MMWR), “at least 23,000 people die because of infections or complications from resistant infections” (Demirjian et al., 2015, p.871). These resistant infections can lead to poor health outcomes, higher health care costs and more toxic treatments, without the help of new antibiotic developments (Demirjian et al., 2015). Antibiotic prescribing must be tracked to understand and decrease antibiotic resistance. The cost of antibiotic resistance to the U.S. economy is an estimated \$20 billion annually in excess direct health care costs, with an additional \$35 billion in lost productivity (Demirjian et al., 2015).

In March 2015, *The National Action Plan for Combating Antibiotic-Resistant Bacteria*, was released to combat antibiotic resistance in the United States (Report to the President on Combating Antibiotic Resistance, 2015). The five goals include preventing the development and spread of resistant infections, increasing surveillance efforts, developing new drugs and diagnostic tests, and promoting international collaboration to prevent and control antibiotic resistance (Ault, 2015). Tracking antibiotic prescriptions is important to improve prescribing and provider accountability, with the long-term goal of improving health care quality and safety. A Cochrane review of all methods to reduce antibiotic abuse in a clinic concluded that short courses and “3 day prescriptions” was the only method with documented success. Also by using

the word “viral infection” that will likely get better in three days and prescribing a prescription dated for three days from visit is useful (Bartlett, Spellberg & Gilbert, 2013).

Section II – Review of the Literature

An extensive literature search was conducted using the electronic databases of Google Scholar, Medscape, PubMed and Cochrane Library obtained through the Hospital library system and the help of the librarian. The PubMed and Cochrane strategy was (antibiotics OR antibiotic resistance) AND (delayed antibiotics OR treatment OR placebo) AND (acute otitis media OR AOM, Upper Respiratory Infections OR URI). This criteria search yielded over 147,221 results for antibiotic resistance and 382 results for delayed antibiotics. Using Google Scholar, with search of pediatric Acute Otitis Media (AOM), delayed prescription yielded 10,500 results. With an added “antibiotic resistance” category, the results yielded 4,850. Narrowing it down on PubMed to antibiotic resistance, AOM and delayed prescription yielded 210 studies.

According to Reuters, using Google alone will yield over 10 million hits for this topic, but only two sites; Alliance for the Prudent use of Antibiotics (APUA) and the Centers for Disease Control and Prevention (CDC), got the highest scores of quality criteria (Reuters, 2014). The CDC’s “Get smart about antibiotics”, received top scores for quality and usefulness of information and relevance (Reuters, 2014).

There were many studies to choose from including Randomized Controlled Trials (RCT), Meta-analysis, and Reviews. According to the Evidence Hierarchy, Meta-analysis and Randomized Controlled Trials rank the highest (Long, 2012).

Pediatric Studies

In the review of literature for pediatric research trials, all of the studies used two groups, an antibiotic versus a placebo or “wait and see” observation period, in a population between the

ages of six months to twelve years. Only children with Acute Otitis Media (AOM) were studied, all healthy with no other medical comorbidities or chronic illnesses.

The first pediatric research study by, Chao, Kunkov, Reyes, Lichten, and Crain (2008) was a randomized control trial using the pediatric population of two-year olds to twelve-year olds, all with AOM diagnosis. There were two groups: observational therapy without antibiotics and observational group with antibiotic prescription upon discharge. Both groups were randomly picked and had follow-up calls ten days post first diagnosis visit. The observational group without antibiotics consisted of 117 patients, with a completion at follow up of 100 patients, and the second observation group with antibiotics 115 patients, with a follow up of 106 patients after ten days (Chao et al., 2008).

The second pediatric study was a meta-analysis of RCT's, by Vouloumanou, Karageorgopoulos, Kazantzi, Kapaskelis and Falagals (2009) who studied antibiotics versus a placebo group of watchful waiting for (AOM). Seven trial studies were used with two groups of antibiotic patient's versus a placebo group, with a population size of 1,405 patients. Four of the trial studies consisted of groups of antibiotic use versus, watchful waiting groups. The population consisted of 915 patients, both consisting of 2,320 patients diagnosed with AOM with an age bracket between six months and twelve years old (Vouloumanou et al., 2009).

Inclusions for both studies were pediatric patients between six-months and twelve-years old diagnosed with (AOM), consent signed for randomness of groups, compared treatment with antibiotics versus a placebo group of watchful waiting observation. All had follow-up by either telephone or revisit in three to ten days. Exclusion criteria consisted of allergies to antibiotics, comorbidities of immunodeficiency's, cranial abnormalities, frequent or chronic (AOM's),

sensitivities to Tylenol or Motrin and tube placements for drainage. In addition, patients without telephones were excluded due to lack of follow up (Vouloumanou et al., 2009).

Study quality as mentioned, was high on the Evidence hierarchy pyramid with meta-analysis and RCT studies rating well. The limitations of these studies would be the age group of six-months to two-years and the recommended guidelines by the AAP to give antibiotics to this group due to age. The rating of pain in the pediatric groups deemed subjective in which it would be difficult obtaining a good quality rating. In the Chao, et.al (2008) research, the study was conducted in one urban emergency department with patients having limited access to primary care physicians for follow up. All of the researchers used a convenience sample. Other potential limitations were based on parental reporting of antibiotic use and persistence of symptoms as oppose to querying pharmacy databases. The interventions of the two studies were randomly assigned groups consisting of the same measures of antibiotic groups, placebo groups and observational, “wait and see” groups.

Outcomes of Pediatric Studies

The outcome of the studies all measured the presence of pain, fever and the resolution of (AOM) symptoms, some at three days, and others at ten to fourteen days. In the Chao et al. (2008) study, two observational groups, one given no prescriptions for antibiotics, and one given a prescription for antibiotics, found that adherence to antibiotic therapy was better for those not offered prescriptions. The observational group with the prescriptions, 53% did not fill the antibiotic. In the Vouloumanou et al. (2009) meta-analysis of eleven studies, antibiotic treatment was associated with a more favorable clinical course in children with (AOM), compared with placebo, and compared with watchful waiting (Vouloumanou et al., 2009).

Both studies had a good patient / parent satisfaction rating with all children experiencing resolution of symptoms; however, the placebo and the observations groups took longer than the antibiotic groups. No morbidities noted, and an increase of side effects such as diarrhea and rash allergies were noted in the antibiotic groups and not in the placebo or observational groups. This may be a future educational tool with parents demanding antibiotics for viral syndromes explaining the chance of adverse side effects from antibiotics. In the placebo groups, there was a higher usage of analgesia than the antibiotic groups.

Conclusion of Pediatric Studies

Of the two pediatric studies examined in this systematic review, all resulted in antibiotics given to the pediatric patients yielded the best results for decrease of (AOM) symptoms, pain, and fever. The null hypothesis would be true in these studies: antibiotic use > placebo / wait and see approach.

Two of the studies, used pediatric patients between the ages of six months to two-years old, which may have led to the results leaning towards antibiotics. Children under two-years of age are less likely than older children to experience improvement without antibiotic treatment (Meropol, 2007). Pain assessment of patients younger than two-years old would be more difficult to determine as compared to patients older, who can express pain in a more measurable scale. Parental time and loss of wages due to a sick child may be another desirable tradeoff for using antibiotics and could be a barrier to a successful implementation of the American Academy of Pediatrics guidelines for AOM (Meropol, 2007).

To note, that from the studies, there was a small discrepancy between the relief of symptoms, pain and fever from the antibiotic groups, the placebo or wait and see groups. Most

non-antibiotic groups did receive relief of symptoms, but with a longer resolution time. Future studies could be limited to participants under two years of age.

Delayed prescribing refers to a strategy in which patients are given access to a prescription for antibiotics together with advice to wait for a certain amount of time before deciding whether to start and get the antibiotic filled. In a Cochrane systematic review of 9 RCTs compared delayed and immediate antibiotic prescriptions for URIs. Of the patients who filled their prescriptions, 32% were given delayed prescriptions and 93% were given immediate prescriptions. Statistical outcomes for delayed versus immediate prescriptions with significant differences reported; bronchitis or common cold- no difference; pharyngitis diagnosis found that symptoms were worse at day three with delayed prescriptions but other outcomes were not different. Other outcomes with no difference were otitis media in one study found that the pain severity and malaise at day 3 were worse with delayed prescriptions, but other outcomes were not different. Delayed prescriptions slightly reduced patient satisfaction, 87% vs 92%, compared to immediate prescriptions. Other outcomes were lower re-consultation rates and less adverse events of diarrhea with delayed prescriptions. The bottom line is that delayed prescriptions substantially reduces antibiotic use (Spurling, G.K.P., Del Mar, C. B., Dooley, L., & Foxlee, R., 2013).

Legare et al. (2011) noted that acute respiratory infections (ARI) are the most commonly reported reason for patients presenting to a family practice. While research shows that bacterial infections are only responsible for 38% of acute rhino sinusitis, 6% to 18% for ARI and 5% to 15% of pharyngitis, 53% of patients are prescribed antibiotics (Legare et al., 2011). Resistance for individuals is of concern, but the public health issue of the overall community population resistances has major public health implications. (Legare et al., 2011) broached the idea of

shared decision making (SDM) with the physician and patient in order to make the best decision with the most informed information (Legare et al., 2011). In a pilot, clustered, randomized control trial to examine antibiotic prescribing for ARI in primary care settings, four family medicine groups were randomized into intervention groups and control groups. The intervention group used DECISION+, a multifaceted intervention for implementing SDM in medical practices that included training, reminders and feedback (Legare et al., 2011). The use of this program decreased “immediate antibiotics” (those taken immediately after physician visit) by 20%; therefore, these researchers felt that it had the potential to reduce antibiotic with (SDM) which empowered patients to make value-based decisions (Legare et al., 2011).

In another focus group, by Peters et al. (2011), allowed greater access to the view and practices of delayed prescribing among practitioners. Participants were recruited through methods of phoning and advertising at training events in United Kingdom. The General Practitioners (GPs) discussed their practices and concerns with delayed prescribing. Most of them gave their patients a prescription for antibiotics and instructions to delay taking the medication, but felt they had no knowledge of whether it was filled or not. Some GPs, felt that giving a delayed prescription gave a mixed message about the efficiency of antibiotics for self-limiting RTIs, which gave the patient too much control over their condition. The GPs felt that delayed prescriptions (DP) were a form of a safety net incase the patients symptoms worsened, but felt that explaining and consultations regarding antibiotics to be confrontational. Some GPs did not use DP and employed alternative strategies as justification of non-prescribing, education about antibiotics and promoting self-management of symptoms by way of literature (Peters et al., 2011).

Some limitations of this study are the provider's influence over their own DP strategy and ways to defend their beliefs. Many providers used DP to avoid conflict. The conclusion was the DP was not considered to be helpful strategy for managing patients with self-limiting respiratory tract infections in primary care facilities. The GPs did not feel that this was a means for reducing antibiotic prescribing (Peters et al., 2011).

In a study by Høy et al. (2013) conducted in Norway, the aim was to investigate whether a combined intervention of education information on delayed prescribing and a pop-up reminder on the EHR, in hopes this would alter the proportion of antibiotic prescriptions dispensed at pharmacies. The second aim was to investigate and identify factors affecting GPs decisions to issue delayed prescriptions and patient's decisions to fill their antibiotic. According to the authors, this also was the first educational intervention study on using antibiotics to treat RTIs includes the recommendation for delayed prescribing.

The results promoting delayed prescribing amount GPs resulted in a small decrease in antibiotic dispensing. The dispensing rate for delayed prescriptions was 59.2%, which is a higher rate than any consumption rate reported in randomized controlled trials. Past rates were 24% to 53%. This was considered a limitation due to the possibility of GPs being less empathetic in delivering the delayed prescription advice. There was also a low use of the strategy of the pop-up reminder of the delayed prescribing vs the number of filled prescriptions.

In the study by Little et al. (2014), the objective was to estimate the effectiveness of different strategies involving delayed antibiotic prescriptions for acute respiratory tract infections (ARTI) in a primary care setting. The population was 889 patients, aged 3 years and over, with ARTIs from 25 practices. Patients who did not need immediate antibiotics for ARTIs were randomized to undergo 1 to 4 strategies:

- Re-contact for a prescription
- Postdated prescriptions
- Collection of a prescription
- No antibiotic prescription

The main outcome showed minimal differences in symptom severity observed between those who received no prescriptions and those receiving a delayed prescription. Symptom duration did not differ between groups, and no significance was observed for patient satisfaction. Those receiving antibiotics did not appear to benefit from them based on symptom severity scores. Strategies involving no prescription or delayed prescriptions resulted in <40% of patients using antibiotics, was associated with less strong beliefs in antibiotics and similar symptom outcomes compared to immediate prescriptions.

In a study with urgent care centers, Hasbach (2015) examined current practices and attitudes towards delayed prescribing of eight health care providers and twenty-seven of their adult patients with an RTI who received a delayed prescription for antibiotics. The patients completed a questionnaire survey that consisted of seven questions about their treatment. The study also investigated the effect of an education intervention for providers regarding antibiotic prescribing. The patients received education materials developed by the Centers for Disease Control and Prevention.

The findings indicated that both patients and providers considered delayed antibiotic prescribing for RTIs a satisfactory treatment choice. Patients actually expressed a preference for delayed prescribing should they experience similar symptoms in the future. Just over half of the patients did not fill their prescription, signifying that delayed prescribing can reduce the use of antibiotic prescribing, indicating that the intervention was beneficial. These findings support

previous findings that delayed prescribing can maintain or improve patient's satisfaction, provide safe treatment for patients with worsening symptoms and decrease unnecessary use of antibiotics (Hasbach, 2015).

This next study was an observational study by Francis et al. (2012). Promoting strategies to reduce antibiotic consumption were used with delayed antibiotic prescribing for Lower Respiratory Tract Infections (LRTI), in fourteen primary care networks of thirteen European countries. Patients were given delayed prescriptions at time of visit and recorded their consumption of antibiotics. "Two-hundred and ten (6.3%) of the 3,368 patients were prescribed delayed antibiotics. The median recommended a delay period of three days. Seventy-five (44.4%) of the 169 consumed the antibiotic, and 18 (0.7%) took another antibiotic during the study period. Fifty patients (29.6%) started their delayed prescription course on the day they received the prescription" (Francis et al., 2012, p. e640). The finding that two-thirds of those who consumed antibiotics prescribed in their delayed prescriptions did so on the day it was prescribed due to either poor communication or resistance of the patients. Patients, who stated they wanted antibiotics at visit, were more likely to consume their delayed prescription.

The conclusion of this study is that a delayed antibiotic prescribing was used infrequently for adults presenting in general practice with LRTIs. Educational materials were not used, and the provider did not record their strategies for delayed (Francis et al., 2012).

A study by Lee et al. (2014) was a retrospective analysis of nationally representative data from the Medical Expenditure Panel surveys from 2000-2010 trending in population based prescribing. The aim of the study was to describe national trends in outpatient antibiotic prescribing, broad-spectrum antibiotics prescribing for acute respiratory tract infections (ARTIs)

and the antibiotics prescribed during the ARTI visits of children, adolescents, adults, and older adults (Lee et al., 2014).

The results of the study during 2000-2010 reported, that an estimated 1.4 billion outpatient antibiotics were dispensed in the US, with annual outpatient prescriptions purchased, ranged from 106 million in 2000 to 143 million in 2003 (Lee et al., 2014). Overall, antibiotic use has remained stable. Antibiotic use decreased among children and adolescents, there was no change among adults, and older adults experienced an increase intake of antibiotics. ARTI visits rates have decreased in the last decade, however when patients who experience an outpatient ARTI visit, they are more likely to receive an antibiotic. Therefore, there have been fewer visits for ARTIs, but a higher propensity to treat these conditions with an antibiotic. The study suggests that older adults receive a higher amount of antibiotics upon visits, which may suggest the need for more research to understand the benefits of antibiotic use among older adults since the older adult populations is rapidly growing.

In the seventh study by Hoye, Frich and Lindbaek (2011), they described the feasibility of delayed prescribing for RTIs. A questionnaire was sent out to forty-nine GPs in Norway regarding their patients receiving a wait and see prescriptions. The survey reported the patient's symptoms, confidence, and consumption of antibiotics, reported diagnoses, reason for issuing a "wait and see" prescription and their opinion about the methods.

The most common diagnosis from the GPs to issue a "wait and see" prescription was sinusitis and otitis. Forty-six percent of the patients reported taking the antibiotics. Of the 304 responses, the GPs found in 210 cases that delayed prescribing was a very reasonable strategy and that 270 patients would prefer to receive a "wait and see" prescription in a similar situation in the future (Hoye et al., 2011). In this study, they also calculated the patient's age and whether

they had a fever. Many of the GPs were satisfied, as well as their patients, with the delayed prescribing strategy. They also concluded that the patient's age, symptoms, and malaise are more important than the diagnosis in predicting antibiotic consumption.

Conclusion

In all of the above studies, the result was that giving patients delayed prescriptions did have a positive effect on the dispensing of antibiotics. When providers used some of their own strategies to discuss delayed prescriptions with their patients, the results did not help the patients understand the importance of not taking antibiotics and most filled their prescriptions after their visit. Using combined interventions of educational materials, developing patient trust and using delayed prescriptions had a lower antibiotic dispensing rate and better patient satisfaction.

Many of the patients took their antibiotics due to poor communication by the providers. Trends in age of the patients determined that the older the patient the more frequently they received an antibiotics. Children have a lower prescription rate when age and fever was calculated into the decision to taking the antibiotics. Other reasons why patients took the antibiotics was the misconception that the antibiotic would help the symptoms.

Various approaches tested to reduce inappropriate antibiotic prescribing while avoiding effects on patient satisfaction. The studies show patient satisfaction can be achieved through delayed prescriptions coupled with informative patient handouts and advice about pain and fever management. Antibiotic misuse needs a permanent solution. Lack of evidence-based research and unproven clinical experiences are seen as factors contributing to antibiotic overuse. Understanding the real reasons behind patient satisfaction and requesting antibiotics may be the key point to stopping antibiotics for viral syndromes.

Theoretical Framework

The theoretical framework of the project will expand on the idea of self-care, by nursing theorist Nola J. Pender, PhD, RN, FAAN, who created the *Health Promotion Model* in 1982. Pender's ideas are complementary counterpart to models of health protection, and states, "that people should be committed to engaging in behaviors that give them personal valued benefits" (Cranick, Miller, & Allen, 2015). The concept of self-care should encompass not only physical fitness, but also emotional, mental, and spiritual needs. The environment in which an acquired potential can be fully expressed, shapes the key concepts for the Health Promotion model. Thus, Pender's idea was a reciprocal relationship between person and environment (Cranick et al., 2015). According to Pender, health is an evolving life experience with illnesses as discrete events throughout the life span that can hinder or facilitate a person's quest for health. One of Pender's assumptions is that people interact with their environment, transforming it and themselves over time. Using this concept people, may be able to understand the dangers of taking antibiotics unnecessarily and transform their beliefs that they do not help viruses. Using this theory of self-care, advocates strong patient involvement, which allows patients to be individuals and have an active role in their plan of care (Pender, 2012).

Section III - Methodology

Widespread use of antibiotics leads to development of antimicrobial resistance, an increasing threat to health worldwide. The strategy of delayed antibiotic prescribing reduces antibiotics used for viral syndromes as described in the literature. Using delayed prescribing should be encouraged as a tool to adhere to treatment with the use of multi-faceted interventions of provider trust and educational materials.

Delayed prescribing refers to a strategy in which patients are given access to a prescription for antibiotics together with advice to “wait and see” for a certain amount of time before deciding to take the antibiotic. The provider may explain the criteria that should determine the patients decision to take antibiotic or not, usually if the symptoms deteriorate or a fever develops. This strategy is advocated and studied in cases of potentially self-limiting infections and the most common are respiratory tract infections and viral syndromes.

Practitioners are the key in regulating the amount of antibiotics the community in primary care offices. Delayed prescribing can be used as a clinical tool for prescribers but the concept of shared decision-making (SDM) should not be ignored.

Implementation of this project was accomplished in five phases. Phase I entailed the determination over the needs and project proposal objectives. In this phase, the setting was determined with the project design and patient sample. Phase II involved obtaining approval and support from the nineteen providers currently working at both urgent care centers. Phase III involved the development of the phone survey and a results sheet to record the patient’s responses after receiving a wait and see prescription for antibiotics. Educational packets were developed using the CDC’s *get smart about antibiotics*, for each of the viral syndromes. A workflow logic model was developed on how the patients would be discharged and given their information packet. Phase IV was the implementation process, in which the phone calls were made post visit, by a nurse. In this phase discharging and giving the patients the educational information was ongoing. Phase V was the projects evaluation process in which the results were tabulated and organized to see the outcome of how many patients filled their prescriptions or waited and did not fill the antibiotic.

Phase I

Each year many people seek care for primary care complaints from urgent care centers. Patients who cannot get appointments with their primary care provider will go to walk in urgent care centers. The urgency presented by patients and parents of children who are in pain usually means the providers frequently find it easiest to focus on a resolution of giving antibiotics. The prescription serves as a psychological role as well as a patient satisfier. The goal of this implementation plan is to decrease antibiotic use in the urgent care setting by way of using a “wait and see” prescription plan for patients with viral syndromes, including Acute Otitis Media (AOM), in children and adults, influenza, sore throats and URIs. The project took place from October 1, 2015 and finished October 31, 2015.

This project was conducted in two urgent care centers in two different counties, with a combined patient volume of 16,000 yearly. The urgent care centers used in this project are affiliated with a major hospital system in central New Jersey. The providers currently work at both urgent care centers on a rotational basis, as well as the emergency department of the hospital. All the providers are trained and board certified in emergency medicine. The providers were asked to participate and welcomed the project. The medical director of the urgent care suggested sending an email out to all the providers (Appendix A) which would be the most efficient way of informing. The patient sample will be adults and children older than three, who visit the urgent care center for viral syndromes.

Phase II

The providers were asked to participate in the project. A letter was developed and approved. The letter was emailed to all the on staff providers describing the project and tentative workflow. The physicians have been utilizing the “wait and see” antibiotic prescription in the

past, and were excited to be able to view the results when completed. The project began with the physicians making a diagnosis of viral syndromes. A “wait and see” prescription for an antibiotic was given to the patients and or parent. A telephone survey was developed with questions to ask the patients to determine the results of the project. (Appendix B) A logic Model (Appendix C) was developed to determine a workflow.

Phase III

After diagnosis of viral symptoms, the nurse brought all necessary handouts, utilizing the CDC’s, *Get smart about antibiotics program*. The nurse or the provider reviewed the discharge instructions and answered all questions. The information from the CDC consisted of posters in each room, brochures (Appendices D, E, F, G, H, I and J) and viral RX prescriptions all describing the dangers of antibiotic misuse. The nurse educated the patient and/or parent about the dangers of taking antibiotics for illnesses that do not require antibiotics. Questions were answered at time of discharge, along with a prescription for a “wait and see” antibiotic if the provider deemed fit. It was suggested that the patient and /or parent wait three to four days to fill the prescription. If on the fifth day they were no better and worse, they have the prescription and can get it filled at the pharmacy. The providers gave out the literature and discharged the patients when the nurse was not available. The results were tabulated as to whether the provider or the nurse handed the patient the literature and discharged the patient. A list was kept at the providers’ desk to keep track of the patients that received the “wait and see” prescriptions and literature if discharged by the provider.

Phase IV

Callbacks to the patients and/or parents were made one day following the office visit to reiterate the plan and answer any other questions regarding their symptoms. Finally, on day five

of post visit, follow up calls were made to see if the patient had filled their antibiotic. The calls were made by the nurse and results were tabulated on an excel sheet using no medical identification.

Phase V

The last phase V consisted of continuing to call the patients and complete the phone survey along with documenting results. At the end of the month, the results were tabulated and calculated. The providers were very happy with the progress the project had and felt that the information on antibiotic misuse was very helpful in their treatment.

The outcomes of the implementation plan were to educate and bring awareness to the patients and/or parents about the dangers of antibiotics and their misuse in urgent care settings. Education about viruses and possible side effects of antibiotics discussed. Patients were encouraged to wait before running to the pharmacy to get that antibiotic. On top of the benefits, the community gains a much more cost-effective option of fewer antibiotics when seeking medical care. The long-term outcome is to decrease the use of antibiotics for viral syndromes and decrease the changes of antibiotic resistance in the future.

Section IV – Project Outcomes

All nineteen providers from both urgent care facilities agreed to participate in the project. Not all providers were scheduled during the project period of October 1, 2015 and October 31, 2015. Only approximately fifteen providers were on duty. A total of 68 patients received the “wait and see” prescriptions for viral syndromes during the project time frame. All of the patients were given educational material by the CDC in packet form, diagnosis specific by either the nurse or the provider. Thirty-four out of the 68 patients did not fill their antibiotic prescriptions. Four patients (5.9%) filled their antibiotics after day four. Nineteen patients filled

their antibiotics on day one, four patients (5.9%) filled their antibiotic on day two, and seven patients (10.3%) filled their prescriptions on day three. A total of 34 patients (50%) did not fill their prescriptions and 34 patients did fill their prescriptions for antibiotics within the four day span. (Table 1) Fifty percent of patients took their antibiotics and 50% did not get their prescriptions filled, signifying that that “wait and see” prescriptions have a 50/50 chance of reducing the intake of antibiotics using educational material at discharge.

Table 1*Prescriptions Filled*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Did not fill Rx	34	50.0	50.0	50.0
	Filled Day 1	19	27.9	27.9	77.9
	Filled Day 2	4	5.9	5.9	83.8
	Filled Day 3	7	10.3	10.3	94.1
	Filled Day 4	4	5.9	5.9	100.0
	Total	68	100.0	100.0	

The difference in patients who did not fill their antibiotics as to whether the provider or the nurse gave the educational discharge information was significant. Of the 34 patients who did not fill their prescriptions, the provider discharged eight patients and the nurse discharged twenty-six patients. This shows that when the patient was discharged by the nurse, there may have been more time given for education and to answering questions at discharge, where the provider did not have the same amount of time. To test if there was a significant difference on when patients filled their prescription given who educated them, a median test was conducted since the distribution is skewed. In the results, who gives the education has a significant

difference where the median number of days is lower if a nurse versus the provider gives the education. (Table 2)

Table 2

Discharged by Provider or Nurse

Given By	N	Median	Mean
Provider	29	1.00	1.38
Nurse	39	.00	.62
Total	68	.50	.94

Patients had a variety of reasons for filling their prescriptions. Teachers did not want to get their students sick, patients were going on vacation, and many felt that the antibiotics have helped them in the past. There still needs to be more education regarding the spread of viruses. All of the sixty-eight, patients rated the treatment they received and their satisfaction with the delayed prescribing for future use as excellent and would like to be offered a “wait and see” prescription in the future.

Phone survey: The initial plan of the phone survey was to call the patients day one post visit to reiterate the plan of “wait and see” prescriptions and to answer any questions. After a small amount of calls made on day one and then day five, some patients commented on all the calls to be annoying. A modification of the phone survey to exclude the day-one post visit and call the patients only at day five to see how they were doing, answer any questions and to see if they had filled their prescriptions for antibiotics. The modification was made for patient satisfaction purposes.

Section V - Summary

According to the CDC Health Report (2013), prescribing of antibiotics for ambulatory care visits for the diagnosis of cold symptoms was higher in adults and less in children under 18 years old.

In figure 1, antibiotic prescribing has declined by two-fifths, from 44.7% in 1995 – 1996, to 27.1% in 2009 – 2010 (CDC 2013). The percentages are going down. (Figure 1)

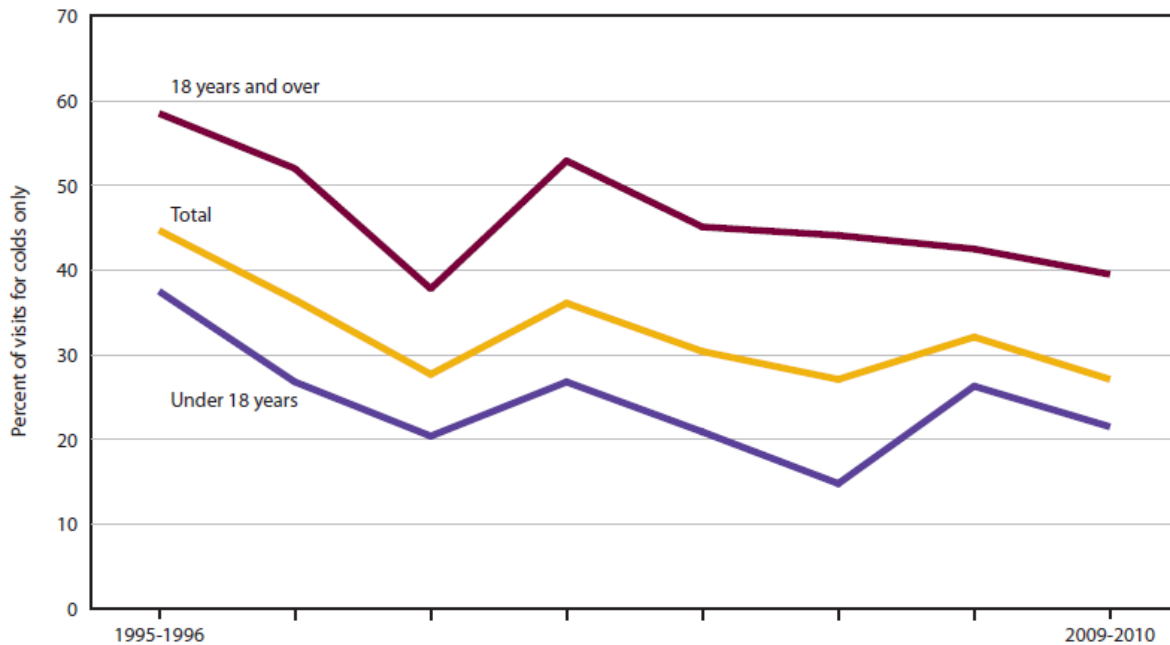


Figure 1. Antibiotics ordered or provided during emergency department, outpatient, and physician visits for cold symptom diagnoses, by age: United States, average annual, 1995–1996 through 2009–2010 (CDC 2013)

The results of this project indicated that delayed prescribing provided a high level of satisfaction for the patients by the results when asked if they would like “wait and see” prescriptions in the future. The providers were satisfied by the results of the number of patients who did not fill their prescriptions. Many times providers try to do what is right for medicine and not give out antibiotics readily, but management for patient complaints and a decreased score on patient satisfaction surveys reprimands them. This report and its findings support previous findings that delayed prescribing can maintain or improve patient’s satisfaction, provide safe treatment for patients with worsening symptoms and decrease unnecessary use of antibiotics. Patient satisfaction is an important outcome measurement in assessing and

evaluating healthcare. It is also a useful tool in improving patient care. Patients satisfied with their care are more compliant with treatment in the future.

One of the limitations of this project would be the anonymity bias of the telephone survey and the fact that the population was drawn from only two facilities in suburban areas. This leaves out the demographics of urban areas. Another limitation would be that urgent care centers generally have a unique challenge in developing patient / provider relationships. Patients are seen once in this setting and others are seen infrequently. The providers have a large patient volume daily and may have a high acuity level in which time to explain antibiotic misuse is just not possible. The visit is short and brief unlike a primary care provider who the patient has been with for many years.

The outcomes of this project will be to educate and bring awareness to the patients and/or parents about the dangers of antibiotics and their misuse in urgent care settings. The long-term outcome is to decrease the use of antibiotics for viral syndromes and decrease the changes of antibiotic resistance in the future.

The author would like to conclude that with the support of providers and patient education on a continuous basis, antibiotic prescribing patterns could have a positive effect on the decrease usage of antibiotics for unnecessary illnesses. Continuous quality improvement is feasible in a small-scale urgent care center with sufficient facilitation and support of the “*Be smart about antibiotics*” program. We may be able to succeed with the help of other providers in the community adopting the principles of this project to discourage the misuse of antibiotics in patients with viral symptoms.

Sustainability

To make this decade old problem of antibiotic misuse obsolete, will not be an easy accomplishment due to the structure and walls that healthcare systems built against change. Any change will take time and effort to change the way hospitals, physicians and communities think about illness and antibiotics. Materials from the CDC made available for awareness to all participating providers and patients seems to be a helping factor. To sustain the discharge process if the nurse is not available, the providers will hand out the educational information along with the delayed prescriptions.

Economic factors and patient satisfaction will be monitored through Press Ganey surveys and the centers callback system with feedback. If dissatisfaction occurs by means of the patient satisfaction surveys, the program can be reevaluated and modified.

One of the strengths of this project was that the educational information was free from the CDC. The literature can be easily downloaded and duplicated as needed on a regular basis. Another strength is that the providers have been practicing delayed prescribing for a few years and truly believe that decreasing antibiotics to patients is necessary project for the health of the future.

The author of this paper and project believes that the sustainability of this project will be on going and only become stronger with the White House Committee developing a strategy to decrease the use of antibiotics. In the future, it may be possible to come up with a plan to monitor the antibiotic prescribing of all providers and hold them accountable for over-prescribing. With all the providers practicing good antibiotic prescribing, patient satisfaction scores will level out. It may become the norm to have all providers not give antibiotics for specific diagnostic codes.

Recommendations

Future recommendations may be not giving the patients the option for delayed prescriptions at time of visit. Educational materials can be given at discharge with instructions to call in one week if the symptoms have gotten worse the urgent care center will call in a prescription for an antibiotic if necessary. Educational community conferences can be held to educate the public about viruses and antibiotic resistance.

Another recommendation may target patient's gender, age, and educational status. Instead of a phone survey, give a questionnaire to the patients with viral syndromes requesting permission to contact them about their thoughts on antibiotics and delayed prescriptions. This can be done while waiting for the providers to see the patients. This educational survey tool can be used for tracking the use of antibiotics.

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APPENDIX A

Letter to Providers for Agreement

Good Afternoon:

As some of you are aware, I am currently in my last semester of achieving my DNP (Doctor of Nursing Practice) in Healthcare Administration with Seton Hall University. My proposed scholarly project is implementing an Antibiotic Abuse project in the Urgent Care Centers in Hillsborough and Flemington. Most of my information and patient literature will be from the CDC's "Get smart about Antibiotics" campaign. This scholarly project addresses an identified need for education on antibiotic overuse, already researched and published in the past years.

My goal is to initiate and implement a program designing and educating the patients utilizing the urgent care centers on the dangers of antibiotic abuse for viral syndromes such as AOM, Flu, colds, URI/bronchitis, and pharyngitis. The project will start October 1, 2015, and end October 31, 2015.

With the support of the physicians, patients will be educated and given information regarding viral symptoms that are not cured by antibiotics. What I am asking from you is:

- Any patient with a diagnosis of any viral syndrome, mentioned above, to give a brief explanation of why they may not need an antibiotic. This is at your discretion based on your own medical practices.
- Give a hand written or printed "wait and see" prescription for an antibiotic that may be filled after 3 or 4 days if their symptoms are getting worse. (cannot e-scribe)
- Inform me of the visit, and I will discharge the patient giving them information on delayed prescriptions and antibiotic overuse. If I am not in the building, there will be a log in the doctor's office. If you can put the patients name and date, I will look up the patient the following day and call them. In addition, if I am not around, I will have CDC antibiotic information and discharge instructions, which you could give the patient at discharge. I will try to go over this in person when you are working.
- I will be calling the patient one day post visit to answer any further questions they may have, and then on day five to see if they filled the prescription or not.

This project will be conducted according to ethical principles of using collected data by way of methods and tools established by the standards of the syllabus of Seton Hall University.

Thank You,

Pat Hansen RN, MSN

Appendix B**Delayed Antibiotic Prescriptions in the Urgent Care Setting for Viral Syndromes**

Seton Hall University College of Nursing

Pat Hansen

Date of Service	MRN Number	Diagnosis at Discharge

PHONE SURVEY DAY POST DATE OF SERVICE (DOS)		
	YES	NO
Are you feeling any better today after your visit yesterday?		
Did you think you needed an antibiotic at your time of visit?		
Did you receive information / Education on the Delayed Prescription Treatment?		
	Nurse	Phys.
Who gave you the Education material?		
	YES	NO
Do you have any questions about the Delayed Prescription you received?		
If Yes; Questions:		
PHONE SURVEY DAY 5 POST DOS		
	YES	NO
Did you fill your Delayed Prescription?		
Did you see another Provider due to dissatisfaction with your treatment?		

	No	Day 1	Day 2	Day 3	Day 4
What Day did you fill your Delayed Prescription?					
	YES	NO			
What Treatment would you Prefer in future visits?					
Immediate Antibiotics?					
No Antibiotics?					
Delayed Antibiotics?					
Did the Education Information influence you in making your decision about getting your Antibiotic Prescription filled?					

Appendix D

Antibiotics: Will they work when you really need them?

**Get Smart
About Antibiotics Week**
November 18-24, 2013

Did you know?


1. Antibiotic resistance is one of the world's most pressing public health threats.
2. Antibiotics are the most important tool we have to combat life-threatening bacterial diseases, but antibiotics can have side effects.
3. Antibiotic overuse increases the development of drug-resistant germs.
4. Patients, healthcare providers, hospital administrators, and policy makers must work together to employ effective strategies for improving antibiotic use – ultimately improving medical care and saving lives.

Scope of the Problem


- Antibiotic resistance occurs when bacteria change in a way that reduces or eliminates the effectiveness of antibiotics.
- Infections with resistant bacteria have become more common in healthcare and community settings, and many bacteria have become resistant to more than one type or class of antibiotic.
- Antibiotics can cure bacterial infections, not viral infections. Treating viruses with antibiotics does not work, and it increases the likelihood that you will become ill with an antibiotic-resistant bacterial infection.
- It is estimated that more than 50% of antibiotics are unnecessarily prescribed in office settings for upper respiratory infections (URIs) like cough and cold illness, most of which are caused by viruses.
- Up to 50% of antibiotic use in hospitals is either unnecessary or inappropriate.
- In children, reactions to antibiotics are the most common cause of emergency department visits for adverse drug events.
- Children may have up to nine colds each year. Three out of 10 children who visit an outpatient provider with the common cold receive an antibiotic. This is an improvement from previous years, but antibiotics are not indicated for a common cold.

Antibiotics are powerful tools for fighting illness, but overuse of antibiotics has helped create new strains of infectious diseases.

The problem is that we expect antibiotics to work for every illness, but they **don't**.



Centers for Disease Control and Prevention
Get Smart Programs




www.cdc.gov/getsmart/community/materials-references/print-materials/index.html

Appendix E

A GUIDE FOR PARENTS QUESTIONS AND ANSWERS

Runny Nose (with green or yellow mucus)



Your child has a runny nose. This is a normal part of what happens during the common cold and as it gets better. Here are some facts about colds and runny noses.

What causes a runny nose during a cold?

When germs that cause colds first infect the nose and sinuses, the nose makes clear mucus. This helps wash the germs from the nose and sinuses. After two or three days, the body's immune cells fight back, changing the mucus to a white or yellow color. As the bacteria that live in the nose grow back, they may also be found in the mucus, which changes the mucus to a greenish color. This is normal and does not mean your child needs an antibiotic.



What should I do?

- The best treatment is to wait and watch your child. Runny nose, cough, and symptoms like fever, headache, and muscle aches may be bothersome, but antibiotics will not make them go away any faster.
- Some people find that using a cool mist vaporizer or saltwater nose drops makes their child feel better.



Are antibiotics ever needed for a runny nose?

Antibiotics are needed only if your healthcare provider tells you that your child has sinusitis. Your child's healthcare provider may prescribe other medicine or give you tips to help with a cold's other symptoms like fever and cough, but antibiotics are not needed to treat the runny nose.

Why not try antibiotics now?

Taking antibiotics when they are not needed can be harmful. Each time people take antibiotics, they are more likely to carry resistant germs in their noses and throats. These resistant germs cannot be killed by common antibiotics. Your child may need more costly antibiotics, antibiotics given by a needle, or may even need to be in the hospital to get antibiotics. Since a runny nose almost always gets better on its own, it is better to wait and take antibiotics only when they are needed.

1-800-CDC-INFO
www.cdc.gov/getsmart

www.cdc.gov/getsmart/community/materials-references/print-materials/index.html

Appendix F

Preserving antibiotics for the future

**Get Smart
About Antibiotics Week**
November 17-23, 2014

Did you know?

1. Antibiotic resistance is one of the world's most pressing public health threats.
2. Antibiotics are the most important tool we have to combat life-threatening bacterial diseases, but antibiotics can have side effects.
3. Antibiotic overuse increases the development of drug-resistant germs.
4. Patients, healthcare providers, hospital administrators, and policy makers must work together to employ effective strategies for improving antibiotic use – ultimately improving medical care and saving lives.

Looking ahead at the problem

- No single strategy can solve the issue of antibiotic resistance; a multi-pronged approach is required.
- There are four core actions that will help fight these deadly infections:
 - Preventing infections and preventing the spread of resistance
 - Tracking resistant bacteria
 - Improving the use of today's antibiotics
 - Promoting the development of new antibiotics and developing new diagnostic tests for resistant bacteria

4 Core Actions to Prevent Antibiotic Resistance


1. Preventing Infections, Preventing The Spread of Resistance
2. Tracking
3. Improving Antibiotic Prescribing/Stewardship
4. Developing New Drugs and Diagnostic Tests


Bacteria will inevitably find ways of resisting the antibiotics we develop, which is why aggressive action is needed now to keep new resistance from developing and to prevent the resistance that already exists from spreading. Combating resistance will take significant effort from clinicians, healthcare facility leaders, policy makers, and the agriculture industry.

To raise awareness and engage stakeholders, CDC recently released Antibiotic Resistance Threats in the United States, 2013, a snapshot of the complex problem of antibiotic resistance today and the potentially catastrophic consequences of inaction. In 2014, the White House announced the Executive Order and the National Strategy to Combat Antibiotic-Resistant Bacteria. These actions provide goals and direction to help the nation contain the spread of resistant bacterial strains, manage existing antibiotics to preserve their effectiveness, and help guarantee a steady pipeline of new, effective antibiotics and diagnostics.

Why we must act now

- The way we use antibiotics today or in one patient directly impacts how effective they will be tomorrow or in another patient; they are a shared resource.
- Antibiotic resistance is not just a problem for the person with the infection. Some resistant bacteria have the potential to spread to others – promoting antibiotic-resistant infections.
- Since it will be many years before new antibiotics are available to treat some resistant infections, we need to improve the use of antibiotics that are currently available.



Centers for Disease Control and Prevention
Get Smart Programs


Appendix G

CDC/25166

Sniffle or Sneeze? No Antibiotics Please

CDC advises parents about colds, flu and antibiotics

The Centers for Disease Control and Prevention (CDC) has news for parents this cold and flu season: antibiotics don't work for a cold or the flu.

Antibiotics kill bacteria, not viruses. And colds, flu and most sore throats are caused by viruses. Antibiotics don't touch viruses — never have, never will. And it's not really news. It's a long-documented medical fact.

But tell that to parents seeking relief for a child's runny nose. Research shows that most Americans have either missed the message about appropriate antibiotic use or they simply don't believe it. It's a case of mistaken popular belief winning out over fact. According to public opinion research, there is a perception that "antibiotics cure everything."

Americans believe in the power of antibiotics so much that many patients go to the doctor expecting to get a prescription. And they do. Why? Physicians often are too pressured for time to engage in lengthy explanations of why antibiotics won't work. And, when the diagnosis is uncertain — as many symptoms for viral and bacterial infections are similar — doctors are more likely to yield to patient demands for antibiotics.

Risk of antibiotic-resistance

The problem is, taking antibiotics when they are not needed can do more harm than good. Widespread inappropriate use of antibiotics is fueling an increase in drug-resistant bacteria. And sick individuals aren't the only people who can suffer the consequences. Families and entire communities feel the impact when disease-causing germs become resistant to antibiotics.

The most obvious consequence of inappropriate antibiotic use is its effect on the sick patient. When antibiotics are incorrectly used to treat children or adults with viral infections, such as colds and flu, they aren't getting the best care for their condition. A course of antibiotics won't fight the virus, make the patient feel better, yield a quicker recovery or keep others from getting sick.

A less obvious consequence of antibiotic overuse is the boost it gives to



What to do for colds and flu


- Children and adults with viral infections recover when the illness has run its course. Colds caused by viruses may last for two weeks or longer.
- Measures that can help a person with a cold or flu feel better:
 - Increase fluid intake
 - Use a cool mist vaporizer or saline nasal spray to relieve congestion
 - Soothe throat with ice chips, sore throat spray or lozenges (for older children and adults)
- Viral infections may sometimes lead to bacterial infections. Patients should keep their doctor informed if their illness gets worse or lasts a long time.

drug-resistant disease-causing bacteria. Almost every type of bacteria has become stronger and less responsive to antibiotic treatment when it really is needed. These antibiotic-resistant bacteria can quickly spread to family members, school mates and co-workers — threatening the community with a new strain of infectious disease that is more difficult to cure and more expensive to treat.

According to the CDC, antibiotic resistance is one of the world's most pressing public health problems. Americans of all ages can lower this risk by talking to their doctors and using antibiotics appropriately during this cold and flu season.

www.cdc.gov/getsmart/community/materials-references/print-materials/index.html

Appendix H




GET SMART

Know When Antibiotics Work

Get Smart. Take a look at this chart to find out which upper respiratory infections are usually caused by viruses — germs that are not killed by antibiotics. Talk with your doctor about ways to feel better when you are sick. Ask what you should look for at home that might mean you are developing another infection for which antibiotics might be appropriate.

Illness	Usual Cause		Antibiotic Needed
	Virus	Bacteria	
Cold	<input checked="" type="checkbox"/>	<input type="checkbox"/>	No
Flu	<input checked="" type="checkbox"/>	<input type="checkbox"/>	No
Chest Cold (in otherwise healthy children and adults)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	No
Sore Throats (except strep)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	No
Bronchitis (in otherwise healthy children and adults)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	No
Runny Nose (with green or yellow mucus)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	No
Fluid in the Middle Ear (otitis media with effusion)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	No



www.cdc.gov/getsmart/community/materials-references/print-materials/index.html

Appendix I

Antibiotics Aren't Always the Answer



SIX SIMPLE AND SMART FACTS ABOUT ANTIBIOTIC USE

1. **Antibiotics are life-saving drugs**
Using antibiotics wisely is the best way to preserve their strength for future bacterial illnesses.
2. **Antibiotics only treat bacterial infections**
If your child has a viral infection like a cold, talk to a doctor or pharmacist about symptom relief. This may include over-the-counter medicine, a humidifier, or warm liquids.
3. **Some ear infections DO NOT require an antibiotic**
A doctor can determine what kind of ear infection your child has and if antibiotics will help. The doctor may follow expert guidelines to wait a couple of days before prescribing antibiotics since your child may get better without them.
4. **Most sore throats DO NOT require an antibiotic**
Only 1 in 5 children seen by a doctor for a sore throat has strep throat, which should be treated with an antibiotic. Your child's doctor can only confirm strep throat by running a test.
5. **Green colored mucus is NOT a sign that an antibiotic is needed**
As the body's immune system fights off an infection, mucus can change color. This is normal and does not mean your child needs an antibiotic.
6. **There are potential risks when taking any prescription drug**
Antibiotic use can cause complications, ranging from an upset stomach to a serious allergic reaction. Your child's doctor will weigh the risks and benefits before prescribing an antibiotic.

Get Smart symptom relief tips & tools for your child at:
www.cdc.gov/getsmart or call 1-800-CDC-INFO (232-4636)



National Center for Immunization and Respiratory Diseases
Division of Bacterial Diseases



www.cdc.gov/getsmart/community/materials-references/print-materials/index.html

Appendix J



Most cough and cold illnesses are caused by viruses. Antibiotic use can only cure bacterial illnesses—not viral illnesses.

Viruses cause common illnesses that antibiotics CANNOT treat like:

- Colds
- Influenza (the flu)
- Runny noses
- Most coughs
- Most bronchitis
- Most sore throats
- Most sinus infections
- Some ear infections

Viral illnesses, like colds, usually go away without treatment in a week or two. Even many bacterial ear infections go away by themselves. When an antibiotic is not prescribed, ask your child's doctor or pharmacist what can be used to relieve symptoms.

Taking antibiotics for viral illnesses:

- Will NOT cure your child's illness
- Will NOT help your child feel better
- Will NOT keep others from catching your child's illness

Bacteria cause illnesses like strep throat that are often treated successfully with antibiotics.

Remember—there are potential risks when taking any prescription drug. Antibiotics should only be used when your child's doctor determines they are needed.

Antibiotic use can:

- Kill good bacteria in your child's body, which may lead to complications, such as diarrhea or yeast infection.
- Cause a serious allergic reaction that may require hospitalization.
- Result in an antibiotic-resistant infection. Resistant bacteria are stronger and harder to kill. They can stay in your child's body and can cause severe illnesses that cannot be cured with antibiotics. A cure for a resistant infection may require stronger treatment—and possibly a hospital stay.

Talk with your child's doctor about the best way to care for your child during this illness.