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The Use of the Centers for Disease Control (CDC) Outpatient Antibiotic Stewardship Program to Reduce Unnecessary Antibiotic Prescriptions Written for Sinusitis in a Rural Urgent Care Clinic Setting

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The Use of the Centers for Disease Control (CDC) Outpatient Antibiotic Stewardship Program to Reduce Unnecessary Antibiotic Prescriptions Written for Sinusitis in a Rural Urgent Care Clinic Setting.

A DNP Project Submitted to the
Graduate Faculty of Jacksonville State University
in Partial Fulfillment of the
Requirements for the Degree of
Doctor of Nursing Practice

By

Melanie Maddox

Jacksonville, Alabama

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Abstract

Background: The discovery of antibiotics has been a significant success in fighting bacterial infections. According to the Centers for Disease Control (CDC), in 2018, inappropriate prescribing of antibiotics contributed to antibiotic-resistant conditions, which led to 2 million infections, and has killed about 23,000 Americans annually (Chaney, 2018; CDC, 2019). By 2050, 10 million people are expected to die globally due to bacterial resistance, with the cost potentially reaching \$100 trillion (WHO, 2019).

Purpose: The purpose of the DNP Project is to decrease unnecessary antibiotic prescriptions for the diagnosis of sinusitis in a rural urgent care clinic and increase provider awareness of the importance of appropriate antibiotic use.

Methods: A quality improvement project was performed by implementing a pre-and post-test to clinicians in a rural urgent care clinic. Post-testing followed a didactic PowerPoint presentation consisting of CDC guidelines for diagnosing and treating sinusitis.

Results: Statistical results identified the provider's use of the most appropriate antibiotics improved after completing the didactic requirements. Statistical data showed no decrease in the prescribing of antibiotics for the treatment of sinusitis. Statistical data supports the providers' knowledge in diagnosing bacterial versus viral sinusitis.

Conclusion: The project helped identify the importance of the appropriate distribution of antibiotics and the need to avoid inappropriate and unnecessary use when treating patients in the urgent care clinic setting.

Keywords: *antibiotic resistance, antibiotic stewardship, sinusitis, urgent care*

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I want to praise God for giving this author the wisdom to understand His calling and better serve Him and her fellow man through a nursing career.

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The Use of the Centers for Disease Control (CDC) Outpatient Antibiotic Stewardship Program to Reduce Unnecessary Antibiotic Prescriptions Written for Sinusitis in a Rural Urgent Care Clinic Setting

At thirty, Ms. Anne Miller of New Haven, Connecticut, was near death. Her infection had progressed, invading her bloodstream, resulting in sepsis. In a desperate attempt to save her, doctors administered an experimental drug called penicillin, discovered by Alexander Fleming 14 years earlier. In hours, Ms. Miller recovered and became the first person saved by using an antibiotic. Ms. Miller lived to be 90 years old due to the miracle cure of the antibiotic penicillin (Centers for Disease Control (CDC), 2019a). The discovery of antibiotics has been the basis for fighting bacterial infections since their discovery, but through overuse and abuse, antibiotic resistance has resulted. According to the CDC, inappropriate antibiotic prescribing contributes to antibiotic-resistant infections, leading to 2 million illnesses and 23,000 deaths in Americans annually (Chaney, 2018). By 2050, ten million people are expected to die globally due to bacterial resistance, with the cost potentially reaching \$100 trillion (WHO, 2019).

Background

For a Doctorate of Nurse Practice (DNP) Project, an antibiotic stewardship program was selected and implemented for Providers of a rural urgent care clinic. The DNP Project served as an educational tool for developing knowledge regarding appropriate diagnoses of bacterial versus viral sinusitis, with guidelines for the most effective recommended antibiotic treatment, if warranted. Statistical information was obtained from each provider's patient electronic health record (EHR) treated for sinusitis, including four weeks before and after the DNP Project was implemented.

Health Risks

The appropriate use of antibiotics saves lives, but patients can suffer minor to severe side effects, including death, when improperly used. When antibiotics are misused, the primary concern is the contribution to antibiotic resistance after identifying any adverse impact on the patient because resistance “is among the greatest public health threats today” (CDC, 2021, p.6). Globally, antibiotic resistance increases dangerously, resulting in increased costs of life and money (WHO, 2021; CDC, 2019b). The ability to treat common infections of today will be decreased or impossible with the rise of continued new resistances. Common curable or treatable infectious illnesses such as pneumonia, tuberculosis, sepsis, gonorrhea, and foodborne diseases are becoming more complex or untreatable as antibiotics continue to become less effective (WHO, 2021).

Antimicrobial resistance is occurring faster than the production of new antibiotics. In vast parts of the world, antibiotics can be purchased and utilized to treat humans and animals without a prescription or monitored usage. However, nonprescribed and prescribed use continues to contribute to the continued emergence and spread of antibiotic resistance (WHO, 2021). The use of antibiotic standards in the United States (US) and globally requires expeditious action to decrease and prevent a ‘post-antibiotic era,’ where minor injuries and common infections will have enough resistance to killing again.

Urgent Care Centers

Urgent care centers provide immediate medical services and are more frequently used for the necessity and convenience of the patient:

Urgent Care Medicine is the provision of immediate medical service offering outpatient care for the treatment of acute and chronic illness and injury. It requires a broad and comprehensive fund of knowledge to provide such care. Excellence in care for patients with complex and or unusual conditions is founded on the close communication and

collaboration between the urgent care medicine physician, the specialists, and the primary physicians. Urgent care does not replace your primary care physician. An urgent care center is a convenient option when someone's regular physician is on vacation or unable to offer a timely appointment. Or, when illness strikes outside of regular office hours, urgent care offers an alternative to waiting for hours in a hospital Emergency Room. (AAUCM, 2022, p.1)

Factors contributing to the popularity of urgent care clinics include long wait times for PCP appointments, demand for accessible care, and avoidance of emergency room (ER) crowds. Urgent care clinics operate, for the majority, on a walk-in basis during extended evening hours and on weekends (Yee et al., 2013). The American Academy of Urgent Care Medicine reported a 16% increase in urgent care centers in the United States between 2008 and 2016 (Smith & Ritsema, 2018). These centers have recently erupted from stand-alone establishments to large chains across the US. In the most recent study, 60% of antibiotics are prescribed in outpatient ambulatory care settings, with 40% of those prescribed by urgent care centers (Wells, 2018). Hyman reports that “urgent care centers exacerbate the issue of antibiotic resistance by writing unnecessary prescriptions in order to satisfy their patients” (2020, p. 1.).

The number one diagnosis for antibiotic prescription in the urgent care setting involves respiratory issues, one of which is sinusitis. The Journal of Urgent Care Medicine (JUCM) states that antibiotic drugs account for more than 1 to 5 adult patients (Seybold & Tse, 2022). One of the most important aspects of diagnosing sinusitis is determining if the cause is viral or bacterial. Recommendations from the IDSA and the American Academy of Otolaryngology-Head and Neck Surgery Foundation were integrated and used as guidelines to diagnose acute bacterial rhinosinusitis (ABRS) (Chow et al., 2012).

What is an antibiotic stewardship program?

Merriam-Webster defines stewardship as (a) the office, duties, and obligations of a steward and (b) conducting, supervising, or managing something (2022). Antibiotic stewardship is the function of medical clinicians to measure antibiotic prescription use within an organization to improve the provider's routine practices and course of treatment. The process ensures the appropriate prescribing of antibiotics and minimizes delayed or misdiagnosis resulting in the underuse of an antibiotic. Clinicians participating in a stewardship program are aware of their current prescription practices. Their participation enables them to review and modify treatment methods based on evidence-based practices (CDC, 2021).

Benefits of Antibiotic Stewardship Programs

According to the CDC, antibiotic stewardship programs improve patient healthcare outcomes and decrease the risk of harm from excess use (2021). By practicing antibiotic stewardship, clinicians enhance the treatment of infected patients, protect them from unnecessary damage, and reduce antibiotic resistance (CDC, 2021).

Needs Analysis

The CDC (2019a), WHO (2022), and the Infectious Disease Society of America (IDSA) (2022) emphasize antibiotic resistance as a public health crisis and global threat. They also identify the unnecessary use of antibiotics for humans and animals as a primary facilitator in the precipitous progression of antimicrobial resistance. The urgent care sector has been identified as a primary proliferative source contributing to antibiotic misuse and promoting antibiotic resistance (Wells, 2018). Wells states that due to an "astronomical" growth rate, "representing a \$15 billion industry with more than 10,000 high-volume clinics nationwide," urgent care centers promote frequent visits due to lowered barriers for routinely scheduled office visits (2018, p. 1).

Studies show that same-day access, proximity, and lower out-of-pocket costs are major contributory factors that appeal to consumers bringing them into the urgent care sector (Wells, 2018). Due to ease of use, a reduction of restrictive barriers affords consumers increased access to medical treatment and prompts frequent medical visits for conditions that naturally resolve with rest and symptom management at home (Wells, 2018). “Antibiotic prescriptions were 2 to 3 times higher at urgent care centers than at other outpatient sites” (Wells, 2018, p.1).”

Retail Medicine and Customer Satisfaction

Many consumers expect to receive a medicine prescription, especially antibiotics, when treated in an urgent care center. Customer satisfaction is a primary reason for unnecessarily prescribing antibiotics in urgent care clinics (Fletcher-Lartey et al., 2016). As with any business, customer satisfaction is crucial to a successful establishment. Additionally, clinicians must meet and eliminate public perception through educational information regarding the appropriate use and harm caused by antibiotic misuse. To shift public perception of a ‘quick fix,’ patients need access to high-quality, patient-g geared information regarding disease processes and proper treatment practices to understand the best treatment practices (Wells, 2018).

Problem Statement

The problem statement is, does the implementation of the CDC antibiotic stewardship program compared to no antibiotic stewardship program reduce the number of unnecessary prescriptions written for sinusitis within eight weeks among rural urgent care clinicians?

Aims and Objectives

1. Decrease unnecessary antibiotics to diagnose sinusitis in the urgent care setting.
 - a. Improve appropriate diagnosis of acute bacterial sinusitis.
 - b. Improve evidence-based treatment for acute bacterial sinusitis.

2. Decrease the contribution of antimicrobial resistance by reducing unnecessary antibiotic prescriptions.
3. Increase patient awareness of antibiotic misuse.
 - a. Improve patient knowledge by providing clinician-based education about the appropriate use of antibiotics.
 - b. Improve patient knowledge by providing education regarding harm caused by unnecessary antibiotic use.

Review of Literature

Academic journal databases available through the Houston Cole Library at Jacksonville State University utilized master and meshed headings to identify relevant data regarding antibiotic stewardship. Using master and meshed headings, the following key terms were used: antibiotic stewardship, antimicrobial resistance, antibiotic stewardship, and outpatient, with 448 potential sources found through different term combinations. Results were narrowed using sinusitis, academic journal, and publication history limitations of the last ten years, reducing potential sources to eight findings. Additional articles were eliminated if they were unavailable in full text or online. The CDC was the primary resource for project materials for the DNP Project and was supplemented with leading health organizations' findings and academic journal materials.

A rapid and global spread of multi- and pan-resistant microbes (bacteria, also called superbugs) resulted in the WHO's proclamation of a global crisis (WHO, 2021). These pathogens have developed mechanisms resistant to existing antimicrobial medicines such as antibiotics. With the formation of antimicrobial resistance, common infections are becoming increasingly difficult to cure or treat with the existing antibiotics available (WHO, 2021).

Moreover, antimicrobial pathogens are reproducing faster than the clinical pipeline of new antimicrobials can be produced. Therefore, in 2019, the WHO organized a list of priority pathogens and divided them into three categories to assist and guide antibiotic development (WHO, 2021).

The WHO Priority Pathogen list directs the research and development (R&D) focus on the most critical pathogens (WHO, 2017). In the ‘pipeline,’ R&D currently has 60 products (50 antibiotics and ten biologics) in development. “Of the 50 antibiotics in the pipeline, 32 target the WHO’s list of priority pathogens, but the majority have only limited benefits when compared to existing antibiotics. Two of these are active against the multi-drug resistant Gram-negative bacteria, which are spreading rapidly and require urgent solutions” (WHO, 2020, p.1). In 2020, 252 pre-clinical antibiotic agents were in development. In 10 years, the WHO is optimistic that two to five pre-clinical antibiotic candidates will be available for patient treatment (2020). The antibiotic development process (especially at its current production rate) cannot meet or treat at the same rate as antibiotic resistance. The need for antibiotic stewardship is essential in combating the current global crisis of antibiotic resistance (CDC, 2021).

National economies and their health care systems suffer overwhelming financial deficits and difficulties regarding more significant expenses for extended hospitalization and intensive care requirements. Therefore, the need for practical tools to treat, prevent, and improve access to antimicrobials is essential to populations worldwide (WHO, 2021). In the US, the CDC estimated that approximately 47 million unnecessary antibiotic prescriptions occurred in the outpatient care setting (discharge from ER, primary care physicians/clinics, and urgent care clinics) (2019). In addition, the CDC (2021), WHO (2022), and IDSA (2022) identify outpatient

care clinics as a significant contributor to the development of antimicrobial resistance and the need for antibiotic stewardship programs to address this issue.

A quantitative study using the 2010-2011 National Ambulatory Medical Care Survey and National Hospital Ambulatory Medical Care Survey confirmed sinusitis is one of the top diagnoses associated with antibiotic use in the urgent care setting. Acute upper respiratory illnesses (URI) include rhinosinusitis or sinusitis (two terms interchangeably used). In addition, sinusitis is one of the top 3 diagnoses associated with antibiotic use, according to statistical data calculated for outpatient visits with oral antibiotic prescriptions using identifiers of age, region, and diagnosis in the US (Fleming-Dutra et al., 2016).

The findings of a two-year survey were combined for analysis to increase the sample size by age and diagnosis calculated with 95% confidence intervals. "For sinusitis, the estimated appropriate antibiotic prescription rates per 1000 participants by age group were as follows: 59 (95% CI, 32-86) for 0 through 19 years, 27 (95% CI, 17-36) for 20 through 64 years, and 37 (95% CI, 16-59) for 65 years and older" (Fleming-Dutra et al., 2016, p. 1).

Sinusitis is a common URI that may or may not require antibiotics (Fleming-Dutra et al., 2016). Seybold and Tse noted the difficulty differentiating between acute bacterial sinusitis and viral sinusitis as "clinically challenging" (2022, p. 1). Therefore, Seybold and Tse utilized the IDSA and American Academy of Otolaryngology-Head and Neck Surgery (AAO-HNS) guidelines for diagnosis and treatment (2022). In addition, the study was implemented in 14 Legacy Go Health Urgent Care clinics in Portland, Oregon, in a metropolitan region where antibiotic misuse had been identified (Seybold & Tse, 2022).

A Plan-Do-Study-Act model was implemented for a change using 60 participants, including physicians, nurse practitioners, and physician assistants. Each clinic was managed by

the same leadership and used the same electronic health record (EHR) and protocols. The clinics provided approximately 13,000 patient encounters each month, with over 600 patients treated for acute sinusitis during the peak seasons. The inclusion criteria were 18 years or older and diagnosed with acute sinusitis using the *International Classification of Diseases, 10th edition* (ICD-10) codes for acute sinusitis. Additionally, the plan included an educational session to include current sinusitis guidelines and a Clinical Decision Support Tool (CDST). Pre- and post-intervention data were collected via EHR of each provider's patients one month before and post-educational intervention with a random sample selected.

In conclusion, the participants did not regard the education guidelines and CDST as a significant determining factor in treating acute sinusitis. In high-volume urgent care settings, clinicians provide services rapidly to quickly treat large volumes of patients. Additionally, much emphasis is placed on patient satisfaction scores and reviews to incentivize clinicians to prescribe according to patient satisfaction rather than evidence-based practices (Seybold & Tse, 2022).

Antibiotic stewardship implementation is regarded and accepted as an essential tool to decrease antibiotic resistance in outpatient settings. However, the clinicians' attitudes and views are necessary for success. A qualitative study by Zetts et al. (2020) examined the effects of clinicians' perception and attitude to antibiotic stewardship in the outpatient setting and its effectiveness. The study consisted of eight focus groups with a primary care provider (PCP) utilizing an independent moderator with a moderator guide. The process involved an audio recording of the participants and was transcribed and coded before using a deductive and inductive content analysis method for primary theme identification. A total of 52 participated in the study, 26 family/internal medicine and 26 pediatric medicine physicians (Zetts et al., 2020).

The PCPs acknowledged antibiotic resistance as an essential health issue but second to other pressing problems such as obesity, opioids, cardiac disease, and diabetes. The PCPs recognized inappropriate and unnecessary prescribing of antibiotics in the outpatient setting. They attributed the cause to patients' demands in non-primary care settings (urgent and retail clinics). The PCPs agreed to the need for antibiotic stewardship efforts but were skeptical regarding the metrics used to evaluate and obtain quality measurements. The study validates the need to consider the attitudes and beliefs of clinicians regarding the implementation of antibiotic stewardship.

A qualitative antibiotic stewardship study utilized an analytical framework for a quality improvement project in a hospital-based urgent care center with 11 nurse practitioners and physician assistants rotating through as a single provider per 10-hour shift. The stewardship consisted of four biweekly team meetings, a shared decision aid (SDA), a 5 Ds tool (proper diagnosis, drug, dose, dosage route, duration), and a case management log (Forrest & Verzone, 2021). The study entailed 90 days with a team approach, daily data collection, and continually updated charts to monitor efficacy. The median average of patients per day of all ages in an urban area was 40, with a 16% poverty level. The Plan-Do-Study-Act project improved appropriate antibiotic prescribing from 20% to 95% in the urgent care setting. Proper diagnosis, watchful waiting, and delayed filling of antibiotic prescriptions were also improved. The study resonates with how antibiotic stewardship can be implemented in the urgent care setting and successfully decrease unnecessary antibiotic use (Forrest & Verzone, 2021).

Theoretical Model

The theoretical framework utilized to guide this project is the Knowledge to Action Framework (KTAF) (Graham et al., 2006). Ian D. Graham and colleagues developed the KTA Framework in Canada to address the confusing multiplicity of terms describing the movement

and implementation of knowledge into action (Field et al., 2014). The KTAF allows the identification of knowledge gaps during the research stage, the knowledge synthesis process, and the development of guidelines using evidence-grading systems. The challenges for health professionals across the globe share the issues of “translating the best available evidence into actual health interventions in a timely way to provide the most effective care and service (Field et al., 2014).” The Knowledge to Action Framework is intended to help translate knowledge into sustainable, evidence-based interventions. Knowledge translation has been defined as a process ‘that includes synthesis, dissemination, exchange, and ethically sound application of knowledge to improve...health... provide more effective health services and products and strengthen the health care system (Fields et al., 2014).’ The KTAF theory allows real-world, research-based knowledge to be contextualized since introducing evidence-based knowledge may require tailoring to overcome specific barriers (Fields et al., 2014). In addition to implementing existing and new solutions, learning and developing new knowledge requires a unique cyclical process. In this context, the process is a continual build of corrective actions to improve and close the gap in clinical practices affording successful implementation of evidence-based practices in the clinical setting (Fields et al., 2014).

The use of antibiotic stewardship in this DNP Project is to elicit evidence-based practices in a rural urgent care clinical setting to improve antibiotic use in the diagnosis of sinusitis. A preparational assessment was utilized to identify potential barriers and define promotional strengths. Using the KTAF, continual monitoring and documentation of the data will be recorded to ensure the appropriate data measurement for statistical information validation. The project will successfully implement antibiotic stewardship, contributing to programs in other urgent care

clinical settings. The outcome evaluation of the aims and objectives of this project will be discussed in another section.

Methodology

The methods utilized for this project included observation, educational survey, focused educational presentations, primary and secondary data analysis, and quantitative data extraction for electronic health record chart review within a rural urgent care clinic. The implementation of this project was focused on improving the awareness of the inefficient use of antibiotics in the acute care setting.

Setting

The urgent care clinic is located in the town of Cartersville, in the county seat of Bartow County, Georgia, United States. Cartersville has a population of approximately 108,000 and is located about 45 miles north of Atlanta and 65 miles south of Chattanooga, Tennessee, along Interstate 75 and is comprised of roughly 470 square acres in Bartow County (Bartow County, 2018). Cartersville is found at the foothills of the Appalachian Mountains and provides balanced growth through a strong tax base, economic opportunities, and a competitive job market (Bartow County, 2018). In Bartow County, Georgia, manufacturing is the most profitable and significant sector, followed by retail, then accommodation and food services. The largest concentrated areas for employment are manufacturing, utilities, transportation, and warehousing. The largest contributor to Bartow County, Georgia's gross domestic product is manufacturing, with over \$4.48 billion in goods and services produced, followed by retail. The urgent care clinic is located on the west side of Cartersville. It averages 70 to 100 patients per weekday and 20 to 30 on weekend days per EHR records and the regional clinical manager M. Harrell (personal communication, January 31, 2022). Treatment is provided from two years old and up. The clinic

is staffed with two providers Monday to Friday (the highest patient volume day) and one provider on Saturday and Sunday.

Population

The population of interest was the clinicians in a rural urgent care clinic; clinicians consisting of permanent, part-time, or per diem, and working 7 to 12-hour day shifts were included. The employee roster for this clinic consisted of nine clinicians (three medical doctors (MD), three physician's assistants (PA), and three nurse practitioners (NP)). Two clinicians were not included making the sample size a total of seven clinicians. One clinician is the principal project investigator (PPI), and the other did not work at the clinic after implementing the DNP project.

Inclusion/Exclusion Criteria of Participants

Inclusion Criteria:

- All employed clinicians of the designated urgent care clinic.
- Employment status: full-time, part-time, per diem at the designated urgent care clinic.
- Provided treatment of patients 18 years old and older for sinusitis.
- Patients have a diagnosis of sinusitis.

Exclusion criteria:

- Administrative Clinicians
- Executive Clinicians
- Any clinician that does not meet the inclusion criteria.
- Clinicians who did not work in the clinic during the DNP project from January 4, 2022, to March 26, 2022.

Recruitment

The clinic clinicians were approached to participate, via email and in person, in the DNP project for the appropriate use of antibiotics according to the CDC's Core Elements of Outpatient Antibiotic Stewardship. The prospective clinicians were given a brief overview of the requirements for participation. The requirements included written consent, an educational PowerPoint presentation with a pre-and post-test, and the collection of statistical data of the clinician's EHR records 4-weeks before the academic presentation and 4-weeks after the presentation.

Consent

The DNP project used the clinician staffing of a rural urgent care center in northwest Georgia. Approval by the Institutional Review Board (IRB) for Jacksonville State University (JSU) was gained before recruiting clinicians (see Appendix A). Clinicians were aware clinical management had no impact or participation in this project, and the DNP student oversaw the project. With the agreement of their involvement, clinicians were requested to sign a consent form outlining the details of the project, substantiating no compensation or disciplinary actions due to their participation, ability to withdraw at any time without retribution, and an understanding of participant confidentiality (see Appendix B).

Design

A PowerPoint presentation (see Appendix C) was emailed to each participant to distribute didactic material. Clinical staff utilized and preferred email communications due to the ongoing COVID-19 pandemic and time limitations of the clinicians. Upon receiving consent, clinicians were asked to complete a 10-question examination. The PPI constructed the questions obtained from the CDC website. Questions 1-5 were directly acquired from the CDC website

(CDC: Quiz Questions and Answers, 2020), and questions 6-10 were formed using additional information from the CDC website regarding the diagnosis and treatment of sinusitis.

(CDC: Antibiotic Use Questions and Answers, CDC (see Appendix D): Antibiotic Use and Sinusitis, CDC (see Appendix E): Adult Outpatient Treatment Recommendations (see Appendix F). Once the pre-test was completed, an educational PowerPoint presentation (see Appendix C) was provided, and a post-test. The pre-and post-tests assessed clinician knowledge present before or gained after the presentation.

Chart Review

The PPI collected data from the clinic's EHR by examining the prescribing of antibiotics from each clinician and studying four weeks before and four weeks after completion of the intervention by receiving the post-test. Charts used for statistical data included those patients older than 18 with a primary diagnosis of sinusitis. They were within the date range of 28 days before and 28 days after the clinician completed the didactic training with a completed post-test. Patient charts were deemed qualifiable by examining diagnosis codes entered by the clinicians. Medical record numbers were the only identifiable patient information used in collecting the data. All identifiable patient information and clinician information were de-identified. Non-identifiable information was used for computing the statistical analysis: a post-review one week after discharge was performed to review any change in documentation. The study took place over 12 weeks. The electronic health record system used by the urgent care clinic is E-Clinical Works, the only system used in this project. The PPI and the committee chairperson were the foremost researchers retrieving the data.

Risks and Benefits

Confidentiality was the minimal actual or potential risk for participating clinicians in this project. Confidentiality of the clinicians, quiz answers, and survey responses was moderated through the security design of the survey through de-identifying data by the PPI. The clinicians were given assurance that participation would not alter their job status. The benefits for the clinicians included increased awareness of antimicrobial resistance through the misuse of antibiotics, side and adverse effects to patients taking antibiotics, and how to diagnose and treat sinusitis in the outpatient care setting.

All clinicians were equitable, and the principle of justice was maintained regardless of age, sex, religion, or race. The project adhered to the ethical principles and standards, including the moral obligation to “(a) benefit the patient, (b) avoid or minimize harm, and (c) respect the values and preferences of the patient (Varkey, 2020).” Participants’ autonomy was respected, and clinicians were free to leave the project without any consequence or retribution. This project aimed to increase the clinician’s knowledge of their contribution when antibiotics are misused, causing antibiotic resistance and harm to their patients. The project also identified the use and benefits of antibiotic stewardship to assist them in being better clinicians by providing evidence-based practices in the outpatient setting.

Compensation

No compensation was offered to the participating clinicians. The clinicians received only educational information.

Timeline

The DNP project's prerequisite was finding and obtaining approval in an area with a gap in practice for the utilization of evidence-based approaches to improve the quality of care. After

identifying the setting and gap in practice, site approval was obtained. The JSU Proposal Evaluation and Review Committee (PERC) form was submitted and approved. After receiving an approval letter (see Appendix B) from the JSU Institutional Review Board (IRB), the DNP Project was implemented. Providers of the rural urgent care clinic were approached and presented with information regarding participation in antibiotic stewardship in treating sinusitis. Consent was obtained, and a pre-test was given to each participant for completion and returned to the PPI. The educational PowerPoint presentation was emailed with a post-test when the pre-test was received. Once the post-test was received, the EHR was accessed, and data were obtained for eight weeks, including four weeks before and four weeks after the post-test. The project timeline by calendar dates began on January 4, 2022, and ended on March 26, 2022. After completing data collection, information was analyzed and compiled for the presentation. No ethical issues were identified by project participants, who were all providers in the rural urgent care clinic.

Budget and Resources

The limited financial cost of \$200.00 was anticipated for the DNP project and was maintained upon completion. Subject material was retrieved from the CDC website for testing and education at no cost. Additional scholarly resources were obtained from the JSU Library online. Printing costs for consent forms per provider were \$5.00. The printing cost of patient educational materials was \$60.00. Time with each participant averaged 30 minutes and consisted of in-person or electronic communication. Providers were allowed to participate at times most convenient for them without interruption of patient care or time off.

Evaluation Plan

Statistic Considerations

Descriptive statistics (frequencies, percentages) were used to describe the characteristics of the study population, to identify test scores for pre-and post-testing, for antibiotic use appropriateness for sinusitis by a clinician, and to identify use appropriateness for the diagnosis of sinusitis (CDC, 2021). The comparison tool utilized for data collected from the EHR for each participant was a paired t-test. After the second review of statistical data, the information was completed to account for any documentation changes. A paired t-test (Complete Dissertation, 2022; Meta-calculator, 2022) was used to compare the ordinal data obtained using pre-and post-educational results per clinicians. An online paired t-test statistical calculator was utilized to complete the statistical data analysis (Math Cracker, 2022).

Data Maintenance and Security

Identifiable information for participants and patients was used during data collection. After collection, all identifiable information was removed to comply with the Healthcare Insurance Portability and Accountability Act of 1996 (HIPAA) regulations. Data collected was stored and secured on a password-protected data drive, and access was limited, mediated, and accessed only by the PPI. No increased risk of patient harm occurred during this project compared to routine medical risks. The DNP student and the participating providers followed professional medical practice behaviors.

Results

Results of Chart Review

This project aimed to identify and address the gap in evidence-based practices in a rural urgent care clinic to diagnose and treat sinusitis. Implementing antibiotic stewardship was the

primary initiative to identify and educate clinicians regarding the appropriate diagnosis and treatment of sinusitis in the outpatient care setting while improving patient health outcomes. Concurrently, antibiotic stewardship decreases the contributions to antimicrobial resistance caused by the overuse of antibiotics. Quantitative data was obtained and measured to identify the project's effects in the efforts to meet these goals.

After further analysis, there were no significant findings to conclude an increase or decrease in the use of antibiotics to treat sinusitis. The pre-and post-educational quiz scores remained the same, with all clinicians scoring 100% on both tests. This data validates the clinicians' understanding of antibiotics in sinusitis treatment before antibiotic stewardship. Of the clinicians', 57% were female, and 43% were male (see Table 1). Participant demographics showed that 4.3% were full-time employees (FT), 2.4% were part-time employees (PT), and 2% were as-needed (PRN) staff (see Table 2); 28.5% were medical doctors (MD), 28.5% were physician's assistants (PA), and 42% were nurse practitioners (NP) (see Table 3).

There was no statistical significance pertaining to the reduction of the number of antibiotics prescribed. The evidence corroborated the clinicians' knowledge of the appropriate diagnosis and treatment according to the IDSA guidelines for ABRS diagnosis regarding patients receiving antibiotic therapy. (Chow et al., 2012).

The use of antibiotic therapy before the implementation of antibiotic stewardship resulted in 77% of patients receiving antibiotic treatment and 23% without antibiotic treatment. After antibiotic stewardship, 79% received antibiotics, and 21% were without antibiotic treatment (see Tables 4 and 5.).

Before the implementation of the DNP Project, when identifying patient acuity according to the IDSA guidelines for the diagnosis of ABRS, 26% did not meet any criteria, 28% met

category one criteria, 23% met category two criteria, and 23% met category three criteria (Chow et al., 2012). In the post-antibiotic stewardship, 26% did not meet any criteria, 23% met category one or (a) criteria, 33% met category two or (b) criteria, and 18% met category three or (c) criteria (see Table 6). There was no significant difference in the pre-and post-stewardship results in identifying greater acuity. In both, 26% of the patients did not meet the criteria, and 74% did meet the criteria. Those not meeting criteria did not receive antibiotic treatment and were advised to use conservative treatment with over-the-counter medications. Each provider provided adequate documentation to support their diagnosis of ABRS criteria pre-and post-stewardship classification.

Educational information regarding bacterial versus viral sinusitis was prominently distributed, discussed with the patient, placed at eye level in each patient assessment area, and documented in the patient charts. The type of antibiotic used in sinusitis treatment is crucially important, especially considering contributions to antibiotic resistance. UpToDate, an online resource center for clinicians, adheres to the sinusitis treatment guidelines issued by the AAO-HNS and IDA, recommending either amoxicillin or amoxicillin-clavulanate (Augmentin) for initial empiric treatment (Patel & Hwang, 2022). In the review of the antibiotics prescribed for sinusitis, Amoxicillin was administered 25% of the time before antibiotic stewardship and 31% after (see Table 7). An increase in the use of Augmentin was noted from 15% to 31%. Doxycycline or other Fluoroquinolones is recommended in those individuals with Penicillin allergies, in which there was no change. The AAO-HNS and IDSA recommended either doxycycline or a respiratory fluoroquinolone such as levofloxacin in penicillin-allergic patients. The Food and Drug Administration subsequently recommended against using fluoroquinolones for ABRS unless no alternatives exist. Fluoroquinolones are not recommended for use due to

increased adverse effects of tendinitis, tendon rupture, and peripheral neuropathy. (Patel & Hwang, 2018). Macrolides and trimethoprim-sulfamethoxazole are not recommended due to high rates of *S. pneumoniae* resistance (and for trimethoprim-sulfamethoxazole, also *H. influenzae* resistance) (Patel & Hwang, 2022).

Discussion

The findings from this DNP Project align with the findings of multiple issues of existing literature identifying the need for antibiotic stewardship in the outpatient care settings. Although urgent care centers do not replace primary care clinics, they are utilized in a manner of ‘retail medicine’ by the public. Urgent care clinics are growing in record numbers to serve public needs and the desire for convenience. Patients utilize urgent care clinics to avoid waiting weeks to see their primary care physicians for treatment. Urgent cares provide accessibility to healthcare professionals due to extended hours of operation that are longer than primary provider office hours, including weekends and holidays. Urgent care centers practice a customer-first approach with decreased wait times through walk-in and online sign-in convenience to expedite their visit. These factors contribute to the increased numbers of patients receiving treatment via urgent care clinics.

The surge of patients in urgent care clinics results in higher profits, which rely on customer satisfaction for return business. Urgent care clinics focus on the patient’s experience using satisfaction ratings via online surveys and smartphone applications, primarily immediately after discharge. Public perception of adequate medical treatment includes the ideation of obtaining some form of medication, especially antibiotics, for the treatment of sinusitis. Patients want to take medication to ‘feel better now’ and want a ‘quick fix’ so their work and daily activities are not affected by illness. Public perception of obtaining antibiotics for viral or

bacterial illnesses is a driving force in the urgent care industry. Satisfied customers are return customers resulting in higher revenue.

Implications

Implications of Clinical Practice in the Outpatient Setting

Statistically, antibiotics prescribed increased after the implementation of antibiotic stewardship. When comparing an accurate diagnosis of sinusitis according to diagnostic criteria, the percentage of appropriate treatment increased (see Table 6). In evaluating these findings, the goals were met by determining the validity of sinusitis diagnosis with the most appropriate treatment. The DNP project increased the clinicians' awareness of the importance of antibiotic stewardship, their contributions to antibiotic resistance, and the importance of evidence-based practices. Additional extensive studies are needed to validate the importance of antibiotic stewardship to be effective in the global fight against antimicrobial resistance. This DNP project concludes that antibiotic stewardship can positively affect outpatient clinicians and optimize patient healthcare outcomes in ambulatory settings.

Implications of Healthcare Policy in the Outpatient Setting

Profit is the focus in the outpatient care settings, otherwise referred to as 'retail medicine' (JUCM, 2022) Clinical policies for the outpatient setting are guided by payment sources such as insurance companies and the Center for Medicaid and Medicare Services (CMS). For reimbursement, urgent care centers receive a percentage rate higher than in the primary care setting, and these institutions regulate reimbursement according to the services provided (JUCM, 2022). Unlike the primary care setting, the key to success in the outpatient or urgent care setting is the capability to treat the presentation of non-emergency issues to the patient's satisfaction. Antibiotic stewardship affords the clinician with educational tools for patient education and

understanding of the treatment of bacterial versus viral infections. When the patient better understands the appropriate use of antibiotics for treatment, the clinician can successfully improve their healthcare outcomes. Satisfied customers with successful treatment are return customers, which equals higher profit.

Implications for Safety and Quality

The patient is the central focus in providing safe, high-quality care in inpatient or outpatient settings in the healthcare industry. This DNP project improved the quality and consistency of antibiotic stewardship in diagnosing and treating sinusitis. The clinical administrator noted the successful effectiveness for the clinicians and patients. At least three other urgent care clinics managed by this company are discussing antibiotic stewardship implementation.

Limitations

There were several limitations to this DNP project, the most prominent being the small scale. The study would better benefit from a more extended period to validate antibiotic stewardship effectiveness. One small rural urgent care clinic, with a limited eight-week time frame, will not give an adequate and accurate measurement of antibiotic stewardship. Multiple areas with small and more significant larger clinics are needed to obtain validation of antibiotic stewardship effectiveness.

Additional limitations include a more in-depth look at how clinicians continue to diagnose patients with sinusitis and their prescribed treatment regimens. Some clinicians will prescribe antibiotics and tell the patients not to get them unless specific criteria occur or if there is no improvement by a particular date. Further examination is needed to review when and how the patients have been prescribed the antibiotics and to assess if patients wait to see if conditions

improve before taking the antibiotics. Other questions are whether the patients are purchasing the medication and storing it for other uses later or if the medication is taken regardless of dosage direction to wait and see.

Dissemination

The dissemination of the project included the use of electronic communication via email and text messaging, posters, and an electronic PowerPoint presentation. Links to the CDC website regarding antibiotic stewardship, antimicrobial resistance, and diagnosis and treatment of sinusitis were provided. A narrated PowerPoint or Poster presentation will be made at the JSU Annual DNP Dissemination Day on Friday, July 15, 2022. This DNP project will be archived in the JSU Digital Commons repository for viewing by researchers, educators, and students.

Sustainability

While writing this manuscript, antibiotic stewardship in the rural urgent care clinic is still in place. Poster materials regarding bacterial and viral infection remain in each patient assessment room of the clinic. Antibiotic stewardship can only be effective when used by clinicians, and in this rural urgent care clinic, the clinician turnover rate is high. The struggle to provide quality care versus quantity is an issue in urgent care clinical settings. In combination with the expectation of volume for monetary gain, antibiotic stewardship can easily be null and void in new staff clinicians' efforts, not knowing the importance of antibiotic stewardship.

Plans for Future Scholarship

The findings in this study provide evidence and supporting data to indicate further needs for antibiotic stewardship, especially in the outpatient urgent care setting. Additional research is needed to identify other diagnoses where antibiotics are misused or overused. Further research identifying methods of antibiotic stewardship and their effectiveness is necessary to ensure the

ongoing pursuit of success. Validation of evidence practices (with or without success) and the methods of implementation, management, and measurement are crucial for the advancement of antibiotic stewardship in acute care settings. A mediator or designated individual must ensure ongoing antibiotic stewardship with implementation and techniques to promote success.

Future research can provide more in-depth data detailing the implementation and use of antibiotic stewardship over extended periods with continued educational provision to clinicians. Clinicians need reminding of the importance of awareness in using antibiotics to treat sinusitis, especially in the hectic pace of the urgent care setting. With ongoing antibiotic stewardship, the individual assigned for the implementation and management of the stewardship will review patient and clinician records to validate the use or need of antibiotics, if used, in each patient encounter.

Conclusion

Antibiotics have continued to save millions of lives since the discovery of penicillin. What will happen when they no longer work? Antibiotic stewardship is a principal tool that can be implemented in every clinical setting to provide the best health outcomes for the patient. Antibiotic stewardship can be successful when practicing clinicians are reminded of how they contribute to developing ongoing antibiotic resistance and the limited effect of new antibiotic medication. Through antibiotic stewardship, clinicians are made aware of their use, appropriateness, and the many conditions where antibiotics are unsuitable for treatment. The public's demands, ideations, and satisfaction to provide a 'quick cure' in using an antibiotic must be stopped. Education regarding validated uses of antibiotics must be as publicized as any popular content on all forms of social media. The issue of antimicrobial resistance is a global

crisis. It will only worsen unless prescribing clinicians implement proper measures to prevent contributing to this worldwide issue.

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<https://bmjopen.bmj.com/content/10/7/e034983.full>

Tables

Table 1

Clinicians Ratio: Male to Female

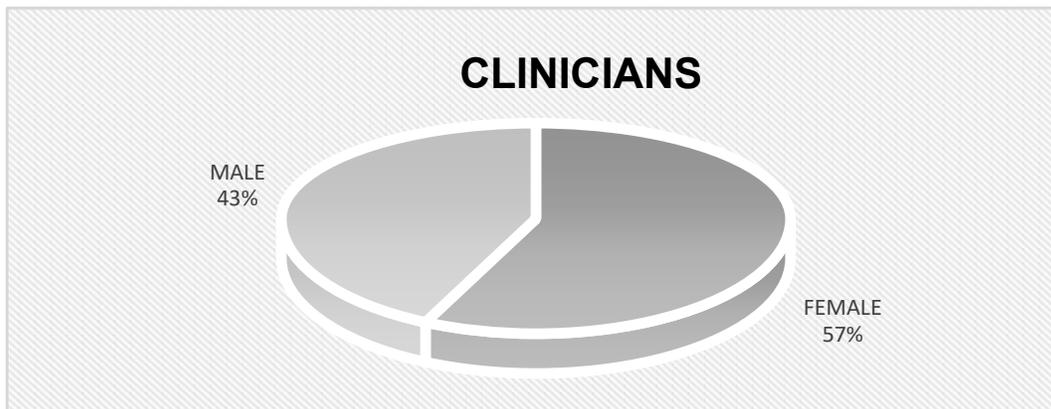


Table 2

Clinician Employment Status

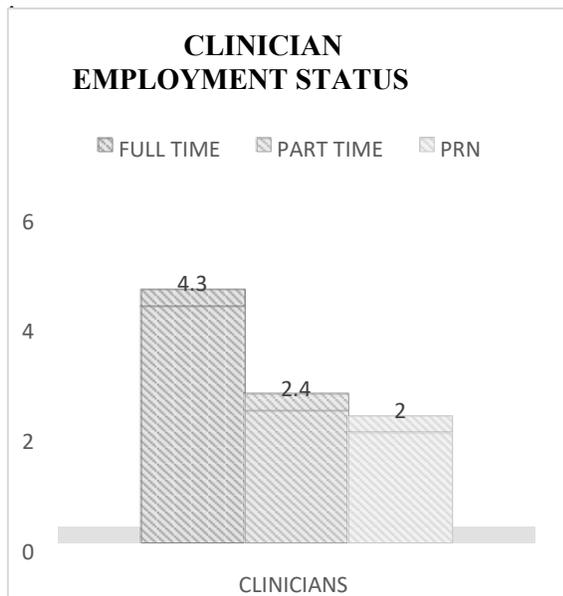


Table 3

Type of Clinician

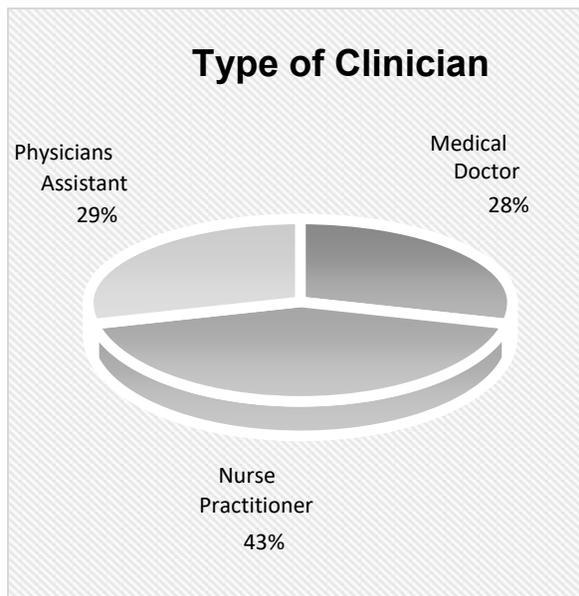
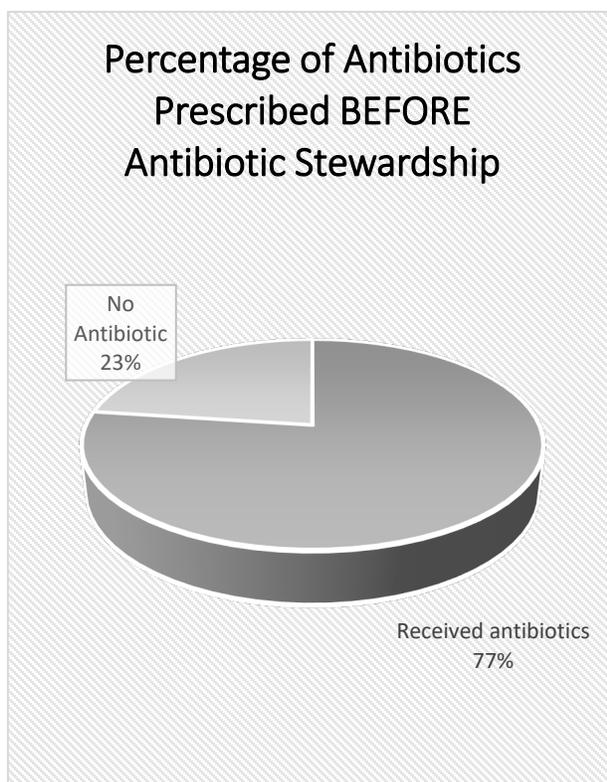
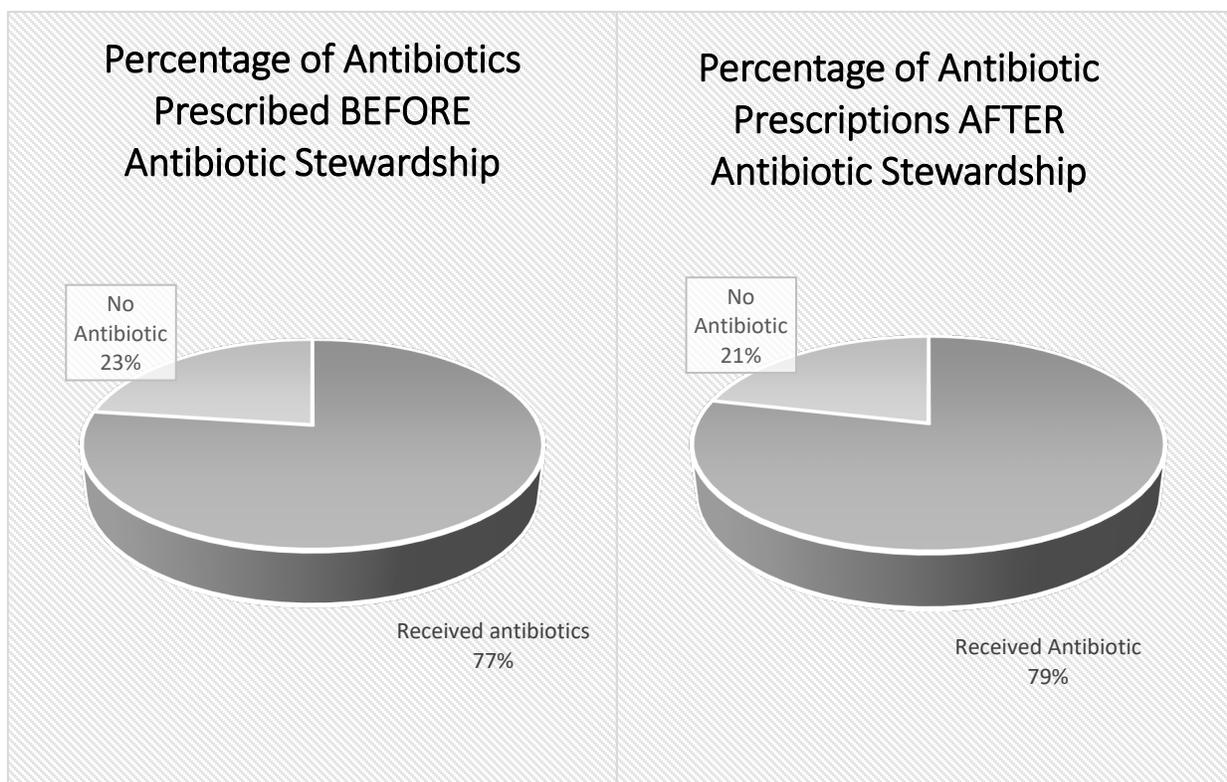


Table 4

Percentage of Antibiotics Prescribed Before Antibiotic Stewardship

**Table 5**

Percentage of Antibiotic Prescriptions After Antibiotic Stewardship

**Table 6**

Assessment of Patient Qualifying ARBS Diagnostic Category Criteria: Before and After Implementation of Antibiotic Stewardship

Assessment of Patient Qualifying ARBS Diagnostic Category Criteria: Before and After Implementation of Antibiotic Stewardship							
Does Not Meet Criteria		Criteria A Persistent and not improving ≥ 10 Days		Criteria B Severe $\geq 3-4$ Days		Criteria C Worsening or 'double sickening' $\geq 3-4$ days	
Before	After	Before	After	Before	After	Before	After
26 %	26%	28%	23%	23%	33%	23%	18%

Table 7***Percentage of Antibiotics Prescribed Before and After DNP Project Implementation***

Percentage of Antibiotics Prescribed BEFORE and AFTER DNP Project Implementation.		
Medication	Before	After
Amoxicillin	25%	31%
Augmentin	15%	31%
Doxycycline	2%	2%
Cephalosporin	18%	12%
Levaquin	20%	0%
Azithromycin	20%	24%

Appendix

Appendix A

IRB Approval Letter



Institutional Review Board for the Protection of Human Subjects in Research
203 Angle Hall
700 Pelham Road North
Jacksonville, AL 36265-1602

December 9, 2021

Melanie Maddox
Jacksonville State University
Jacksonville, AL 36265

Dear Melanie:

Your protocol for the project titled "The Use of the Centers for Disease Control (CDC) Outpatient Antibiotic Stewardship Program to Reduce Unnecessary Antibiotic Prescriptions Written for Sinusitis in a Rural Urgent Care Clinic Setting" 120920201-08 has been granted exemption by the JSU Institutional Review Board for the Protection of Human Subjects in Research (IRB). If your research deviates from that listed in the protocol, please notify me immediately. One year from the date of this approval letter, please send me a progress report of your research project.
Best wishes for a successful research project.

Sincerely,

A handwritten signature in black ink, appearing to read 'Lynn Garner', written over a horizontal line.

Lynn Garner
Associate Human Protections Administrator, Institutional Review Board

Appendix B

Consent Form for Participation in DNP Project

CONSENT FOR PARTICIPATION IN A DOCTORATE OF NURSE PRACTITIONER PROJECT

Project Title: The Use of the Centers for Disease Control (CDC) Outpatient Antibiotic Stewardship Program to Reduce Unnecessary Antibiotic Prescriptions Written for Sinusitis in a Rural Urgent Care Clinic Setting.

By: Melanie Maddox RN, MSN, CRNP, FNP-BC

Email Contact Information: maddoxm2004@gmail.com

You are being asked to participate in a Doctorate of Nursing Practitioner Project. Before giving your consent, read the following information and ask as many questions as necessary to ensure understanding regarding what is being asked of you.

Purpose of the Research: The discovery of antibiotics has been a major success in fighting bacterial infections. According to the CDC, inappropriate prescribing of antibiotics contributes to antibiotic-resistant infections, which led to 2 million illnesses and have killed about 23,000 Americans annually (Chaney, 2018). It is expected that 10 million people will die globally due to bacterial resistance, and the cost may reach \$100 trillion by 2050 (WHO, 2019)

An antibiotic stewardship program is not utilized in the current urgent care setting proposed for this Doctorate of Nursing Practitioner (DNP) project. The CDC defines antibiotic stewardship to measure and improve how clinicians prescribe antibiotics and how patients use them. The prescription and use of antibiotics are essential to protect patients from harm caused

by unnecessary antibiotic use, effectively treat infections, and combat antibiotic resistance (2021).

After discussing quality issues for the clinic with the clinical administrator and medical officer, this topic was identified as a priority due to no current program in place. The DNP project will serve as an educational tool for developing knowledge regarding the most effective and appropriate use of antibiotics for sinusitis prescribed by the providers. By utilizing the electronic health record (EHR) system, the current prescriptive activity of each provider will be evaluated to determine the effectiveness of an antibiotic stewardship program before and after completion. Quantitative data will be obtained and used for comparison to get statistical values.

Provider identity, as with patient identity and information, will not be publicized and protected and not used for any disciplinary means. This project aims to educate and ensure the use of evidence-based practices ONLY.

Procedures: If you agree to participate in this project, you will be asked to complete a multiple-choice test. After completing this test, you will be asked to view a PowerPoint regarding the diagnosis and treatment of sinusitis. Additionally, you will be provided with information regarding when and what type of antibiotics are most effective according to evidence-based practice. The PowerPoint presentation will be sent after receiving a completed copy of the initial exam. The viewing of this presentation will take approximately 60 minutes. After the presentation, a second multiple-choice questionnaire will be completed and returned. The estimated time for these procedures is approximately 2-hours total. Once the second examination is completed, the DNP student will collect statistical data from the E-Clinical Works program regarding antibiotics prescribed for a diagnosis of sinusitis only. The information collected will entail eight weeks, four before testing and four after testing.

Potential Risks or Discomforts: There are no foreseeable risks; however, participants may experience positive or negative feelings as they respond to questions or reflect on practices. The project will be via email due to the most recent outbreak of the Omicron COVID variant. There is no cost or monetary gains from participating in this project. You have the right to discontinue participation, temporarily or permanently, without any consequence.

Potential Benefits of Participation: As stated previously, there are no monetary gains. However, the participant may benefit from knowledge gained which can be utilized in their everyday professional practices by using evidenced-based practices for the care of sinusitis.

Confidentiality and Data Storage: Identifying information will be confidential and not shared. Participants will be assigned pseudonyms unrelated to name and type of provider, which will be utilized on all transcripts, notes, journals, and demographic datasheets. Demographic datasheets will be kept in a locked location, separate from the participating clinic. Your name will not be used in discussions with others regarding the project. Data will be stored in the Jacksonville State University DNP student's research office on a password-protected computer. Only the DNP student will have access to the information and it will be destroyed after completing the project. The written transcript and statistical information will be maintained indefinitely and possibly published.

Question, Participation, and Withdrawal: Your participation in this project is voluntary. As a participant, you may refuse at any time. To withdraw from the project, please get in touch with the DNP student, Melanie Maddox, by phone at 256-239-9337 or email at maddoxm2004@gmail.com.

Reasons for Exclusion from this Study: The exclusion criteria for this project are the inability to read English or lack of practice as a provider in the clinical setting.

By signing this document, I agree to participate in the DNP project by Melanie Maddox for the DNP program at Jacksonville State University.

Signature of Participant

Date

Participant Name (Please Print)

Date

Witness Obtaining Consent

Date

Appendix C

PowerPoint Didactic Presentation

The Use of the Centers for Disease Control (CDC) Outpatient Antibiotic Stewardship Program to Reduce Unnecessary Antibiotic Prescriptions Written for Sinusitis in a Rural Urgent Care Clinic Setting.

A DNP PROJECT SUBMITTED TO THE GRADUATE FACULTY
OF JACKSONVILLE STATE UNIVERSITY IN PARTIAL
FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF NURSING PRACTICE
BY

MELANIE MADDOX MSN, CRNP, FNP-BC



Antibiotic stewardship is defined as the effort to...

- measure antibiotic prescribing
- improve antibiotic prescribing by clinicians and use by patients so that antibiotics are only prescribed and used when needed
- minimize misdiagnoses or delayed diagnoses leading to underuse of antibiotics
- ensure that the right drug, dose, and duration are selected when an antibiotic is needed



Antibiotic resistance is among the greatest public health threats today, leading to an estimated 2 million infections and 23,000 deaths per year in the United States.



(Seybold & Tse, 2020)



At least 30% of outpatient antibiotic prescriptions in the United States are unnecessary.

Antibiotics are life-saving drugs that are critical to modern medicine, infections with pathogens resistant to first-line antibiotics can require treatment with alternative antibiotics that can be expensive and toxic.

(Seybold & Tse, 2020)

The most important **modifiable** risk factor for antibiotic resistance is **inappropriate prescribing of antibiotics.**

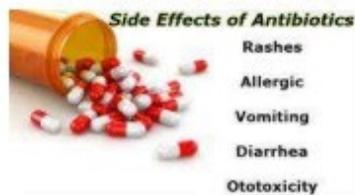
Approximately half of the outpatient antibiotic prescribing is inappropriate, including antibiotic selection, dosing, or duration, in addition to unnecessary antibiotic prescribing



Approximately 60% of U.S. antibiotic expenditures are related to care received in outpatient settings.

(Seybold & Tse, 2020)

The goal of antibiotic stewardship is to **maximize the benefit** of antibiotic treatment while **minimizing harm** both to individual persons and to communities.



(Seybold & Tse, 2020)

Examples of types of high-priority conditions for improving antibiotic prescribing include:

Conditions for which antibiotics are overprescribed, such as conditions for which antibiotics are not indicated (e.g., acute bronchitis, nonspecific upper respiratory infection, or viral pharyngitis).



Conditions for which antibiotics might be indicated but for which the wrong agent, dose, or duration often is selected, such as selecting an antibiotic that is not recommended (e.g., selecting azithromycin rather than amoxicillin or amoxicillin/clavulanate for acute uncomplicated bacterial sinusitis).

(Seybold & Tse, 2020)



Barriers that lead to deviation from best practices include :

- Clinician knowledge gaps of best practices and practice guidelines
- Perceived pressure to see patients quickly
- Perception of patient expectations for prescription of antibiotics
- Concern about decreased patient satisfaction when antibiotics are not prescribed.



(Seybold & Tse, 2020)

Current trends emphasize patient satisfaction creating incentives for providers to prescribe treatments that will meet patients' expectations, such as antibiotics, rather than evidence-based practices.



(Seybold & Tse, 2020)

Sinusitis

is a common upper respiratory illness with over 30 million adults in the U.S. diagnosed annually.

Sinusitis accounts for more than 1 in 5 antibiotic prescriptions for adults, making it the fifth most common diagnosis responsible for antibiotic use and resulting in \$5.8 billion in annual healthcare costs.



(Seybold & Tse, 2020)

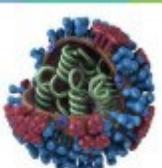
Differentiating between acute bacterial rhinosinusitis (ABRS) and viral rhinosinusitis is clinically challenging.

Acute rhinosinusitis usually begins after an upper respiratory infection (URI), then inflammation moves into the paranasal sinuses.

It is estimated that 90%-98% of acute rhinosinusitis cases are viral, whereas only 2%-10% of cases can be attributed to bacterial causes.



BACTERIA	CAN BE EITHER	VIRUS
Skin infections Strep throat Whooping cough UTI	Sinus infections Ear infections Bronchitis Pneumonia	Common cold Sore throat Flu COVID-19
Antibiotics? YES	Antibiotics? MAYBE	Antibiotics? NO



(Seybold & Tse, 2020)

Rhinosinusitis (sinusitis)

is an inflammation of the mucosal lining of the nasal passage and paranasal sinuses.

Classification by length of symptoms.

ACUTE
Less than 4 weeks

SUBACUTE
4-12 weeks

CHRONIC
12 weeks or more

The current guidelines for the diagnosis and treatment of sinusitis were developed by the Infectious Diseases Society of America and the American Academy of Otolaryngology-Head and Neck Surgery

(Seybold & Tse, 2020)

Acute Bacterial Rhinosinusitis Diagnosis Criteria

Diagnosis of ABRS can be differentiated from viral sinusitis when the patient meets any of the three clinical presentations: severe, persistent, or worsening.

- ❑ Onset with severe symptoms or signs of high fever (39°C [102°F]) and purulent nasal discharge or facial pain lasting at least 3-4 consecutive days at the beginning of illness; or
- ❑ Onset with persistent symptoms or signs compatible with sinusitis, lasting for at least 10 days without evidence of clinical improvement; or
- ❑ Onset with worsening symptoms or signs characterized by the new onset of fever, headache, or increase in nasal discharge following a typical viral URI that lasted 5-6 days and were initially improving ("double sickening")



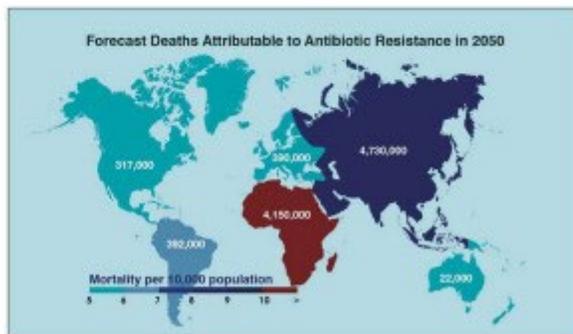
Prescribing practices should reflect the low rate of bacterial disease. Even when antibiotics are indicated by guideline, the Infectious Diseases Society of America (IDSA) reports that approximately 70% of patients with acute rhinosinusitis improve spontaneously in placebo-controlled randomized clinical trials.

(Seybold & Tse, 2020)

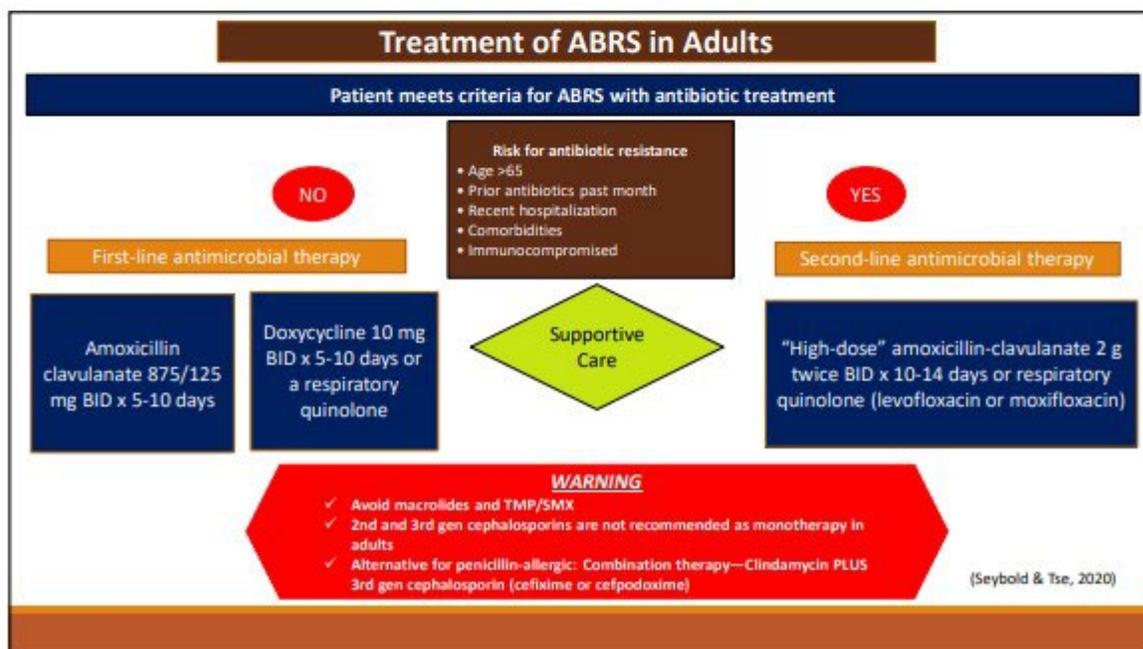
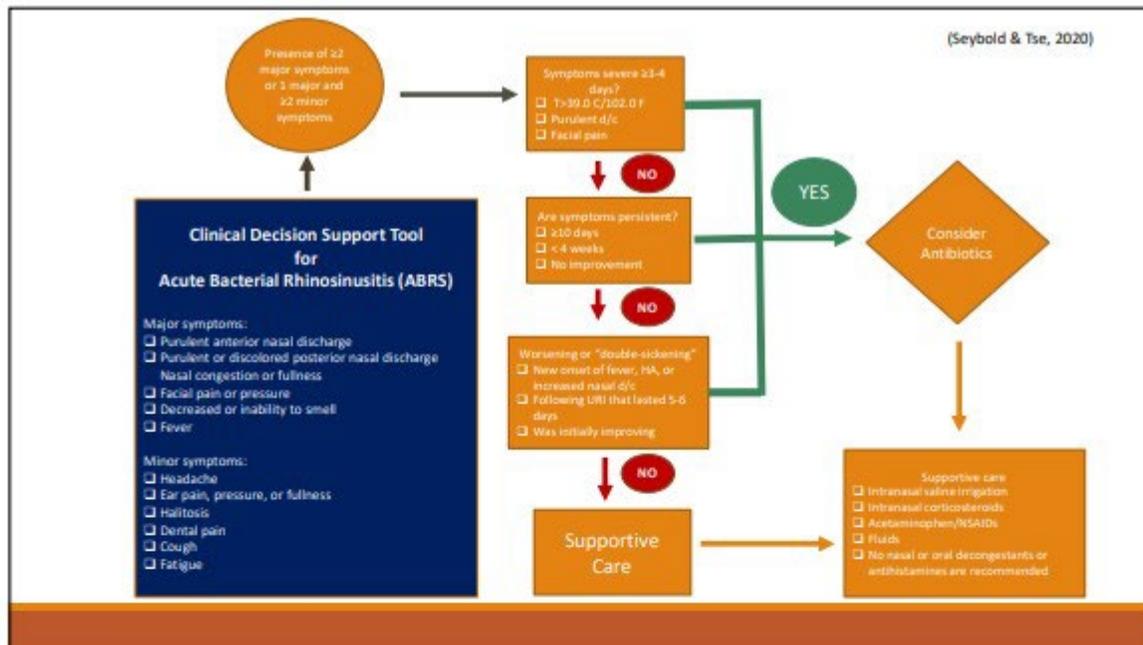
Global Crisis

Unnecessary antibiotic use exposes patients to preventable and potentially serious health problems.

The emergence of drug-resistant bacteria is a critical public health threat with a reported 2.8 million antibiotic-resistant infections occurring each year and claiming the lives of 35,000 people in the U.S. each year



(Seybold & Tse, 2020)



As a provider, what can I do?

As an urgent care provider, you can make a difference by following guidelines for the administration of antibiotics...



1

evidence-based
 improve
 practice
 knowledge
 outcomes
 interest
 relevant
 increase
 support
 best
 skills
 change

Use **evidence-based** diagnostic criteria and treatment recommendations.

When possible, these criteria and recommendations should be based on national or local clinical practice guidelines informed by local pathogen susceptibilities. This can be accomplished by adhering to recommendations from clinical practice guidelines for common infections published by national professional societies such as the American Academy of Pediatrics and the Infectious Diseases Society of America.

(CDC, 2022)

2



Use delayed prescribing practices or watchful waiting, when appropriate.

Use delayed prescribing

Delayed prescribing can be used for patients with conditions that usually resolve without treatment but who can benefit from antibiotics if the conditions do not improve (e.g., acute uncomplicated sinusitis or mild acute otitis media). Clinicians can apply delayed prescribing practices by giving the patient or parent a postdated prescription and providing instructions to fill the prescription after a predetermined period or by instructing the patient to call or return to collect a prescription if symptoms worsen or do not improve.

(CDC, 2022)

3



Watchful Waiting

Watchful waiting means providing symptomatic relief with a clear plan for follow-up if infection symptoms worsen or do not improve.

Watchful waiting and delayed antibiotic prescriptions are evidence-based approaches that can safely decrease antibiotic use when used in accordance with clinical practice guidelines.

(CDC, 2022)

4



Provide communications skills training for clinicians.

Communications skills training can be used to promote strategies to address patient concerns regarding prognosis, benefits, and harms of antibiotic treatment; management of self-limiting conditions; and clinician concerns regarding managing patient expectations for antibiotics during a clinical visit.

(CDC, 2022)

5



Require explicit written justification in the medical record for non-recommended antibiotic prescribing.

This technique has reduced inappropriate prescribing by holding clinicians accountable in the medical record for their decisions.

(CDC, 2022)

6



Clinical Decision Support Software



Wolters Kluwer

Provide support for clinical decisions.

Clinical decision support, which provides specific information in electronic or print form during the typical workflow, can facilitate accurate diagnoses and effective management of common conditions (e.g., discouraging antibiotic prescribing for acute bronchitis in healthy adults).

(CDC, 2022)

Thank you

For participating





The End



Please complete the post test, scan and return to
Melanie Maddox
via email or text.

maddoxm2004@gmail.com or 256.239.9337

Appendix D

Pre- and Post-Didactic Test

Quiz Questions

Circle your answers.

You may number 1-10 on a piece of paper and provide an answer by each number for the associated question and send a scan or picture via email or text once completed, signed, and dated. It must be signed and dated!

QUESTION 1

Janine believes that her daughter, Samantha, has a bad cold. Concerned that her daughter's symptoms might get worse, Janine takes Samantha to an urgent care clinic. She hopes the doctor will give Samantha an antibiotic because she believes antibiotics will help Samantha feel better. An antibiotic will help Samantha feel better if she has a cold.

True or False

QUESTION 2

At the urgent care clinic, Samantha is diagnosed with a cold, and antibiotics are not prescribed. Several days later, Samantha is getting better but still has some cold symptoms. Janine wonders if antibiotics may help now, so she calls Samantha's pediatrician. The typical cold can have symptoms that last for 10-14 days and antibiotics will not help.

True or False

QUESTION 3

Janine remembers that she has some antibiotics leftover from the last time Samantha was sick and asks Samantha's pediatrician if this antibiotic may help if Samantha does not get better. What should Janine do with leftover antibiotics?

- A. Give them to Samantha now
- B. Save them for the next illness
- C. Give them to a friend or family member
- D. Dispose of them properly

Janine runs into her neighbor, Cynthia, who asks how Samantha is feeling. Janine relays she is thankful that Samantha is feeling better and that she did not need antibiotics, because antibiotics can have many potential side effects. Which of the following can happen after taking antibiotics?

- A. Yeast infection
- B. Severe diarrheal infection called *C. difficile* infection
- C. Allergic reaction
- D. All of the above

QUESTION 5

Which of the following ARE NOT treated with antibiotics?

- A. Colds and runny noses, even if the mucus is thick, yellow, or green
- B. Most sore throats (except strep throat)
- C. Flu
- D. Most cases of chest colds (bronchitis)
- E. ALL the above

QUESTION 6

What are some of the best ways to stay healthy and keep others healthy?

- A. Cleaning hands with soap and water or using hand sanitizer with at least 60% alcohol
- B. Staying home when sick
- C. Getting all recommended and seasonal vaccines
- D. All of the above

QUESTION 7

What are core actions to fight resistance?

- A. Preventing Infections --> Prevents the Spread of Resistance (handwashing, covering your cough)
- B. Tracking (list of infections)
- C. Improving Antibiotic Prescribing & Stewardship
- D. Developing New Drugs & Diagnostic Tests
- E. All the above

QUESTION 8

Antibiotic stewardship is a commitment to always use antibiotics only when they are necessary to treat, and in some cases prevent, disease; to choose the right antibiotics, and to administer them in the right way in every case.

True or False

QUESTION 9

The purpose of antibiotic stewardship is to ensure every patient gets maximum benefit from treatment, avoid unnecessary harm, avoid allergic reactions and adverse effects, and preserve the life-saving potential for future use.

True or False

QUESTION 10

Amoxicillin or Augmentin is the most sufficient antibiotic treatment, if antibiotic treatment is appropriate, for someone with sinusitis and without known drug allergy?

True or False

(CDC, 2020)

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Signature of Participant

Date

Name of Participant (PLEASE PRINT)

Send to Melanie Maddox at:

Maddoxm2004@gmail.com or via text to 256.239.9337

Thank you for your participation. Once your test has been received you will receive a PowerPoint Presentation regarding Antibiotic Stewardship and a post-test to be taken after reading the presentation.

Thank you for your time and assistance with this project!

Appendix E**Citi Program Certificate**

Completion Date 05-Dec-2021
Expiration Date 04-Dec-2024
Record ID 46270506

This is to certify that:

MELANIE MADDOX

Has completed the following CITI Program course:

Not valid for renewal of certification
through CME.

Social and Behavioral Responsible Conduct of Research

(Curriculum Group)

Social and Behavioral Responsible Conduct of Research

(Course Learner Group)

1 - RCR

(Stage)

Under requirements set by:

Jacksonville State University

CITI

Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?wa1d6d757-0af5-44b2-bb39-6cd45d3bb697-46270506
