Implementation of a Syphilis Screening Tool in a Primary Care Clinic

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Dedication

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Abstract

Health screenings are important for health promotion and the prevention of disease. Screening for STIs can be conducted in diverse healthcare settings, yet it has been found that patients often seek screening from sexually transmitted infection (STI) clinics more often than from primary care providers (Hoover et al., 2015). Primary care providers are in an optimal position to screen patients for syphilis. Syphilis infection is a sexually transmitted infection (STI) for which individuals can be screened. The purpose of this project was to create a syphilis screening tool for primary care providers to use with sexually active adult patients and to implement the tool in one primary care clinic. Inclusion criteria were non-pregnant adults, 18 years of age or older. The screening tool was used to screen patients for high-risk sex practices. Patients determined by the screening to be in a high-risk category; they were then educated about the STI and offered testing. This quality improvement project aimed to increase appropriate syphilis screening in a primary care clinic in eastern North Carolina over a 9-week implementation phase. The project was guided by Lewin's Change Theory to assist participants with adaptation to a standardized process for patient screening at the project site. The screening tool was used in 6% of appropriate patient encounters. During the implementation phase, only 0.27% of the appropriate patients had documented billing codes for syphilis testing.

Key words: change theory, guidelines, health screening, primary care, sexually transmitted infections, screening, syphilis

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Chapter One: Overview of the Problem of Interest

Over the past six years, there has been a significant rise in the number of reported syphilis cases in North Carolina (NC). In 2017, a total of 30, 644 cases of syphilis were reported throughout the United States (Centers for Disease Control and Prevention [CDC], 2018b). This was a 72% increase from 2013 data, which demonstrated 5.5 cases per 100,000. According to the North Carolina HIV/STD/Hepatitis Surveillance Unit (2018), in 2017, there were 1,844 cases of syphilis diagnosed in North Carolina. This quality improvement (QI) project addressed syphilis screening in primary care. This QI project focused on improving syphilis screening through provider education. Discussion in this chapter will consist of the epidemiology of syphilis, the definition of syphilis and its effect on local communities, and testing conduction.

Background Information

Globally, syphilis infection rates have been on the rise (Hook, 2017). In the United States infection rates have been fluctuating since the 1940s, with periods of highs and lows ultimately yielding a steady increase. Although the origin of syphilis is unknown, it is proposed that its beginnings date back to the 16th century among European countries (Tampa, Sarbu, Matei, Benea, & Georgescu, 2014). It has been thought that the infection was transmitted to the United States by sailors during the voyage of Christopher Columbus in the mid-1490s to America (Barnett, 2018). At first, syphilis was treated with mercury, which caused intense side effects such as ulcers and nerve damage (Barnett, 2018). It wasn't until 1943 that penicillin was deemed the correct treatment for syphilis (Shockman, Buescher, & Stone, 2014). Syphilis was and still is a perplexing disease. Some thought syphilis was the same as gonorrhea, and in 1837, 17 prisoners were injected with gonorrhea to attempt to determine if there was a difference between syphilis and gonorrhea (Barnett, 2018). This incident was the first, but not the last time

individuals would be purposefully exposed to the disease. Between 1932 and 1972, over 300 unsuspecting black men were inoculated with syphilis and not treated; this is now known as the Tuskegee Syphilis experiment (Park, 2017). Unsure if this may have had an impact on statistical data, the Centers for Disease Control and Prevention (CDC) increased efforts in the 1970s to supply funding for venereal disease programs due to the increasing rates of syphilis (Shockman, Buescher, & Stone, 2014). These efforts had a positive impact, as evidenced by the fact that in the year 2000, the lowest rates of new syphilis cases were noted since 1941 (Shockman, Buescher, & Stone, 2014). However, the rate of syphilis has continued to rise since 2001, with most infections seen in males (CDC, 2017a).

Syphilis is a complicated yet treatable condition (Petrosky et al., 2016). Syphilis is a sexually transmitted infection (STI) that can be easily spread via sexual contact vaginally, orally, or anally. Although these are the common modes of transmission, it can be contracted via non-sexual contact with a person who is already infected or in utero from mother to fetus (Hook, 2017). The bacterium source for syphilis is Treponema pallidum (T. *pallidum*) (McNeil & Bachmann, 2016). This spirochete-shaped bacterium leads to this multistage disease with periods of dormancy (Church, Wall, Webb, & Cameron, 2019). Although Treponema is a part of the human microbiota, the T. *pallidum* is specific to syphilis infection (Stamm, 2015). This infection is usually noticed due to a sore or sores at the original site, but as time progresses, visible symptoms may change or even disappear although the individual remains infected (CDC, 2017b).

Syphilis infection is divided into four stages: primary (P), secondary (S), latent, and tertiary (Stamm, 2015). The primary stage is characterized by a chancre or lesion at the site of inoculation, which typically heals without treatment (Fantasia, 2017). This stage has an

incubation period of 2 to 6 weeks (Stamm, 2015). Left untreated, it progresses to the secondary stage. Secondary syphilis is characterized by rashes located on the skin or lesions of the mucous membranes (CDC, 2017b). Individuals may present with fever, malaise, headaches, swollen lymph nodes, or patchy alopecia (Stamm, 2015). This stage can last for weeks to months but will progress to latent syphilis if untreated or inadequately treated. The risk of transmission is highest in the primary and secondary (P&S) stages. In latent syphilis, individuals are categorized as early latent, which is infection within a year, or late latent, which means infection longer than one year (Stamm, 2015). Latent syphilis is more difficult to classify due to the lack of physical symptoms. If treatment failure occurs or no treatment is obtained, it can advance to tertiary syphilis. Individuals who have gone several years with this infection display symptoms that are less obvious. Body systems, such as cardiovascular and neurological, are impacted due to infection progression (Stamm, 2015).

Individuals should be screened for the need for syphilis testing, meaning that we assess the patient for risk factors that make them susceptible to the condition. Testing for syphilis involves serologic testing to investigate the presence of the *T. pallidum* bacterium. Because the infection has different stages, it is possible for an individual to be infected with the bacterium and not display any signs and symptoms of infection. Per the CDC guidelines, screening should be conducted on the following: 1) all pregnant women at their first prenatal visit, with retest in the third trimester and at delivery if high risk, 2) men who have sex with men (MSM) at least annually if sexually active or every three to six months if considered high risk, and 3) persons with Human Immunodeficiency Virus (HIV) who are sexually active should be screened at the first evaluation of HIV and more frequently depending on risk behaviors (CDC, 2015). The American College of Obstetricians and Gynecologists (2016) does not recommend the routine

screening of non-pregnant sexually active women. However, the U.S. Preventive Task Force [USPSTF] (2016) does endorse screening in asymptomatic, nonpregnant, high-risk adults.

Diagnosing and staging of syphilis is essential because it guides the treatment plan. Diagnosis can be accomplished in different ways. Definitive testing for syphilis is conducted by Darkfield examinations (CDC, 2015) and Treponema pallidum PCR (Tp-PCR) (Gayet-Ageron et al., 2015). However, this requires the presence of an ulcer for examination to inspect serous exudate (U.S. Department of Health and Human Services [USDHHH], 2017). Nontreponemal and treponemal testing are used as screening mechanisms for syphilis (CDC, 2015). Nontreponemal testing consists of the Venereal Disease Research Laboratory test (VDRL) and the Rapid Plasma Reagin (RPR), which are inexpensive and usually used for the initial diagnosis of the infection (Shockman et al., 2014). Treponemal testing includes tests such as T. *pallidum* particle agglutination assay (TPPA) and Fluorescent Treponemal Antibody Absorbed [FTA-ABS] (Shockman et al., 2014). Due to limitations in both test types and the possibility of false positives with other medical conditions, it is recommended that a combination of the tests is used in the diagnosing of syphilis (Stamm, 2015). Generally, non-treponemal testing is employed for screening and treponemal for confirmation, but laboratories across the country have been reversing this algorithm (Stamm, 2015). Per Cantor, Pappas, Daeges, and Nelson (2016b), “three studies of the diagnostic accuracy of screening test confirmed that they are accurate for diagnosing syphilis in asymptomatic individuals (sensitivity >85%, specificity >91% for the nontreponemal and treponemal test in most studies)” (p. 2336).

Once the diagnosis has been confirmed through testing, treatment should be initiated immediately. Benzathine penicillin G is the antibiotic treatment of choice for syphilis (Stamm, 2015). Dosages are dependent on the stage at which syphilis is diagnosed (Stamm, 2015).

Individuals with advanced stages are more challenging to treat due to the inability to stage the infection progression and the multi-organ system effects (Stamm, 2015).

Early diagnosis and treatment positively impact disease acquisition and transmission (Workowski, Bolan, and CDC, 2015). Although screening has been focused on MSM, pregnant women, and individuals with HIV, data shows that in 2017 15% of the cases were of men who had sex with women only, 6% were bisexual men, 15% were men with the partner's sex unknown, and 12% were women (CDC, 2016). So, 48% of those infected with syphilis did not fall into the categories of the CDC guidelines for screening criteria. It is essential that providers are not only discussing STIs with those patients labeled as high risk but also encouraging others to seek screening for syphilis when presenting for testing of other STIs.

Syphilis affects those of all ages, ethnicity, and economic status. In 2017, individuals aged 25 to 29 had the highest incidence of P&S syphilis at 29.9 per 100,000 people (CDC, 2018b). Second were those in the age group 20–24, with a rate of 24.9 per 100,000, and third at 22.4 per 100,000 were individuals ages 30–34 (CDC, 2018b). Of those top three infected age ranges, blacks had the highest incidence of reported cases in every group in 2017, for a total of 6,356 cases (CDC, 2018b). The second in total number of cases in the specified age range were whites, with 4,882, and third were Hispanics, with 4,104 cases in 2017 (CDC, 2018b). Out of the 50 states, NC ranked eighth in reported syphilis cases at 11.2 cases per 100,000, with number one being Nevada at a rate of 20 per 100,000 population (CDC, 2018a). In NC alone, there has been a 64% increase in reported syphilis cases between January 2014 and December 2015 (North Carolina Department of Health & Human Services [NCDHHS], 2018). Higher rates of P&S syphilis have been noted among MSM (McNeil & Bachman, 2016). It was pointed out by the CDC (2016) that 52% of the reported syphilis cases were MSM. Men who have sex with women

only and men who have sex with an undisclosed partner gender were ranked second, with each accounting for 15% of reported P&S syphilis infections (CDC, 2016). Women have a 12% rate of P&S syphilis infection, while bisexual men account for 6%.

The prevalence of syphilis, not only in NC but throughout the United States, is a serious cause for concern as statistics have shown. This infectious disease impacts the lives of adolescents, adults, geriatrics, and fetuses (Barnett, 2018). It is vital that efforts are made to not only increase testing but to discover ways to include screening methods in the electronic medical record, ensure patients are being screened for high-risk behaviors, decrease the further spread of syphilis, and create rapid testing to reduce the incidence of delayed treatment or non-treatment due to return failure of follow-up visits (CDC, 2017a). The CDC has indicated the severity of the problem. Recognition of this problem and its increased rate of occurrence nationwide precipitated the Affordable Care Act (ACA) to dictate that private health insurers must fully cover the cost of syphilis screening, especially considering the U.S. Preventive Services Task Force (USPSTF) recommendation for syphilis screening is grade "A" (Katz, 2016). The grade A recommendation means that the benefit of conducting this testing is substantial (Hunter et al., 2014).

Significance of Clinical Problem

The absence of screening sexually active adults leads to undiagnosed infections, increased transmission, and progression of the infection (Workowski, Bolan, CDC, 2015). However, there were no harms noted in the screening of this same population (Clement & Hicks, 2016). Patients should be assessed for exposure not only to syphilis but other STIs and HIV at every visit (CDC, 2017a). Evaluating exposure risk provides an opportunity for open dialogue

regarding STIs and gives the provider a chance to encourage safe sex practices as well as impart education.

Question Guiding Inquiry (PICO)

Cantor et al. (2016a) found that from 2000 to 2003, many gynecological examinations conducted did not use diagnostic codes for testing of HIV, syphilis, chlamydia, or gonorrhea, independent of whether the patient would be considered high-risk. The information obtained in this review correlates with the progressive increase noted in syphilis infection rates. The rise in these infection rates is not localized to one specific population, therefore screening is appropriate to any clinical site. The QI project seeks to assess if utilization of a screening tool by primary care providers will increase the number of patients engaged in testing for syphilis.

Population. This project QI project was targeted toward primary care providers.

Intervention. The providers were given a screening tool to use with adult patients, 18years or older during patient visits. If the patient answers yes to any of the questions, according to the established screening guidelines, the patient was to be informed that it is suggested they be tested for syphilis. If the patient consented to screening, then a green mark was placed on the checklist; if the individual refuses, a red mark was used.

Comparison. During the analysis, the percentage of patients who received syphilis screening before the implementation of the intervention was compared to the percentage of patients screened with the intervention.

Outcome. The outcome hypothesized was an increase in the number of patients who underwent syphilis testing due to providers using the screening tool for three months.

Summary

This chapter has provided content to validate the importance of syphilis screening. As we strive to meet health objectives established by HealthyPeople2020 and the standards of the Triple Aim, we must not negate the importance of sexual and reproductive health. Sexual and reproductive health has an impact physically as well as psychosocially. The use of effective screening approaches creates avenues to encourage testing and early diagnosis. Without testing, there are unknown individuals who are infected and engaging in unsafe sex practices, which place others at risk for exposure. In an ideal society, syphilis infection would be eradicated. Reducing the syphilis rates back to early 2000 levels would be desirable.

Chapter Two: Review of the Literature

This chapter explores content regarding facilitators and barriers to syphilis screenings in primary care. Disclosure of data sources, sampling criteria, and evaluation criteria from evidence-based research and scholarly resources was explored. A review of the literature conveyed current practice guidelines and methods to improve syphilis screening among primary care providers.

Literature Appraisal Methodology

Sampling strategies. A review of the literature was conducted by searching the East Carolina One Search database, PubMed, and the Cumulative Index to Nursing and Allied Health Literature (CINAHL). Search terms used for the database Onesearch and PubMed were "syphilis," "screening," "primary care," and "United States." PubMed yielded 121 articles, and the search was narrowed by refining the search criteria to include clinical trials, guidelines, journal articles, practice guidelines, reviews, full-text articles, dated within the past five years, of human species, and adult age >/= 18 years old. This resulted in 16 articles. After examining the articles, three were kept.

After applying the same search terms to the One Search database and narrowing the search by refining the search criteria to full text online, scholarly and peer-reviewed documents, dated within the past five years, the adult population, and English language, there were 643 results. Then, a step further was taken to exclude articles that pertained to pediatrics, pregnancy, infant, newborn, child, China, MSM, adolescents, and men who have sex with men; the results were decreased to 172 articles. Next, articles were removed that were not based on information related to the United States or about other STIs not inclusive of syphilis, which left a total of 4 articles.

Finally, a search was conducted using the CINAHL database. The search term used for this search was “syphilis,” which resulted in 3,042 articles. Then “health screening” was searched, which provided 38,804 results. The terms “health screening” and “syphilis” were combined to form a search of inclusive terminology, with refined search criteria of full-text documents, the English language, in peer-reviewed journals, and located in the United States, which decreased the results to 16 articles. Of those 16 articles, only three pertained to the focused content of this project.

Evaluation criteria. This QI project addressed primary care providers who screen sexually active adult patients. Articles included in this literature review consisted of content about adults only in the United States and information on screening practices and guidelines being employed in primary care based on the CDC and USPSTF guidelines. For this project, adults were classified as any individuals 18 years of age or older. Sexual orientation was an independent factor when evaluating article content; however many articles focused on the high-risk group of MSM.

Although offering valuable information, articles were excluded that consisted of topics related to congenital syphilis, ocular syphilis, and syphilis in adolescents. Also, articles that were not based on data obtained in the United States, duplicated articles, or articles that exclusively discussed STIs other than syphilis were also excluded. Personal commentaries such as editorials and blogs were excluded due to a lack of scholarly content or evidence-based material. A literature matrix was constructed as well as a Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram (Appendix A).

Literature Review Findings

Facilitators and barriers to syphilis screenings have been acknowledged in many contexts; however a review of the literature did not provide a definitive way to improve primary care provider interventions to increase syphilis testing. The review indicated that guideline changes could lead to more candidates for syphilis screening and increased diagnosis. It also revealed some interventions that have been used to improve screening and provider interventions.

Men who have sex with men (MSM) are a group on which the literature is closely focused regarding syphilis due to the increased prevalence of infection among this community. With 52% of cases in the United States affecting MSM, it is reasonable that it does. Primary care providers have an optimal opportunity with patient encounters to discuss sexual health and risky behaviors, not only among MSM but anyone considered high risk. Individuals labeled as high risk are those with more than one sex partner, have a new sex partner, engage in sex with someone who has other sexual partners, and those who use condoms inconsistently (Lee et al., 2016).

In Los Angeles, efforts were being made to impact high-risk individuals by using Public Health Investigators (PHIs) to provide case management and partner notification services (Stahlman et al., 2015). PHIs assisted with services such as locating options for counseling, partner notification, and treatment referrals for those diagnosed with a syphilis infection (Stahlman et al., 2015). Despite these efforts, the rate of syphilis infections continues to be on the rise (Stahlman et al., 2015). Participants in an MSM study group gave in-depth interviews between 2010 and 2011 regarding their perceptions and attitudes toward current and proposed interventions such as phone calls and text messages to remind individuals of needed testing every

three months (Stahlman et al., 2015). Of the 19 participants, most saw no benefit for the personal use of the service because they were compliant with testing recommendations. Eleven of the 19 participants still felt the service was a positive idea (Stahlman et al., 2015).

Counseling is beneficial pre- and post-syphilis testing. It has proven helpful in reducing risky sexual behavior, increase the usage of condoms, and decrease the likelihood of acquiring a sexually transmitted infection (STI) (Lee et al., 2016). According to a survey conducted by Quest Diagnostics in New Jersey, 51% of sexually active women respondents said they had no desire to discuss sex or STIs with their healthcare provider, and 49% said their provider never asked if they desired to have STI testing (Bowers, 2018). Counseling individuals for at least 30 minutes is effective (Lee et al., 2016). Hunter et al. (2014) stated there is good evidence that moderate- to high-intensity behavioral counseling reduces the rate of infection. Counseling should include topics such as defining and preventing STIs, reducing transmission, and patients' risk factors (Lee et al., 2016).

In Baltimore, MD, gaps in screening and case findings were noticed among MSM coinfected with HIV and syphilis (Schumacher et al., 2018). Research indicated strong links between those infected with HIV and syphilis (Schumacher et al., 2018). According to NCDHHS (2015), in 2014, 48% of men with syphilis also had HIV. Schumacher et al. (2018) said that there was a significantly larger increase in early latent syphilis compared to primary and secondary syphilis (P&S), which suggested a gap in diagnosis by primary care providers of MSM by stage, by age (that are older), and have coinfection with HIV. It may be appropriate to increase screening of all MSM, not just those reporting high-risk behaviors, to stem the epidemic among MSM (Schumacher et al., 2018). Routine syphilis screening education should be promoted during HIV care and in primary care (Barnett, 2018).

Facilitators. Initiating the topic of syphilis screening in a non-judgmental manner is a way to promote open communication and facilitate compliance with recommended testing if appropriate (Hunter et al., 2014). Another facilitator is to build rapport with the person (Hunter et al., 2014). Listening to the patient, applying two-way communication, and assessing concerns and fears are all ways to build trust and to facilitate rapport. Building rapport could positively impact the barrier of self-disclosure regarding risky sexual behavior (Burchell et al., 2016).

Collaboration among primary care providers and local public health departments is beneficial on a personal and community level. This collaborative approach enhances partner notification and treatment (Hunter et al., 2014). It is also important in the epidemiology of STI through community monitoring. Although local health departments are limited due to financial constraints, Hunter et al. (2014) say that 52% of those with HIV and 89% of those with syphilis received partner notification services, in comparison to the 17% with gonorrhea and 12% with chlamydia.

Barriers. Barriers to screening were lack of knowledge, perceived time constraints, workloads, competing priorities, financial concerns, and gender (Nattabi et al., 2017). Privacy, confidentiality, and cultural differences can also be barriers to STI testing (Nattabi et al., 2017). Barriers don't have to be objective or quantifiable. Patient perception is enough to decline participation in testing or disclosure of personal information.

Organizational amenities. Organizational amenities can impact an individual's choices of where to seek services. Sexual health care is often not obtained in the primary care setting (Hoover et al., 2015). Using a self-administered, paper-based survey Hoover et al. (2015) found that 49.5% of respondents preferred to use STD clinics over primary care because of factors such as same-day availability, followed by lower cost at 23.9%. The factor that least played a role in

provider location selection between the STD clinic and a primary care office was expert care (Hoover et al., 2015).

Decision making. Primary care providers are adequately educated to diagnose and treat STIs (Hunter et al., 2014). Individuals deemed high risk should receive testing for syphilis as well as other STIs. Involving the patient in the process, also called shared decision making, optimizes screening opportunities. In shared decision making, the patient is informed of choices, given a description of available options, exploration of preferences, and assisted with decision making (Hunter et al., 2014). Involving the patient in the process instead of telling the patient it is required represents autonomy (Farrugia, 2019). Active participation by the patient empowers them to be involved throughout care planning and treatment (deBronkart, 2015).

Limitations of the Literature Review Process

Limitations noted during this review process were locating resources that addressed the general population. Most articles focused on individuals with HIV, MSM, or pregnancy. There was also difficulty locating data on how providers can impact syphilis screening practices. Data supported guidelines usage for testing, but there was insufficient data on how to use the guidelines to motivate patients to receive testing. Data revealed low bill coding for syphilis testing but not what providers were doing to improve this or how providers were approaching patients regarding STI testing. Encouraging testing of individuals with HIV is redundant, considering it's already known that these individuals have a high-risk incidence of coinfection with syphilis.

Gaps in literature. There was a gap in knowledge about increased infection rates and how providers can increase syphilis testing that leads to early diagnosis and treatment. Providers are aware that high-risk individuals should be screened for STIs, syphilis specifically. But

designating a patient as high risk requires the collection of personal information. Patients need to feel comfortable in the environment to disclose personal information. However, as a provider, it is important to collect information in an unbiased manner. The literature suggested that individuals seek sexual health care services from clinics but not from primary care (Hoover et al., 2015). This implied a disconnect between sexual health and primary care.

Algorithm description. To improve the practice gap, a tool was created for individuals who are involved in patient screening to indicate those who met guideline standards for testing criteria. The questionnaire consisted of questions such as 1. Have you ever had a positive HIV test? 1a. If they are HIV positive, have they ever had a syphilis test? 1b. If yes, when was the last time you were tested for syphilis? 2. Has the patient ever been to jail, are you currently or recently a commercial sex worker, or do you have a new sex partner or more than one sex partner? 3.For males only. Do you engage in sexual activity of any sort (giving or receiving oral or anal) with other men? 3a. If yes, have you ever been tested for syphilis? The answers to these questions provided information about patient sexual behaviors, preferences, and preventative practices.

Advantages. Syphilis is a vast topic, and there were numerous articles available on the subject. However, the literature review did not delineate a specific evidence-based intervention for providers in primary care to improve syphilis screenings. Various options were noted that could be employed in the practice setting to facilitate compliance with recommendations by USPSTF and the CDC guidelines. The proposed intervention of providers using a tool to assess patient criteria for testing represents how improving practice change can positively impact patient outcomes.

Disadvantages. Although the topic of syphilis provides an enormous amount of material,

locating information related to screening in primary care with non-pregnant adults within the United States provided challenges. There were multiple articles that discussed ocular syphilis, syphilis during pregnancy, congenital syphilis, and MSM. Also, many articles pertained to data that was collected outside of the United States. A collaborative effort was made with the assistance of the librarian, with a marginal improvement of article retrieval results. However, with modified search terms and specifying the United States, many articles supplied data of sources outside of the United States in places such as China and Australia. It was also difficult to locate data on how often testing was being conducted overall. Data results demonstrated those who had positive syphilis results categorically.

Use of findings in practice change. In the targeted practice environment, the plan for implementation was as follows: An algorithm was created, copied, and given to each provider. If the patient visit was for an adult aged 18 + years is for an annual wellness exam or related to sexual health, then the provider or the patient needed to complete the questionnaire. If the patient met the criteria for testing, the word “tested” would be circled in green. However, if the patient did not meet the criteria for testing, a pink circle was placed around “not tested.” If the patient did meet criteria, yet declined to test, “tested” was to be circled in green with decline written on the form. To maintain patient privacy, no identifying patient information was obtained, only patient gender. Syphilis testing data were obtained pre- and post-intervention via analysis of billing codes. Billing codes indicated how often patients are being tested for syphilis infection.

Summary

The goals of the Triple Aim are improving the patient experience, reducing cost, and improving population health (Institute for Healthcare Improvement, 2019). This project addressed improving population health. This improved population health by conducting an

adequate evaluation of patients, leading to increased screening and diagnosis of syphilis. After a diagnosis is made, individuals can be treated promptly and accurately to decrease the spread of infection. Also, by addressing sexual behavior, individuals engaging in high-risk activities can be educated about safer sex practices to decrease transmission and promote prevention. This aspect also pertains to the objective of HealthyPeople 2020 to reduce domestic transmission of P&S syphilis (USDHHS, 2019).

Chapter Three: Theory and Concept Model for Evidence-Based Practice

Theory is complex, with many ideas, definitions, and explanations. Knowledge development and improved patient care occur because of theory. This chapter discusses the theoretical framework for this project and gives a description of the major concepts involved in this framework and how they apply to this project. This chapter will also discuss a change model and how it is used within this project to support the change process in practice.

Concept Analysis

The major elements of this theoretical framework consist of person, health, environment, adaptation, and goals of nursing (Whetsell, Gonzalez, & Moreno-Fergusson, 2015). These elements worked together to explain abstract and concrete concepts involved in the care of the patient and guide nursing practice. In this section, the definition of the concepts and how they work together will be discussed.

The first element of discussion is person. The concept of person goes beyond the individual in the physical sense. The person is considered one person or a group. It is composed of conscious and subconscious self. The person behaves purposefully to meet physical, psychological, emotional, and spiritual needs. Through conscious decision, the person adapts to the environment or situation to meet the current demands. For this project, the person was the provider. The provider adapted to the use of a screening tool during patient visits to impact population health via increased syphilis screening. Use of the screening tool was in an exam room to maintain patient privacy at the approved practice site, i.e., the environment. For this project, although not the direct focus, the person was also the patient. The patient was impacted by choosing to participate or decline recommendation for testing once the tool had been used, and the patient deemed a candidate for testing.

The environment consisted of every element in the vicinity. It was composed of location, nature, and conditions. Everything in the environment elicits a response, whether internal or external. The environment can affect the type of behavioral response in a direct or indirect manner. The environment for this project was the approved practice site, the exam room, and the community in which the office provided services. The community is impacted by increased screening, resulting in increased treatment of those infected and decreased transmission. The overall health of the population is improved because increased testing leads to increased diagnoses and an increase in treatment. The goals of nursing care are met by using a secure environment to promote privacy in health care, decreasing further spread of infection, and improving population health.

Health is more than the absence of illness. Health is a holistic mechanism that incorporates mind, body, spirit, and its ability to adapt. It is a state of flexibility and adequate coping mechanisms. The project focus was to increase syphilis testing to improve community infection rates and therefore decrease population impact. The health of the community impacts the practice environment. More cases noted in the community indicate a need for increased testing and patient education regarding syphilis infections and other STI prevention and treatment modalities. Goals of nursing are also met through improving the health of the community, the provision of health education, and participation in screening practices.

Adaptation is the ability to cope and comply with the change. Individuals, groups, and even organizations make changes to integrate with other persons or the environment to achieve certain outcomes. Some adaptations occur to meet needs on a personal level while others are done to accommodate the needs of someone besides oneself. Providers in this project adapted to engaging in conversation regarding sexual health and using the tool during patient visits for

annual wellness visits or visits about sexual health, such as testing for other STIs or concerns regarding the genitourinary system. Providers will be re-educated on the CDC and USPSTF guidelines regarding patient screening and testing criteria. Patients will adapt to engaging in these conversations in the primary care office, versus the STD clinics, as evidenced by data found by Bowers (2018).

The goal of nursing has long been to educate, promote, and prevention in a broad sense. By educating individuals on achieving and maintaining a healthy state mentally, physically, and emotionally, the promotion of wellness and prevention of illness is obtained. Improving patient health and the health of the community by promotion of safe sex practices and prevention of disease acquisition and spread are all considered goals of nursing. Not only clinical nurses but providers can meet the goal of nursing by impacting health, in a safe environment, through adaptation of the use of the syphilis screening tool.

Outcome goal. This project's outcome goal was to see an increase in syphilis screening at a primary care clinic. This outcome relates to each element noted in the theoretical framework. Desired outcomes reflect the concept of nursing goals prominently. The project aimed for appropriate screening practices among providers to reduce syphilis infections in an eastern NC county. Although it most fits this concept, the outcome certainly applies to the other concepts of health, environment, adaptation, and person (See Appendix B). Project site providers (who represent the concept of person) adapted to using the constructed assessment tool with patients. Patient, community, and population health are impacted by health screenings. The environment for this project was the location where the project was being conducted, however surrounding areas where patients who are served by this organization live are also impacted, as well as those

individuals they are in contact with.

Theoretical Framework

Naming the theory. This DNP project employed Roy's Adaptation Model (RAM). RAM was developed by Sister Callista Roy in 1970 (Whetsell, Gonzalez, & Moreno-Fergusson, 2015). From 1970 forward, the model has changed based on nursing experiences Roy encountered during her career (Whetsell, Gonzalez, & Moreno-Fergusson, 2015). Instead of using the traditional concepts of person, health, environment, and nursing to define her model, Roy renamed the elements adaptation, person, environment, health, and goals of nursing (Whetsell, Gonzalez, & Moreno-Fergusson, 2015). These elements were used to focus on ways to guide nursing care, to ground research, and to expand education.

RAM's central focus is adaptation related to elements of the internal and external stimuli in the environment. According to Barone, Roy, and Frederickson (2008), the environment contains every concrete or abstract form that influences a person. The environment impacts the person and their ability to adapt to it. The person also impacts the environment. A person modifies the environment to make it suitable to achieve favorable conditions. RAM is used in health care, research, and educational environments in the United States and in foreign countries. The first international chapter of Roy's Adaptation Association (RAA) was established in Japan in 2006. This and other chapters consist of scholars who focus on research and innovative practice (Roy, Whetsell, & Frederickson, 2009). The Boston-based Adaptation Research in Nursing Society conducted a critique that included 163 studies involving RAM-based research (Barone, Roy, & Frederickson, 2008). Of the 163 studies assessed, 116 studies met the criteria for quality research and synthesis of knowledge (Barone, Roy, & Frederickson, 2008).

RAM was also used in the building of the middle range theory (MRT) called Adaptive Spirituality (Dobratz, 2016). From the beginning, Roy's early conceptualization of adaptation to nursing included an interest in integrated spirituality (Dobratz, 2016). Roy's original model laid the foundation for expansion into this MRT from its outset because it addressed the spiritual aspect when caring for the person in a holistic manner. Through Dobratzs' (2016) analysis of 21 RAM-based studies, the MRT of spirituality was abstracted, and clarification was achieved regarding the conceptual meaning of adaptive spirituality. Adaptive spirituality reiterates how a person's belief system impacts their behavior and influences their adaptive outcomes (Dobratz, 2016).

Application to practice change. This DNP project used a RAM model to implement practice change. The project aimed to change practice standards at the primary care project site. An assessment tool for providers was created to determine which patients need syphilis screening. This tool was based on CDC and USPSTF guidelines for testing high-risk individuals. The provider (person) adapted to tool use as they encounter patients during visits. Patients who had an annual wellness visit or are seen for sexual health issues should receive syphilis screening. Screening addresses the concept of health. The assessment occurred in an exam room, i.e., the environment. In this environment, the provider, while assessing the patient for risky behavior, was able to provide education on safe sex practices, inform the patient of signs and symptoms related to syphilis, and promote prevention techniques. The desired outcome was an increased number of syphilis screening tests conducted at the site. The goal of nursing was to promote health in individuals; thus, patients who are positive for syphilis receive prompt treatment and patients who need education will obtain it. Early diagnosis and treatment of syphilis lead to reduced transmission among the general population.

EBP Change Theory

The Change Model. Kurt Lewin developed a three-stage Change Theory in the 1940s (Bishop, 2015). It says that there is a driving force that pushes people toward change, and there is an opposing force that makes them resistant to change (Wojciechowski, Pearsall, Murphy, & French, 2016). This change theory consisted of a three-step process: unfreezing, moving, and refreezing (Wojciechowski, Pearsall, Murphy, & French, 2016). In the unfreezing phase, old behaviors are discarded to prepare to adapt to newly learned behaviors (Wojciechowski, Pearsall, Murphy, & French, 2016). This step may be difficult because people become complacent with long-term behaviors. The second step is moving or changing. In this phase, alternatives to previous behaviors are sought, benefits to changed behavior are acknowledged, and previous behaviors are decreased (Wojciechowski, Pearsall, Murphy, & French, 2016). The last step of the change theory is refreezing. In refreezing, individuals adapt to the new behavior and integrate it into regular practice (Wojciechowski, Pearsall, Murphy, & French, 2016).

Application to practice change. The unfreezing phase consisted of getting providers to engage in conversations regarding sexual health and use the tool for syphilis screening. In the past, the patients were given the option to test without being assessed on the need for testing. Unfreezing consisted of breaking provider old habits and adopting new habits. During the moving phase, providers use the tool without hesitation, although some need reinforcement and encouragement. Providers were assessed at three-week intervals and questions were answered and difficulties discussed to promote compliance of using the tool. Also, discussion about positive and negative attributes of using the tool was reviewed to enhance tool usage. In refreezing, providers used the tool as a regular part of practice. It would be beneficial at this

stage to incorporate the usage of the tool into the electronic medical record.

Lewin's Change Theory is appropriate for this DNP project due to its simplicity. This small group of providers permits adaptation and accommodations to be more simply made than in a large group. Provider education given in a close setting creates an environment that fosters decreased intimidation and a teamwork atmosphere regarding the project. During all three phases, when providers were reluctant to change, it was easier to provide support, reinforcement, and guidance to those who need it. I encouraged them to keep going with the process because it will get easier over time and become second nature. Encouragement and guidance transitioned providers to the next phase along the trajectory until reaching refreezing. By the end of the implementation period, providers adapted to using the tool versus asking patients if they would like to be tested for syphilis. Providers engaged in more personal and uncomfortable topics with patients regarding sexual health. These types of conversations are uncomfortable, but they must be had.

Summary

This chapter defined the concepts of adaptation, health, environment, person, and goals of nursing as they pertain to this DNP project. The concepts were gathered from selecting Roy's Adaptation Model as a theoretical framework to direct this project. The outcome goal was increased syphilis testing at the primary care site. RAM suggests that adaptation is a multifactorial principle that leads to desired outcomes (Whetsell, Gonzalez, & Moreno-Fergusson, 2015). By using this theory in this QI project, there was a direction in which to take the provider and to guide the project. Employing the change theory aided in dealing with the positive and negative conditions that could be encountered along the journey.

Chapter Four: Pre-Implementation Plan

Before the implementation of this DNP project, planning was conducted to guide the project and prepare for its success. This chapter will discuss the many components of the planning phase, which include the rationale for project conduction and the members of the project team. This chapter will also cover the process taken to obtain project approval from the project site and the Internal Review Board (IRB). A cost-benefit analysis was done, and the evaluation process for the project discussed. These elements worked together to obtain specified outcomes.

Project Purpose

The purpose of this DNP QI project was to improve provider screening and increase patient screening for syphilis. To influence the growing number of individuals infected by this condition and improve screening methods, providers used a screening tool during patient encounters to evaluate if the patient was an appropriate candidate for testing. The goal was to increase syphilis testing within this primary care site by applying the guidelines established by the Centers for Disease Control (CDC, 2015) and the U.S. Preventive Services Task Force (USPSTF, 2016) regarding non-pregnant, sexually active adults.

Project Management

Organizational readiness for change. The organization recognized the need to increase syphilis screening as an area for improvement. Acknowledgment of the need promoted participation by the staff. This organization appeared to be receptive to the project. Employees demonstrated these attributes by welcoming the initial proposal. During the first encounter with two providers, they verbalized the project was a good idea. However, they were concerned about how to conduct the project without violating HIPAA and protecting patients' private health information (PHI). The dialogue between the DNP student and the two providers consisted of

preliminary plans and goals for the project. Presentation of statistical data to providers during the first encounter demonstrated the prevalence of the condition across the United States, specifically in NC, to gain support for the project. Since the initial meeting, interactions with the providers and the human resources (HR) manager have gone well.

Interprofessional collaboration. Collaboration among the team was imperative to ensure the success of the project. The team leader, who is also the DNP student, was responsible for disseminating materials and establishing plans, goals, and direction for the project. The DNP student also provided education, supportive assistance, and performed data analysis. The site champion's role was one of supportive responsibility. This person functioned as a resource to navigate the health system and provide project feedback. The site champion also supported the student and desired the student's success. The team included the participating providers. These providers participated in educational meetings to discuss syphilis guidelines and a description of how to use the template. They provided feedback regarding project progress, problems, or suggestions for improvement.

Data retrieval by the HR manager was accomplished by using the electronic health record to identify the number of adult patients seen and the total number of the billing codes used for syphilis testing. The patients seen at the primary care site were also members of the team, although not in a direct manner. The patients provided answers to questions on the screening tool so that providers can differentiate those who were candidates for testing. The goal was to get patients screened, tested, diagnosed, and treated for syphilis to decrease infection acquisition, progression, and transmission. And finally, the team included the DNP faculty member. The DNP faculty member ensured the student met the program goals, remained focused, and had

appropriate guidance. The faculty member also served as a resource to the student and supported the success of the project.

This project was a collaborative process in which everyone had a role to play. Although the project was collaborative, the level of responsibility, investment, and participation in the project established a casual hierarchy. The DNP student developed the project, established the plan and goals for the project, and was at the top of the hierarchy pyramid. Next is the DNP faculty member, who supported student team leader, then the site champion, the providers, and the HR manager.

Risk management assessment. A risk assessment is an unbiased evaluation regarding the actual or potential strengths, weaknesses, opportunities, and threats for the project. These words are commonly referred to by the acronym SWOT, and this acronym will be used to assess the project.

Strengths. Strengths for this project were organizational support, a need supported by the evidenced that syphilis rates are rising throughout North Carolina, team educational components, the need for minimum supplies, and a single primary care site. Demonstrating a need and organizational support were two essential elements for the project.

This team encompassed a variety of educational backgrounds, including advanced practice nursing degrees, a medical degree, and a human resource manager with a bachelor's degree. These backgrounds influenced the project in different aspects. Collaboration among the team facilitated a holistic project view.

This QI project required minimal supplies. The organization has its own laboratory department to collect serology samples. Materials such as paper and printer ink for printed

materials such as the screening tool and provider educational materials were provided by the team leader.

The last strength to discuss is that although the organization has multiple locations, the project occurred among three providers at one location. Limited provider involvement within the facility was a stipulation of the supervising provider, due to collaborative care among facility providers. Limited provider involvement was considered a strength by the supervising physician and the team leader because it made the participating group smaller and more feasible to manage.

Weaknesses. Although restricted provider participation was considered a strength, it is also considered a weakness due to limitations in the number of syphilis screening tools used during patient encounters. Restricting the participating providers also limited access to patients who were coming to the facility for treatment. Therefore, fewer patients would be screened. There are seven providers in the building. However, only three of them participated in this QI project. Other weaknesses to consider for this project were an overabundance of information, the potential need for a statistician or editor, finances to afford those additional team members, and time constraints.

Team leader and team member time constraints were considered a weakness. Unplanned circumstances could have impacted investment in the project and its success. External interference to project commitment, such as personal life circumstances, was unpredictable. Planning to allocate for obstacles by making sure there were plenty of supplies in advance for provider use was essential to minimize this weakness and its effects on the project.

Opportunities. Project opportunities include (1) implementing the plan throughout the entire facility, (2) expanding the project and using the screening tool at other locations within the organization, and (3) obtaining grant money to sustain the interventions of the project. This

project was restricted to three providers at the primary care site. Implementing the screening tool throughout the organization would have provided for evaluation of more patients and hopefully increased testing and diagnoses. It also provided for more feedback regarding the use of the screening tool. Expanding this project to other locations would be beneficial to the primary care site as well as the community. The primary care site has the potential for recognition as the pioneers for implementing the use of the tool and impacting provider change. There are screening tools used for other conditions but not a screening tool for syphilis. This facility would be the first to implement the use of such a tool. If other locations within the organization are also using the syphilis screening tool, more individuals in the community would be evaluated, tested, diagnosed, and treated.

Previously the government provided grants to specific health departments to aid in screening for syphilis and testing, but funding has since diminished. Using grant funding to sustain the project would be beneficial to the community that is awarded these funds. The funding could be used to incorporate the screening tool into the electronic health record (EHR) for ease of provider use. Integrating the screening tool with the EHR will alert the patient and future providers of the last time the patient was tested and as well as continuity of care.

Threats. Threats to this project included employee and provider non-compliance as well as patient reluctance. Patients may be reluctant to divulge personal information and answer the question honestly. Providers were receptive to the project initially, but during the implementation phase, they may have felt that the questions are interfering with visits or are too time-consuming for the already tight schedule. Promotion of adherence to using the tool transpired by employing the concepts of Lewin's Change Model to foster provider compliance. Members were encouraged by the team leader to understand that change is difficult, but continued use of the

screening tool, lead to it being a part of regular practice. A script was created to be used by the provider during patient encounters. Using the script helped patients understand the rationale behind the questionnaire and assist providers who had difficulty addressing the topic. Also, provider usage of the script ensured that patients received the same information.

Organizational approval process. Initiation of the approval process began by locating data and articles to support the need for this QI project. During an assignment, this student noted the increased rate of syphilis infection not only in NC but throughout the United States over the past six years. During clinical practicum one, the team leader also noticed that inquiry of patients regarding if they thought they needed syphilis testing was the primary mechanism for screening. Screening such as this occurred on more than one occasion with patients. A casual conversation took place with the providers regarding screening techniques and syphilis testing within the office. During this discussion was when the idea originated about turning this conversation into a DNP project, which the supervising physician agreed would be a good idea. The physician relayed a concern about maintaining patient privacy during the collection of data. This concern was addressed with the provider, by relaying that no identifiable patient information would be obtained during patient screening. One of the nurse practitioners (NP) at the practice provided direction on who to contact to gain project approval. After the formal meeting between the student, the supervising physician, and one of the NPs, an email was sent to the HR manager to inquire about the approval process, including a brief description of the project. The HR manager then forwarded the information to the administration for approval. Once the project gained administrative support, an approval letter from the organization was obtained (See Appendix C). The site champion officially agreed to take on the role, after clarification of the task. This person

was chosen based on personality, ability to guide within the organization, and their professional position. The site champion for this project functioned in the role of an NP.

Information technology. Information technology to implement this project was minimal. The creation of the syphilis screening tool (see Appendix D) and educational content was done with Microsoft Word. Using the electronic health record (EHR), which is eClinical Works for this organization, the HR manager ran an analysis of the amount of coding for syphilis testing and the number of patient visits among the participating providers over three months pre- and post-project implementation. Excel is used to create a cost-benefit analysis related to this project.

Cost Analysis of Materials Needed for Project

Project supplies needed consist of printer paper reams, printer ink, highlighter markers, gas for travel, meals, and time (see Appendix E). Materials such as paper, ink, and markers were used to create educational packets and the syphilis screening tool. Several copies of materials were needed by multiple individuals. Travel distance to the project site was 43 miles one way, which was an approximately 45-minute drive. Educational lunches were conducted at the primary care site to minimize inconvenience to the providers. Visits to the project site occurred during working hours, and educational materials were limited to 5 packets to reduce waste and maximize site time.

Plans for Institutional Review Board Approval

The Institutional Review Board (IRB) was used to review student projects to evaluate its appropriateness and its risk to potential participants (Burson & Moran, 2017). This project site did not have an internal IRB and relied on the approval of the University and Medical Center Review Board (UMCRB) of East Carolina University. There was no formal process for project approval at the primary care site. The initial meeting was held face to face with the site champion

and supervising physician to garner interest and preliminary support of the project. Once they agreed to participate in the project, dissemination of information on how to move forward with the approval process and whom to contact ensued. Ongoing e-mail communication commenced with the HR manager, who communicated with the administration to gain project approval. Communication via email was used to relay the purpose of the project, the project time frame, the proposed intervention, and the providers who were participating in the project. A formal approval letter was provided to the student, who forwarded it to the DNP faculty member for review.

East Carolina University uses its own IRB to review and approve student projects. After faculty reviewed and approved the project, the student completed ePirate registration. The final step in the approval process was that the student submitted the IRB proposal using the self-certification tool via ePirate (Sparrow, n.d.). The project was deemed quality improvement and waived by the university IRB.

Plan for Project Evaluation

Demographics. This project gathered data from non-pregnant, sexually active adults, aged 18 years or older at a primary care clinic in eastern NC. Data collected depicts if individuals who met criteria, i.e., adult and sexually active, are being screened adequately. It also sought to encourage testing for syphilis in those who met criteria according to the established guidelines of the CDC (2015) and USPSTF (2016). The data collection of tool usage and the number of patient encounters demonstrated if providers were using the screening tool during patient encounters for adults 18 years or older (See Appendix F). Tables and figures were used to display this information for pre- and post-intervention data. A table was used to show the number of completed screening tools in comparison to the number of adult patients seen in the office during

the same period.

Outcome measurement. The desired outcome was to see an increase in the number of patients tested for syphilis infection at the project site. Monitoring the use of the screening tool and the number of patient encounters were project process measures for this project. The tool was to be completed for each patient 18 years or older. Using the tool with each adult patient demonstrates consistency in care practices. Neither the CDC nor the USPSTF has established a definitive interval for testing. At least once during this implementation phase, each patient should be evaluated and asked the screening questions. Increased syphilis testing at the project site was an outcome measure. A screening test is a covered expense under the Affordable Care Act for adults who are at higher risk for syphilis (USDHHH, 2019b). The focused outcome measure was increasing testing following the providers' use of the screening tool by evaluating the total number of patients tested, not the outcome of the syphilis tests. Therefore, this made the outcome measure the project site outcome. Increased patient testing can lead to more diagnoses and earlier treatment initiation. Early diagnosis and treatment facilitate decreased infection acquisition and transmission throughout the community.

Evaluation tool. The tool was created by using the established guidelines published by the CDC and USPSTF to screen for syphilis in the high-risk population. As more providers use the tool, more patients should screen as high-risk and participate in syphilis testing (see Appendix D). The critical element was consistent provider use of the tool.

The screening tool used was for patients 18 years or older due to project patient focus. The first question addressed the patient’s HIV status. Evidence has shown that patients with HIV are often co-infected with syphilis. The tool not only addressed the patient’s HIV status but also inquires when was the last syphilis test. Individuals with HIV should be tested more often for

syphilis infection (Stahlman et Al., 2015). Next, other circumstances that denoted a patient as high-risk are asked, such as incarceration, commercial sex worker, and information about their current sex partner. Because males who have sex with other males are at higher risk for syphilis infection, they underwent a few more questions to ascertain sexual activity as it related to other men. While using the screening tool patients who were candidates and were willing to be tested, a green circle was placed around the word "tested." If the patient was not a candidate for testing, a pink circle was placed around "not tested." Finally, if the patient was a candidate for testing and refused, the screening tool was to have a green circle placed around "tested" and have declined written on the form.

Data analysis. At the completion of the implementation phase, evaluation was done to evaluate how consistently the tools were used and if there was an increase in the number of syphilis tests billed at the site. Was there a screening tool completed for each adult patient? And how many patients were billed for testing during this period? The tool was checked to ensure that each item was addressed, if appropriate. The questions in the tool were used to identify patients who engage in high-risk sexual behaviors. It was checked to ensure there was one tool completed for each adult patient visit, even if the patient was found not to need syphilis testing. The goal was to see the tool used during each adult patient encounter. Data retrieval done by the HR manager consisted of the number of documented billing codes in the EHR for syphilis testing. The HR manager also retrieved the number of patient encounters during the specified time period among the participating providers. If adult patients met criteria for syphilis testing, then there should have been a correlation in the number of billing codes noted for the syphilis test. There are no organizational, local, state, or national benchmarks related to the number of individuals having syphilis testing.

Data management. Data collection was reviewed every three weeks to determine the number of patients seen, the number of tools completed, and if the providers had any problems using the tool. The data collected was stored in Excel and saved to an external hard drive. The document had primary and secondary password protection, one for the computer system and another for the document. The data was stored in this manner until the completion of the project in May 2020. Data was destroyed by deleting material from the internal and external hard drives used to store information. Protected health information was not collected during this project. The only person who had access to the data was the team leader. The data was shared with the DNP faculty because that person was the overseer of the student and the project. Data was also shared with the participating providers to evaluate performance with the project and if there was an increase noted in syphilis testing at the primary care site. The primary care site might wish to continue to use the tool after completion of this project if an improvement in practice and patient care is noted. The HR manager had access to the facility data because she is conducting the electronic healthcare analysis.

Summary

Because this project was seeking to increase syphilis testing with the use of a screening tool, this chapter consisted of the components related to the planning phase. The discussion provided information about how the project was to be conducted and evaluated at its completion. Here was also discussed the approval process for the facility as well as the IRB approval process. A cost-benefit analysis was conducted to assess the feasibility of the project for those involved. Outcomes were clearly defined, with measurement modalities discussed.

The SWOT analysis identified areas of strengths and weaknesses related to the project as well as opportunities and threats. Organizational support, team education, and minimal need for

supplies were some things considered as strengths for the project. In opposition, weaknesses to consider were restricted provider participation, time constraints, and information overload. Despite recognized weaknesses, opportunities were available to expand the implementation of the screening tool throughout the facility and organization.

A seamless and simplistic organizational approval process was experienced with the facility. This primary care site does not have an internal IRB, so it relied on the decision of the UMCRB of East Carolina regarding project approval.

Information technology used in this project consisted of Microsoft Word, Excel, and eClinical Works. These systems were used to collect and store data. They were also employed to create educational and screening tools for distribution to providers. Data analysis consisted of information collected by the HR manager in eClinical Works regarding the number of syphilis billing codes noted over three months. It also encompassed the number of screening tools used in comparison to the number of adult patients screened. The goal was to see a 100% compliance rate with the usage of the tool by the providers.

This chapter covered the team dynamics of this project to achieve success. Collaboration allows for support and teamwork to impact change and improve quality care for patients. This QI project seeks to improve the care of the patient in a primary care setting with regards to syphilis testing.

Chapter Five: Implementation Process

The implementation process was the segment of the DNP project when the student demonstrated competency of leadership skills, collaboration, clinical scholarship, and advanced nursing practice skills. This chapter will display these aspects of the DNP project through a description of the practice setting, the participants, and the recruitment process. This section will also describe the steps taken during the implementation process for future replication by others.

Setting

This DNP project occurred in a primary care setting in eastern North Carolina. This facility provided a multitude of services to the pediatric, adolescent, adult, and geriatric populations. It is a public entity that offers services such as dermatology, women's health, primary care, and laboratory services, to name a few. This facility accepts patients with Medicare, Medicaid, and private insurances as well as self-pays. The practice in which the project implementation occurred is one of several sites within the organization. It is operated in a community setting to serve the members of the local population. This organization did not have an affiliation with a university or state. The project site was willing to work with a multitude of institutions, upon attainment of appropriate approval.

The organization, first established by providers with private funding, later grew to multiple facilities within the area (BWC, 2019). Since that time, funding for this organization has been through the payment of services rendered, including government-funded insurance (Medicaid and Medicare), commercial insurance, and out of pocket funds from uninsured patients. Because the organization began as a collaborative effort among the community, it is reasonable for the institution to seek ways to improve the health of that community. Endorsement of the project stems from interest among the providers and the DNP student regarding ways to impact the acknowledged increasing incidence of syphilis infections noted in

the previous chapters. Though the topic of this DNP project is sensitive, the project site maintains patient privacy and confidentiality by interviewing patients in private exam rooms.

Participants

Collaborative participation was vital to this project. The participants in the project consisted of the student, also referred to as the DNP student, three primary care providers, a human resources (HR) manager, and a DNP faculty member. The DNP student collaborated with all team members to lead and guide the direction of the project. The DNP student established the purpose of the project, along with goals and desired outcomes. The DNP student functioned in the organization to direct the flow of the project at the site and provide education to other participants and collaborate with members of the team internal and external to the site.

The providers involved in the project consisted of one physician and two nurse practitioners (NP). These participants played an active role in carrying out the implementation phase of the project. The providers used the screening tool to assess which patients were candidates for testing, as established by the guidelines. Questions on the screening tool were used to identify if patients were considered to be at high risk for acquiring syphilis. Based on the responses to questions on the screening tool related to sexual practices, providers would discuss the need for syphilis testing. Patients were asked questions to decipher their HIV status and high-risk behaviors. Primary care providers interacted with patients during visits to explain the purpose of the questions and to provide education regarding syphilis infection and the need for screening. The participating physician was the supervising physician for both NPs. Inclusion of these NPs was at the request of the supervising physician for collaborative practice reasons.

The HR manager was an indirect participant in this QI project. The HR manager conducted data retrieval during the pre-, peri-, and post-implementation phases. Data retrieval

was done to ascertain how many adult patients were seen by the three providers. The quantity of syphilis billing code usage during this time frame was also determined. Participation by the HR manager prevented the student from accessing patient health information, thereby protecting patient information. The HR manager was included to keep the student from having to access patient health information.

The DNP faculty member was also an indirect participant whose role was evaluating the project from beginning to end. The DNP faculty member evaluated the planning, implementation, and assessment processes measures and outcomes for the project. The DNP faculty member assisted the DNP student to ensure implementation of the intervention was conducted as planned, and the evaluation of the process done in an unbiased manner. The faculty member also aided in ensuring that vital elements of the process were documented and tracked as needed to meet the established project purpose and goals.

Recruitment

Participation by the DNP student was obligatory, due to a requirement of this project for the attainment of the Doctor of Nursing Practice degree. The recruitment of all other project participants was voluntary. Four project site employees volunteered to work with the project, including a physician, two NPs, and the HR manager. Patient participation was optional, yet implied if they responded to the questions on the screening tool. Patients could choose to opt-out of participation at any time during or after the interview process.

Fostering support from the providers was effortless. From the beginning, the providers expressed support, and most were enthusiastic participants. The supervising physician, though agreeable, verbalized concern about the logistics of the project consisting of protecting patient health information—specifically, identity—and the cost incurred to patients for participation and

having syphilis testing conducted. Discussion with this provider revealed that no identifiable patient information would be collected. This provider was also made aware of a project where billing code analyses were used to evaluate facility testing frequency. This project used this concept as a means of outcome measurement. The NPs were agreeable to participate in the project.

Providers' ability to screen patient participants was important. Patient participation was also vital to the DNP project. A written introduction was supplied for providers' use to ensure all patients received consistent information and to reduce provider burden. The introduction included a description of syphilis, its effect on the community, the rationale for conducting the project, and the patient's willingness to participate. At the request of the participating physician, other providers were not asked to participate in the DNP project.

The HR manager was asked to participate and agreed to do so. When asked about obtaining data for syphilis billing codes, the manager volunteered to perform the data retrieval. Discussion was had between the DNP student and the HR manager regarding data retrieval. The DNP student relayed what data was needed relating to the project. It was determined that the HR manager would retrieve data such as the quantity of syphilis billing codes and the number of patient visits before and after the implementation phase.

The most substantial barrier to obtaining other provider participants was the request made by the supervising physicians at the facility. Other providers at the primary care site may have been willing to or interested in participating but were unable to be approached. This barrier posed a hindrance because it limited the number of patient encounters; however, it was not significant enough to derail the project. A potential barrier was patients' reluctance to participate. Sexually transmitted infections (STIs) have, over the years, been stigmatized, and patients may

have been reluctant to answer the questions due to fear of judgment or embarrassment regarding sexual practices. Good communication between the patient and the provider helped alleviate these concerns. Providers were encouraged to use the script to alleviate concerns of coercion.

Implementation Process

Project implementation occurred from September through November 2019. Before implementation began, planning among the DNP student, the providers, and the DNP faculty team members took place (see Appendix G). A syphilis screening tool was created by the DNP student, in collaboration with the providers. The Centers for Disease Control (CDC) and the U.S. Preventive Services Task Force (USPSTF) guidelines supplied the information used for the creation of the screening tool (CDC, 2015; USPSTF, 2016). A meeting was held before initiation to discuss the plans and the project and to review educational material. Input was collected from the team regarding any changes or suggestions.

The DNP project was waived by the University and Medical Center Institutional Review Board at East Carolina University. Implementation began in September 2019 at the approved primary care site. Before initiation of the intervention, providers were supplied with educational packets, screening tools, and highlighters for in-office use. The providers used the tools to screen patients for three weeks. At that time, a data retrieval was conducted to determine the number of adult patient visits, how many screening tools were used, and the number of syphilis screening billing codes filed during the three-week interval. Data retrieval consisted of patient data that included the patients of the three participating providers. Screening tools were collected by the DNP student from the project site weekly. The tools were then counted, and an Excel spreadsheet was created to track how many tools were completed at the project site each week. The HR manager at the end of the three-week interval would perform data retrieval from the

EHR to determine the number of patients seen among the three participating providers. The HR manager also retrieved the number of syphilis screening billing codes that were filed during that same three-week interval among the participating providers at the project site. The DNP student was responsible for collecting the screening tools from the primary care site, data analysis, and documentation of data into the Excel spreadsheet.

During the implementation of the intervention, screening tools were retrieved from the site weekly. Data retrieval was conducted every three weeks, and more data was obtained by the HR manager. Data collected by the HR manager every three weeks included the number of potential participating patients seen and the number of billing codes submitted for syphilis testing among the three participating providers. The HR manager was responsible for obtaining data related to the number of syphilis billing codes used and how many adult patient visits there were among the three participating providers. The DNP student was responsible for collecting the screening tools from the primary care site, data analysis, and documentation of data into the Excel spreadsheet. The DNP student was responsible for meetings and continued progress of the project. The DNP student lead meetings among the team to assess progress in meeting project goals. During weekly visits to the project site, participating providers were encouraged to relay any concerns, advantages, or disadvantages to uses of the screening tool during patient encounters. Formal meetings occurred between the site champion and the DNP student during each interval to discuss areas for improvement, communication that may have occurred among the providers regarding the project in the absence of the DNP student, and ideas to improve the project. Lewin's Change Theory was pertinent during project implementation to assist provider transition to the new process. When changes were needed, they were discussed collectively with the team.

The project measure for the implementation phase of this project was the percentage of appropriate adult visits in which the screening tool was used by the participating providers. The goal was for the participating providers to use the screening tool during 100%of the adult patient encounter unless the patient declined to participate. The percentage was calculated by the number of screening tools used divided by the number of appropriate adult visits in which the tool should have been used. When a patient refused testing after providing answers to the screening tool, the tool was included in calculating the process measure. It was not tracked how many patients opted out of screening to syphilis. The outcome measure was the percentage of patients screened for syphilis. The percentage was calculated by dividing the number of syphilis screenings billed by the number of patients completing the screening tool during each three-week interval.

The primary goal of this project was to improve the process of syphilis screening among sexually active adult patients at this primary care site. The measure of a successful outcome was to see an increase in the number of patients completing the syphilis screening tool. Increasing patient screening had the potential to discover undiagnosed syphilis infections. Diagnosis and treatment were paramount in decreasing the acquisition, spread, and progression of this STI.

Plan Variation

The implementation phase of this project incorporated the use of five implementation intervals worksheets to evaluate the project progress and changes. During the first interval, no changes were made, due to just starting project implementation at the project site. During the second interval, we decided to omit the use of highlighters on the screening tool. Using different colored highlighters would be time-consuming and had no bearings on the outcome of the project or the collection of data. During the third interval, no changes were made to the project. It was

during the third interval time period that the student noted a significant variation in the number of screening tools completed, compared to the number of patients seen among the three participating providers at the project site. In the fourth interval time period, no changes were made. However, after the completion of the fourth interval, the team decided to place the screening tools in the exam room. There were no changes during the fifth interval.

Summary

The implementation phase was an essential part of the QI project. It was during that time that the intervention was applied to promote change and improve patient care within a patient care site. Improving health care is essential to promote patient retention, improve patient outcomes, and meet the medical needs of the community. This chapter covered topics related to the implementation process, such as the setting, participants, and recruitment. The planned steps for the intervention and any changes that were needed as the project progressed were also discussed.

This project occurred in a primary care setting that offers a variety of services throughout the different stages of life. This site provides services for children, adolescents, adults, and the geriatric population. Patients who are willing to participate provided answers to the screening tool in an exam room to comply with HIPAA and PHI standards of care.

The recruitment of participants for this project was voluntary. The provider participants in this project were all more than willing to participate and work toward improving patient care at this site. The HR manager's project participation, although minimal, was also voluntary. This person was eager to lend a helping hand with obtaining needed information to start and continue the project. The DNP student and DNP faculty member are the only participants in the project whose participation was obligatory.

The implementation phase was set to start in August 2019. The initiation of the intervention commenced in September 2019. Preliminary data were obtained to get baseline information before applying the intervention at the facility. Every three weeks evaluation was conducted on the number of adult patient visits, the number of screening tools used, and how many syphilis billing codes were submitted. During this collection of data, feedback was requested from the participating providers to promote adherence and seek areas for improvement. The application of Lewin's Change Theory was applied to facilitate and encourage the continued and consistent use of the screening tool.

Chapter Six: Evaluation of the Practice Change Initiative

Quality improvement (QI) projects are conducted to promote quality care and improve patient outcomes. This DNP project sought to increase the rate of syphilis screenings for high-risk patients at a primary care site. Efficient screening of patients for syphilis is vital to assess patients who would be appropriate candidates for syphilis testing. This chapter discusses and analyzes the data collected during the nine-week implementation phase at the project site. A description of patient demographics, the project intended outcomes, and findings are also explained.

Participant Demographics

The participants of this DNP project consisted of the DNP student, the DNP faculty member, an HR manager, a physician, two nurse practitioners, and an editor. The physician, the HR manager, and the two nurse practitioners were employees of the primary care site, and all were voluntary participants. Participants were educated to screen and test all adult patients who were 18 years of age or older and sexually active for the syphilis screening. A screening tool simply documented the patient's answers to questions indicating sexual activities considered "high risk" by the Centers for Disease Control and Prevention (CDC) and the United States Preventive Task Force (USPSTF) (CDC, 2015; USPSTF, 2016).

Intended Outcome(s)

This project had intended short-, intermediate- and long-term outcomes. An intended short-term outcome for this project was the consistent use of the syphilis screening tool during each adult patient encounter. The use of the tool with each adult patient encounter during initiation generated an assessment of those individuals who were considered high risk, even if they were asymptomatic and may otherwise not be considered for testing.

An intended intermediate outcome was to have continued and consistent use of the screening tool, as evidenced by completed screening tools for 100% of sexually active patients who were at least 18 years of age. This was documented by the number of billing codes for syphilis testing. An increase in the number of syphilis billing codes indicated an increase in the number of syphilis tests completed for sexually active adult patients, with a testing goal of 100% of appropriate patients screened.

An intended long-term outcome was for the syphilis screening tool to be incorporated into the electronic health record (EHR). Incorporating the syphilis screening tool in the EHR could present a straightforward screening process for the provider. The provider would be able to see if and when patients were screened for syphilis, when the patient last had syphilis testing, and if the patient is flagged as high risk for acquiring syphilis due to high-risk behaviors. By having information available in the EHR, it lends to the sharing of information to promote collaborative care across disciplines, care locations, and providers (Raymond & Marchand, 2019). Systems such as EPIC provide access to patient data to a multitude of healthcare providers in different locations.

This project relates to the other intended outcomes by potentially improving population health by decreasing the spread and progression of the disease. Buy-in from providers for consistent tool usage was facilitated through communication with participating providers. Consistent use of the screening tool would promote buy-in from the providers to help impact patient health and prompt positive outcomes. Consistent use of the screening tool provided the care providers the opportunity to engage in conversation with patients about sexual health. It also helped demonstrate that more patients at the project site needed to undergo testing for syphilis due to being considered high risk. The more providers used the tool, the more they could see the

relevance of its use. In a study conducted by Applequist et al. (2016) regarding the patient-centered medical home, three themes were discovered that facilitated buy-in. The three themes identified were: effective communication, technique reinforcement, and having a designated champion or leader for the project (Applequist et al., 2016). Ultimately, the intended outcome of this DNP project was to improve syphilis screening in one primary care site to increase syphilis testing. Increased syphilis testing increases the likelihood of accurate diagnosis and treatment of the infection and decreased community spread. Increasing appropriate care for syphilis potentially reduces the neurological and cardiovascular complications of undiagnosed or poorly treated infections (Stamm, 2015).

Findings

Collection of data started prior to the implementation phase of this project at the project site. Quantitative data was collected to see how many adult patients were seen by three participating providers during the previous three months and how many times the billing codes for syphilis had been filed at the primary care site during that same time period. Billing codes that were used and evaluation of syphilis testing were 86592 (NC Medicaid, 2019).

Pre-implementation. Prior to the implementation phase, data from the EHR showed that 2,119 adult patients had been seen at the project site among the three participating providers during the three months before the use of the syphilis screening tool. Of those 2,119 patients seen at the practice during pre-implementation, 17 had a documented procedural code of 86592 for syphilis testing in the EHR. This data demonstrated that of the adult patients seen at this primary care site, 0.8% had codes filed for syphilis testing.

Table 1.

Syphilis Data by Interval

	Pre-Implementation Data	Interval 1 9/25/19-10/15/19	Interval 2 10/16/19-11/6/19	Interval 3 11/7/19-12/2/19
Number of Adult visits	2,119	846	661	681
Number of tools completed	N/A	127	22	33
Number of syphilis testing codes	17	1	2	3
Number of Patients refused	N/A	2	0	0

Note: Data obtained from the collection of syphilis tools from the project site and EHR data collected by the HR manager.

Interval one. Interval one occurred from September 25, 2019, through October 15, 2019. During this interval, data obtained from the EHR showed 846 patients were seen at the primary care site. Of these visits, 127 syphilis screening tool surveys were filled out at the site. Of these surveys, only 89 screening tools were fully completed; 37 screening tools were incomplete. Refusal to participate in the survey or declination for testing occurred with three individuals. It was unclear how many patients chose to opt-out from the screening tools collected as opposed to the provider being sidetracked from completing the screening tool by something else during the encounter. Screening tool data showed that three patients were candidates for testing. It also showed that 89 patients were not candidates for testing.

The EHR revealed the billing code, 86592, for syphilis testing was used three times during this interval. It was found that 10.52% of the patients seen at the office fully completed the syphilis screening tool. It was noted that billing codes filed for syphilis testing were 0.12% during this interval, which was a decline from pre-implementation data by 0.68%.

Interval two. The second interval of the implementation phase of the project was from October 16, 2019, to November 6, 2019. During the second interval, data was collected and evaluated for the same aspects of content and completion as with the other intervals to maintain consistency. In this interval, the participating providers provided care to 661 adult patients, per the data obtained from the EHR. It was demonstrated that although 22 surveys were filled out, only 19 of them were fully completed. Again, in this interval, it is unclear how many patients opted out of participation as opposed to the tool not being completed for reasons on the provider's side of the encounter.

Data demonstrated that the screening tools were used with 3.33% of the adult patients who had visits among the three participating providers. It also showed that 0.3% of the adult patients who received healthcare services at the project site had billing codes submitted for syphilis testing. There were two times during this interval that the billing codes for syphilis were filed. This was a 0.18% increase in syphilis code usage from the previous interval. None of the patients refused testing during this interval.

During this second interval, it was noted there was a substantial deficiency from the number of patients seen at the office and the number of screening tools collected from the project site. Communication occurred between the student, the site champion, and the providers at the project site participating in the project. It was decided to place the screening tools inside of the patient exam rooms as a reminder to ensure they were being done with each adult patient upon encounter.

Interval three. Implementation of interval three was conducted November 7, 2019, to December 2, 2019. Data from the last interval was obtained and evaluated identically to the other intervals. The HR manager retrieved from the EHR the number of patients seen among the

three providers at the project site, and how many times the billing code 86592 was used at the completion of the interval. It was revealed that 681 adult patients were seen among the three participating providers at the project site. Screening tools were obtained from the project site weekly by the DNP student and evaluated for content and completion during this interval. The analysis of the data revealed that 33 screenings tools were filled out at the project site, with one incomplete and no documented refusals. Data was not collected to ascertain how many patients had opted out of participation as opposed to something on the provider's side of the encounter intervening and the tool being forgotten. According to the screening tools collected, three individuals were candidates for syphilis testing, and the EHR showed that the billing code 86592 for syphilis was filled for three occurrences. During this interval, the providers used the syphilis screening tool with 4.85% of adult patient encounters at the project site. Data from the EHR revealed that 0.29% of the adult patient visits resulted in billing for syphilis testing.

During this last interval, after implementing the changes noted in Interval two, it was noted that overall there was an increase in the usage of the tool. From interval two, through the completion of interval three, there was a 1.52% increase in usage of the screening tool among the participating providers.

The mean number of patients evaluated during the implementation phase of this project was 729.33. The mean quantity of syphilis billing codes filed during the implementation phase of this project over a nine-week time frame was two. Syphilis screening tools that were not completed were not included in the statistical analysis of the data. Data showed usage of the syphilis screening tool did not increase the number of billing codes filed during patient encounters at this project site.

Summary

This chapter has discussed data collected from pre-implementation throughout each interval of the implementation phase of this DNP project. The DNP student implemented the project at the project site using a three 3-week interval time frames. It was noted that with each interval, there was an increase in the percentage of billing code usage for syphilis testing at the project site. The pre-implementation phase demonstrated that providers were already conducting syphilis testing. The pre-implementation data analysis showed that 0.80% of the patients at the project site had coding in the EHR for syphilis. At the completion of interval one, it was found that 0.12% of patients seen at the clinic had coding submitted for syphilis testing. This was a decline in testing by 0.68% from the pre-implementation data. Interval two resulted in 0.3% of patients seen at the project site, among the three participating providers, had the billing code 86592 present in the EHR. Compared to pre-implementation data, this was a 0.50% decline; however, testing had increased from Interval one by 0.18%. The third interval yielded 0.29% of adult patients seen at the project site had bill coding for syphilis present in the EHR. That demonstrated a 1.52% increase in coding for syphilis from the second interval and a 0.59% decline compared to pre-implementation data. With the continued rise in the cases of syphilis in the population of North Carolina (North Carolina HIV/STD/Hepatitis Surveillance Unit, 2018), it seemed justifiable to seek ways to increase the testing of individuals in the community.

Chapter Seven: Implications for Nursing Practice

Nursing practice is a growing and changing area of health care. Patients are getting older, with more complicated health conditions, so it is essential that healthcare providers administer quality and comprehensive care. This chapter discusses how the doctoral candidate met the objectives for the final project related to obtaining the degree of DNP.

Practice Implications

Essential I: Scientific underpinnings for practice. Over the years, nursing has become a trusted and valued profession and discipline, supported by theories and scientific underpinnings. The Doctor of Nursing Practice (DNP) degree has also been developed and grown using some of these same theories and underpinnings, as well as many others. Concepts garnered from other disciplines, such as psychology, have been used to define and support the evolution of the DNP degree.

Roy's Adaptation Model (RAM) is a grand nursing theory that uses the significant concepts of person, nursing, health, and environment to provide patient care in a holistic manner (Roy, 2011). A holistic approach to nursing means that a person is recognized for their diverse attributes, not just the physical being, and all parts of the patient must be addressed in order to provide holistic care.

Nightingale and Roy had substantial impact on this DNP project by supplying foundational theoretical concepts. Change does not have to be large to make an impact; it needs to be significant. This project sought, on a small scale, to impact the screening practices for syphilis in a primary care clinic. The concepts used to define the problem were person, health, environment, nursing, and adaptation. This project used these theories to impact change by employing guidelines established by the CDC and USPSTF to increase the number of patients being screened for syphilis during visits at a primary care office. Based on statistical information

previously discussed in Chapter 1, the rate of syphilis had been on the rise for the past six years. This QI project goal was to increase the number of individuals who had syphilis screenings through the use of a standardized screening tool at a particular site. This project sought to use a syphilis screening tool to decipher which patients where appropriate candidates for syphilis testing. Patients that are considered high risks, such as those with HIV, men who engage in sex with other men, and those who have multiple partners, are candidates for syphilis testing (Lee et al., 2016).

Essential II: Organization and systems leadership for quality improvement and systems thinking. Evaluation of care delivery approaches was conducted by first assessing the current practices at the site regarding syphilis screening. The practices that were initially operating at the site permitted the patients to decide whether they needed testing. Through analysis of current guidelines, it was discovered that individuals who meet certain criteria should undergo syphilis testing (Lee et al., 2016). Many of the patients at the test site who should be getting tested were not. With the continued 64% increase of syphilis cases throughout NC, the student concluded that it was essential to develop a project to address the current problem and impact future populations (NCDHHS, 2018). Reviews were conducted to locate information to support the developing project idea. Literature reviews provided evidence of the severity of the problem, the populations affected, and the current practices in communities to address the growing rate of syphilis infections. Accountability for quality health care is essential for communities and populations. Demonstration of accountability during this project was displayed by seeking out literature that provided evidence-based practice concepts to ensure patients are receiving the best care. It was also ensured that patient privacy would be maintained throughout the project. During the collection of data, all patient information was collected anonymously.

This student ensured that patients' protected health information (PHI) was not compromised. Identifiable patient information was not collected to safeguard against the Health Insurance Portability and Accountability Act (HIPPA) violations.

It was the responsibility of this student to demonstrate a need for change within the practice and develop a plan to implement change. Also, to meet the objectives outlined in this required component of graduation, the student, who was also the team leader, was responsible for using critical thinking skills throughout this project to incorporate skills obtained in the program that lead this QI project. Communication between the team leader and other members of the team, such as the DNP faculty member, the site champion, and others participating in this project, demonstrated the student's competency related to communications with the practice: Oral and written communication were used to provide information on syphilis, the growing rate of cases throughout NC, the purpose of this project, and what the project will entail. Written communication was used to obtain the appropriate approval related to the project through ECU and the project site. A Qualtrics survey was completed to determine if the project was considered research or quality improvement. The survey also aided in establishing whether human subjects would be directly involved or impacted by conducting this quality improvement project. Based on the survey responses, it was determined that the project did not require IRB review (Appendix H).

This project was able to view the impact of syphilis in a comprehensive manner by employing a wide range of theories. Impacting syphilis at the person level by using the established guidelines, we were able to advocate for improved screenings for sexually active adult patients by developing and incorporating change within the site. Insurance benefits were evaluated both to improve the cost of health care and to monitor cost and budgets. Based on

observation, most patients at this primary care site used Medicare or Medicaid. Syphilis screenings are covered under Medicare Part B for patients who are pregnant or at increased risk (Medicare.gov, n.d.). Medicaid recipients are covered for sexually transmitted infection (STI) testing annually and up to six times per year (NC Medicaid, 2019). Although many patients present with these two types of insurance, others have another source of insurance. According to the USPSTF (2017) under the Affordable Care Act (ACA), private insurers must cover preventative care services that have a recommendation grade of A or B. Because syphilis screening is a grade A recommendation, patient testing is covered by the insurer, which reduces or eliminates patient out-of-pocket cost. Economic consideration was also given for the student and the project site. Meetings between the project site and the student were held during business hours to eliminate paying overtime for the organization. During the planning stage, the student was mindful of the supplies needed to conduct the project, without creating a financial burden to them. Prior to the purchase of supplies, an analysis was done of prices to obtain the most economically sound, quality products. Home equipment was used to minimize unwarranted spending. A log was kept documenting the amount and cost of materials and lunches for the budget.

When seeking to make changes, one must be mindful of ethical dilemmas. This project overcame an area of concern when attempting to maintain patient anonymity. No identifiable information was recorded or gathered on the syphilis screening tool to maintain patient anonymity. Also, to maintain patient privacy, the team leader did not access the patient electronic health record (her). All data obtained from the EHR was obtained by the human resources (HR) manager and disseminated to the student.

Essential III: Clinical scholarship and analytical methods for EBP. Evidence-based practice is essential to the development and analysis of the DNP project. Analysis of the literature began with the creation of a literature matrix while performing literature searches. Literature searches were conducted on promoting quality care and supporting evidence-based practice. Information obtained through literature reviews was used to support the development of the project and sustain it in the future. The selection of supportive content was made based on article sources, legitimacy of Web sites, and scholar content contained within the material. Care was taken in applying content from web sites to ensure that the provided information that was evidence-based. Guidelines from the CDC and USPSTF were used to create a syphilis screening tool to be used by the providers during in-office patient encounters to determine which patients are candidates for syphilis testing (USPSTF, 2016; CDC, 2015).

Evaluation of processes in the planning, implementation, and evaluation phases were done on a continuing basis. During the planning phase, a book was read to direct the construction of a literature matrix. This was relevant because it helped establish the organization of content for use during the construction of this paper and for use later during other phases. An evaluation tool was also created for use during the implementation and evaluation phases to demonstrate how often the providers at the project site used the tool in comparison to how many adult patients were seen in the office. The tool was then analyzed to depict the compliance of the provider with tool usage. Benchmarks related to syphilis screening were not able to be located with literature searches. Due to not being able to locate an established benchmark, it was decided to establish the pre-implementation data as the benchmark for the project site.

Data tables were created to depict information found before and during the implementation phase of this project. Charts were created to display data in a clear and concise

manner. Tables were used to organize articles, clinical trials, and other written material related to the project. An evaluation tool created by the team lead was used to provide guidance for evaluating areas of concern. An Excel spreadsheet was used to keep track of data pertaining to tool usage and meeting dates at the project site. An expense table was created using Microsoft Word to keep track of expenses throughout the implementation phase of the project and how often the screening tools were being used by the providers within the primary care clinic.

Quality improvement strategies were implemented to promote quality patient care. Lewin's Change Model was used as a guide to assist providers with adaptation to the use of the screening tool. This model assisted the student in providing support as the providers transitioned through each stage. A tool was designed to display each phase experienced through the transitions of change. Communication with the team led to the implementation of changes to promote adherence to the project. An education packet was created and designed by the student for disbursement to the participating providers. This packet and education session included information on who this STI effects, the impact of the problem currently, and how it has changed historically. Also included in the education session was how this project planned to impact changes in syphilis screening to promote positive patient outcomes.

Collaboration among the team and the patients was vital. The purpose of the project is to impart changes to impact the quality of care for the patients. This team communicated via e-mail, telephone, and in person. Communication consisted of questions about project goals. Questions were addressed with respect to those on the team. Questions lead to the improvement of the project process and provided clarification to areas of perplexity. When patients were having difficulty completing the screening, modifications were made to facilitate ease of use. This also gave the perception that providers were not properly implementing the use of the tool as

intended. The student had to reinforce the purpose of the tool usage and the importance of providers' use of the tool.

Dissemination of information throughout the project was imperative. Information was relayed verbally and through written communication. Members of the team were kept abreast of changes prior to and post-implementation. As data were collected, information was shared with team members to facilitate changes to improve patient outcomes. This provided the opportunity to reiterate to the providers the need for active conversation regarding syphilis and the importance of screenings with the patients, not merely giving the patient the tool to fill out.

Essential IV: Information systems/technology and patient care technology for the improvement and transformation of health care. Technological advancements are ongoing. This project used a document created by the student for providers to evaluate patients' need for syphilis testing based on the established guidelines. The project site currently has an EHR system in place. It would be ideal for the screening tool to be placed in the EHR 1) to serve as a reminder for providers to screen patients during visits at least every six months, and 2) to alleviate unnecessary repeat screening of patients. In the future, the project site may choose to incorporate the tool into the system.

The EHR maintains patient information in a secure manner and allows for access to patient information across different disciplines. For this project, to maintain patient privacy and ensure anonymity of the participants, no identifiable patient information was obtained during the implementation phase of this project. Data collected during the implementation phase consisted of the number of screening tools used by the provider, the number of patients seen at the office, the number of times the billing codes for syphilis were used, and how many patients refused screening. This information was then used to determine the percentage of provider compliance. It

was also used to determine if there was an increase in the percentage of patients being tested at the site. Prior to the implementation of the screening tool, 0.8% of patients had been tested for syphilis at the project site.

Essential V: Healthcare policy for advocacy in healthcare. Healthcare policy ensures that care is delivered in a uniform manner. For this project, the team leader and providers adhered to the standards of HIPPA. Patient privacy was maintained during encounters with patients to discuss STIs. Patient information was not collected during any portion of data collection or analysis.

The team leader distributed the guidelines from the CDC and USPSTF to the providers that were participating in the QI project (USPSTF, 2016; CDC, 2015). During our first meeting, syphilis screening guidelines were reviewed with providers to cover topics such as who should be tested and how often. They were also taught on how to bill for patients to not accrue additional financial constraints for the organization or the individual being tested. Current Procedural Terminology (CPT) is used for billing of procedures and services in health care (Young, Burge, Kumar, & Wilson, 2017). For syphilis-only testing, the providers should use billing codes 86592 or 86593 (NC Medicaid, 2019). Providers were also given a copy of the clinical coverage policy related to this topic. The nursing staff was provided with education on how to answer questions for patients when they entered the exam room. A script was created for providers to use during patient encounters to explain the rationale for these screenings.

Essential VI: Interprofessional collaboration for improving patient and population health outcomes. Interprofessional collaboration among the team throughout this project was consistent. Lutifiyya et al. (2019) defined interprofessional collaboration as “the provision of comprehensive health services to patients by multiple caregivers from different professions who

work collaboratively to deliver quality care within and across settings" (p. 3). This project team consisted of a physician, a family nurse practitioner, a human resource manager, the DNP faculty member, and the student who was the team leader for the project. Each person on the team used their strengths to add support and worked toward success for the project. The nursing staff, for example, reminded the providers to use the screening tools during each patient encounter. They also ensured that completed screening tools were placed in the correct designated area for pick-up. The HR manager aided in obtaining the data from the EHR. Providers communicated with patients regarding the importance of syphilis screening and other STIs. Providers also ordered testing for syphilis, participated in educational meetings, and provided feedback on project progress. Providers met with the student regularly to discuss improvement strategies as well as positive aspects. One positive aspect was that this project promoted conversations between providers and patients regarding sexual health.

E-mail and oral communication helped convey concerns and suggestions and address questions related to the project. Clear communication facilitated meeting project goals and deadlines.

There were many different leadership skills used throughout this project for the student, who also functioned in the role of the team leader. The student conducted reviews of the literature to support the development of the project. Once evidence-based practice concepts were in place to support the project, this student created a proposal for a quality improvement project. This proposal was shared with the DNP faculty for approval. Discussion with the DNP faculty member and the student consisted of the goals and objectives for the project and plans to conduct the project. The student communicated project design, participant responsibilities, and project direction among the team members. Analysis of data obtained throughout the project was done

by the student. After analysis, interpretation of data by the student dictated changes at the site to improve the quality of care. The student established a timeline to keep the project on track to meet deadlines. Meetings were scheduled by the student between members of the team on a regular basis.

Essential VII: Clinical prevention and population health for improving the nation's health. Improving the health of the population is a component of the Institute for Healthcare Improvement (IHI) triple aim (IHI, 2019). This project addressed this component. Research regarding the epidemiology of syphilis demonstrated the increasing incidence of syphilis in North Carolina. The biostatistical analysis showed the prevalence of syphilis was independent of race, gender, ethnicity, or cultural differences. Data collected revealed that in North Carolina, 17.9 per 100,000 of the population were infected with syphilis in 2017 (North Carolina HIV/STD/Hepatitis Surveillance Unit, 2018).

Lewin's Change Theory was used to guide changes and assist providers with adaptation to the use of the tool. This change model included three phases, which consisted of unfreezing, moving, and refreezing (Wojciechowski, Pearsall, Murphy, & French, 2016). As the project progressed, communication among the team dictated adjustments to practice behaviors to adapt to consistent use of the tool. Through communication with the team, it was discovered that Mondays were the most difficult days to use the tool. Providers, staff, and the student brainstormed ideas on how to remind everyone in the practice to use the tool when returning to the office each Monday. It was decided that placing a tool in the exam room on Friday evenings would facilitate its use on Monday mornings. During the first patient encounter on that day, the tool was already in the exam room, and providers would then be prompted to use them for the rest of the day.

During the implementation phase of this project, providers were to screen every sexually active adult patient for syphilis using the screening tool. It was assumed that every patient who was sexually active during the completion of the syphilis screening tool. Patients who were classified as high risk were encouraged to undergo testing for syphilis. When developing the tool, care was taken to ensure it was created in an unbiased manner. Cultural differences were considered during the development of the project to facilitate interaction between the provider and the patient. Cultural competency was addressed through the use of the provider script. The provider script provided a brief description of the problem and why the providers were asking these questions. It was important that providers made patients aware that the screening tool was a mechanism for prevention strategies to impact the acquisition and spread of syphilis. The use of this screening tool increased the conversation of safe sex practices within the primary care site.

Essential VIII: Advanced nursing practice. The syphilis screening tool was designed to be inclusive of adult patients, regardless of race, ethnicity, gender, or sexual orientation. Data has shown that males having sex with males (MSM) have a higher rate of syphilis infection than other groups; therefore, the questionnaire asks one question specific to this population (CDC, 2016). The providers on this team were instructed to inform each patient of the purpose of the questionnaire prior to questioning. The tool highlights characteristics of high-risk behavior and therefore explains the need for testing.

The DNP project student leader demonstrated the attributes related to the role of the Advanced Practice Nurse by developing, planning, implementing, and evaluating a quality improvement project. The team leader provided support to team members to adapt to the use of a syphilis screening tool. Transition to the consistent use of the tool was guided by Lewin's Change Theory. Staff was supported during the transition to the use of the tool by the student

engaging with staff about the tool and their concerns on a weekly basis. The student addressed feedback in a timely fashion to convey the concept of teamwork and facilitate buy-in from the team.

Syphilis screening and testing guidelines were examined. Articles that were supported by evidence-based practice concepts were evaluated for relevant content related to non-pregnant sexually active adults. The student used information from these articles to develop a project to improve patient outcomes. Improvement of patient outcomes in this project stem from prevention and diagnosis. The hope is that diagnosis will lead to treatment, which will produce a decrease in the spread of syphilis.

This project was designed to meet the American Nurses Credentialing Center (ANCC) established essentials while making minimal changes to impact the provider-patient interaction (Moran, Burson, & Conrad, 2017) Critical thinking skills were applied to make appropriate decisions. Problem-solving skills were used throughout this project. When it was discovered that there was a vast difference from the number of screening tools completed and the number of patients seen at the clinic, a root cause analysis was done to ascertain ways to improve on this. As a result of the information, it was inferred that as patients were returning for follow-up appointments, they were participating in syphilis screening again. Through evaluation of the data, observation at the site, and explanation from the team, it was discovered that tools were not used as consistently on Mondays as the other days of the week. Changes were implemented to account for this issue.

Summary

This chapter has discussed the components of not only a DNP project but this project specifically. The student demonstrated academic rigor by meeting the deliverables and essentials

and demonstrating the competencies related to this degree. The student demonstrated the ability to function in the role of leadership through the development, implementation, and evaluation of the DNP project. The student worked collaboratively across disciplines on a team to improve quality care as well as patient outcomes. Literature reviews were conducted to provide evidence-based practice concepts to support the project. Competency within these components provided a demonstration of the student's ability to function in the capacity of leadership.

Chapter Eight: Final Conclusions

Completion of the implementation phase had triggered the beginning of the evaluation phase of the DNP project. Objective evaluation of the project allowed for transparency, honesty, and easier replication for future scholars to build on. This chapter will discuss project findings, strengths, and weaknesses that were revealed. Also discussed will be project limitations, benefits, and recommendations for the practice.

Significance of Findings

The outcomes for this project were an increase in discussions about STIs with patients and a failure to increase the percentage of appropriate patients receiving syphilis testing at the project site. Using the screening tool brought attention to difficult conversations about sex and STIs. Data was not collected to quantify this aspect; however, staff feedback relayed this information to the DNP student. Feedback from staff revealed that they noticed the use of the screening tool opened the door for conversation related to sexual health with the patients during examinations. The increased discussion regarding syphilis and other STIs was significant because it allowed providers to engage in difficult conversations related to sexual health. Through these conversations, providers were able to relay the need for STI testing not only in younger populations but the elderly as well. Hoover et al. (2015), discussed how a lack of sexual health care is obtained within the primary care setting. These conversations between provider and patient gave providers an opportunity to educate patients regarding how their sexual health needs could be addressed in a primary setting with accuracy and sensitivity regarding the subject.

This QI project measured the percentage of appropriate adult patients who were screened with the syphilis screening tool at the project site. The percentage of patients who had billing codes filed for syphilis testing was also measured. Analysis of data collected during the implementation phase of this project did not yield an increase in the percentage of syphilis

testing at the project site. Inconsistent use of the screening tool was noted throughout each interval of the implementation phase. The number of patients seen during each interval by the providers was significantly higher than the number of completed screening tools collected. For instance, during the first interval, there were 846 patients seen between the three participating providers. However, only 127 syphilis screening tools were collected from the site. Before the implementation of the syphilis screening tool, this project site was not using a standard method for patient screening for syphilis. Due to the lack of a hardwired process there, it was impossible to account for the number of patients who had been screened for syphilis prior to the implementation of this project. During the first interval, the syphilis screening tool was utilized 10.52% of the time during adult patients' encounters. The percentage of patients who were screened using the screening tool declined to 3.33% during the second interval. This decline in screening tool utilization was an indication to revise the current manner of screening tool distribution. The team discussed the current practice of taking the screening tool into the exam room upon the patients' arrival. At this time, it was decided to place the screening tools in the exam room, so they are already in place upon patient arrival for their visit. After initiating the change of screening tool placement, interval three yielded an increase of 1.52% in the usage of the tool.

Pre-implementation at the project site showed 0.8% of adult patients had documentation in the EHR for syphilis test billing. The percentage of patients whose billing histories included 86592 fluctuated throughout each interval of the DNP project. The conclusion of the nine-week implementation duration demonstrated that 0.27% of adult patients seen at the project site among the three participating providers were billed for syphilis testing. Project results indicated the

implementation of the syphilis screening tool did not increase the percentage of patients receiving syphilis testing.

Project Strengths and Weaknesses

The strengths of this project were cost, the participants, and the simplicity of implementation. The project cost was kept to a minimum. Materials used during this project were plain white printer paper, a storage bin, and printer ink. Cost minimization was accomplished by keeping materials to the essentials. The lack of a lot of materials also helped maintain the simplicity of the project, was also a strength. Its simplicity was evident by the lack of needed materials, minimal need to make changes throughout implementation, and the ease of provider use. The project was designed to not consume a large amount of time during patient visits with providers.

Participants were actively involved and willing to engage in the project. Participants were flexible throughout the project, which they demonstrated by allowing the DNP student to observe the flow of the project on multiple occasions. The staff was also willing to communicate about the project process and changes. At the completion of interval two, it was noted there was a significant difference in the number of patients seen in the office in comparison to the screening tools that were collected. The DNP student, along with the staff, discussed what could possibly be the rationale for such a low number of screening tools completed. It was presented that the reason for low screening tool completion could be because they would forget to do them on Mondays. It was also relayed that one provider did not have a designated nurse to help prompt them to complete the screening tool during patient encounters. During this discussion, it was decided that the screening tools would be stocked in the patient exam rooms as a reminder to the providers to complete it with the patient. The discussion also emphasized that patients who had

already completed the screening tool during a visit did not need to repeat it. Open communication allowed for clear feedback and clarification when there were concerns or questions.

Weaknesses were also noted during this project. The weaknesses identified in this project were limited provider experience and lack of patient demographic information. The lack of provider experience caused a provider to have a different focus. One provider was new to their role and verbalized that their focus was on the patients' chief complaint for the visit. This provider verbalized that they would forget to address the screening tool with the patient during patient encounters. This participant found that incorporating the tool into visits was not at the forefront of visit components.

Lack of patient demographics was also a weakness that was noted during the analysis of data. The syphilis screening tool was to be administered to all patients who were sexually active. Patient demographics, such as current sexual status, would have been useful to ensure that patients completing the tool were appropriate.

Project Limitations

Limitations noted during the QI project were time constraints, limited pre-implementation data, short implementation phase, an unknown quantity of return visits, how many patients opted out of syphilis screening, the number of patients that were sexually active at the time of screening tool completion, and provider participation within the project site. Time was considered a limitation because team meetings needed to be conducted without interfering with patient visits. Most often these meetings occurred during providers' lunch. Team meetings with providers at the project site were not had outside of business operating hours. Another

limitation was the short implementation phase. A longer implementation phase would have allowed for the collection of more data and more time to adapt to the use of the tool.

Before the implementation of this project, the site did not have a standardized process to screen patients regarding syphilis. Screening meaning that patients were assessed for high-risk factors to see if they should be tested for syphilis. There was no way to evaluate how many patients had been screened prior to the implementation of this project. During the implementation phase, it was not documented how many patients during the second and third intervals were follow-up visits, and had, therefore, already completed the syphilis screening tool during a recent visit. The screening tool also did not ask if the patient was currently sexually active. It was assumed that all patients completing the screening tool were sexually active. It was not tracked by the participating providers or the DNP student how many patients opted out of participation. If patients were unwilling to participate or refused to test, the word refused was written on the screening tool. However, there was no description as to why the patient refused or if patients were opting out of participation in the project.

The last project limitation I would like to discuss is provider participation. Due to the restriction on the number of providers, fewer providers at the project site than actually practice on the site used the screening tool, and fewer patients had the opportunity to be screened for syphilis or the need for testing.

Project Benefits

There were numerous benefits noted throughout this project. Project benefits were identified as the development of a standardized screening process for syphilis, identification of undiagnosed infected individuals, and simplicity to incorporate it into practice for use. Other potential benefits included increased provider efficiency, increased patient access to screening

and testing, reduction in community infection, and improved STI awareness. This project also had the potential to generate revenue for the organization.

Development of a standardized syphilis screening tool was at the forefront of this project. The creation of the screening tool allowed a cohesive manner for patients to be appropriately screened within the organization. The screening tool was employed by providers to assess patients' risk factors for STIs, more specifically, syphilis. To improve efficiency, questions on the tool were derived from guidelines established by the CDC (2015) and USPSTF (2016) for patients that are candidates for testing. Having a standardized tool ensures that all providers are considering the same elements when designating the patient as high risk or when encouraging the patient to seek testing for syphilis.

This project offered the benefit/opportunity to identify undiagnosed and asymptomatic individuals. In the latter stages of syphilis, individuals often lack the physical characteristics of the infection. Assessment of patient sexual practices is needed for testing. A positive syphilis test such as VDRL, RPR, or PCR leads to prompt treatment of the condition. When individuals are treated adequately and appropriately, eradication of the infection in the individual is possible. Undiagnosed patients run the risk of disease progression to neurosyphilis and possibly death (Stamm, 2015). Increasing access to screening and testing increases the identification of undiagnosed or asymptomatic syphilis for individuals.

Provider engagement in conversation regarding syphilis, as well as other STIs, brought awareness to patients at the project site. Patients who receive services at the clinic usually reside within the community. Patient exposure to screening, testing, and education has the potential to reduce the cases of syphilis in the community. The reduction of syphilis in the community could elicit a positive impact on population health through decreased acquisition and transmission.

The simplicity of the project was also a benefit. This QI project required minimal materials to implement, which aided in cost containment. Using the screening tool did not impact patient visits in a negative manner regarding time. The questions on the screening were pertinent to evaluate for testing. The screening tool was simple to read and consisted of three main questions. Questions on the screening tool were minimal to address pertinent criteria to categorize patients as high risk.

Although the project was simplistic, it did offer the benefit to potentially generate revenue. STI counseling is a billable procedure even if the patient has no symptoms of infection (National Coalition of STD Directors, 2016). During project implementation, although not mentioned, providers relayed the patients were occasionally counseled about safe sex practices. To bill insurance companies for patient counseling, be sure to document the time spent during the visit for safer sex practices (National Coalition of STD Directors, 2016).

Practice Recommendations

A screening tool was created for this project to assess patients' needs to receive syphilis testing. Data analysis revealed inconsistent use of the syphilis screening tool and an overall decline in the quantity of syphilis billing code usage at the site. These findings indicate that although the practice was receptive to the project, they did not adapt to the usage of the screening as desired. Lewin's Change Model was used to assist with provider adaptation to using the screening tool. Practice recommendations are incorporating the screening tool in the EHR, documentation of lacking data, a longer implementation phase, and inclusion of all providers at the primary care site.

Customization of the EHR by organizations is an invaluable feature. The addition of the screening tool to the EHR provides a designated area for screening assessments. The EHR also

allows for alerts to be established as a reminder to the provider to screen the patient at least annually. If the patient has HIV, screening alerts should be set for every 3-6 months (CDC, 2015). Documentation of syphilis screening allows for other providers to know when the patient was last screened or tested for syphilis as a means to integrate interdisciplinary collaboration.

It is recommended for future scholars or providers to collect data related to patients' current sexual status. It is also recommended to document when a patient opts out of participation, when they refuse to be screened, or when testing is declined. If the patient refuses, document the reason why the patient refused to be tested or refused screening participation. If the screening tool is not incorporated into the EHR, it is recommended that repeat visits are tracked to know how many patients are repeats and have already completed the screening tool. This visit information is important when conducting data analysis. For example, during this project in the first interval, there were 846 patients visits. During the second interval, there were 661 patient visits. It can be assumed that some of those visits were repeat visits; however this data was not tracked. This information is important when conducting data analysis to justify the decline in screening tool completion as the interval progresses.

A longer implementation phase is recommended. A longer implementation phase provides for increased data collection and more time to incorporate changes to improve the project. This project was implemented for nine weeks. A minimum of a three-month implementation phase is recommended. Obtaining data before project implementation to determine how many adult patients have been screened for syphilis at the project site is recommended. Obtaining this data provides baseline data to see if providers are following the established guidelines and how often patients at this site are being screened for syphilis.

Adequate participants are desired for any project. It is recommended that all providers at the project site participate in the QI project. Involving more providers in the project potentially allows for increased chances to conduct patient screening for syphilis. The more patients that are screened for syphilis, the more chances there are to locate undiagnosed infected individuals. As more individuals are diagnosed, the desired outcome is that more individuals would obtain treatment, therefore decreasing the number of currently infected individuals and potentially the spread of infection.

Final Summary

This DNP project was conducted to implement a quality improvement project. This project sought to improve syphilis screening in a primary care setting. A literature review was conducted to collect evidence-based information to demonstrate that syphilis infections are a problem that needs to be addressed. Information revealed that syphilis infection rates had risen 72% in North Carolina over six years (North Carolina HIV/STD/Hepatitis Surveillance Unit, 2018). The arrival of syphilis to the United States from European countries caused a stir in the medical community. Treatment modalities for syphilis such as mercury had adverse side effects, which eventually lead to penicillin as the designated treatment (Barnett, 2018). Early treatment is desired to decrease the spread of the illness and preferably eradicate the condition.

Patients' first sign of infection is usually a chancre sore at the site of inoculation (Fantasia, 2017). When undiagnosed and untreated, syphilis can progress through the four stages and terminate in death. Syphilis is an infection that affects all ages, ethnicities, and genders. It is prevalently noted in MSM (McNeil & Bachman, 2016). Coinfection is commonly noted with syphilis and HIV (Schumacher et al., 2018). A combination of treponemal and nontreponemal testing is used as a confirmatory mechanism for syphilis (CDC, 2015; Stamm, 2015). The CDC

(2015) designated darkfield microscopy as the definitive test for syphilis. Treponema pallidum PCR (Tp-PCR) has also been established as a definitive test for syphilis (Gayet-Ageron et al., 2015).

Screening patients for at-risk sexual practices guide the provider in a manner to categorize, as needed, a patient as high risk. Patients deemed to be a high risk should be educated and encouraged to be tested for syphilis. Screening involves asking patients relevant questions related to syphilis infection. Questions used to evaluate the patient's HIV status included whether they were MSM or engaged in activity of other high-risk behaviors as established by the CDC (2015) and USPSPTF (2016) to warrant testing.

The project site for this project did not have a standardized way to screen patients for syphilis. Although standardized screening tools are available for conditions such as HIV or tuberculosis, there is not an approved one for syphilis. A screening tool was created with key questions for primary care providers to use to assess and evaluate patient risk factors for syphilis.

The screening tool was implemented in a primary care clinic in eastern NC for nine weeks. Providers were to use the tool with sexually active adult patients during this implementation period. It was assumed that each patient who completed the tool was sexually active. Data collected during the pre-implementation period demonstrated that although the clinic lacked a standardized screening method for syphilis, 0.8% of patients' seen within the previous three months at the participating providers at the clinic had billing codes in the EHR for syphilis testing.

During the implementation phase, the DNP student obtained the screening tool from the project site weekly. Each interval during the implementation period was three weeks long. At the

completion of each interval, the HR manager collected the number of patient visits and retrieved the number of times the billing code for syphilis testing, 86592, was used from the EHR.

Screening tools were evaluated by the DNP student for completion and testing status. At the completion of the nine weeks, data was evaluated by the DNP student. Data showed that the screening tool was used with 10.52% of patients seen at the project site during the first interval, with one billing code for syphilis testing in the EHR. During the second interval, the screening tool was used with 3.33% of the patient seen, and the billing code for syphilis filed two times. Interval three yielded 4.85% use of the screening tool by the providers, with three occasions for syphilis testing billing code use. The syphilis screening tool was used on an average of 0.27% of patient encounters during the implementation period. This percentage demonstrated that the primary care providers did not adopt the usage of the screening tool.

Lewin's Change Model was used as a tool to guide the providers with adaptation to the use of the screening tool in practice. Changes were made at the completion of interval two. To help providers remember to use the tool, the tools where be kept in the exam room instead of at the nurses' station.

Limitations noted during the project were time constraints and lack of pre-implementation data. Strengths were identified as cost, the participants, and simplicity. Weaknesses were identified as limited provider experience and inadequate patient demographic information. Development of a standardized screening process, identification of undiagnosed infected individuals, increased provider efficiency, simplicity to incorporate the new syphilis screening, increased patient access to screening, a potential reduction in community infection, and improved STI awareness were all benefits of this DNP project.

Recommendations for future use include a longer implementation period, full project site participation, collection of patients' current sexual activity status, and incorporating the screening tool into the EHR. More projects should be conducted to decipher ways to improve syphilis screening in the primary care setting. As more data is collected it may reveal what works best to improve syphilis screening to meet the goal of impacting population health by decreasing syphilis infection rates throughout our communities.

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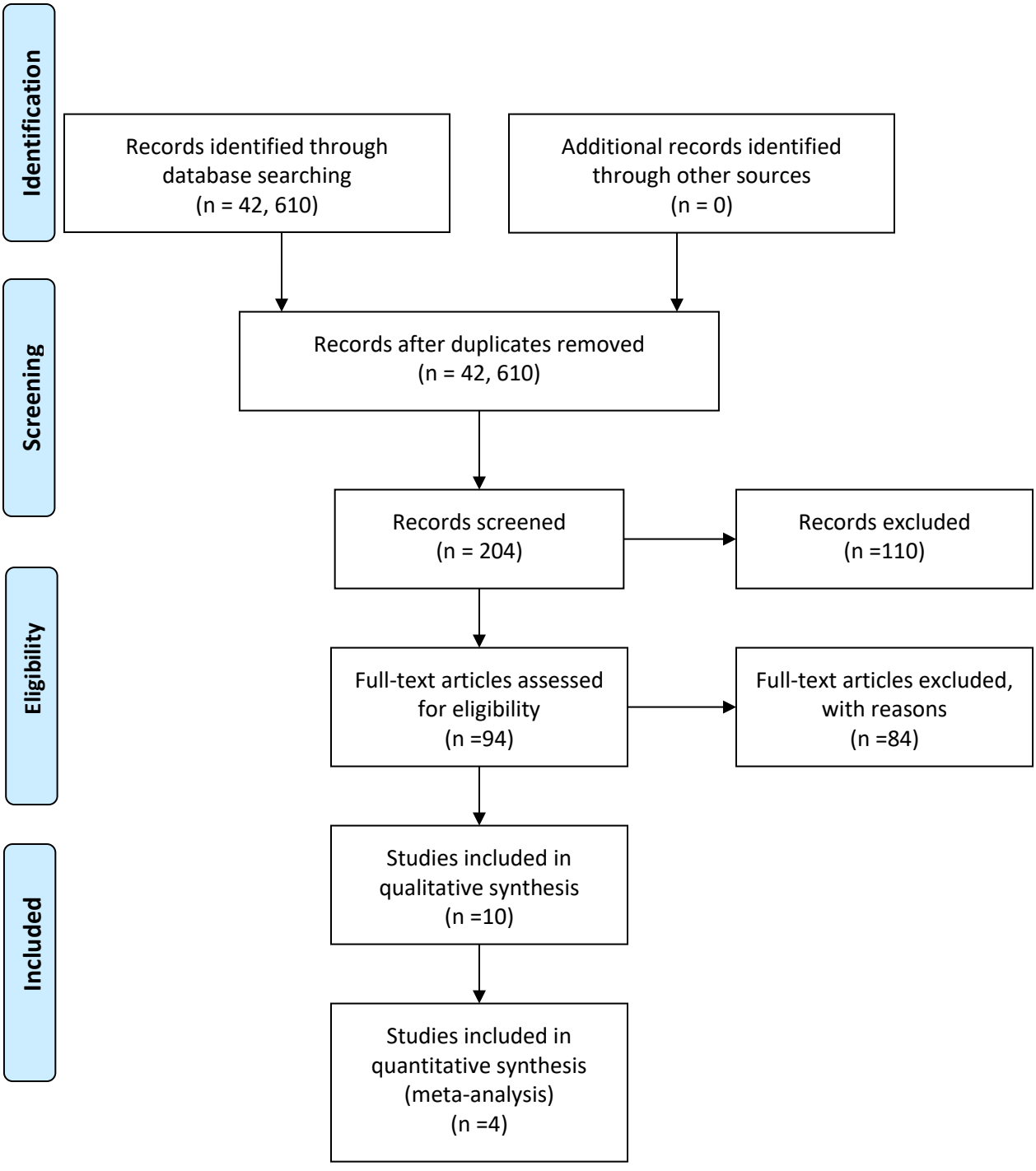
Appendix A.

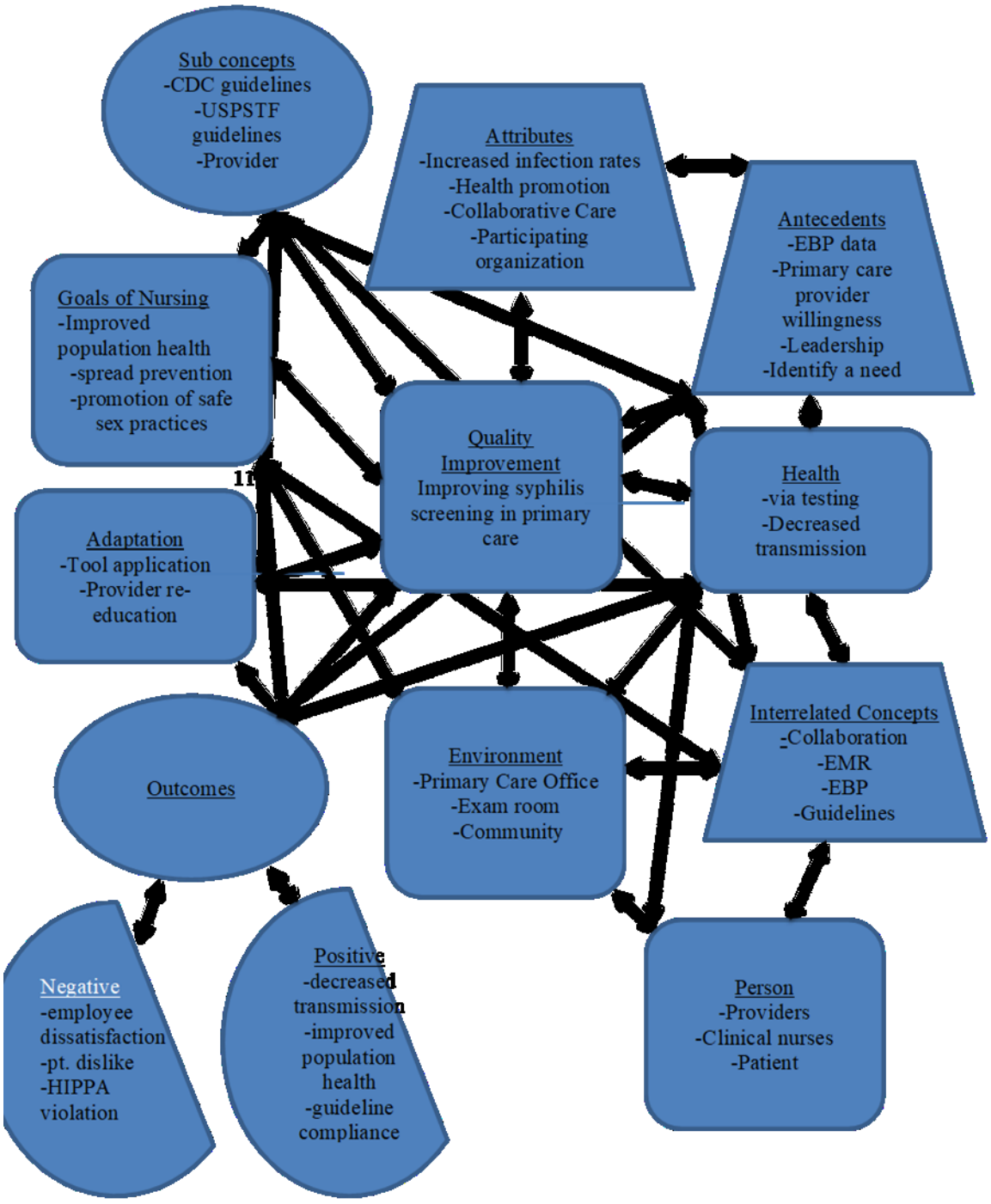
PRISMA



(Moher, Liberati, Tetzlaff, Altman, & The PRISMA Group, 2009)

Appendix B.

Concept Map



Appendix C.

Letter of Review

[redacted]

March 29, 2019

To East Carolina University College of Nursing,

We at [redacted] have reviewed Susan Elliott's DNP Project Proposal, "Syphilis Screening in Primary Care". Ms. Elliott has organizational support and approval to conduct her project within our institution. We understand that the timeframe for this project is from the date of this letter through April 30, 2020. Implementation at the project site will occur August/September through November 20, 2019, unless otherwise negotiated. We understand that for Ms. Elliott to achieve completion of the DNP program, dissemination of the project will be required by the University which will include a public presentation related to the project and a manuscript submission will be encouraged.

Our organization has deemed this project as a quality improvement initiative. We are aware that this project will be processed through the University and Medical Center Internal Review Board of East Carolina University (UMCIRB). Our organization does not have an Internal Review Board (IRB).

Thank you,

[redacted]

HR Manager

[redacted]

Appendix D.

Syphilis Screening Tool

Provider Script: I'm not sure if you're aware, but syphilis is a sexually transmitted infection that is on the rise across the United States, including here. My fellow providers and I are participating in a project to improve syphilis screening and increase testing at this office. The desire is that by diagnosing and treating more individuals, the rate of syphilis in our area will eventually decline. Would you be willing to answer a few questions to decide if you are a candidate for testing?

1. Have you ever had a positive HIV test? Yes or No
    a. If yes, have you ever had a syphilis test?
        b. If yes, when was the last time you were tested for syphilis?
2. Can you answer yes to any of the following?
    a. Have you been to jail?
    b. Are you currently or recently a commercial sex worker?
    c. Do you have a new sex partner or more than one sex partner?
3. **For males only.** Do you engage in sexual activity of any sort (giving or receiving oral or anal) with other men?
    a. If yes have ever been tested for syphilis? Yes or No
    b. If yes, when was the last test, and what were the results?

Tested **Not Tested**

Appendix E.

Cost-Benefit Analysis

Material	Price	Quantity	Total	Benefit
Printer Paper	$14.49	2	$31.51	Needed for educational materials and screening tool creation
Printer Ink	$60.05	1	$60.05	Needed for reprint of materials
Gas	.58 p/miles	43 miles (one way)	UTA	Need for travel to facility
Meals	$50 (to feed three providers during meetings)	3	$50	Lunch provider for provider participants
Time	UTA		UTA	No way to quantitate time
Storage container	$5.00	1	$5.00	To provide a designated area to place the completed screening tools

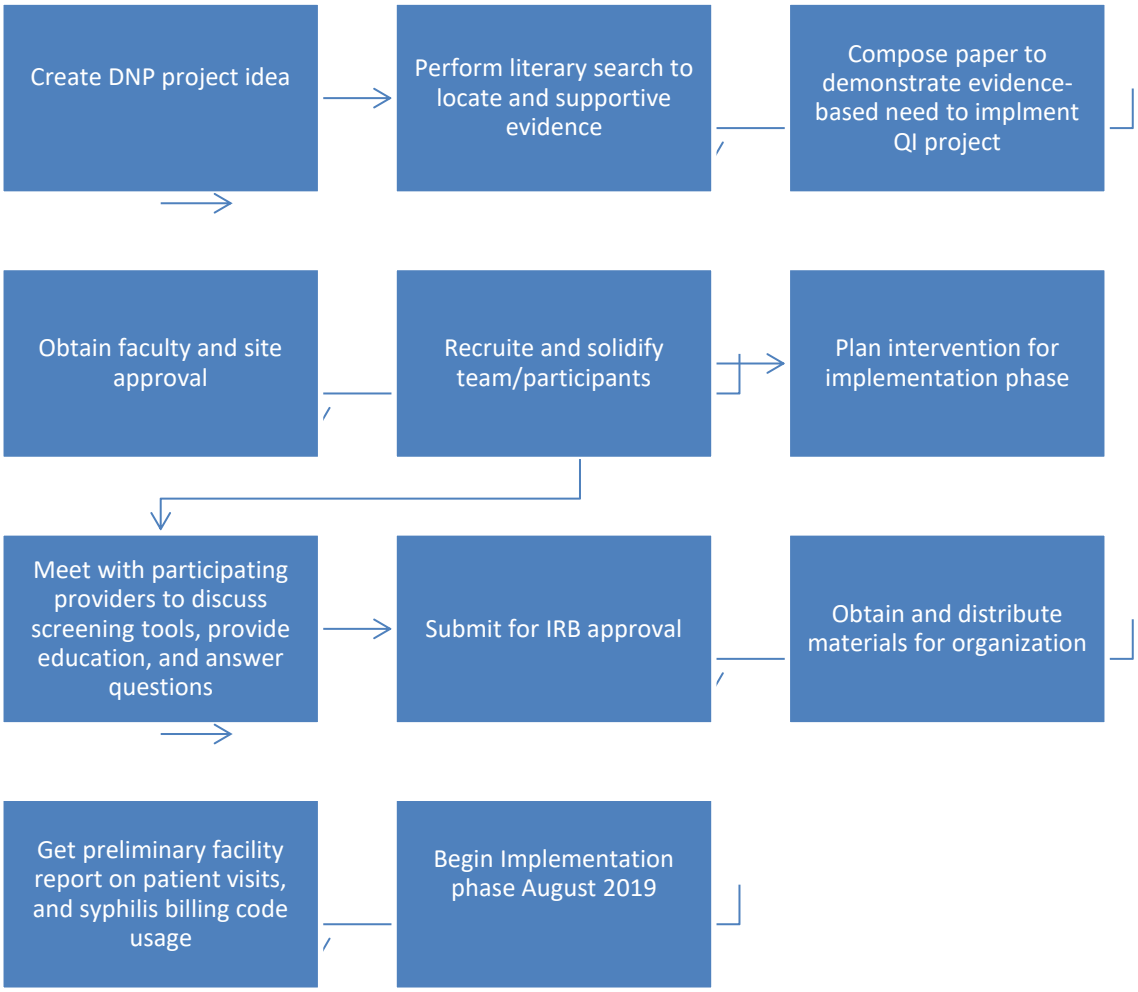
Appendix F.

Evaluation Tool

	Pre-Implementation Data	Week 3 9/25/19-10/15/19	Week 6 10/16/19-11/6/19	Week 9 11/7/19-12/2/19
Number of Adult visits	**2,119**	846	661	681
Number of tools completed	**N/A**	127	22	33
Number of syphilis testing codes	**17**	1	2	3
Number of Patients refused	**N/A**	2	0	0

Appendix G.

Phases of DNP Project



Appendix H.

Quality Improvement/Program Evaluation Self-Certification Tool

Purpose:

Projects that do not meet the federal definition of human research pursuant to 45 CFR 46 do not require IRB review. This tool was developed to assist in the determination of when a project falls outside of the IRB's purview.

Instructions:

Please complete the requested project information, as this document may be used for documentation that IRB review is not required. Select the appropriate answers to each question in the order they appear below. Additional questions may appear based on your answers. If you do not receive a STOP HERE message, the form may be printed as certification that the project is "not research", and does not require IRB review. The IRB will not review your responses as part of the self-certification process.

Name of Project Leader:

Susan Elliott

Project Title:

Implementation of a Screening Tool in a Primary Care Clinic for Syphilis Screenings

Brief description of Project/Goals:

Syphilis is a sexually transmitted infection (STI) that can alternate between periods of active lesions and periods of dormancy. Transmission of this STI can occur in a variety of ways to unsuspecting individuals. A lack of conducting screening and testing within individuals considered high risk can lead to the infection going undetected for years. As the STI remains undiagnosed and untreated, there is an increased risk for the spread of the infection. This QI project seeks to increase syphilis screening, with the outcome goal of increased testing, within an Eastern NC primary care setting. The intervention for this project is to provide a screening tool, to the agreed upon providers, to assess which patients would be appropriate candidates to be offered syphilis testing according to the published guidelines. The implementation of this intervention will occur from August 2019 to December 2019. Before implementation, providers will participate in meetings that include education regarding screening recommendations for syphilis based on the Centers for Disease Control and Prevention and the U. S. Preventive Task Force Guidelines and how to use the screening tool. The collection of identifiable patient information will not occur during this QI project. Analysis of the billing codes for syphilis testing will be conducted before implementation and after the intervention to assess if utilization of the tool resulted in increased syphilis testing at this site.

Will the project involve testing an experimental drug, device (including medical software or assays), or biologic?

- ○ Yes
- ● No

Has the project received funding (e.g. federal, industry) to be conducted as a human subject research study?

- ○ Yes
- ● No

Is this a multi-site project (e.g. there is a coordinating or lead center, more than one site participating, and/or a study-wide protocol)?

- ○ Yes
- ● No

Is this a systematic investigation designed with the intent to contribute to generalizable knowledge (e.g. testing a hypothesis; randomization of subjects; comparison of case vs. control; observational research; comparative effectiveness research; or comparable criteria in alternative research paradigms)?

- ○ Yes
- ● No

Will the results of the project be published, presented or disseminated outside of the institution or program conducting it?

- ○ Yes
- ● No

Based on your responses, the project appears to constitute QI and/or Program Evaluation and IRB review is not required because, in accordance with federal regulations, your project does not constitute research as defined under 45 CFR 46.102(d). If the project results are disseminated, they should be characterized as QI and/or Program Evaluation findings. Finally, if the project changes in any way that might affect the intent or design, please complete this self-certification again to ensure that IRB review is still not required. Click the button below to view a printable version of this form to save with your files, as it serves as documentation that IRB review is not required for this project. 7/19/2019