



Doctor of Nursing Practice at The University of Texas at El Paso

“DIAGNOSIS AND TREATMENT OF URINARY TRACT INFECTION”
8TH ANNUAL DNP PROJECT SYMPOSIUM- MAY 13, 2020

COHORT VIII

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The University of Texas at El Paso

School of Nursing

Doctor of Nursing Practice

DNP Scholarly Project Report

Diagnosis and Treatment of UTI at Gateway Internal Medicine

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Abstract

The project is a quality improvement (QI) initiative with a target population concentrated on adult women, between 18 and 99 years of age, presenting with symptoms of urinary tract infection (UTI). The symptoms are often nonspecific, and dipstick urinalysis lacks adequate specificity; empiric treatment leads to substantial antibiotic exposure that ultimately proves unnecessary. The completion of this QI project came about after a ten-day reflective practice, during which I identified a UTI diagnosis and treatment problem in women at Gateway Internal Medicine in El Paso, Texas. The QI project is aimed at reducing inappropriate outpatient antibiotic use and UTI recurrence by using diagnostics like urine culture before the initial treatment. The project is an evidence-based Practice QI with the use of PDSA methodology to ensure proper diagnosis and treatment as well as antibiotic stewardship to decrease long-term complications. The project was carried out at Gateway Internal Medicine (GIMA) from January 21, 2020, to March 11, 2020. Using Plan-Do-Study-Act (PDSA) quality improvement methodology, a team of four employees was created to spearhead the project. Patients with symptoms of UTI were asked to give a urine sample for culture and sensitivity. There was a telephone encounter follow-up two to three days after the initial visit to update the patient on the results, and a two-week follow-up after treatment. Out of the eighteen patients, fourteen urine cultures were positive with high sensitivity to Nitrofurantoin. Seventeen of the eighteen patients came in for follow-up. The team reviewed current guidelines and ordered sets related to specimen collection, storage, and transportation. The implementation of a standard protocol for urine culture follow-up and the discontinuation of unnecessary antibiotics were effective and safe for all eighteen patients that participated in the project. The antibiotic prescription rate decreased by 36% compared to the previous year.

Keywords: Women UTI, Geriatric infections, Urinary tract infection, Diagnosis of UTI, Treatment of UTI, women UTI treatment, treatment duration, guidelines UTI treatment, Bladder and infection.

Introduction and Background

The most common infection occurring in the United States is urinary tract infection (UTI), accounting for nearly 7 million office visits, 1 million emergency room visits, and 100,000 hospitalizations per year (NCBI, 2015). Significantly more women than men are likely to experience UTIs, with 1 in 3 women having at least 1 episode of UTI necessitating treatment with antibiotics by the age of 24. Nearly half of all women will experience at least one UTI during their lifetime. Acute UTI is a frequent and potentially severe infection if not treated specially in women. Urinary tract infections are the second-most-common infection in noninstitutionalized elderly populations and account for nearly 25% of all diseases. The financial impact of UTIs is significant, with costs of up to \$2 billion per year (NCBI, 2015). The diagnosis of UTI is based on suggestive symptoms, pyuria, and positive urine culture results, but these results may take up to 48 hours to confirm infection. Providers like me, therefore, frequently prescribe empiric antibiotics for a presumed UTI while awaiting the culture results. However, because UTI symptoms are often nonspecific and dipstick urinalysis lacks adequate specificity, empiric treatment leads to substantial antibiotic exposure that ultimately proves unnecessary.

In many health care settings like the emergency room or urgent care, the lack of guaranteed patient follow-up may lower the threshold for providing empiric treatment and thus increase antibiotic overuse. A study of women discharged from the emergency department with empiric antibiotic therapy for a presumed UTI found that only 21% had the diagnosis confirmed

by pyuria and a positive urine culture result (NCBI, 2013). Overconsumption of antibiotics can lead to both immediate and long-term consequences, including the development of *Clostridium difficile*-associated diarrhea, antibiotic-associated adverse events, and the emergence of multidrug-resistant bacteria. Researchers from University College London found that more than 90% of patients diagnosed as having a lower UTI in the emergency department at the Queen Elizabeth Hospital in Birmingham were prescribed an antibiotic.

Reducing inappropriate outpatient antibiotic use is a priority of national programs aimed at curbing the threat of antimicrobial resistance. Positive urine cultures that require a change in patient management are routinely reviewed and acted upon at the clinic. Patients and caregivers are notified of the results and the recommended change in treatment, if warranted, via telephone. Before the present QI project was conducted, however, there was no consistent way of diagnosing and treating UTI at Gateway Internal Medicine. After a 10-day clinical needs assessment of my practice, I documented, reviewed, and reflected upon my findings. I identified three (3) possible opportunities to improve the care I presently provide my patients and picked UTI in women. Evidence shows that other diagnostics like urine culture should be applied before the initial treatment. Even appropriate and judicious empiric UTI therapy will result in unnecessary antibiotic exposure in most patients; therefore, urine culture follow-up and antibiotic discontinuation should be the standard of care in all settings.

Gateway Internal Medicine is an outpatient clinic with one Doctor of Osteopathic, three Family Nurse Practitioners, and fifteen medical assistants. The clinic encounters patients with a variety of chronic and acute illnesses daily. One of the most critical problems I've encountered in my three years at the clinic is urinary tract infection in women. The disease could be of new-onset or recurrent, especially in women. One of my first thoughts upon seeing these patients

with symptoms of UTI was “What can I do for this patient to prevent her from being exposed over time to multiple antibiotics that are going to lead to resistant bacteria?” With the escalation of antibiotic-resistant bacteria, this is a crucial component of treating any infection. As urinary tract infections are incredibly frequent, this is an area where we can see some impact. Urinary tract infection remains one of the most common indications for prescribing antimicrobials to otherwise healthy community-dwelling women.

Despite published guidelines for the optimal selection of an antimicrobial agent and duration of therapy, studies demonstrate a wide variation in prescribing practices (Gupta, 2011). In 1999, the Infectious Diseases Society of America (IDSA) published a clinical practice guideline on the treatment of women with UTI and pyelonephritis. Since then, antimicrobial resistance has increased in uropathogens causing UTI.

Urine culture should increase diagnostic accuracy and allow for specific use of antibiotic therapy. The present article presents the most important diagnostic procedures, together with their role in establishing UTI diagnosis. The gold standard for the determination of a urinary tract infection is the detection of the pathogen in the presence of clinical symptoms. The pathogen is detected and identified by urine culture (Schliemann et al., 2010). The guideline recommendations for the antibiotic treatment of infections of the urinary tract are often not implemented in practice. National and international recommendations warn against the widespread and uncritical use of antibiotics for uncomplicated infections. The high number of prescriptions shows how widely these recommendations are ignored in practice. These prescription practices have led to increasing resistance and endanger the use of antibiotics in severe infections (Schmiemann et al., 2010)

UTI has been an ongoing battle at the clinic, where women visit with complaints of UTI symptoms. The patients are most often prescribed antibiotics, with either symptomatic presentation or dipstick urinalysis without sensitivity result confirmation. As noted above, positive urine culture results may take up to 48 hours to confirm infection. Therefore, providers frequently prescribe empiric antibiotics for a presumed UTI while awaiting the culture results. I realized that the rate of antimicrobial predisposition is escalating, predisposing these patients to antimicrobial resistance and giving rise to recurrent infections.

UTI symptoms are often nonspecific, and empiric treatment leads to substantial antibiotic exposure that ultimately proves unnecessary (International Guidelines, 2010). It describes the relationship of diagnoses, treatment, and outcome to the others under consideration. The literature review identifies new ways to interpret prior research, reveals any gaps that exist, and can be used in a quality improvement project like this project. As noted above, the overconsumption of antibiotics can lead to both immediate and long-term consequences. Reducing inappropriate outpatient antibiotic use is a priority of national programs aimed at curbing the threat of antimicrobial resistance (Song et al., 2008).

Description of the problem

The completion of this quality improvement project came about when I identified a UTI diagnosis and treatment problem in women at Gateway Internal Medicine in El Paso, Texas after a ten day reflective practice. The clinic treats about seventy patients per day with chronic and acute problems. The most cases I encounter daily are women presenting with UTI symptoms; at this office, we often diagnose the patients symptomatically or with a dipstick. Patients are subsequently sent home with antibiotics for five to ten days. For their two-week routine follow-

up visit, the patients treated with the antibiotics will return to the clinic with a recurrence or complaints of the same symptoms.

After a 10-day reflective practice, I documented, reviewed, and reflected upon my findings. I identified five possible PICOT Questions that could be used to improve the care of my patients. I then narrowed the list to three questions before meeting with my Chair and selecting one possible PICOT Question to use in the QI project. With the approval of the Chair, I began a literature review and identified the top three articles with the highest level of evidence validating my quality improvement project. With the evidence for practice change, I approached the medical director, who is also my immediate supervisor and the owner of the clinic, to discuss my intentions with the proven evidence. I discussed my plan to execute and spearhead the project without disrupting the daily clinic routine or patients flow; all were in full support. I have practiced as a full time Family Nurse Practitioner at the clinic for three years, and I am well-versed in my patients' needs; thus I believe it is time to make a practice change that will have a positive impact on the patients as well as the clinic.

The clinic is situated in old Eastside El Paso, where there is a large low-income population, the vast majority being Spanish speakers only. Per American Community Survey data, the number of people in El Paso County, Texas, was 833,592 for 2012-2016. The region has a civilian labor force of 362,814, with a participation rate of 60.0%. Of individuals between the ages of 25 and 64 in El Paso County, Texas, 23.5% have a bachelor's degree or higher, compared to 31.8% nationwide. The median household income in El Paso County, Texas is \$42,075, and the median house value is \$114,700 (Texas.gov, 2017).

The clinic has a total of 22 employees, including one osteopathic doctor, one medical doctor, three Family Nurse practitioners, the billing department, the office Manager, two scribes, and eleven medical assistants. Two medical assistants were assigned to follow-up with the specimen collection and storage and to ensure safe transportation.

The following are the inclusion and exclusion criteria. Female patients evaluated at the clinic with symptoms of UTI with no urine culture previously ordered were eligible for the QI project. Patients were excluded if they were male or younger than 18 years of age, or if they received a diagnosis other than or in addition to UTI, such as acute otitis media, streptococcal pharyngitis, or cellulitis. The culture result was considered negative if it yielded no organisms. IRB determined that this quality improvement project is a practice change, did not meet the definition of human participant research, and did not require patient consent.

Literature Review

The literature search was performed to find a solution to the empiric treatment of UTI at Gateway Internal Medicine clinic. Of the many articles reviewed, ten were picked that were found to be useful in developing a project that can improve and change the quality of care at the clinic. The following databases were used to retrieve articles: MEDLINE, CHOCHRANE, PUBMED, and EBSCO. Ninety-three articles were retrieved in Medline and eighty articles in the Cochrane database. The search was not differentiated by category. I included a total of nineteen articles on diagnostic testing, and the update found sixty-three articles in PubMed. No current articles on diagnostic testing were found in the Cochrane database.

The keywords used were: women, UTI treatment, UTI diagnosis, Current UTI treatment, complicated and uncomplicated UTI, UTI in women, Diagnostic tests UTI, and Course

treatment. Of the hundreds of articles found, only ten were of significance for the quality improvement project.

The literature review search was verified, aimed in supporting the current practice at the clinic in the diagnosis and treatment of UTI in women of the mentioned age. The literature review validated that the treatment of uncomplicated UTI with the use of Nitrofurantoin is the first line. The practice confirmed by the literature review was not working for my patients. At the clinic, we perform microscopy to diagnose UTI, which is supported by the guidelines, but does it lead to over-diagnosis and overtreatment of UTI? I found other literature reviews that support diagnostic tests like urine culture being applied before the initial treatment. This pathway is suggested for proper diagnosis and treatment of UTI, ensuring antibiotic stewardship to decrease long-term complications.

In search of other literature, I came across a guideline from an update by the Infectious Diseases Society of America and the European Society for Microbiology and Infectious Disease states, which noted that the choice of agent should be individualized based on patient allergy and compliance history, local practice patterns, local community resistance prevalence, availability, and patient and provider threshold for failure (2010). Considering the percentage of the patients that return to the clinic with symptoms of recurrence after initial treatment, this approach should be applied to all patients. The evidence shows that a urine culture and susceptibility test should always be performed, and initial empirical therapy should be tailored appropriately based on the infecting uropathogen.

The third literature review shows that strategies for optimizing urine culture when local resistance patterns are not known should be implied to prevent complications that may arise as a

result of recurrence. The evidence shows that the gold standard for a urine test is to perform a bacteriological urine culture, with identification of the pathogen, along with quantification and sensitivity testing. To test whether the patient has a UTI at all, orientating indirect methods are often used in practice to detect the bacteria or inflammation (dipsticks) (NCBI, 2016). The bacterial count may be assessed by urine microscopy and immersion culture media. Additional studies state that urine culture requires the urine sample to be collected and processed with as little contamination as possible. I educated my medical assistants regarding the correct way to collect, store, and transport the specimen at the clinic during the project.

Urine dipsticks are one of the most frequently used instruments for diagnostic testing if there is clinical evidence that a patient is suffering from UTI. Multistix is used, which may be able to detect nitrite (a metabolic product of typical pathogens of the urinary tract), leukocyte esterase, protein, and blood (as a marker of inflammation) (NCBI, 2016). If nitrite is detected, this increases the probability of a urinary tract infection, with a likelihood ratio. However, the sensitivity is relatively low, and it is the type of test used at the clinic. Sensitivity based on a typical history is between 50% and 80%. Immediate therapy, without additional diagnostic testing, is thus an enticing option and is quite conventional in many practices, including at the clinic. This approach implies maximal sensitivity; all cases of UTI are treated, but many false positives are accepted. With the increasing development of resistance, I chose to question the practice and start a quality improvement project to make a change and improve our approach to UTI diagnosis and treatment.

Project Design

The project is an evidence-based, research-supported practice improvement project of patients diagnosed with UTI who returned to their follow-up appointment with unresolved signs and symptoms of UTI after treatment. The selected problem came about after a 10-day reflective practice log (RPL), review of patients, 3 PICOT questions, I selected one, and completed the literature review to determine if there was a better intervention than the current intervention. In my current practice, every patient presenting with the signs and symptoms of UTI was treated empirically with Nitrofurantoin 100mg bid for 5 days. The patients were then scheduled for a follow-up appointment two weeks later to assess whether the patients were improving by eliciting history and physical or by urine dipstick test. The practice was based on the International Clinical Practice Guidelines for the Treatment of Acute Uncomplicated Cystitis and Pyelonephritis in Women. This recommendation did not work effectively for my practice since the cure rate was less than 50% of the patients treated for UTI (2010).

The below-average outcome for these approaches was a red flag that warranted an intervention to improve results. I consequently chose to investigate the problem further with the intention to improve my practice and the quality of care for patients. At this point, urine culture is deemed as an appropriate approach to curb the problem with the support of evidence-based practice. The design of the project was based on the results of the literature review. Urine culture before initial antibiotic initiation was proven to be an effective way of diagnosing UTI in multiple articles reviewed. Urine culture proves to be useful in the diagnosis of UTI than the use of a dipstick urine test in a randomized control trial and a meta-analysis. It is also a preferred source of diagnostic tests in the clinical practice guidelines set forth by the International Clinical

Practice Guidelines for the Treatment of Acute Uncomplicated Cystitis and Pyelonephritis in Women (2010).

The diagnosis and treatment of UTI at this clinic is set to take a different approach than our usual routine. For each female patient between the ages of 18 and 99 that presented with UTI signs and symptoms, a urine specimen was collected for a urine culture before antibiotic initiation. Patients were notified that antibiotics would be prescribed depending on the urine culture results. The patients with negative urine culture results were not given antibiotics but were educated on some home remedies, such as urinating when the need arises, proper hydration, hygiene, and the use of probiotics. For patients with positive results, antibiotics were called in depending on the sensitivity at their preferred pharmacy. A follow-up appointment was scheduled two weeks after the visit for each patient. Patients were given courtesy calls to remind them of their follow-up 24 hours prior. At the follow-up, most patients had no complaints of the symptoms after finishing the course of antibiotics, and thus did not warrant a repeat urine test. The improvement in the patients' condition was noted to determine whether an improvement was achieved.

The project was first discussed with the medical director of the clinic, who is also the owner. He agreed to the plan and allowed the project to be carried out at the clinic. The manager was notified as well, who gave her full support. A meeting was held to explain the project details to the staff, including the providers. All of their questions and concerns were addressed. We utilized patients' preferred pharmacies to call in antibiotics.

The clinic provides services for the adult population, ages 18 and over, at an average of 70 patients per day. This population is about 70% Spanish speakers, and 30% Anglo, African

American, and Asian patients. At the clinic, we accept most health insurances as well as self-pay patients. The staff are primarily of Hispanic origin and are bilingual; except for the providers, we are all mixed race. Two medical assistants were explicitly assigned to this project. The medical assistants triage, collect urine samples, store them appropriately, and send them out as it becomes available. Additionally, the medical assistants schedule follow-up appointments and make calls to remind the patients of their follow-ups. After reviewing the urine culture results, I call the patients to discuss the results and the plan of care.

The clinic provided many resources utilized to make the project a success. Examples of supplies provided at no extra charge from the office are: the specimen cups, gloves, storage of the specimen, and copy paper; the printer was also available for use at any time. The medical assistants were devoted to learning and the thriving successful completion of the project. As I spent more time and focus on the project, the other providers were supportive by picking up most of the patients' load daily.

The PDSA method was used in the QI project to assess the progress and success by providing a straightforward result. The quality improvement in lieu becomes part of the practice's culture, and my team and I continuously put effort toward finding opportunities to improve existing processes. I showed and educated my team on how the framework works, and I reviewed our progress with every step. I started by recruiting four patients during the first week. Following the PDSA model, we had all four stages of the model successfully documented and revised as planned. PLAN: Obtained IRB and work approval. Identify the problem via 10-day reflective practice. Formulate PICOT question. DO: Assess patients that had sign and symptoms of UTI. Urine culture was collected before antibiotic initiation for every patient. Pt were then sent home with home remedies until the results were received from the lab. STUDY: Patients

were seen at follow-up visit after the end of antibiotics for assessment. Results are reported as a descriptive analysis. ACT: The use of urine culture prior to antibiotic initiation was adapted at the clinic due to positive results.

The steps of the project were different from the previous routine at the clinic; for patients with symptoms of UTI, urine specimen was collected first before initiating any antibiotics, and patients were educated on home remedies before discharge. From January 21 through March 11, 2020, I had a medical assistant assigned to specifically triage and check in the population of patients described in the project. Urine specimen was collected, stored properly, and transported within an hour of collection to minimize risk of contamination. The results took about 24 to 48 hours to finalize before I could contact my patient. After the urine culture resulted, I called the patient, discussed the results, and called in antibiotics with instructions.

A verbal script was read to individual patients participating in the project. Patients were notified that the project is a quality improvement that will bring about change to better patient's care. All questions posed by the patients were answered to the best of my expertise, and the patients verbalized understanding. After thoroughly explaining the whole process, the patients were discharged home with home remedies as I awaited the culture results.

The cost of implementing my project was \$210, not including the resources supplied by the clinic. The budget consisted of a one-time lunch for the staff meeting to discuss the quality improvement plan and the success envisioned; the cost of the lunch was \$150. The printer, pens, printing papers, and urine cups were provided by the clinic as mentioned earlier. Transportation of the specimen for all eighteen patients was \$60. The total amount spent was \$210.

While the project was still underway, there were other patients diagnosed with UTI by the other providers working at the clinic. However, the project only applied to the patients to whom I provided care during the timeframe. The project was entirely directed by me, including the data mining and documentation while monitoring the progress in the EHR. No HIPAA violations were encountered during this project.

Finding Outcomes

Fourteen patients of the eighteen that were seen had a positive urine culture diagnosed with UTI. None of the patients given antibiotics had a drug allergy. Thus, antibiotics were prescribed per the sensitivity results; ten of the patients were prescribed Bactrim DS twice daily for three days, and the other four patients were prescribed Nitrofurantoin 100mg twice daily for five days. Each patient was scheduled for a follow-up appointment in two weeks or as needed if symptoms persisted. All eighteen patients were called for their follow-up reminders by the medical assistants. Seventeen patients came for their follow-up appointments.

The patients reported improvement in the signs and symptoms of the UTI after finishing the course of antibiotics. The improvement percentage was calculated using the number of patients that reported no symptoms and the urine culture tested negative, divided by the amount of the total number of patients that returned to their follow-up appointment, multiplied by 100. The results validated a 46% improvement from the previous year. The total antibiotic prescriptions went down by 36%; in the same month of the previous year, it was 86%. The project results proved the literature review's data and success at improving patient care.

The billing department completed the cost-benefit analysis. The total tallied visits for the eighteen patients was forty visits, including sick visits and follow-up visits. During these visits,

urine culture was performed. Patients were treated with either antibiotics or home remedies depending on the culture results. At the evaluation of the cost benefit analysis, it was noted that the reimbursement for each of these visits was \$137 total to \$5,480.

Because the patients had no further complaints, most of the follow-up visits were changed to well visit physical exams. The well visits' reimbursement ranged from \$150 to \$287. The average of these two reimbursements was \$212, and these visits combined brought up the reimbursement from \$5,480 to \$8,125. This calculation was done at an average of \$212 reimbursement. After the evaluation of the cost-benefit analysis, the outcome was positive to the clinic, patients and the insurance companies as well. There was an increase in revenue, and the patient's positive outcome.

The results were disseminated using John Hopkins Nursing Model EBP. Three-step process called PET Used to implement the quality improvement project; Inquiry: 10 -day Reflective Practice. Practice: 18 Patients participated, Urine culture collected as EBP, antibiotics called in. Progress documented in EMR. Learning: patient outcome was positive after 2 weeks follow up. Best Practice: Practice change since the project outcome is positive. The finalized project results were discussed with the medical director, who was on board with the project and in complete support of the practice change. Urine culture as a diagnostic test before antibiotic initiation is now an implemented practice at the clinic. The director also supported the change in follow-up appointments and accepts walk-in patients if the signs and symptoms worsen or do not improve. The flexibility in clinic visits will give the clinic a chance to increase the number of both well visits and annual visits every month, boosting the financial revenue of the clinic.

Evaluation

I had full support from everyone from the beginning, including the medical director and the staff at large. They were receptive to the project and wholeheartedly supportive in assuring the success of the project. The project came about following the 10-day RPL and a PICOT question to achieve a reduction in the rate of recurrent UTI and associated antibiotic resistance in the female population with UTI symptoms. The rate of the antibiotic prescription and the recurrence were calculated the same way as the previous year with the positive results.

The decrease in the antibiotic prescription from the previous year could have changed either positively or negatively depending on the patients' follow-up visits and the treatment plan. For example, if a patient that did not show up for a follow-up still had symptoms or vice versa, both scenarios would affect the outcome percentage.

Revenue increase at the clinic and the patients' outcome were positive outcomes of the project, benefiting the patient, the clinic, the insurance, and the provider. The revenue increase was only projected and not exact due to the differences in the amount reimbursed by the insurance companies with each patient visit.

Conclusion

Urine culture is the preferred diagnostic testing for UTI before antibiotic initiation. Conducting the testing prior to initiation has reduced the percentage of antibiotic prescription by 36% compared to the previous year. The project design was a success with achieving the intended outcome. The result of the project was well-received at the clinic and was shared with the medical director. The collection of urine culture prior to antibiotic initiation has now been implemented at the clinic. The medical director also agreed to have flexibility with the follow-ups, depending on the patient's progress. This flexibility will help increase the clinic revenue.

The implementation of a standard protocol for urine culture follow-up and the discontinuation of unnecessary antibiotics were both effective and safe for all eighteen patients that participated in the project.

Discussion

I recommend this project to any clinician that is experiencing the same problem with the diagnosis and treatment of UTI. The results of the project may provide the most affected population with immeasurable gains in quality of life. UTI symptoms are often nonspecific and dipstick urinalysis lacks adequate specificity; empiric treatment leads to substantial antibiotic exposure that ultimately proves unnecessary. Urine culture should be applied before the initial treatment. This pathway is suggested for proper diagnosis and treatment that ensures antibiotic stewardship to decrease long-term complications.

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Appendix 1-Verbal Scrip

Dear patient

This letter is to inform you that the clinic has partnered with The University of Texas at El Paso (UTEP) to carry out a quality improvement project at Gateway Internal Medicine. The project is a quality improvement initiative with a target population concentrated on adult women, 18 - 99 years of age, presenting with symptoms of UTI. Dipstick urine testing is what we usually use for these populations, and after following up, most of the patients still have the same sign, if not worse. The purpose of this project is to reduce inappropriate outpatient antibiotic use aimed at curbing the threat of antimicrobial resistance by using diagnostics like urine culture before the initial treatment of UTI. This pathway is suggested for proper diagnosis and treatment that ensures antibiotic stewardship to decrease long-term complications. There is no added risk to this intervention. I will follow up with a telephone call once I get the results and discuss the plan of care individually. Also, the patients can come in follow up as needed if the symptoms do not alleviate or get worse.

The project information will be kept confidential per HIPPA regulations. The results of the project are shared with the following parties; Dr. Morales, who is the Chair of this project, the medical director of the clinic, the other three practitioners, and the DNP Symposium in May 2020. Thank you for your attention, and if you have any questions, please contact Kathra Wickam, APRN, FNP-C at this clinic.

Kathra Wickam, APRN, FNP-C

DNP Nursing Student