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Nurse Driven Antibiotic Stewardship

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“Nurse Driven Antibiotic Stewardship”

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NURSE DRIVEN ANTIBIOTIC STEWARDSHIP

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Abstract

Antibiotic use has increased tremendously and has led to antimicrobial resistance. Because it is a growing problem across healthcare systems around the world, healthcare systems and organizations must combat the detrimental effects of inappropriate use of antibiotics. The development of antibiotic stewardship programs is crucial to providing high quality, safe patient care. The work of this project intends to form a basic understanding of a nurses' role as a member of the antibiotic team. Most healthcare systems have operated by a pharmacy driven antibiotic team concept and have just recently included nurses as a missing component to a full functioning team. Antibiotic stewardship teams need nursing engagement to lead evidence-based nursing practice and culture change to sustain antibiotic stewardship programs. Much like other models driven by nurses for Central Line Associated Blood Stream Infection and Catheter Associated Urinary Tract Infection, healthcare professionals now believe nurses can help develop sustainable antibiotic stewardship protocols. Frontline nurses can be the driving force to implement nurse driven protocols because bedside nurses spend the most time with patients and their families. Nurses are often patient educators and advocates for any patient concerns. Nurses are at the forefront of patient care to identify safety concerns involving antibiotic appropriate use.

Dedication

I dedicate this to my three children, my husband, my parents, siblings, and my extended family. My family provided me with the support and love I needed to pursue my educational and professional goals. We often lean on each other because of the teachings provided by my parents. I have learned and observed my parents to always put family first. I now can share those teachings with my own family.

Although my grandmother lost her battle to cancer, she was with me in spirit. Her teachings to get an education was spoken to me often and that has remained with me until this day. My grandmother was a strong, beautiful woman who never stopped encouraging me. The loss of her physical presence is undoubtedly felt, but I know she is smiling down on me because I fulfilled a dream, she was unable to. Ayóó ánííníshní (I love you).

Acknowledgements

Dr. Liesveld, you have been a great support to me during my DNP journey. I appreciate you giving me encouraging words to make me feel at ease. Your sweet nature reflects your unwavering ability to assist students in a very caring way. I was very drawn to you because of your experience of working on the Navajo Nation early in your career. I am ever grateful to your dedication to get me through till the end and you will be missed indefinitely.

Dr. Cole, you also have been such a great role model. I almost feel that we instantly connected, and I was able to talk to you when I needed someone to talk to about what was going on in my life. We have both experienced similar life events, which only solidified our unique relationship. Thank you for listening to me and offering guidance and most importantly encouragement that I am on the right track.

Dr. Delucas, I sincerely appreciate your commitment to making me feel that I have the potential to advance, and you offered your guidance for me to be open to change. You also devoted time to meet with me to help me get through some difficult times when I needed it the most.

Each of you has a special place in my heart. Thank you so much for the opportunity to become a part of the UNM nursing community and showing me that I am surrounded by truly caring nursing colleagues who only want to share their wealth of knowledge and experience. A'he'hee (Thank you).

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CHAPTER 1: INTRODUCTION AND BACKGROUND

Antibiotic stewardship programs (ASP) are crucial to nursing practice to ensure patient safety and to conserve the effectiveness of antibiotics. The American Nurses Association (ANA) and Centers for Disease Control (CDC) joined efforts to promote and emphasize antibiotic stewardship as a patient safety issue and bring to light the great need to include nurses as a key member of the ASP team. Antibiotic use may impose negative consequences such as Clostridium Difficile Infection (CDI), adverse drug reactions, and emerging microbial resistance. ASPs can also promote cost savings. According to the World Health Organization (2013) antibiotic resistance is a global health threat. “In the United States alone, 2 million individuals acquire an infection resistant to antibiotics, and 23,000 will die as a result of these infections each year,” (Carter, Manning, & Pogorzelska-Maziarz, 2019, p. 591). CDI is easily transmitted and contributes to the increase of infections in hospitals worldwide. Unintended antibiotic use and overly prescribing antibiotics significantly impacts patients acquiring CDI and other multi-drug resistant organisms (MDROs).

In 2014, the CDC developed the *Core Elements of Hospital Antibiotic Stewardship Programs*, outlining seven components: leadership commitment, accountability, drug expertise, action, tracking, reporting, and education (ANA, 2017). In 2017, the Joint Commission mandated for accredited hospitals to establish an ASP under the medication management elements of performance. The Centers for Medicare and Medicaid released a final rule requiring participating hospitals to develop and implement ASPs by March 2020 (CMS, 2019). Antibiotic resistance impacts health care systems increasing costs, and unnecessarily takes precious lives. It is

important for health care organizations to implement preventive measures and strategies to decrease antibiotic resistance and to assist health care providers to make better clinical decisions when prescribing antibiotics.

Problem Statement

Chinle Comprehensive Health Care Facility (CCHCF) identified a problem with increased rates of community onset CDI (CO-CDI). The current ASP is pharmacy driven and lacks the guidance of an infectious disease physician. It is crucial to gain a better understanding of the nurses' attitudes, beliefs, and confidence of antibiotic stewardship. The lack of awareness and knowledge of antibiotic stewardship practices may negatively impact patient care. Nurses are patient advocates and are often utilized to help educate patients about their health care. The issue deserves attention because ASPs are needed to combat the fight against antimicrobial resistance and nurses must increase their knowledge to define their role in an ASP. Nurses need to engage in a multidisciplinary effort to address a critical need to expand antibiotic stewardship and recognize nurses play an essential role in patient safety and quality improvement (ANA, 2017). It is important for nursing staff to become more aware and familiar with concepts of a nurse driven ASP to gain a better understanding of the benefits of positive patient outcomes. A nurse driven ASP can foster professional growth and promote evidence-based practice (EBP) by developing and implementing established guidelines to help decrease antibiotic resistance and the emergence of multi-drug resistant organisms (MDROs). Frontline nurses, nurse educators, and nurse executives all play a central role to promote antibiotic stewardship practices and

activities. Nurses are potentially the driving force to sustain an ASP since nurses spend more time at the bedside and are viewed as the most trusted profession.

PICOT Question

The purpose of this study is to gain insight of the nurses' attitudes, beliefs, confidence and their role in an ASP by offering a training specific to antibiotic stewardship. The data gathered will contribute recommendations for next steps toward implementation of a nurse driven ASP. The PICOT question for this scholarly project was: "How does a presentation of antibiotic stewardship change the attitudes, role importance, and confidence of nurses and antibiotic stewardship at three different time points (pre, post, and 1 month follow up)?"

Objectives and Aims

The short-term objective of this study was to recruit nurses to participate in a survey at 3 different time points. These timepoints are identified as before, immediately after and at 1 month follow-up after the antibiotic stewardship presentation. Another objective was to introduce a formal training method to the CCHCF nursing staff. The aim of the study is to gain a better understanding of nurses' attitude, role importance, and confidence of antibiotic stewardship practices and more importantly what is their role in an ASP.

CHAPTER 2: REVIEW OF LITERATURE

This scholarly project focused on investigating strategies for antibiotic stewardship. The evidence-based practice literature of the PICOT question was found using the CINAHL database. Efficacy of antibiotic stewardship was used in the first search in the CINAHL database.

A more specific search was needed because many articles were found with such a broad title. Key words used: Antibiotic stewardship and nurse were used in the second search for literature support and produced articles related to nurse and antibiotic stewardship. There was limited research specific to a nurse driven antibiotic stewardship. However, the search had generated several articles related to nurses' involvement in an ASP.

Beliefs, Attitudes, and Role Perceptions

According to Monsees, Popejoy, & Lee (2018), 21% nurses who had worked less than five years were not as familiar with the term antibiotic stewardship but 69% of all respondents agreed or strongly agreed that they knew what the term antibiotic stewardship meant. In another study by Abbas, Cooper & Bearman (2019), it was found that most respondents (99.4%) recognized a role in ASP alongside physicians and pharmacists. However, in both studies, nurses were not able to clearly define their role in ASP. The ANA/CDC whitepaper emphasizes "this central role puts nurses in a unique and vital position in optimizing antibiotic use," (ANA, 2017, p. 4).

Challenges and Barriers

Greendyke, Furuya, Srinivasan, Shelley, Bothra, Saiman, & Larson (2018) found nurses wanted to assist in ASP but faced challenges and barriers. These challenges and barriers included lack of formal education or knowledge of antibiotic stewardship practices, lack of accountability and lack of awareness. In another study by Carter, et al (2018) nurses were resistant due to perceptions of exceeding their scope of practice when collecting accurate penicillin drug allergy

history or conducting an antibiotic timeout with full participation. Nurses also listed additional challenges between nursing practice and patient outcomes which could potentially lead to prescriber and family pushback. Nurses sensed they were working outside of their scope and maybe lead to prescriber pushback. Nurses also found that family members wanted to hear from the medical provider more about antibiotics and not the nurse. Nurses expressed patient education about antibiotic use was done but the family did not want to listen to them.

Interestingly, it was found by Wong, et al (2020) that “the lack of patient’s trust in nurses would at time impede the nurses’ work.” (p. 479). However, nurses were afraid to provide incorrect information about antibiotic use which may jeopardize the patient’s health and safety (Wong, 2020). Similarly, Abbass, et al (2019) noted time constraints and provider pushback as major barriers to include nursing participation in ASPs.

Lack of Education and Knowledge

There is an overwhelming response from nurses of the lack of awareness and knowledge to empower nurses to extend their role as patient advocates. According to Wong (2020), “continuing nursing education on infections and antibiotics, including updates on the hospital’s antibiotic treatment guidelines, can equip nurses with the knowledge and skills to better perform their roles as antibiotic stewards, as well as the future role of nurse prescribers,” (p. 480).

Monsees, Popejoy & Lee (2018) found there are multiple opportunities for nurse to receive additional education in microbiology and principles of antibiotic use. This recommendation coincides with the ANA (2017) whitepaper that educational needs apply to nurses in training and to nurses currently in clinical practice to successfully integrate nurses’ input and engagement

efforts to lead culture change. In addition, there is a call to address the importance of emphasizing antibiotic use and stewardship practices in nursing schools. Education opportunities should be offered and available to “nursing students, nurses in new-hire orientation and as continuing education for practicing nurses,” (ANA, 2017, p. 12). Evidence-based nurse driven antibiotic stewardship training are needed to empower nurses to extend their roles as patient advocates and educators.

Cost Benefit

Drekonja, Filice, Greer, Olson, Macdonald, Rutks, Butler & Wilt’s (2015) systematic review focused on the effectiveness of outpatient antimicrobial stewardship programs on prescribing antibiotics, patient outcomes, and costs. Low to moderate strength evidence suggested that ASP improves antibiotic prescribing without adversely effecting patient outcomes. ASP effectiveness depended on the type of program implemented. Wong (2020) recognized that including nurses as a part of the antibiotic team “could potentially lead to substantial cost savings for the organization as nurses become empowered to help reduce inappropriate prescribing practices,” (p. 481).

Nursing Leadership

Nurse leadership support of antibiotic stewardship is crucial to an ASP. Carter, Manning & Pogorzelska-Maziarz (2019) found 49% of survey participants reported that nursing leaders support nurses’ engagement in antibiotic stewardship, yet 42% fewer than half of respondents (n = 96) reported the presence of a designated nurse executive champion for stewardship activities.

“Nurse leaders are critical to the initiation and sustainment of such participation,” (p. 593).

Carter et al. developed four key recommendations for nurse leaders to fully engage and support clinical nurses in their endeavors to become fully active in ASP. The first recommendation is to embrace a shared vision and understanding of the nurses’ role in antibiotic stewardship; the second is to frame a nurse’s perspective and understanding of antibiotic stewardship as an extension of the nurses’ role in patient advocacy and to share the impact of their role based on patient outcomes. The third recommendation is for nurse leaders to acknowledge the need for ongoing education to support the nurses’ ability to fulfil their role. The last recommendation focuses on nurse leaders to spearhead and evaluate the nurse’s role in an ASP to quantify the integration of nurses to an ASP team and the relevant outcome measures. The ANA (2017) Whitepaper discusses that “nurse executives are in a prime position to influence ASPs,” (p. 8). Similarly, Monsees, Lee, Wirtz & Goldman, (2020) study reiterates that nurse leaders are crucial to developing unit-based and organizational level patient safety priorities and formalizing strategic direction for clinic teams to meet their ASP objectives. Direct nurse care leaders are essential to develop innovative nurse-driven tools to help implement components of antibiotic stewardship practices.

Literature Summary

The literature review identified the need for education and nurse leadership involvement. Nurses face barriers and challenges due to their lack of knowledge and inability to fully extend their role as a patient advocate involving antibiotic stewardship. Lack of education and formal training was viewed to be an important factor in the overall effectiveness of an ASP. Nurses

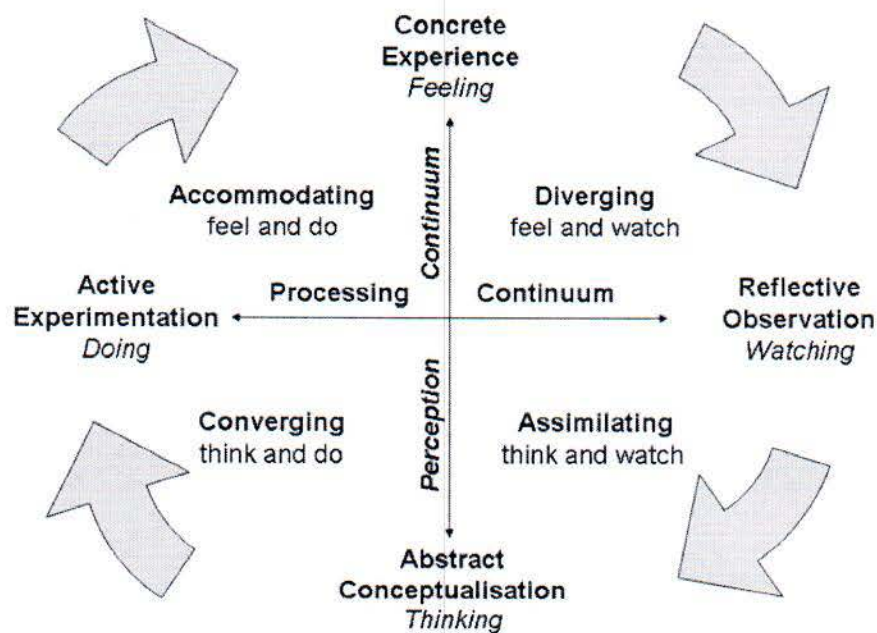
voiced frustration that they could not fully pursue ASP responsibilities if the tools such as guidelines and algorithms were unavailable. Formal training and other types of continuing education, including pre-licensure and post-licensure nurses are needed to increase the knowledge and awareness of nurses to engage and lead changes to implement ASP processes with positive patient outcomes. There is limited research of a nursing's role in ASPs and the extent of nurses' involvement in stewardship practices.

CHAPTER 3: THEORETICAL MODEL AND METHODOLOGY

Theoretical Model

Kolb's Experiential Learning Cycle

Kolb's Experiential Learning Cycle was used for this project. Kolb's Experiential Learning Cycle is based on the theory that "knowledge is created through the transformation of experience" (Murray, 2018, p. 2). The basic premise of this model focuses on meeting the four central stages of learning. The four stages are concrete experiences, reflective observation, abstract conceptualization, and active experimentation (see Figure 1).



(McLeod, 2017)

Figure 1. Kolb's Learning Cycle

The model provided the most appropriate framework for this project. Kolb's learning theory's primary focus is to engage students with learning by involving one's feelings, observations and experiences. The concrete experience stage (feeling) is the basis of learning. Learning emerges upon reflective observation (watching) by being actively involved in new experiences to drive the learner to the abstract conceptualization (thinking) stage. The student moves into the active experimentation phase (doing) by testing the new idea and concepts into practice and in real life situations. This model is useful as a basis of learning for nursing practice including learning about antibiotic stewardship programs.

Chinle Service Unit Performance Improvement Cycle

The Chinle Service Unit (CSU) Performance Improvement Cycle was also used for this project as it focuses on integrating four perspectives to drive quality improvement. The four cardinal directions are used as a guide to walk the path of beauty following Navajo traditional and culture values. The four stages are: Thinking (East), Planning (South), Implementing (South), and Reflecting (North). Each stage is depicted as a cycle like Kolb's four central stages of experiential learning.

This model integrates Navajo beliefs and culture into a process improvement cycle which begins in the East direction entering the doorway of commitment and accountability. This stage is often where ideas and brainstorming are done to identify gaps or problems. The identified problem is antibiotic use and the need to help educate nurses and other staff to follow guidelines and recommendations to decrease unnecessary use. Moving to the South or planning stage, a potential test of changes (or small interventions) is developed to address the problem. In this stage, education was identified as an intervention. In the West direction or implementing stage, nurses can learn the ASP principles and use their new knowledge to gain experience of incorporating ASP practices into patient care. In the North or reflecting stage, the test of change or intervention is evaluated. In this stage, nurses may reflect on the learning they received and potentially think of other ways to implement and sustain into daily patient care workflows.

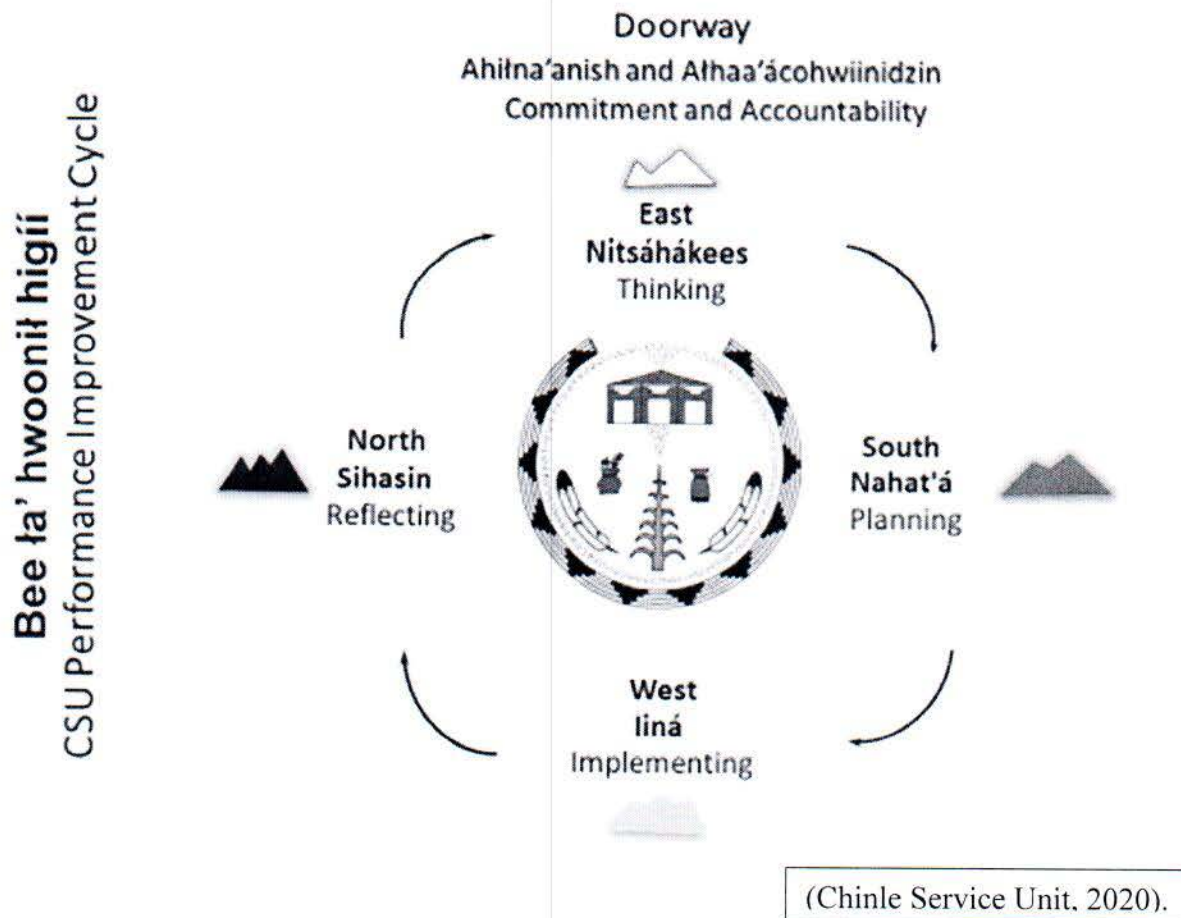


Figure 2. Chinle Service Unit Performance Improvement Cycle.

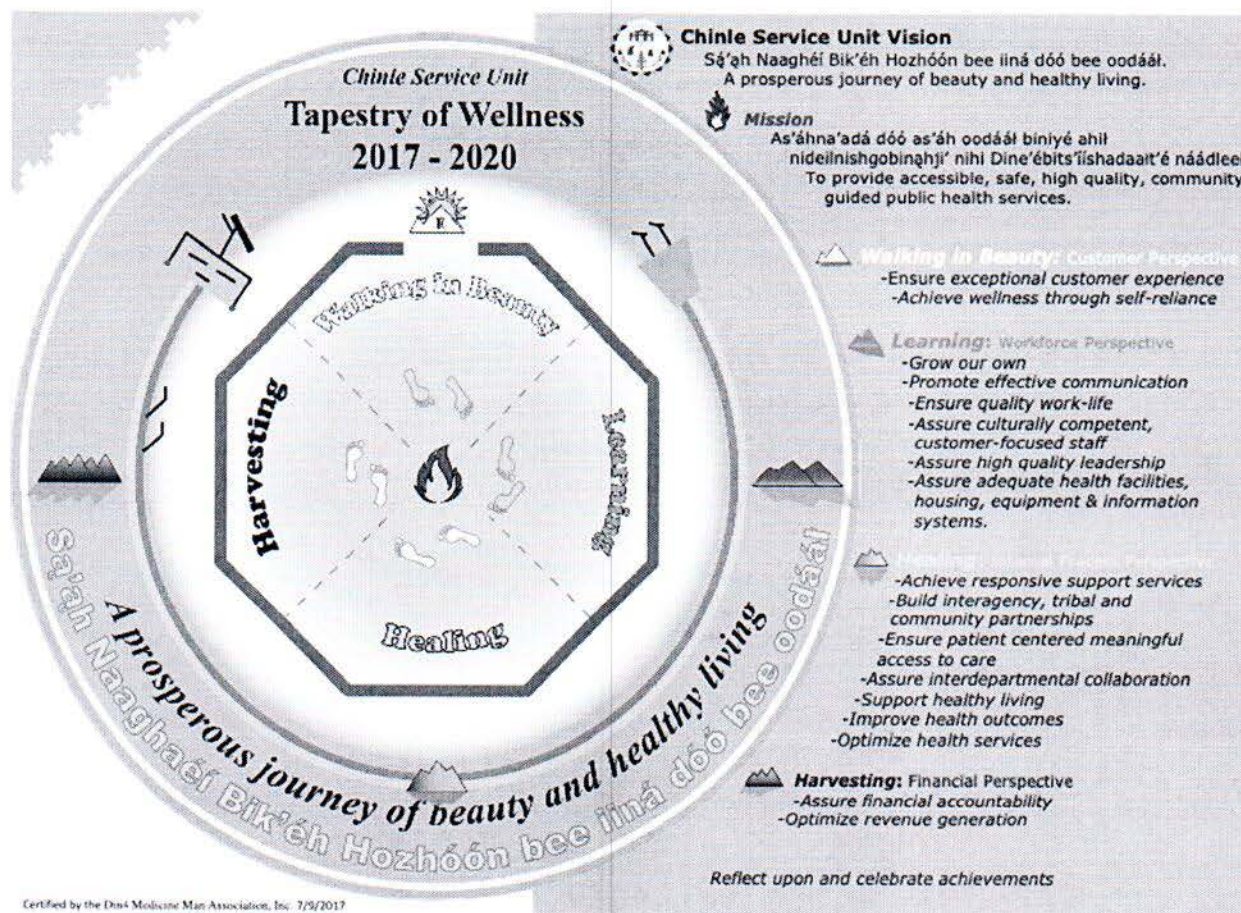
Chinle Service Unit Tapestry of Wellness

The Tapestry of Wellness (TOW) strategic plan mission is “To provide accessible, safe, high quality, community guided public health services.” and our vision is “A Prosperous Journey of Beauty and Healthy Living,” (Chinle Service Unit QAPI Plan FY2021, 2020, p. 2). The four perspectives include Walking in Beauty (Customer Service), Learning (Workforce), Healing (Internal Process) and Harvesting (Financial).

The TOW strategic objectives are in four main perspectives:

- East: Walking in Beauty - Customer Perspective – An ASP requires effective communication and helping Navajo patients understand appropriate antibiotic use
- South: Learning - Workforce Perspective – Engaging nurses and other healthcare providers to learn about antibiotic stewardship practices to promote effective communication.
- West: Healing - Internal Process Perspective promotes interdepartmental collaboration by working together to develop sustainable protocols, guidelines and policy to improve patient outcomes and optimize health services by decreasing inappropriate antibiotic use. Establishing partnerships with other entities, like Arizona Department of Health Services was achieved in this stage.
- North: Harvesting - Financial Perspective – implementation of an ASP will be a cost benefit to the organization and the patients.

This model was appropriate for this project to address knowledge gaps and the increase of CDI cases which may impact patient outcomes. The model informed the study to initiate quality improvement processes within the four perspectives to effectively promote antibiotic stewardship practices.



(Chinle Service Unit, 2020)

Figure 3. Chinle Service Unit Tapestry of Wellness

Ethics and Human Subjects Protection

In addition to the University of New Mexico (UNM) Institutional Review Board (IRB) approval, other IRBs were needed for this project due to tribal and federal jurisdiction involvement. The Chinle Service Unit Executive Committee, Central Navajo Health Board, Chinle Agency Council, and the Navajo Nation Department of Health Navajo Human Research Review Board (NNHRRB) approvals were submitted and obtained.

Methodology

This study collected participant data by surveying registered nurses (RNs) employed at Chinle Service Unit. The 30 survey questions consisted of antibiotic stewardship global attitudes, role importance and confidence using a Likert Scale ranging from 1 (strongly disagree), 2 (disagree), 3 (neither agree nor disagree), 4 (agree), to 5 (strongly agree). Participants were not required to complete the survey. Surveys were distributed at three time points which were pre-intervention, post-intervention at two weeks and at one month post follow up. The intervention was a two-hour formal training about antibiotic stewardship. The Arizona Department of Health Services (ADHS) Healthcare-associated Infection (HAI) epidemiologist presented basic principles of antibiotic stewardship practices. The same presentation was offered at two different times to increase participation for interested hospital staff and to also accommodate nursing staff working the night shift.

Study Population

There were four categories of nurses included in the project: staff nurse, nurse manager/director, nurse educator, and other. The nurses were from the CSU boundaries which included CCHCF, Pinon Health Center (PHC) and Tsaile Health Center (THC). Participants were recruited via email and a consent was signed by each participant to proceed with the Antibiotic Stewardship Program Registered Nurse (ASP RN) survey (see Appendix A). Permission was obtained from a fellow antibiotic researcher to use the ASP RN survey. This

survey was one of the first surveys used to ask RNs about ASP.



Figure 4. Project Timeline.

The online survey focused on RNs attitudes, role importance and confidence in an ASP. Participants also were given the opportunity to leave comments as a free text. The Research Electronic Data Capture (REDCap) application collected and stored data. Data was analyzed using the SPSS software Version 26.

Chapter 4: RESULTS AND DISCUSSION

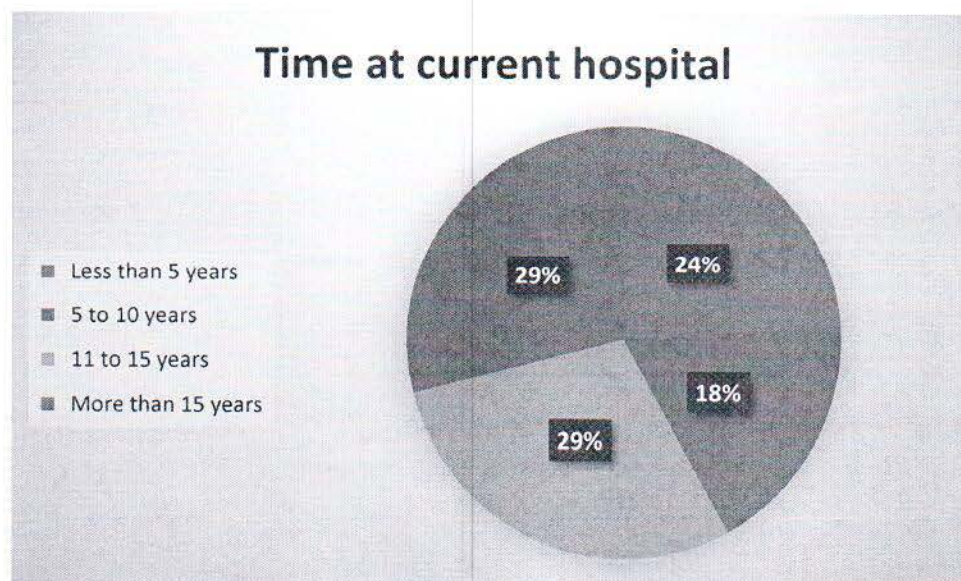
Data Analysis

Initially, 17 RNs completed the pre-intervention survey. Five participants completed the post-intervention survey, and 3 participants completed the one month follow up survey. All participants ($n = 17$) comprised of Registered Nurses. Most participants (53%) graduated from nursing school fifteen or more years ago. In comparison, 6% of participants ($n = 1$) had graduated from nursing school 1 to 5 years ago. Five participants (29%) were employed at Chinle Service Unit (CSU) for 11-15 years and an additional 5 participants (29%) were employed at CSU for more than 15 years. Of the total nurses, 24% ($n = 4$) had spent 1-5 years at CSU and 23% of

participants ($n = 6$) reported the Pediatric Care Unit as their primary unit. Of the nurse participants, 47% of nurses ($n = 8$) reported their primary role as a nurse manager or director and staff nurses comprised of 41% of participants ($n = 7$). Lastly, 94% of nurses reported they were not nursing contractors.

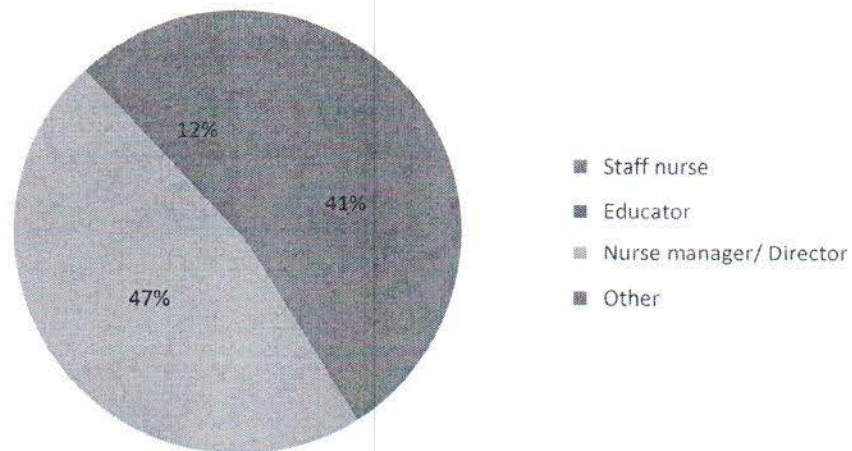
Table 1. Baseline characteristics of study participants ($N = 17$)

	<i>n</i>	%
Time since graduation from nursing school		
Less than 1 year	0	0
1 to 5 years	1	6
6 to 10 years	3	17
11 to 15 years	4	24
More than 15 years	9	53
Time at current hospital		
Less than 5 years	4	24
5 to 10 years	3	18
11 to 15 years	5	29
More than 15 years	5	29



	<i>n</i>	%
Primary patient unit		
Special Care Unit	2	8
Pediatric Care Unit	6	23
Medical Unit/ Adult Care Unit	2	8
Obstetrical Care Unit	4	15
Surgical Unit/ OR	2	8
Urgent Care	2	8
ER	3	11
Public Health Department	1	8
Ambulatory Clinic	4	15
Primary nursing role		
Staff nurse	7	41
Educator	0	0
Nurse manager/ Director	8	47
Other	2	12
I work as a traveler nurse for this hospital		
Yes	1	6
No	16	94

Primary nursing role



The Wilcoxon signed rank test was used due to the small sample size of the two intervals after the pre-intervention survey. Among those who responded to both surveys, the global attitudes scores ($M = 2.75$; $SD = 0.97$) from baseline ($n = 5$) to post global attitude scores ($M = 2.20$; $SD = 0.45$) decreased by 0.25. Role importance baseline scores ($M = 4.66$; $SD = 0.63$) was slightly increased by 0.07. There was no change in the confidence score from baseline ($M = 4.30$; $SD = 1.15$) to post intervention ($M = 4.30$; $SD = 0.56$). Wilcoxon signed rank test revealed no statistically significant differences in global attitudes following participation ($n = 5$) in a training session, $z = -1.62$, $p > 0.05$, with a large effect size ($r = 0.72$); for role importance, $z = 1.50$, $p > 0.05$, with a large effect size ($r = 0.67$); for confidence, $z = 0.54$, $p > 0.05$ with a small effect size ($r = 0.24$).

When comparing follow up scores at one month ($n = 3$) to baseline, global attitude scores ($M = 2.25$; $SD = 0.25$) and confidence scores ($M = 3.73$ $SD = 0.21$) and role importance scores ($M = 4.78$; $SD = 0.38$) all decreased from baseline. Wilcoxon signed rank test revealed no statistically significant differences in global attitudes at one month follow-up ($n = 3$) after a training session, $z = 0.82$, $p > 0.05$, with a large effect size ($r = 0.47$); for role importance, $z = 0.45$, $p > 0.05$, with a medium effect size ($r = 0.26$); for confidence, $z = 1.07$, $p > 0.05$, with a large effect size ($r = 0.62$).

Table 2. Beliefs regarding antibiotic stewardship across study phases

	Baseline ($n = 17$) M (SD)	Baseline ($n = 5$) M (SD)	Post ($n = 5$) M (SD)	Baseline ($n = 3$) M (SD)	Follow up ($n = 3$) M (SD)
Global attitudes	2.52 (0.59)	2.75 (0.97)	2.20 (0.45)	2.50 (1.00)	2.25 (0.25)
Role importance	4.48 (0.43)	4.66 (0.63)	4.73 (0.48)	4.87 (0.51)	4.78 (0.38)
Confidence	3.96 (0.38)	4.30 (1.15)	4.30 (0.56)	4.10 (1.18)	3.73 (0.21)

Table 3. Beliefs regarding antibiotic stewardship across study phases

	Post vs. Baseline <i>z</i> (<i>r</i>)	Follow up vs. Baseline <i>z</i> (<i>r</i>)
Global attitudes	1.62 (0.72)	0.82 (0.47)
Role importance	1.50 (0.67)	0.45 (0.26)
Confidence	0.54 (0.24)	1.07 (0.62)

In summary, there were no statistically significant differences observed. Direction of change was mixed with decreases, no change, and increase in means observed. Effect sizes for differences were also mixed with small, medium, and large effect sizes observed.

Discussion

Nurses are integral members of an ASP team. “Nurses are in a pivotal position to positively influence antimicrobial management due to their consistent presence in health care delivery,” (Gotterson, Buisin & Manias, 2021, p. 2). More education is needed to help nurses learn more about antibiotic stewardship practices and their role in an ASP. Evidence-based nursing practice is essential to the sustainment of an effective ASP. Bedside nurses may hold the key to leading and promoting ASP changes to a more nurse driven ASP.

Nurses have overwhelmingly voiced their need for more education. Antibiotic stewardship education is essential to formalizing a foundation basis for nurse driven ASPs. This much needed education must be focused on microbiology, pharmacology and antibiotic resistance. Formal educational modules are crucial to student nurses, new hire nurses, and practicing nurses. Case studies and simulations should be developed to help nurses work through various case scenarios

to critically think and utilize the resources available to them. These types of resources could be algorithms, guidelines and recommendations tailored to their healthcare setting and population.

In addition to formal education, competencies are scarce and limited. Competencies will assist ASPs by ensuring all healthcare providers are able to perform basic antibiotic practices in a structured manner. This may include obtaining and collecting appropriate urine and blood cultures, thoroughly assessing allergies, appropriate antibiotic use, fundamentals of infection management and antibiotic resistance. Not only can competencies solidify practice but sharing of knowledge and teaching fellow healthcare providers about antibiotic stewardship can promote more informal teaching. The possibility of using antibiotic steward champions to promote new practices in the healthcare setting may bridge the gap between patients, nurses, and providers. E-learning modules may be another method to assist healthcare providers to learn at their own pace. Learning can be individualized and done numerous ways to meet the needs of each healthcare provider.

Implications for Practice

Organizational policy is a steppingstone for antibiotic stewards. Policy can help guide healthcare staff to follow current ASP guidelines to enhance safety priorities and formalize strategic direction (Monsees, Lee, Wirtz & Goldman, 2020). When guidelines change, policy can be revised and changed when the ASP team feels the need to do so. Policy can also place accountability on all staff to uphold their organizational policy. Leaders must actively participate in ASP to support their teams. Nurse executives are essential to the implementation of leading nurse driven ASPs and provide perspective to formulating plans to sustain any process change to

positively impact patient care. The ANA (2017) states “nurse executives are in the prime position to influence ASPs,” (p. 8).

Strengths and Limitations

Nurses were found to want to learn more about antibiotic stewardship practices. Nurses do not need additional reasons to become antibiotic stewards. Nurses view their role as an extension of a patient advocate and do believe antibiotic stewardship practices are within their scope of practice.

Limitations include a small sample at the post and follow up time intervals. The decrease in survey responses could possibly have been affected by CSU response to the COVID-19 pandemic in March and April 2020. The surveys were emailed to participants to complete during this specific timeframe. More research is needed to clearly define the nurses’ role in an ASP.

Conclusion

Nurses must engage in development of evidence-based nursing driven protocols for ASP, Nurses leaders must offer and give support to the nurses’ involvement and engagement in an ASP (Carter & Pogorzelska-Maziarz, 2019). Nurses are innately connected to being viewed as a patient advocate and are essential to leading the way to ensure patient safety. Nurses must feel empowered to influence change by working to improve patient measures and outcomes.

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APPENDICES

Appendix A: ASP RN SURVEY

Please complete the survey below.

Thank you!

Antibiotic Stewardship Programs (ASP) are designed to improve antibiotic use, to address concerns around rising bacterial resistance rates and enhance the quality and safety of clinical care (Centers for Disease Control and Prevention [CDC], 2015). Literature suggests that ASPs led by infectious disease physicians and pharmacists with specialized training have been influential in decreasing unnecessary antibiotic prescribing, enhancing appropriate use, decreasing cost, and influencing patient outcomes in acute care settings.

This survey is intended to help us understand how nurses' view their role in antibiotic stewardship.

Please select the answer that most appropriately describes your knowledge, expertise, and/or comfort level in the areas outlined below that describe antibiotic stewardship activities nurses are likely to participate in.

Are you a registered nurse (RN)?

☐ Yes

☐ No

Thank you for your interest! At this time we are seeking registered nurse participants.

The next series of questions focuses on your knowledge, expertise and confidence level relative to antibiotic stewardship related to your role as a nurse.

antibiotic route from IV to PO.

17) Educating patients and/or families about the importance of taking antibiotics correctly to reduce bacterial resistance and expected side effects is important for my practice.

☐ ☐ ☐ ☐ ☐ ☐

18) I am confident educating patients and/or families about the importance of taking antibiotics correctly to reduce bacterial resistance and expected side effects.

☐ ☐ ☐ ☐ ☐ ☐

19) I am confident in my understanding of the relationship between antibiotic use and acquiring C. difficile.

☐ ☐ ☐ ☐ ☐ ☐

20) Limiting antibiotic use to prevent C. difficile is important for my practice.

☐ ☐ ☐ ☐ ☐ ☐

Antibiotic Stewardship

1) If an antibiotic is ordered electronically for a patient with suspected sepsis, it generally takes _____ before the first antibiotic dose is available to administer.

☐ > 2 hours

☒ 1 - 2 hours

☐ 30 minutes to 1 hour

☐ < 30 minutes

2) I know what antibiotic stewardship means.

☐ Strongly Agree

☐ Agree

☐ Neither Agree nor Disagree

☐ Disagree

☐ Strongly Disagree

3) I perceive that staff nurses on my unit function as antibiotic stewards.

☐ Strongly Agree

☐ Agree

☐ Neither Agree nor Disagree

☐ Disagree

☐ Strongly Disagree

4) Staff nurses need to be more involved in antibiotic stewardship.

☐ Strongly Agree

☐ Agree

☐ Neither Agree nor Disagree

☐ Disagree

☐ Strongly Disagree

5) Is there anything else you would like to tell us about the nurse's role in antibiotic stewardship at Chinle Comprehensive Health Care Facility (CCHCF)?

6) Please share any barriers you experience as an antibiotic steward.

Demographics

Please review your role and clinical experience at CCHCF.

1) I graduated from nursing school...

☐ Less than 1 year ago

☐ 1-5 years ago

☐ 6-10 years ago

☐ 11-15 years ago

☐ More than 15 years ago

2) I have worked at CCHCF...

☐ Less than 5 years

- ☐ 5 - 10 years
- ☐ 11 - 15 years
- ☐ More than 15 years

3) I mainly work in the following type of patient unit(s). Choose all that apply.

- | | |
|---|---|
| <input checked="" type="checkbox"/> Special Care Unit (SCU) | <input type="checkbox"/> Urgent Care |
| <input type="checkbox"/> Pediatric Care Unit (PCU) | <input type="checkbox"/> ER |
| <input type="checkbox"/> Medical Unit/Adult Care Unit (ACU) | <input type="checkbox"/> Public Health Department |
| <input type="checkbox"/> Surgical Unit/OR | <input type="checkbox"/> Ambulatory Clinic |

4) My primary role as a nurse is:

- ☐ Staff Nurse
- ☐ Educator
- ☐ Nurse Manager/Director
- ☐ Other

5) I work as a traveler nurse for CCHCF.

- ☐ Yes
- ☐ No

Appendix B: IRB APPROVALS

University of New Mexico
Informed Consent Cover Letter for Anonymous Surveys

STUDY TITLE
Nurse Driven Antibiotic Stewardship

Judy Liesveld, PhD, PPCNP-BC, CNE from the Department of Nursing, and Shavonna R. White, DNP student from UNM College of Nursing are conducting a research study. The purpose of the study is to understand the nurse's knowledge and confidence level related to the nurse's role in an Antibiotic Stewardship Program (ASP) and to increase the nurse's knowledge to be an active participant in their facility ASPs. You are being asked to participate in this study because you are employed in a rural hospital where there is no Nurse Driven Antibiotic Stewardship program.

Your participation will involve completion of a knowledge, expertise and confidence level relative to antibiotic stewardship related to your role as a nurse Survey at three different times and a demographic questionnaire that includes questions regarding your age, education level, career, gender, and area where you currently are employed. The survey should take about 15 minutes to complete. Your involvement in the study is voluntary, and you may choose not to participate. There are no names or identifying information associated with this survey. You can refuse to answer any of the questions at any time. There are no known risks in this study. All data will be kept year to year in a locked file in a locked office and then will be destroyed once determined destroying of data is acceptable.

The findings from this project will provide information on benefits of providing structured education related to a Nurse's role in antibiotic stewardship program, to healthcare staff in a rural hospital on the Navajo Nation. If published, results will be presented in summary form only.

The contact person for the Navajo IRB Office is Beverly Becenti-Pigman, Board Chair, Navajo IRB Office. Navajo Department of Health, P. O. Box 1390, Window Rock, AZ 86515. Telephone number is (928)871-6929. Fax number is (928) 871-6255.

If you have any questions about this research project, please feel free to call Dr. Judy Liesveld at (505) 282-8862 or Shavonna R. White at 928-380-9904.

By clicking on the 'NEXT' button below, you will be agreeing to participate in the above described research study.

Thank you for your consideration.

Sincerely,

Researcher:
 Dr. Judy Liesveld, PhD, PPCNP-BC, CNE
 Associate Professor
 College of Nursing
 1 University of New Mexico
 Albuquerque New Mexico 87131
 Office: 505-272-8862
 Fax: 505-272-0329
jliesveld@salud.unm.edu

Researcher:
 Shavonna R. White, MSN, RN
 DNP Student
 UNM College of Nursing
 1 University of New Mexico
 Albuquerque New Mexico 87131
 928-380-9904
srwhite@salud.unm.edu

November 25, 2019

Chinle Comprehensive Health Care Facility
Indian Health Service
P.O. Drawer PH
Chinle, Arizona 86503

Beverly Becenti-Pigman, Chairperson
Navajo Nation Human Research Review Board
P.O. Box 1390
Window Rock, Arizona 86515

Re: Support for Shavonna White's doctoral scholarly project at University of New Mexico

Dear Mrs. Becenti-Pigman;

This is to inform you and the Navajo Nation Research Review Board of our support for Shavonna White's doctoral scholarly project at the University of New Mexico. Dr. Judy Liesveld of UNM will serve as Faculty/Chairperson of Ms. White's research project.

Shavonna plans to study a nurse's role in an antibiotic stewardship program in order to decrease the risk of patients acquiring Clostridioides infection otherwise known as C. diff infection. Shavonna plans to provide a training session on "Antibiotic Stewardship" to a select number of regular and contract Registered Nurses (RNs) working at Chinle Service Unit. These RNs will take a pre-training appraisal one week prior to beginning the educational session, 1 week post training and at 6 weeks post-training survey. The results of these pre-/post- assessments will be analyzed and evaluated, followed by a manuscript. There will be no need for Ms. White to access patient records. Thus, only the RNs participating in the educational sessions will be giving their informed consent.

Upon completion of her study, Ms. White agrees to share the findings of her study with our CSU Executive Committee. One of our strategic goals at Chinle Service Unit is to encourage career development by our staff that we term as "grow-our-own". Thus, I applaud Shavonna White's effort toward a Doctoral degree.

Sincerely,

Darlene Chee



CANYON DE CHELLY COMPREHENSIVE HEALTH SERVICES, INC.

CDCCCHS.071119.SWhite

RESOLUTION OF THE BOARD OF DIRECTORS

RECOMMENDING AND SUPPORTING SHAVONNA R. WHITE TO CONDUCT HER DOCTORATE SCHOLARLY QUALITY IMPROVEMENT PROJECT TITLED "NURSE DRIVEN ANTIBIOTIC STEWARDSHIP"

WHEREAS:

1. The Canyon De Chelly Comprehensive Health Services, Inc. (CDCCCHS) is certified by the Navajo Nation Business Regulatory Authority as a non-profit tribal corporation since July 1997 and;
2. The Canyon De Chelly Comprehensive Health Services advocates for the provision of high quality, cost effective, responsive and culturally appropriate health care services in the 16 Navajo Nation Chapters and;
3. The CDCCCHS has the authority, pursuant to resolution CMY-46-80 of the Navajo Tribal Council, to review health care matters affecting the people served by the Navajo Area Indian Health Service, Chinle Service Unit and to advocate for and assist the Indian Health Service's (IHS) mission to elevate the health status of the Navajo and other American Indians to the highest level and;
4. Shavonna R. White, MSN, RN a Doctor of Nursing Practice – Nurse Executive Organizational Leadership student at the University of New Mexico College of Nursing, and is seeking resolution from Canyon De Chelly Comprehensive Health Services, Inc. to support her Doctoral Scholarly Quality Improvement Project at the Chinle Service Unit, which comprised of three (3) health care facilities, they are: Chinle Comprehensive Health Care Facility, Tsaile Health Center, and Pinon Health Center; and
5. Because the proposed Doctoral Scholarly Quality Improvement Project involves obtaining pre and post survey information from Chinle Service Unit nursing staff, the Navajo Nation Human Research Review Board will grant their approval to conduct the Doctoral Scholarly Quality Improvement Project. The Board is in receipt of all the documentation to support the proposed Doctoral Scholarly Project and finds this Doctoral Scholarly Project is in the best interest of the Navajo Nation; and
6. The purpose of this Doctoral Scholarly Quality Improvement Project is to assess the current knowledge and awareness level of antibiotic stewardship practices of nursing staff who attend the

CDCCHS.071119.SWhite

Antibiotic Stewardship training. The assessment will occur before and after training using an anonymous survey tool; and

7. This Doctoral Scholarly Quality Improvement Project will include making recommendations to the Chinle Service Unit, to improve the basic knowledge and awareness of antibiotic stewardship to nursing staff who are not considered specialists in this field; and
8. The objective of this Quality Improvement Project is to improve the knowledge of nursing staff and their confidence to utilize antibiotic stewardship practices for all patients. This will be accomplished through standardized education of nursing staff at the Chinle Service Unit; and
9. The implications for future use on the Navajo Nation is by improving the knowledge of nursing staff, it will in turn improve the care provided to those patients who require appropriate antibiotic treatment.

NOW THEREFORE BE IT RESOLVED THAT:

The Canyon De Chelly Health Services, Inc. Board hereby respectfully recommends and supports Navajo Nation Human Research Review Board grant their approval for Shavonna R. White to conduct her Doctoral Scholarly Quality Improvement Project titled "Nurse Driven Antibiotic Stewardship."

CERTIFICATION

I, the undersigned, do hereby certify that the foregoing resolution was duly considered by the Canyon De Chelly Health Services, Inc. Board of Directors at a duly meeting in Chinle, Navajo Nation (Arizona) at which a quorum was present and that the same was passed by a vote of 4 in favor, 0 opposed, and 3 abstained, this 11th day of July 2019.



Rex Lee Jim
President, CDCCHS, Inc.

Motion: Kevin Rand, MD

Second: Patrick Lynch, MPH

RESOLUTION OF THE CHINLE AGENCY COUNCIL
 NAVAJO NATION
 Resolution No: CAC-10/19-05

RECOMMENDING AND SUPPORTING SHAVONNA R. WHITE TO CONDUCT HER DOCTORATE SCHOLARLY QUALITY IMPROVEMENT PROJECT TITLED "NURSE DRIVEN ANTIBIOTIC STEWARDSHIP"

WHEREAS:

1. The Chinle Agency Council is comprised of sixteen (16) chapters of Central Agency: Black Mesa, Blue Gap/Tachee, Chinle, Forest Lake, Hardrock, Lukachukai, Many Farms, Nazlini, Pinon, Rough Rock, Round Rock, Tsalle/Wheatfields, Tselani/Cottonwood and Whippoorwill; and
2. The Navajo Nation Human Research Review Board is the Institutional Review Board of the Navajo Nation and requires all researchers to follow the "IRB Research Protocol Application Guidelines", [13 N.N.C §3259 (A), (B), (C), (D), (E), (F), (G) and §3260 (A), (B), (C), (D), (E), (F)] ; and
3. Shavonna R. White, MSN, RN a Doctorate of Nursing Practice candidate in Nurse Executive Organizational Leadership at the University of New Mexico College of Nursing and is seeking resolution from Chinle Agency Council to support her doctorate scholarly quality improvement project at the Chinle Service Unit, which comprised of three (3) health care facilities, they are: Chinle Comprehensive Health Care Facility, Tsalle Health Center, and Pinon Health Center; and
4. Because the proposed doctorate scholarly quality improvement project involves researching and interviewing human subjects, the Navajo Nation Human Research Review Board will grant their approval to conduct the doctorate scholarly quality improvement project. The Board is in receipt of all the documentation to support the proposed doctorate scholarly project and finds this doctorate scholarly project is in the best interest of the Navajo Nation; and
5. The purpose of this doctorate scholarly quality improvement project is to assess and the current knowledge and awareness level of antibiotic stewardship practices of nursing staff who attend the Antibiotic Stewardship training; and
6. This doctorate scholarly quality improvement project will include making recommendations to the Chinle Service Unit, to improve the basic knowledge and awareness of antibiotic stewardship to nursing staff who are not considered specialists in this field; and
7. The objective of this quality improvement project is to improve the knowledge of nursing staff, it will in turn improve the care provided to those patients who require appropriate antibiotic treatment.

NOW, THEREFORE BE IT RESOLVED THAT:

1. The Chinle Agency Council hereby recommends and supports Navajo Nation Human Research Review Board grant their approval for Shavonna R. White to conduct her scholarly quality improvement project titled "Nurse Driven Antibiotic Stewardship".

CERTIFICATION

I hereby certify that the foregoing resolution was considered at a duly called Chinle Agency Council meeting at the Rough Rock Elementary School in, Rough Rock, Navajo Nation, Arizona at which a quorum was present and the same time passed by a vote of 25 in favor 0 opposed and 0 abstained on this 19th Day of October, 2019.

 Zane James, President

 Timothy Johnson, Vice-President

 Valencia Edgewater, Secretary