ENHANCING THE ANESTHESIA PROVIDERS' AWARENESS OF RESOURCES, POLICIES, & PROCEDURES SURROUNDING PATIENTS WITH LANGUAGE COMMUNICATION BARRIERS

by

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ABSTRACT

JANZEN KRYSL. Enhancing the Anesthesia Providers' Awareness of Resources, Policies, & Procedures Surrounding Patients with Language Communication Barriers.
(Under the direction of DR. LUFEI YOUNG)

Background: Patients with limited English proficiency (LEP) are facing significant communication challenges in peri-operative settings, spanning from understanding anesthesia-related information to obtaining informed consent. These language-based obstacles lead to decreased quality of care, lower patient satisfaction, and a heightened risk of adverse healthcare outcomes. **Purpose:** The purpose of this study is to investigate if a web-based educational program can increase the anesthesia providers' awareness of resources, policies, and procedures available for LEP patients. **Methods:** This quantitative, quasi-experimental project uses a pretest-posttest design sampling from a full-service community hospital in the Southeastern region of United States. **Results:** Twenty-five individuals participated in this study. There was significant pretest-posttest difference on question : question 1 ($\chi^2(1) = 5.98$, $p = .015$) (federal law); question 2 (language service resources) ($\chi^2(1) = 13.30$, $p < .001$); question 4 (language service procedure) ($\chi^2(1) = 11.80$, $p < .001$); question 5 (policy location) ($\chi^2(1) = 11.70$, $p < .001$); question 6 (resource location) ($\chi^2(1) = 7.29$, $p = .007$); question 7 (resource location) ($\chi^2(1) = 24.10$, $p < .001$). The average number of correct answers increased from 3.19 ± 1.48 to 5.80 ± 0.50 ($t = 6.53$, $p < .001$). **Conclusion:** The result of this data is evidence that utilization of a brief educational module can greatly impact anesthesia providers' awareness of resources, policies, and procedures for language services for patients with language communication barriers. Future projects should aim to highlight the significance of obtaining informed consent via a certified interpreter in lieu of ad hoc interpretation.

Keywords: Limited English Proficiency (LEP), Anesthesia Providers, Educational Intervention, Quality Improvement, Language Communication Barriers, Perioperative Settings, Cultural Competence, Interpretive Services, Patient Safety, Healthcare Education.

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LIST OF ABBREVIATIONS

AH	Ad-hoc
ANOVA	Analysis of Variance
CRNA	Certified Registered Nurse Anesthetist
HIPAA	Health Insurance Portability and Accountability Act
ID	Identification
IRB	Institutional Review Board
IS	Interpretive services
IT	Information Technology
LEP	Limited English Proficiency
OR	Operating Room
PRN	As Needed
QI	Quality improvement
QR	Quick Response
SD	Standard Deviations
SPO	Structure-Process-Outcome
SRNA	Student Registered Nurse Anesthetists
UNCC	University of North Carolina-Charlotte
WF	Wake Forest University

CHAPTER I: INTRODUCTION AND BACKGROUND

Background

One of the most critical aspects of delivering high-quality patient care is ensuring effective communication. Clear and effective communication during the pre-operative evaluation can help improve rapport, reduce patient anxiety, and improve the patient's overall experience. It is also vital in avoiding surgical delays, preventable complications, improving surgical outcomes (Joo et al., 2023). Growing numbers of surgical patients exhibit limited English proficiency (LEP), leading to communication challenges between patients and providers (Joo et al., 2023). Language barriers contribute to the increased risks of adverse events, undesired patient experience, reduced quality of patient education, leading to poor surgical outcomes (Joo et al., 2023). To avoid preventable complications and improve quality of care, the Affordable Care Act (ACA) mandates healthcare organizations to provide meaningful access to patients with LEP (Tan-McGrory et al., 2022). The Department of Justice and the Department of Health and Human Services have stated that failure to provide appropriate interpreter services may be deemed discriminatory, potentially resulting in administrative fines and penalties (Betancourt et al., 2012).

Problem Statement, Purpose, & Clinical Question

Despite the laws, regulations, and policies governing high-quality care for patients with LEP, many anesthesia providers lack knowledge and awareness about these regulations and policies. They may also be unaware of how to access the available hospital resources, services, and established procedures designed to assist them in providing care for LEP patients. To promote clear and effective interactions between anesthesia providers and patients with Limited English Proficiency (LEP), the purpose of this project was to investigate the effectiveness of a

web-based education program on the anesthesia providers' awareness of resources, policies, and procedures for language services for patients with LEP. We hope to answer the following question: compared to current education processes, is a single-session web-based module effective to improve anesthesia providers' awareness of resource, policies, and procedures of language services for patients with LEP? The long-term goal is to empower anesthesia providers to quickly access language services, promoting utilization in the preoperative setting. This aligns with hospital policy and upholds patients' legal rights to such services, thus improving the quality of care and ensuring the equity and safety of LEP patients.

CHAPTER II: LITERATURE REVIEW

Background and Significance

Studies showed the prevalence of communication difficulties and the disproportioned risk of poor health outcomes in patients with LEP (Schiaffino et al., 2014). About 42% to 84% of patients with LEP experience communication difficulties in peri-operative healthcare settings, including the apprehension of anesthesia-related education and informed consent (Patel et al., 2016; Shapeton et al., 2017; Singh et al., 2013). Communication difficulty was reported to be critical in caring for patients with LEP. Language barriers significantly decreased the quality and satisfaction of care and healthcare outcomes and increased the risk of incorrect or insufficient treatment and adverse and safety events. (Burkle et al., 2017; Green et al., 2005; Soleimani et al., 2022; Ali & Watson, 2018; Karliner et al., 2010; Kasten et al., 2020).

Among the previously mentioned articles, ten articles were returned on the effects of proper utilization of interpretive services on the quality of care of LEP patients. By using the correct policies and procedures surrounding the adequate interpretation of all communication for LEP patients, anesthesia providers did what was suitable for the patient and improved the quality of care they provided. Appropriately using interpretive services ensured an open, two-way communication road. It allowed LEP patients to understand the intricacies of the care they received throughout their operative stay while being able to voice their concerns and pose their questions in response to anesthesia providers. By keeping an open line of dialogue between themselves and their LEP patients, anesthesia providers could confirm that they are not sacrificing quality care.

Impacts on Care Quality, Safety, and Equity

There was a significant association between the quality of care and anesthesia providers' proper use of interpretive services for LEP patients (VanderWielen et al., 2014). The factors related to the improper use of interpretive services included the lack of awareness of the proper use of interpretive services (Brooks et al., 2016; Sharpton et al., 2017), the use of an untrained interpreter (VanderWielen et al., 2014; Fatahi et al., 2010; Soleimani et al., 2022; Brooks et al., 2016), and the failure to use a certified interpreter (Brooks et al., 2016; Burkle et al., 2017; Fatahi et al., 2010; Green et al., 2005; VanderWielen et al., 2014).

Per hospital policy, obtaining informed consent on an LEP patient had to be done with a certified interpreter. Lee et al. (2017) attributed the lack of professional interpretive service for informed consent to persistent disparities among LEP patients in the hospital setting. Furthermore, it was reported that using uncertified interpreters to obtain informed consent increased medical errors and compromised safety, legality, and policy (Nápoles et al., 2015). The primary reason for using untrained interpreters was the lack of awareness to access the certified interpreter (Hudelson et al., 2009). Satisfaction of care, favorable outcomes, and equity in care were much more feasible when language congruency between patient and provider occured (Weech-Maldonado et al., 2008). Professional interpreters helped increase LEP patients' autonomy through well-informed education and rights. Professional interpreters could also facilitate understanding of cultural differences, preferences, awareness, and sensitivity, enhance patients' comprehension, and allow patients to voice their decisions and safety concerns, leading to the implementation of empathic tools (Gutierrez et al., 2019; Wu et al., 2017).

To reduce healthcare disparities and provide equitable care among LEP patients, it was critical to educate anesthesia providers about the proper use and access to interpretive service for

LEP patients, which prepared them to evaluate patient's needs, consult their wishes, explain their rights, involve family members, provide emotional support and offer opportunities (Bischoff et al., 2010; Hadziabdic et al., 2014; Locatis et al., 2010; Hsieh et al., 2015; VanderWielen et al., 2014).

In sum, the literature provides evidence that supports the project should have highlighted the need for more awareness and knowledge to use professional interpretive services among anesthesia providers properly. Adequate education of anesthesia providers could have increased awareness of this critical issue. When performing education in the project, it was essential to emphasize the risk of using non-certified interpreters.

Areas Improved by Proper Utilization of Interpretive Services

Quality

Many anesthesia providers underutilized interpretive services they have direct access to and were undereducated on the appropriate situations to employ interpretive services for LEP patients (VanderWielen et al., 2014). Undereducation in the proper use of interpretive services for LEP patients led to decreased quality of care an anesthesia provider provided. Brooks et al. (2016), a study in which focus groups of LEP patients were surveyed, suggested that the quality of care would be improved if more certified interpreters were accessible. This information showed that our project should highlight proper resource utilization and timing of interpretive services in our educational material.

Similarly, Sharpton et al. (2017) added that education in anesthesia departments was necessary and beneficial to resolve misconceptions about interpretive services to improve interactions and the quality of patient care. In their survey of both anesthesia providers and interpretive service members, the research suggested several false impressions by both

departments might have hindered patient care. Proper education could have improved patient communication (Shapeton et al., 2017). Adequate education of anesthesia providers could have increased awareness of critical situations to utilize interpretive services, what interpretive services did, and why the service was essential to LEP patients.

Communication with an LEP patient while using an untrained ad hoc interpreter, such as coworkers or patient family members, was more likely to contribute to errors of clinical consequence and was more likely to be unsuccessful in interpretive communications due to their inability to translate medical jargon which was shown to impact interpretation negatively, therefore, compromising communication between anesthesia providers and LEP patients (VanderWielen et al., 2014; Fatahi et al., 2010; Soleimani et al., 2022; Brooks et al., 2016). Although there was no standard in the United States for the use of a certified interpreter in communicating with an LEP patient, VanderWielen et al. (2014) pointed out that facilities that received federal funding were in direct violation of federal law when insufficient care was provided to an LEP patient because of a language barrier. When performing education in our project, it was essential to emphasize this information about ad-hoc (AH) interpretation and discourage non-certified interpretation.

A decreased quality of care was a recurring theme perceived among LEP patients surveyed when a certified interpreter was not utilized (Brooks et al., 2016). Likewise, Burkle et al. (2017) found that using interpreter services correlated with improved quality of care for LEP patients and increased patient satisfaction without delaying start times for operations. A survey conducted by Green et al. (2005) found that LEP patients who experienced communication difficulties had a perceived decreased quality and satisfaction of care. Not only was patient satisfaction improved when using a certified interpreter, but overcoming an LEP patient's

difficulty communicating with healthcare staff could have improved healthcare outcomes (Soleimani et al., 2022; Burkle et al., 2017).

A qualitative survey about the impact of language barriers in providing care found that communication was the most critical aspect of patient care. Language barriers were the biggest obstacle to providing quality care (Ali & Watson, 2018). Brooks et al. noted the utilization of interpreters who spoke different dialects of Spanish than the LEP patients leading to difficulty communicating and misinterpretations (2016). Therefore, Fatahi et al. offered the solution of prior scheduling of an interpreter in the LEP patient's native language to assist with communication (2010). By providing thorough education to anesthesia providers on the importance of adequately utilizing interpretive services, and the resources available for use, the education intervention could have had the long-term effect of decreasing costs to the healthcare facility.

Safety & Provider Satisfaction

Wu et al. (2017) described how professional medical interpreters could "help prevent adverse events involving patients with LEP." They did so by contributing the following three things to the interaction with non-English speaking patients: "1) facilitating communication and enhancing patients' comprehension, 2) giving voice to patients, and 3) speaking up about safety concerns" (Wu et al., 2017). When creating our education, we emphasized the congruence between proper interpretation and patient safety.

Informed consent was an essential factor we wanted to educate our project participants on. Per hospital policy, obtaining informed consent on an LEP patient had to be done with a certified interpreter. Patel et al. (2016) found that "surgeons reported relying on their non-English

language skills, bilingual staff, and family and friends of patients to obtain informed consent from LEP patients."

AH interpreters played a role in compromising safety, legality, and policy. These were people who spoke the native language of the patient (family, providers, etc.) but were not professionally certified to do so. This was described by Nápoles et al. (2015) through their cross-sectional study results. They found that "inaccurate interpretation occurred at twice the rate for AH (54% of coded TUs) versus IP (25%) and VC (23%) interpretation, due to more errors of omission ($p<0.001$) and answers for patient or clinician ($p<0.001$)" (Nápoles et al., 2015).

Mayo et al. (2016) identified why AH providers were often inappropriately utilized. They stated, "The most important factors related to the likely use of ad hoc interpreters (cutting corners) included locating a qualified interpreter, having to wait for a qualified interpreter, and technical difficulties regarding phone and video technology" (May et al., 2016). Hudelson et al. (2009) stated, "66% of respondents said they preferred working with ad hoc interpreters (patient's family and bilingual staff), mainly because these were easier to access." These studies affirmed the need to capture the utilization of AH interpretation in our pre and post-surveys.

Several articles spoke about translational errors encountered during the interpretation process. Flores et al. (2012) revealed that "the proportion of errors of potential consequence was significantly lower for professionals (12%) versus ad hoc (22%) versus no interpreters (20%)". Schwei et al. (2019) also stated, "use of professional medical interpreters has been shown to improve communication and decrease medical errors in pediatric LEP patients." Other articles addressed the difference in care received between English-speaking and LEP patients. It was noted that LEP patients experienced "challenges accessing health care and are at higher risk of receiving suboptimal health care than native English speakers" (Kasten et al., 2020).

Some of the limitations of using interpretation services were addressed by Lundin et al. (2018) and included availability, accessible areas to maintain confidentiality and technical issues associated with remote interpretation services. Schiaffino et al. (2014) found that only "64% of hospitals provided language services." Availability, accessibility, and confidentiality were all addressed when surveying our project participants.

Equity

Weech-Maldonado et al. (2008) found that "Hispanics in Medicare managed care face barriers to care in general, but there are language and regional differences in their care assessments." This presented the point that satisfaction of care, favorable outcomes, and equity in care were much more feasible when language congruency between patient and provider occurred.

Another problem, as described by Bischoff et al. (2010), was that more than the availability of professional interpretation was needed to guarantee its use. Inequity became the standard of care if this continued to prevail in healthcare. Most respondents from this study found professional interpreters helped with "increasing patients' autonomy (80%) and by ensuring that immigrants are generally well informed (80%) and know their rights (86%)" (Bischoff et al., 2010, p. 18).

Locatis et al. (2010) described how ad hoc interpreters "may not adequately understand technical information providers give and may unintentionally omit parts of the conversation or distort it out of embarrassment." Another issue described in this article was that video interpretation led to a disconnect since the "technology directs their speech to the interpreter, not each other" (Locatis et al., 2010, p. 346). Furthermore, telephone interpretation was highly dissatisfying for both parties since it took longer to set up, and "the significantly shorter phone

interviews raise questions about the prospects of miscommunication in telephonic interpretation" (Locatis et al., 2010). Considering this information and evaluating the most optimal method to provide the best care and not shorten the patient experience was considered when forming our education plan.

Hsieh et al. (2015) proposed that the various interpreting modalities should complement professional interpreters since each had distinct strengths and weaknesses. Hsieh et al. (2015) also found that "only 72% of hospitals routinely record patients' interpreter needs, which can significantly reduce waiting time as an interpreter can be requested ahead of appointments." This emphasized the importance of surveying respondents on where to find interpretation needs in the chart and educating them accordingly.

As Lee et al. (2017) noted, persistent disparities among LEP patients indicated the need for professional interpretation for informed consent throughout hospitalization. We had seen a rise in professional interpreter use for informed consent since it was both a "fundamental and legal obligation for clinicians" (Lee et al., 2017). However, we needed to improve upon culturally shifting and continuing education on why interpretation was required throughout the patient experience in the hospital. Until these hurdles were overcome, we would not have seen enough significant change to reduce the disparity in LEP patient care.

Gutierrez et al. (2019) expanded on this topic, which "highlights the importance of viewing medical interpreters as more than invisible conduits of information" to optimize the LEP patient and provider experience. When professional interpreters were acknowledged as more than word-for-word interpreters, they could shift from a limited role to one that was culturally sensitive, facilitated understanding, and implemented several empathic tools.

Intervention to Enhance Knowledge of Existing Interpretive Service

While many anesthesia providers may have understood the importance of being able to communicate with patients who experienced language communication barriers adequately, many anesthesia providers needed to be made aware of the numerous resources available to enhance communication and break down the barriers between themselves and patients with communication barriers. Of the many factors related to the failure to utilize or improper use of interpretive services, the lack of awareness of the proper use of interpretive services that both Brooks et al. (2016) and Sharpton et al. (2017) pointed out is a factor that could be overcome by applying an intervention to enhance the knowledge of the existing interpretive services and resources within a facility. As was previously stated, Hudelson et al. (2009) found that the primary reason for utilizing an untrained interpreter was the need for more awareness to access the certified interpreter. Anesthesia providers were found to both underutilize and be undereducated on the proper use of interpretive services (VanderWielen et al., 2014). Providing an educational intervention to increase awareness of the importance and existence of the resources available when providing care for a patient with a language communication barrier was essential in providing equitable care for that patient population. As Sharpton et al. (2017) pointed out, anesthesia departments could benefit from education on interpretive services to enhance care quality and improve communication with patients with language barriers. Creating an educational intervention to enhance the knowledge of existing interpretive services would have been mutually beneficial for providers and patients. By enhancing the knowledge of anesthesia providers through intervention, the possibility of safer, more equitable, and enhanced quality of care for patients would have been a real possibility. The benefits above were stripped from the care of patients with language communication barriers by allowing current practices to become a

standard of deviance. This guaranteed LEP patients received care that was far inferior to their counterparts. Educating anesthesia providers on the subject was almost exclusively beneficial as education improved patient-provider interactions while allowing the provider to deliver, and the patient to receive better, safer, and more holistically congruent care across the encountered barriers.

Conceptual /Theoretical Framework

The structure-process-outcome (SPO) model was an essential concept to the quality of healthcare services. The structure, process, and outcome served as the basis for this concept to ensure all quality aspects are met. This model allowed for the efficient and effective evaluation of given healthcare services. For this quality improvement (QI) project, the SPO model improved communication barriers among anesthesia providers and patients across the facilities. Our project increased the ease of utilization of language services and mainstreamed facility-specific resources; our outcomes focused on improving the quality, equity, and safety of limited English proficiency patients (LEP).

CHAPTER III: METHODS

Project Design

This quality improvement project utilized a quantitative, quasi-experimental project design and used a pretest-posttest study design. The study was conducted in a full-service community healthcare facility in the Southeastern region of the United States. The aim was to assess the effectiveness of a single session web-based educational intervention on the awareness of resource, policies, and procedures of language services for patients with LEP among anesthesia providers. This project was approved by the university and clinical site internal review boards (see Appendix D and Appendix E for approval letters). SQUIRE 2.0 guidelines were followed when reporting this scholarly project (*SQUIRE*, 2020).

Sample

The participants included board certified anesthesia providers at the full-service community hospital. Participants were identified through the available outlook contact list for that facility. The investigator excluded temporary employees, such as those considered a "locum" or "traveler," because of their lack of sustained exposure to resources and policies.

Setting

The project took place within a surgical center associated with a comprehensive healthcare system situated in the southeastern region of the United States. The health system was the largest hospital system in the region, boasting a world-class facility that offers a comprehensive range of services. With over 1,100 specialized physicians and providers covering all areas of medicine, the system included the region's only Level 1 trauma center. Additionally, the health system included an approved transplant center for heart, kidney, pancreas, and liver procedures. The entire health system, including the associated surgical center, also operated as

one of five teaching facilities, providing residency training for more than 200 physicians across 15 specialties. The surgical center boasted a proficient team of surgeons delivering comprehensive care within a multidisciplinary team setting. The study site's primary specialties included orthopedic surgery, electroconvulsive therapy, vascular surgery, women's pelvic health and bariatric surgery among other specialties. They do not perform pediatric, obstetrics, cardiac, or acute trauma procedures. The full-service community hospital had 17 operating rooms and fewer ancillary sites, such as endoscopy. Each operating room (OR) could average between one and five cases daily. The full-service community hospital had 69 CRNAs on their Microsoft Outlook contact list. There were seven anesthesiologists at this site. Typical staffing included 20 CRNAs and four anesthesiologists.

Intervention

The single-session web-based educational intervention consisted of a PowerPoint-style presentation that included information about the resources, policies, and procedures of language services available at the study site. Handouts were provided along with the virtual presentation and remain indefinitely accessible. The educational intervention was designed to help anesthesia providers gain quick and easy access to the available resources needed to facilitate seamless patient encounters with LEP patients, and to emphasize the proper policies and procedures related to language services. To ensure equitable care in line with the standards of practice for anesthesia providers, the educational content included: 1) resource links to the hospital system's web pages related to language services; 2) health facility-specific policies and procedures regarding the provision of language services to LEP patients. The exhibition highlighted the appropriate steps when encountering an LEP patient and addresseed the legalities of providing LEP patients with a certified interpreter. Materials within the intervention included pictures, text,

and links to the healthcare organization's sourced material regarding policies and procedures on LEP patients, the utilization of certified patient interpreters, and available resources for anesthesia providers. The content validity of the education intervention was established by the dissertation committee members who have expertise in language services for LEP individuals, as well as CRNA faculties.

The web-based educational module was a self-paced, PowerPoint-style presentation that took approximately 10 minutes to complete. The accompanying handouts were distributed through facility email with a direct link to the handout. The web-based education module could be accessed via a laptop, computer, smartphone, or tablet with an internet connection.

The following strategies were used to enhance and maintain the intervention fidelity. For the study design, we developed a clear and detailed intervention protocol that outlined specific education components and expected outcomes. We provided standardized education materials that align with the intervention protocol. To improve the intervention fidelity, all team members participated in training to develop online surveys and web-based education modules. To ensure the delivery and receipt, we regularly monitored the average time spent on completing the online education modules and scheduled team meeting to identify and trouble shoot any challenges encountered by the participants in completing the online learning module. We also sent out regular emails to encourage active participation and completion, provide guidance on how to access the web-based learning module, and identify areas that may need further clarification. For enactment, we included handouts to encourage participants to apply the knowledge and skills they had gained from the intervention. By addressing each of these components in the design, training, delivery, receipt, and enactment stages of the educational intervention, we made efforts

to improve the intervention fidelity, ensuring that the intervention was implemented as intended and produced meaningful outcomes.

Variables and Measures

The project team constructed identical pre- and post-education surveys to collect demographic information and knowledge-based responses from survey participants. The demographic section of the survey included five questions about each participant's anesthesia role, the number of years in their current role, their gender, if they spoke a language other than English, and the location for which they were employed. The subsequent portion of both surveys comprised seven questions assessing the knowledge of survey participants on the policies and procedures set forth by their facility regarding the utilization of interpretive services when encountering an LEP patient. Questions used a yes-no format, with each answer choice assigned a numerical value (yes as one and no as two). Participants were to answer 'yes' if they were aware of policies, procedures, and resources in place for providers to use when encountering an LEP patient in their practice setting. Conversely, participants were to select 'no' if they needed to be informed about these policies, procedures, and resources. The pre- and post-education surveys were identical to evaluate the participants' knowledge of policies, procedures, and resources before and after the distribution of the educational intervention. The final surveys were digital versions accessible via the SurveyMonkey website. These surveys were developed and validated by committee members and CRNAs before being distributed.

Data Collection Procedures

Both pre- and post-education surveys were sent via mass emails to the anesthesia providers. The link in the email directed the participants to the digital surveys on the SurveyMonkey website. The study site had a group contact on Outlook containing all the

anesthesia providers currently on staff. Response rates were calculated based on the number of surveys sent and compared to those received that were fully completed. Incomplete survey data was reported but ultimately excluded from the final statistical analysis. The target goal for the response rate was 60%.

The subsequent portion of the post-education surveys requested survey participants to respond to questions, using a yes-no answer format, about the project and their knowledge of the facility's policies and procedures for utilizing interpretive services when encountering an LEP patient. ‘Yes’ responses were scored as ‘1’ while ‘no’ responses were scored as a ‘2.’ Scores from this portion of the surveys were summed to assess respondents' overall awareness of facility policy and procedures. Scores were given to survey facilitators as a spreadsheet of individual answers to each question with the identity of the respondent hidden. The pre-education and post-education surveys were identical to assess the effectiveness of the educational intervention after comparing pre- and post-education surveys.

Data collection spanned over four weeks beginning August 7th, 2023, and ending September 4th, 2023. The project team allowed for roughly four weeks to complete the pre-education survey, the educational intervention, and the post-education survey. An email reminder to complete the surveys and educational module was sent at two and three weeks after the original emails were sent. The project team also reminded participants to review the educational intervention via face-to-face interactions. Data was collected through the SurveyMonkey website, negating the necessity for in-person data collection.

Data Management and Security

Each participant was assigned a unique study code (ID) number for data entry, tracking, and analysis. All questionnaires were anonymized and assigned with participant ID. The

participant ID associated with the participant's name was stored in a secure IT-created, IRB-approved web-based folder, password-protected and accessible only by project personnel. The consent form included the participant ID number, name, and other identifiers. In addition, only the study ID number was found in the data collection forms (pre and post-tests). All data was stored in a password-protected cloud-based online data storage site. Data by subject ID was entered into a secure database that is password protected and accessible only by project personnel. The only persons who had access to the data are the project personnel, the sponsor of this research, the Institutional Review Board (IRB), and any other persons or agencies required by law.

The information from this project was intended to be published in scientific journals or presented at scientific meetings, but the participants' identities were kept strictly confidential. Both university and the clinical site had a uniform policy on protecting patient privacy that incorporated all requirements of the HIPAA (the Health Insurance Portability and Accountability Act of 1996) Privacy Rule. The clinical site had a HIPAA compliance training program for all employees and additional training for all employees with access to patient information. The proposed project and research personnel abided by both university and the clinical site ethical policies, including detailed protection of human subjects regarding potential data analysis (presented in consent). Finally, the participants were provided the alternative not to participate in the study. Data security measures were accomplished via anonymous surveys on SurveyMonkey. Project data did not contain any patient data or information.

Data Process and Evaluation

All surveys sent out were done through the SurveyMonkey platform. Access to the collected information was limited to committee members through this password-protected

account. The SurveyMonkey platform served as an essential data analysis tool that was intuitive for secure sites but had limited use. After data collection, the information required further analysis through a secondary site, Excel. Before transferring the information for advanced analysis, the committee ensured to remove any duplicate or incomplete surveys.

Data Analysis

All statistical analyses were performed using R (version 4.0.2, R Foundation for Statistical Computing, Vienna, Austria) with a significance level of 0.05 (de Micheaux et al., 2013). Pre-analysis data screening was performed before statistical analysis to examine coding errors, outliers, and data skewness to determine if any data cleaning procedures were needed. Coding errors often occur when the questionnaires are used as assessment tools. The statistician was consulted to reduce coding errors, and statistical procedures were used to recode the study questionnaires. Additionally, the missing data caused by unanswered questions were reviewed for patterns that would introduce bias in the result. We ensured to go back to ask participants to fill out the questionnaires completely. If some data items remained missing, these issues were resolved in consultation with the statistician and significant advisor.

Descriptive statistics (means, standard deviations, median, interquartile range, numbers, percentages, and frequencies) were calculated for all variables. Demographic characteristics (age, gender, work type, and years of experience of survey participants) of the study population were analyzed as means and standard deviations (SD) for continuous variables and as frequencies and percentages for categorical variables. All statistical tests were 2-tailed. The variables were checked for normality, and the mean and SD were used to measure central tendency since the data are typically distributed.

The $\chi 2$ were performed to describe and compare frequencies. The Student t-test were utilized to test for significant differences between pre and post-survey scores. Pearson's correlation coefficients were used to determine the relationships between key concepts. Univariate and multivariate logistic regression or linear regression analyses were performed to determine the relationships between the pretest and posttest.

Project Timeline

The project topic was finalized in December 2022. A literature review was conducted in March 2023. The proposal defense was successfully completed in April 2023. Following the proposal defense, approvals from both the clinical site and the university Institutional Review Boards were obtained in July 2023. Data collection and intervention took place in August and the first part of September 2023. Data analysis and report generation were finished at the end of September 2023 (Appendix F: a detailed timeline).

CHAPTER IV: PROJECT RESULTS

Sample and Setting Description

A total of 25 anesthesia providers completed the project. This resulted in an overall participation rate of 32.1% as participation was requested from a total of 78 anesthesia providers. Survey data revealed 20 of the anesthesia providers were female (80%) while only five of the anesthesia providers were male (20%) among the participating anesthesia providers. All 25 of the participants were CRNAs although requested participation at the facility included three roles of anesthesia providers: CRNAs, SRNAs, and anesthesiologists. Of the providers who completed all three steps of the QI project, two had 0 to 2 years of experience (8.0%), four had 3 to 5 years of experience (16.0%), four had 6 to 9 years of experience (16.0%), and ten had 10 or more years of experience providing anesthesia (60.0%) (see Figure 1). Of the 25 participants who completed the surveys five participants spoke another language other than English (20.0%), while 20 participants only spoke English and did not speak a second language (80.0%) (see Figure 2).

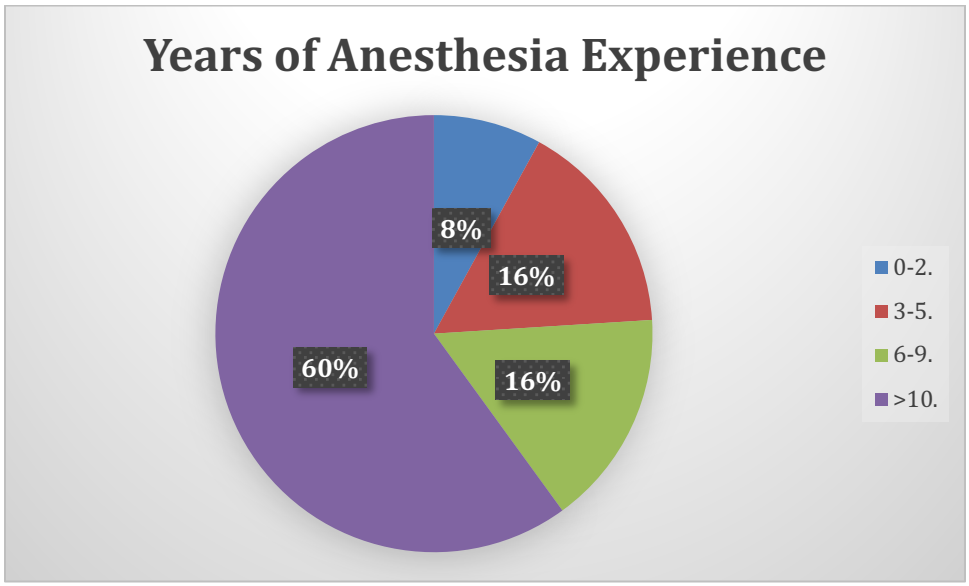

Figure 1.

Years of experience among participating anesthesia providers

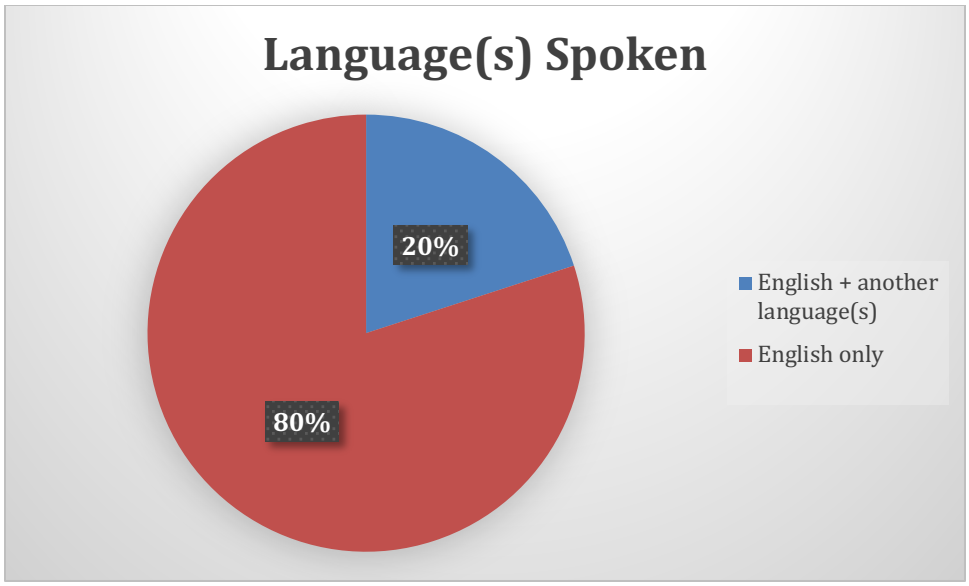

Figure 2.

Language(s) spoken among participating anesthesia providers

Primary Findings

Table 1. Pretest and posttest comparison for each question and total score

	Pretest (n = 40) % correct	Posttest (n = 37) % correct	p-value
1. I understand that the hospital's language assistive services are regulated by Title VI of the Civil Rights Act of 1964.	72.0	100	.015
2. I understand how to initiate language services via three options available within my facility.	52.0	100	< .001
3. According to hospital policy, if I speak the preferred language of the patient, I can perform interpretation services to obtain pre-operative consent.	20.0	0.0	.059
4. Do you know when it is appropriate to NOT utilize hospital-provided language assistive services when communicating with a patient?	32.0	84.0	< .001
5. I know where to locate the hospital policy on Language Assistance.	56.0	100	< .001
6. I know how to locate the information on Epic that informs you on the patient's language needs.	68.0	100	.007
7. I know how to document the use of language assistance on Epic.	24.0	96.0	< .001
Total score	3.19 (1.48)	5.80 (0.50)	< .001

Note. p-values for the individual questions were based on chi-squared tests. The p-value for testing total score difference was based on paired t-test.

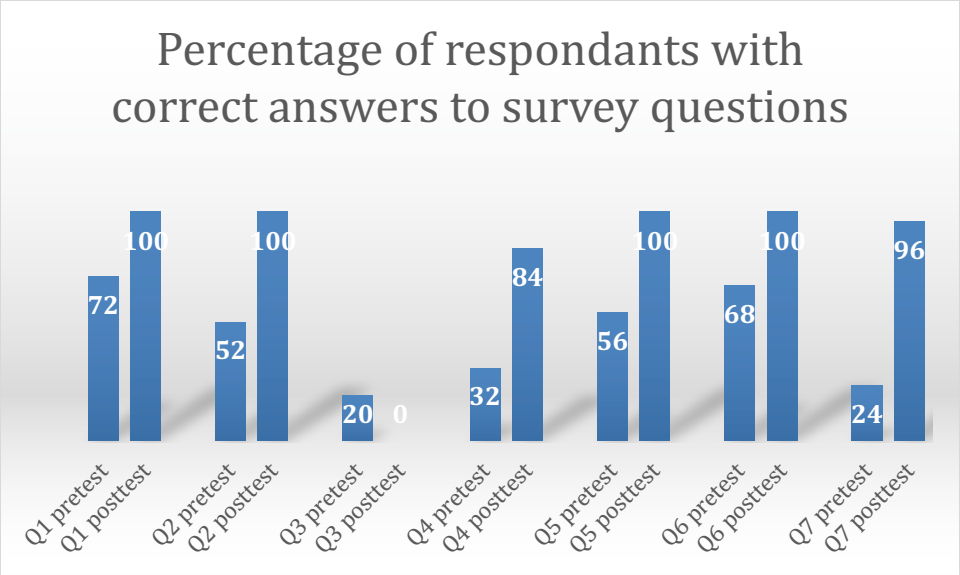

Figure 3.

Percentage of respondents who answered survey questions correctly

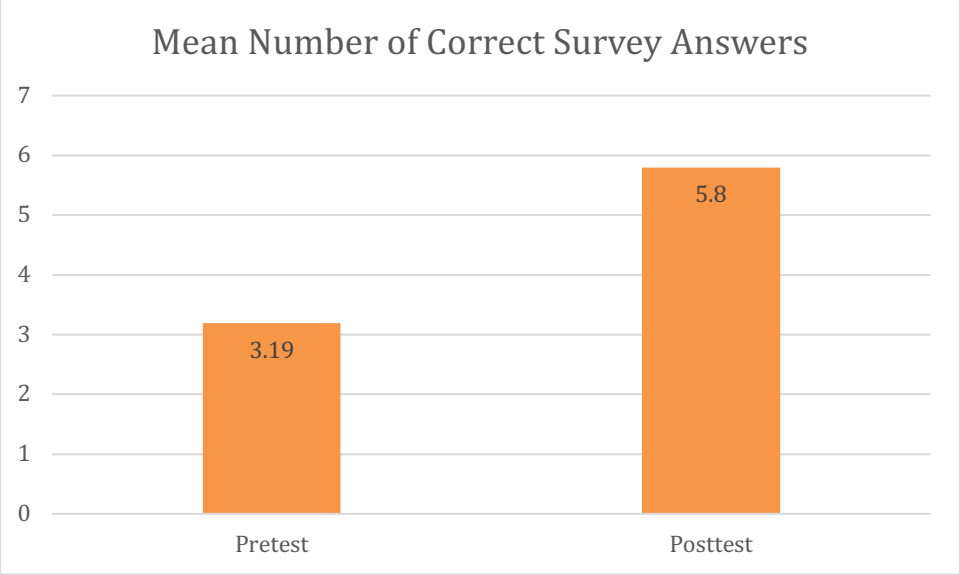

Figure 4.

Mean number of correct survey answers on pretest versus posttest

The percentage of correct answers for each of the pretest and posttest survey questions, as well as the p-values for each individual question that were testing the total score difference were based on paired t-test, are presented in Table 1. All seven graded questions that were included on

the pretest and posttest were based on the knowledge of the anesthesia provider regarding the policies and procedures for interacting with an LEP patient at the facility of the participants. Of the seven questions included in the pretest and posttest surveys, six had statistically significant differences on the posttest versus the pretest. There were significant pretest-posttest differences on the following questions: question 1 ($\chi^2(1) = 5.98$, $p = .015$); question 2 ($\chi^2(1) = 13.30$, $p < .001$); question 4 ($\chi^2(1) = 11.80$, $p < .001$); question 5 ($\chi^2(1) = 11.70$, $p < .001$); question 6 ($\chi^2(1) = 7.29$, $p = .007$); question 7 ($\chi^2(1) = 24.10$, $p < .001$). Question 1 had 72.0% correct on the pretest and 100% correct on the posttest; question 2 had 52.0% correct on the pretest and 100% correct on the posttest; question 4 had 32.0% correct on the pretest and 84.0% on the posttest; question 5 had 56.0% correct on the pretest and 100% correct on the posttest; question 6 had 68.0% correct on the pretest and 100% correct on the posttest; question 7 had 24.0% correct on the pretest and 96.0% correct on the posttest(see Figure 3).There were higher percentages of correct answers on each of these questions on the posttest. Each of the 25 participants (100%) answered question 1, question 2, question 5, and question 6 correctly on the posttest while there were no questions on the pretest with a 100% correct response rate. Each of the 25 participants posttest scores were improved from their pretest scores. Overall, the average number of correct answers increased from 3.19 (SD = 1.48) to 5.80 (SD = 0.50), $t = 6.53$, $p < .001$ (see Figure 4).

Each of the four demographic variables included in the pretest survey were tested for association between each of the four variables and correct answers on the pretest and posttest surveys. Demographic information collected included the anesthesia providers' gender, the role of the anesthesia provider (CRNA, SRNAs, or anesthesiologist), the years of experience within the facility, and the providers' ability to speak a language other than English. Of the

demographic data collected, the four demographic variables did not relate to the number of questions answered correctly, at either pretest or posttest, *p*s > .242.

CHAPTER V: DISCUSSION

Summary

This QI project was the first reported project of its kind and examined provider understanding of the proper policies and procedures when encountering an LEP patient at a full-service community hospital that serves a city in the Southeastern region of United States and its surrounding area. This project was conducted in hope of answering the question of the effect of a single-session web-based education program on anesthesia providers' awareness of resources, policies, and procedures for language assistance services, compared to current education processes. Many anesthesia providers were under-informed and lacked proper education for the necessary procedures and resources when communicating with LEP patients. The aim of the project was to assess provider awareness of policies encompassing interpretive services and the resources available to anesthesia providers regarding these barriers. Over 300 languages are currently spoken daily in the Southeastern region of United States. As the region continues to become more diverse, the need for appropriate education on proper policies and procedures as well as proper utilization of resources for an LEP patient encounter continues to grow in significance.

Interpretation

The findings from both knowledge assessment surveys and the literature review exposed significant implications for provider awareness when utilizing interpretive services. Lack of awareness of access to certified interpreters was the primary reason for the utilization of an untrained interpreter (Hudelson et al., 2009). In the pretest survey, question two, which related to provider awareness of initiating language services, was answered correctly by only 52.0% of survey respondents revealing a clear lack of provider awareness. Furthermore, question four of

the pretest survey which addressed when it was appropriate to not utilize language assistive services when communicating with an LEP patient was answered correctly by a mere 32.0% of respondents. This was highlighted by the findings of VanderWielen et al. (2014), who found many anesthesia providers to be undereducated on the appropriate situations to employ interpretive services for LEP patients. Sharpton et al. (2017) and Brooks et al. (2016) added that education about interpretive services, including the improper use of such services in anesthesia departments was necessary and beneficial to anesthesia providers. Pretest results of questions five, six, and seven revealed the need for further provider education as survey respondents answered those questions correctly at a rate of 56.0%, 68.0%, and 24.0% respectively.

Federally funded healthcare facilities are required to provide congruent care to LEP patients via the utilization of language assistive resources (VanderWielen et al., 2014). Awareness of Title VI of the Civil Rights Act of 1964 was the item with the highest percentage of correct responses at 72.0% on the pre-education survey seen in question one. All the aforementioned questions' percentage of correct responses improved drastically on the posttest survey. Questions one, two, four, five, six, and seven had increased percentages of correct respondent answers with scores increasing to a rate of 100%, 100%, 84.0%, 100%, 100%, and 96.0% correct respectively. Of the seven survey questions, question three was the only question not to see marked improvement from pretest to posttest survey scores with scores of 20.0% and 0.0% correct respectively. Overall, the average number of total correct responses increased from 3.19 (SD = 1.48) to 5.80 (SD = 0.50), $t = 6.53$, $p < .001$ from the pretest to the posttest revealing the effectiveness and necessity of the educational material that took part between the two surveys.

Limitations

There were several limitations of note identified throughout this QI project. The study employed a pretest-posttest study design. The most significant limitation of this type of design was the lack of a control group, potentially introducing bias and threats from confounding factors. The study participants were from one urban, large tertiary academic teaching hospital and therefore the findings of this QI project may not be generalizable to other settings.

Another limitation was the cost of utilizing the SurveyMonkey software for this QI project. Utilization of the SurveyMonkey surveys and all other resources contained within the SurveyMonkey platform involved an initial cost of $400. Additional expenses for other items that may have aided in the implementation of the project, such as the cost to laminate quick response (QR) codes, were limited and had to be eliminated due to the financial constraints. Such financial limitations may have limited the success of the projects implementation and the response rate of participants.

Recruitment challenge contributed an additional limitation of this study. 78 anesthesia providers were invited to participate in the surveys and only 25 of those who were requested to participate (32.1%) chose to participate in all three phases of the project. The 32.1% response rate was far under the participation rate goal of 60.0% initially made for the project. Furthermore, none of the requested SRNAs or anesthesiologists responded to the request for participation in the survey. As a result, the results of this project cannot be used to generalize the data for the two other anesthesia roles. Further studies are required to adequately conclude the differences between each anesthesia discipline. Additional time, resources, and recruitment strategies could be used in the future to mitigate the lack of participation.

Finally, our study was limited by measuring the short-term effect of the online education program. Due to feasibility and time constraints, we were unable to assess the long-term effect of the online education program. Furthermore, the time constraint was caused by the efforts needed to obtain the two required IRB approvals, from both the clinical site and the university, respectively. Due to unexpected delays in the IRB approval process, project implementation was delayed, and the window for implementation was limited. Future projects should seek additional and adequate time to garner increased anesthesia provider buy-in and to achieve more robust results.

Implications and Recommendations

This QI project demonstrates the need for ongoing anesthesia provider education on the proper utilization, and the awareness of policies, procedures, and resources for LEP patients. The educational intervention offered to the anesthesia providers who took part in this survey resulted in an improvement of average survey scores by nearly three additional correct responses per survey. We believe continuing education on the proper policies, procedures, and resources for the LEP patient is needed and utilization of the educational material provided in this QI project can improve the knowledge of anesthesia providers from all three disciplines regarding this issue. Utilization of the educational material provided in this project and implementation of similar QI projects could both improve awareness on the proper use of interpretive services and lead to more successful communication with the LEP patient population while reducing medical errors due to lack of proper communication as made evident by Brooks et al. (2016), Burkle et al. (2017), Fatahi et al. (2010), Green et al. (2005), and VanderWielen et al. (2014).

Follow up projects should address the utilization of ad hoc or uncertified interpreters as our project did not capture an increased awareness of the correct policies regarding such

interpretation strategies. Other recommendations include expanding upon the survey questions to include multiple choice or fill in the blank questions, implementing an interpretive services educational module as part of the required annual educational modules at the facility, and requesting anesthesia provider opinion on the effectiveness of the module to ensure its sustainability. Implications to practice include monitoring patient satisfaction scores among LEP patients and comparing them to scores received from this patient population prior to this project. Viewing such scores would allow for the patients' perception of improvement as a result of the QI project. The utilization of an auditing system to monitor the proper initiation and utilization of interpretive services while monitoring the improper use of ad hoc and uncertified interpreters could also be employed. Taking such a measure would ensure safe passage of LEP patients while confirming equitable levels of care quality.

Conclusion

The result of this data is evidence that utilization of a brief educational module can greatly impact anesthesia providers' awareness of resources, policies, and procedures for language services for patients with language communication barriers. Future projects should aim to highlight the significance of obtaining informed consent via a certified interpreter in lieu of ad hoc interpretation.

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APPENDIX A: PRE-EDUCATION SURVEY\

1. Please choose the facility you primarily work at below:
    a. CMC Main
    b. Mercy
    c. Pineville
2. Please select your gender below:
    a. Male
    b. Female
    c. Prefer not to answer
3. Please select the role that describes you best:
    a. CRNA
    b. SRNA
    c. Anesthesiologist
4. How many years of experience do you have at the hospital?
    a. 0-2
    b. 3-5
    c. 6-9
    d. 10 and above
5. Do you speak a language other than English?
    a. Yes
    b. No
6. I understand that the hospital's language assistive services are regulated by Title VI of the Civil Rights Act of 1964.

   a. Yes
   b. No

7. I understand how to initiate language services via three options available within my facility.
   a. Yes
   b. No
8. According to Hospital policy, if I speak the preferred language of the patient, I can perform interpretation services to obtain pre-operative consent.
   a. Yes
   b. No
9. Do you know when it is appropriate to NOT utilize Hospital provided language assistive services when communicating with a patient?
   a. Yes
   b. No
10. I know where to locate the Hospital policy on Language Assistance.
   a. Yes
   b. No
11. I know how to locate the information on Epic that informs you on the patient's language needs.
   a. Yes
   b. No
12. I know how to document the use of language assistance on Epic.
   a. Yes

b. No

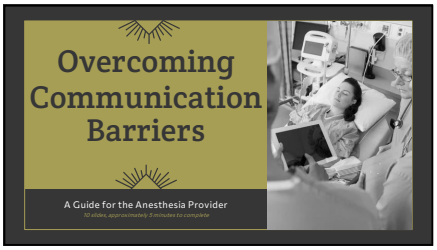
APPENDIX B: POST-EDUCATION SURVEY

1. I completed the Overcoming Communication Barriers pre-education survey.
    a. Yes
    b. No
2. I understand that the Hospital's language assistive services are regulated by Title VI of the Civil Rights Act of 1964.
    a. Yes
    b. No
3. I understand how to initiate language services via three options available within my facility.
    a. Yes
    b. No
4. According to Hospital policy, if I speak the preferred language of the patient, I can perform interpretation services to obtain pre-operative consent.
    a. Yes
    b. No
5. Do you know when it is appropriate to NOT utilize Hospital provided language assistive services when communicating with a patient?
    a. Yes
    b. No
6. I know where to locate the Hospital policy on Language Assistance.
    a. Yes
    b. No

7. I know how to locate the information on Epic that informs you on the patient's language needs.
    a. Yes
    b. No
8. I know how to document the use of language assistance on Epic.
    a. Yes
    b. No

APPENDIX C: EDUCATIONAL INTERVENTION

9/10/23



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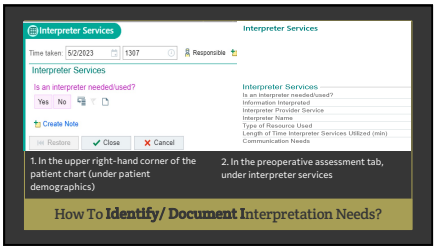

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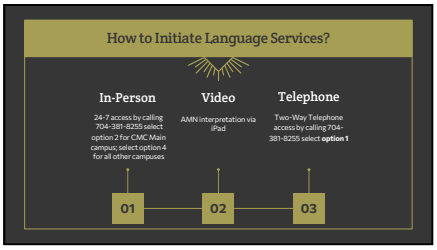
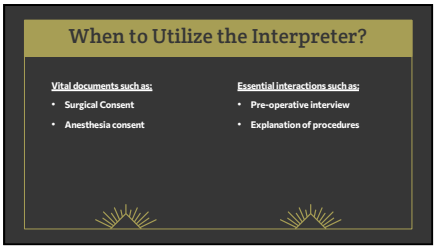
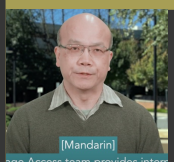


3



4

Who Can Interpret?



age Access team provides interp
lation services in over 200 langu

ONLY a certified interpreter

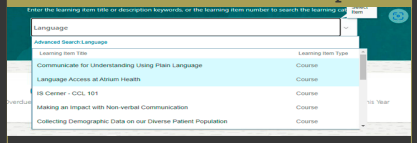
Per Atrium Health policy, ad-Hoc interpretation (friends, family, staff) is prohibited

Atrium Health Policy

Can be found on policy-tech under "Language Assistance Plan"

5

How Does Atrium Health Ensure Compliance



Atrium Health ensures compliance with **Title VI** via completing the above modules found on Core Connect.

6

Civil rights Act of 1964 – Title VI

- Title VI **prohibits** discrimination based on race, color, and national origin in programs and activities that **receive federal financial assistance.**
- Healthcare providers must take reasonable steps to ensure **meaningful access to their services** for individuals with limited English proficiency (LEP).

7

References

Language Access Department Sharepoint. (n.d.). https://carolinashealthcare.sharepoint.com/sites/CMCLS/default.aspx

Lep.gov. (n.d.). https://www.lep.gov/

PR 150.02 Language Assistance Plan : Atrium Health. (2018). Language Assistance Plan

Rights, O. F. C. (2023). Section 1557: Ensuring Meaningful Access for Individuals with Limited English Proficiency.

HHS.gov. https://www.hhs.gov/civil-rights/for-individuals/section-1557/fs-limited-english-proficiency/index.html

8

APPENDIX D: IRB APPROVAL- UNCC

CHARLOTTE
DIVISION OF RESEARCH

To:	Taylor Martin University of North Carolina at Charlotte
From:	Office of Research Protections and Integrity
Approval Date:	25-Jul-2023
RE:	Notice of Determination of Exemption
Exemption Category:	1
Study #:	IRB-23-1071
Study Title:	Communication Barriers

This submission has been reviewed by the Office of Research Protections and Integrity (ORPI) and was determined to meet the Exempt category cited above under 45 CFR 46.104(d). This determination has no expiration or end date and is not subject to an annual continuing review. However, you are required to obtain approval for all changes to any aspect of this study before they can be implemented and to comply with the Investigator Responsibilities detailed below.

Your approved consent forms (if applicable) and other documents are available online at Submission Page.

Investigator's Responsibilities:

1. Amendments **must** be submitted for review and the amendment approved before implementing the amendment. This includes changes to study procedures, study materials, personnel, etc.
2. Researchers must adhere to all site-specific requirements mandated by the study site (e.g., face mask, access requirements and/or restrictions, etc.).
3. Data security procedures must follow procedures as described in the protocol and in accordance with OneIT Guidelines for Data Handling.
4. Promptly notify the IRB office (uncc-irb@charlotte.edu) of any adverse events or unanticipated risks to participants or others.
5. Five years (5) following this approval/determination, you must complete the Admin-Check In form via Niner Research to provide a study status update.
6. Be aware that this study is included in the Office of Research Protections and Integrity (ORPI) Post-Approval Monitoring program and may be selected for post-review monitoring at some point in the future.
7. Reply to the ORPI post-review monitoring and administrative check-ins that will be conducted periodically to update ORPI as to the status of the study.
8. Complete the Closure eform via Niner Research once the study is complete.

APPENDIX E: IRB APPROVAL- WAKE FOREST UNIVERSITY

WAKE FOREST
UNIVERSITY
HEALTH SCIENCES

Office of Research
INSTITUTIONAL REVIEW BOARD

MEMORANDUM

To: Lorraine Schoen
Atrium/Carolinas Healthcare System

From: Jeannie Sekits, Senior Protocol Analyst
Institutional Review Board

Date: 7/18/2023

Subject: Exempt Protocol: IRB00098114
Quality Improvement Project to Address Communication Barriers in LEP Patients

No protected health information will be used or disclosed in this research proposal; therefore the requirement for individual Authorization does not apply.

Note that only the Wake Forest University School of Medicine IRB can make the determination for its investigators that a research study is exempt. Investigators do not have the authority to make an independent determination that research involving human subjects is exempt. Each project requires a separate review and approval or exemption. The Board must be informed of any changes to this project, so that the Board can determine whether it continues to meet the requirements for exemption.

The Wake Forest School of Medicine IRB is duly constituted, has written procedures for initial and continuing review of clinical trials; prepares written minutes of convened meetings, and retains records pertaining to the review and approval process; all in compliance with requirements of FDA regulations 21 CFR Parts 50 and 56, HHS regulations 45 CFR 46, and International Conference on Harmonisation (ICH) E6, Good Clinical Practice (GCP), as applicable. WFSM IRB is registered with OHRP/FDA; our IRB registration numbers are IRB00000212, IRB00002432, IRB00002433, IRB00002434, IRB00008492, IRB00008493, IRB00008494, and IRB00008495.
WFSM IRB has been continually fully accredited by the Association for the Accreditation of Human Research Protection Programs (AAHRPP) since 2011.

Medical Center Boulevard, Winston-Salem, NC 27157-1023 (336) 716-4542 / fax (336) 716-4480

APPENDIX F: TIMELINE

- December 2022 Topic Proposal
- January – March 2023 Literature Review
- April 2023 Oral Defense
- May-August 2023 WF and UNCC IRB approval process
- August 7, 2023 Initial Survey Distribution
- August 21 & 28, 2023 Reminder Emails Sent
- September 4, 2023 Survey Closed
- September 5, 2023 Raw Data Sent To Statistician
- October 6, 2023 Data Analysis Begins
- November 3, 2023 Final Scholarly Paper Returned to Committee
- November 17, 2023 Deadline for Committee to Accept Completed Project
- November 30, 2023 Public Dissemination of Results
- December 1, 2023 Defend Scholarly Project to Committee