Dear NYSANA,

Thank you so much for your participation in my DNP project. It was greatly appreciated and your responses to my survey were fundamental to its completion.

Project Summary:

This project analyzed the barriers and facilitators to using the pericapsular nerve group (PENG) block for patients undergoing hip surgery among CRNAs practicing in New York State. The PENG block is a newer regional anesthesia technique that can have several benefits for this patient population, including improved postoperative analgesia, improved postoperative mobility, and decreased postoperative opioid consumption. Through an extensive literature review and use of a cross-sectional survey, this DNP project identified key barriers and facilitators to its use, which allowed for the creation of evidence-based recommendations that could facilitate its incorporation into clinical practice.

Key Results:

Upon analysis of the survey data, the most common barriers to PENG block use included the lack of training and education on the PENG block, lack of surgeon buy-in, and inability to perform the PENG block frequently. When participants were asked in the short answer portion of the survey what they felt was the biggest barrier to the use of PENG blocks, the most frequently cited barrier was their hospital's culture, in which physician anesthesiologists performed all of the peripheral nerve blocks (n=7; 26.9%). Additionally, surgeon buy-in and lack of time were both cited three times each by participants (n=3; 11.5%). On the other hand, when asked what the most important factor that would facilitate the use of PENG blocks by CRNAs in NYS was, 7 participants cited that more training and experience with peripheral nerve blocks and the PENG

block would be most effective (26.9%). Furthermore, 5 participants (19.2%) cited having an increased scope of practice at their clinical site to perform peripheral nerve blocks would be most effective, and 3 participants (11.5%) cited that surgeon buy-in and understanding would increase their usage.

Table 1

Rank Order of CRNAs Perceived Barriers to PENG Blocks for Hip Procedures

Barrier	Mean ± SD
If I had more training in performing PENG blocks	4.48 ± 0.770
If I attended a workshop focused on learning the PENG block	4.48 ± 0.770
If I performed PENG blocks more frequently	4.44 ± 0.768
If I had a better understanding of PENG blocks	4.36 ± 0.638
If surgeons at my facility understood the benefits of the PENG block	4.28 ± 0.980
If I had better technical skills in performing the PENG block	4.28 ± 0.891
If regional anesthesia and PENG blocks could be more easily integrated into the norms of our existing practice	4.28 ± 0.891
If non-anesthesia providers were more open to change	4.20 ± 0.866
If anesthesia providers were more open to change	4.16 ± 0.943
If I was confident that performing PENG blocks was more cost-effective	4.12 ± 1.013
If I performed regional anesthesia more frequently	4.08 ± 1.038
If I was more comfortable performing regional blocks	4.08 ± 0.954
If I had more clinical resources available to perform and manage PENG blocks	4.04 ± 0.978
If CRNAs performed their own regional blocks at my facility	4.00 ± 1.080
If I had fewer time constraints	3.96 ± 1.020
If the use of PENG blocks did not increase my workload	3.88 ± 0.881
If there was more staff to assist with PENG block placement	3.76 ± 0.926
If patient had a better understanding of the PENG block and its benefits	3.72 ± 0.936
If registered nurses had more training to assist with PENG block administration	3.60 ± 1.190
If surgeons did not prefer anesthesia technique	3.52 ± 1.159
If patients did not fear for adverse effects of the PENG block	3.40 ± 0.957
If patients were more compliant	3.32 ± 1.069

**Scores based on 5-point Likert scale*

Project Deliverable

Recommendations for Certified Registered Nurse Anesthetists (CRNAs) Practicing in New York State to Increase the Utilization of Pericapsular Nerve Group (PENG) Blocks for Hip Surgery Patients

A Doctor of Nursing Practice (DNP) project was completed by John Connor, a Student Registered Nurse Anesthetist (SRNA) at the University at Buffalo, School of Nursing. The project surveyed 26 Certified Registered Nurse Anesthetists (CRNAs) in New York State belonging to the New York State Association of Nurse Anesthetists (NYSANA) on their perceived barriers and facilitators to the utilization of PENG blocks as part of a multimodal pain regimen for patients undergoing hip surgery. Project findings revealed that the most commonly identified items for improving PENG block utilization were 1) If I had more training in performing PENG blocks or performed them more frequently, 2) If surgeons at my facility understood the benefits of the PENG block, 4) If regional anesthesia and PENG blocks could be more easily integrated into the norms of our existing practice, 5) If non-anesthesia and anesthesia providers were more open to change. To address the identified barriers to PENG block utilization among patients undergoing hip procedures by the NYS CRNAs participating in this project, the following recommendations based on project findings have been created and supported by evidence-based literature. The goal is to increase the utilization of the PENG block and improve patient outcomes.

Recommendation 1: Annual educational opportunities or workshops with an emphasis on the benefits of peripheral nerve blocks, including the PENG block, as well as hands-on training with performing peripheral nerve blocks with the ultrasound machine should be provided to all anesthesia providers.

A lack of understanding, training, and experience with regard to PENG blocks was reported by the CRNA participants as some of the top barriers to the utilization of PENG blocks for patients undergoing hip procedures. Additionally, a lack of training and comfortability with the ultrasound machine and peripheral nerve blocks was noted. When asked what would be most beneficial to overcoming these barriers, participants mentioned learning opportunities and practice with the PENG block and ultrasound machine. The PENG block is performed primarily with the ultrasound machine, as well as a majority of peripheral nerve blocks, to increase chances of success and to enhance the safety of regional anesthesia (Wiseman & O'Riordan, 2022). Use of ultrasound requires practice and an understanding of what you are viewing on the screen. Regional anesthesia training courses utilizing ultrasound simulation significantly increase knowledge and confidence among anesthesia providers (Wiggins et al., 2018). By developing and maintaining competency on an annual basis, CRNAs will be able to feel more comfortable performing PENG blocks and other peripheral nerve blocks in their clinical practice.

Recommendation 2: CRNAs should have the opportunity to perform their own peripheral nerve blocks, including the PENG block, as well as gain placement on the "block team" if willing.

CRNA participants identified the inability to perform PENG blocks frequently as a top barrier. When asked what would help them overcome this barrier, CRNA participants frequently cited that physicians allowing CRNAs to perform their own peripheral nerve blocks would be most helpful in facilitating PENG blocks for hip surgery. Additionally, this would provide needed experience and comfortability in performing peripheral nerve blocks and PENG blocks.

Recommendation 3: CRNAs should become involved in organizational leadership in order to help promote change and promote a culture supportive of CRNA practice.

Participants identified organizational resistance to change as a top barrier to the utilization of PENG blocks for patients undergoing hip procedures. According to the American Association of Nurse Anesthesiology (AANA, 2020), CRNAs are innovative leaders in the delivery of evidence-based anesthesia and pain management. They are able to integrate critical thinking and ethical judgment in innovative ways that optimize patient outcomes. This is in line with survey findings from this DNP project, in which the CRNA respondents scored greater than one standard deviation higher on average than the US adult population on the General Self-Efficacy (GSE) scale (34.38 vs. 29.48; SD ± 3.75). The GSE scale is a validated measure of an individual's self-efficacy (Schwarzer, 2009). Therefore, this indicates that CRNAs can be strong leaders who can implement emerging evidence-based anesthesia practices, like the PENG block, and foster a work environment supportive of CRNA practice and organizational change.

Recommendation 4: CRNAs should present current literature highlighting the benefits of including the PENG block into a multimodal analgesic regimen for hip surgery to anesthesiologists and orthopedic surgical team members.

A top barrier to PENG block utilization identified by CRNA participants was resistance to change by non-anesthesia and anesthesia providers. Additionally, a lack of understanding of PENG block benefits by the surgical team was named as a top barrier. When asked what would facilitate PENG block use, several CRNA participants reported that surgeon and anesthesiologist buy-in would be effective. By sharing current literature supporting PENG block effectiveness, surgeons and anesthesiologists may overcome hesitation to use the PENG block for hip surgery and incorporate it into a multimodal pain regimen. One such example of current literature is a meta-analysis by Huda & Ghafoor (2022), in which the researchers analyzed six randomized controlled trials (RCTs) with a total of 346 patients. They found that the PENG block

significantly reduced patients' opioid consumption in the first 24 hours after surgery, significantly prolonged the time to first analgesia request, and resulted in significantly less motor block in the postoperative period.

Recommendation 5: Collaborate with orthopedic surgical teams to develop and implement enhanced recovery after surgery (ERAS) protocols that include the PENG block for applicable hip procedures.

Difficulty integrating regional anesthesia and PENG blocks into the norms of existing practice was identified by CRNA participants as a top barrier to the utilization of the PENG block for hip surgery. Enhanced Recovery After Surgery (ERAS) pathways have become increasingly popular due to improvements in patient outcomes, such as shorter length of stay, reduced postoperative pain, decreased patient complications, and increased patient satisfaction (Kallen, 2018). While ERAS protocols initially began as a way to improve outcomes for colorectal surgery, they have evolved and are now commonplace in many surgical areas, including orthopedic surgery. The implementation of an ERAS protocol for hip surgery with the inclusion of multimodal analgesia and regional anesthesia is not only cost-effective but also allows for earlier patient discharge and a quick return to independency in daily activities (Frassanito et al., 2020).

References

American Association of Nurse Anesthetists. (2024). Scope of nurse anesthesia practice. https://www.aana.com/wp-content/uploads/2023/01/scope-of-nurse-anesthesia-practice.pdf

Frassanito, L., Vergari, A., Nestorini, R., Cerulli, G., Placella, G., Pace, V., & Rossi, M. (2020). Enhanced recovery after surgery (ERAS) in hip and knee replacement surgery: Description of a multidisciplinary program to improve management of the patients undergoing major orthopedic surgery. *Musculoskeletal Surgery, 104*(1), 87-92. https://doi.org/10.1007/s12306-019-00603-4

Huda, A. U., & Ghafoor, H. (2022). The use of pericapsular nerve group (PENG) block in hip surgeries is associated with a reduction in opioid consumption, less motor block, and better patient satisfaction: A meta-analysis. *Cureus, 14*(9). https://doi.org/10.7759/cureus.28872

Kallen, A. N. (2018). Perioperative pathways: Enhanced recovery after surgery. *Obstetrics and Gynecology, 132*(3). https://doi.org/10.1097/AOG.0000000000002818

Schwarzer, R. (2009). Everything you wanted to know about the General Self-Efficacy scale but were afraid to ask. https://userpage.fu-berlin.de/~health/faq_gse.pdf

Wiggins, L. L., Morrison, S., Lutz, C., & O'Donnell, J. (2018). Using evidence-based best practices of simulation, checklists, deliberate practice, and debriefing to develop and improve a regional anesthesia training course. *AANA Journal, 86*(2), 119-126. https://www.aana.com/docs/default-source/aana-journal-webdocuments-1/using-evidence-based-best-practices-of-simulation-checklists-deliberate-practice-and-

debriefing-todevelop-and-improve-a-regional-anesthesia-training-course-april-2018.pdf?sfvrsn=c2505fbI_8

Wiseman, P., & O'Riordan, M. (2022). Pericapsular nerve group (PENG) block- An evidence-based discussion. *World Federation of Societies of Anaesthesiologists.* https://doi.org/10.28923/atotw.478