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Domenica Camaci-Douleh
*Southern Illinois University Edwardsville*

Nicole Gorris
*Southern Illinois University Edwardsville*

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# Utilizing the Anatomage Virtual Dissection Table for Learning Neuroanatomical Structures in Nurse Anesthesia Programs

## Executive Summary

Domenica Camaci-Douleh and Nicole Gorris

Southern Illinois University-Edwardsville

## Problem Statement

Students at the host Nurse Anesthesia Program lack a means of learning neuroanatomical structures pertinent to anesthesia practice in a laboratory setting. Research has demonstrated immense potential in using virtual dissections learning techniques to enhance knowledge and understanding of anatomy. The aim of this project is threefold:

1. Integrate utilization of the anatomage virtual dissection table into the host Nurse Anesthesia Program's curriculum as a tool for learning neuroanatomy.
2. Develop learning modules to aid nurse anesthesia students in future cohorts. The learning modules will contain a stepwise guide for users to efficiently navigate the anatomage table to find neuroanatomical structures and their spatial relationships and questions to facilitate learning neuroanatomy relevant to neuraxial anesthesia.
3. Determine student perceptions of this method of virtual learning.

## Literature Review Summary

Not only has research found that utilizing virtual dissection is an effective tool for learning anatomy, but it has also found that the application of virtual dissection in the procedural setting is promising. Students scored the same or better on anatomy exams when using virtual dissection compared to cadaveric dissection (Anand and Singel, 2014). Overall, abundant evidence demonstrates that virtual dissection is an effective tool for learning anatomy. Students have also expressed positive perceptions of using the anatomage table to learn anatomy (Anand and Singel, 2014). Regarding anesthesia practice, virtual dissection may provide an excellent review of neuroanatomical structures for nurse anesthesia students practicing epidural and spinal anesthetic administration. Students will visualize the bones, ligaments, angles of the spinous processes, meningeal layers, vasculature, spaces, and other structures that make up the spinal column. Reducing the number of attempts to obtain correct placement for neuraxial anesthesia not only increases patient safety but increases patient

satisfaction. There was a significant decrease in patient satisfaction when the patient experienced paresthesia with needle insertion, lightning pain during neuraxial anesthesia, and a failed block (Ida et al., 2018). Visualization with the anatomage table will help students better understand the needle trajectory and depth for properly administering neuraxial anesthesia. This learning tool could potentially reduce student anxiety and increase student confidence when performing these procedures. Experience with the AT will also yield increased patient safety and satisfaction. In conclusion, cadaveric courses have traditionally been used for health science students to gain experience and confidence before performing a procedure on a live patient (Periya and Moro, 2019). However, since research suggests that virtual dissection learning is equally or more effective than cadaveric dissection learning, integrating an anatomy course utilizing the anatomage table in nurse anesthesia programs can enhance skills and confidence when performing neuraxial anesthesia.

## Methodology

This non-experimental knowledge improvement project aims to initiate and integrate a formal, interactive, and educational learning module utilizing the Anatomage Table (AT) at the host Nurse Anesthesia Program. This learning module focused on neuroanatomy related explicitly to neuraxial anesthesia. This project also included a user guide to help students navigate the AT, specifically to access images for learning neuroanatomy.

The population of interest is a sample of convenience. Second-year Student Registered Nurse Anesthetists (SRNAs) participated in their Fall 2022 semester. Each session was about 20 minutes long, with 4-6 students participating per session. Participants first received a demonstration on the anatomage table. After a quick overview, they were presented with images of anatomy related to neuraxial anesthesia. While viewing these images, participants answered questions about anatomy and neuraxial anesthesia administration. Surveys were distributed to the participating students using Qualtrics, and anonymity was maintained. Participants completed the pre-surveys immediately before

participating in the learning modules and then completed the post-surveys immediately after the learning modules. There was no indication of which participant completed which survey. However, there were demographic questions about age, sex, and nursing experience.

## Evaluation

Each survey consisted of 5-point Likert-scale questions. Responses of “Strongly Disagree” counted as one point, “Disagree” counted as two points, “Neutral” counted as three points, “Agree” counted as four points, and “Strongly Agree” counted as five points. The mean average score of each question on the pre-survey across all participants was compared to the mean average score of each question post-survey question. Descriptive statistics and frequencies analyzed each question along with the Wilcoxon signed rank test to compare data from pre- and post-surveys. Finally, the mean average score of each pre- and post-survey question were analyzed using a Paired Two Sample t-test. Data was anonymous and secured on the researchers' devices were password protected.

## Results

The pre-survey included demographic questions including age, sex, years of nursing experience, and type of nursing experience. There were 29 total participants, and the results of the demographic questions are demonstrated in Tables 1.0 through 1.3 of the primary document. The demographic results demonstrate the similarity among the students. The majority of students are female (78.8%), aged 21-29 (63.6%), with 3-5 years of nursing experience (48.5%) in the intensive care unit (97%). In addition, the results of the pre-and post-survey surveys were analyzed using a Paired Two Sample t-test. Table 2.0 of the primary document demonstrates the average results of each question. The results of the Paired Two Sample t-test are demonstrated in Table 3.0 of the primary document.

Nine questions were asked to evaluate learning and perception after participating in the modules. After analyzing the results from the pre-and post-surveys, there were significant differences regarding each question. The results reveal a positive correlation between the pre- and post-surveys.

Both the one-tail and two-tail p-values were <0.05, thus demonstrating statistical significance. These outcomes demonstrated improved students' knowledge and confidence when administering neuraxial anesthesia after completing the provided modules using the anatomage table. Through analysis, it was concluded that the second-year SRNAs better understood neuroanatomy necessary in administrating neuraxial anesthesia and overall enjoyed this method of learning and reviewing neuroanatomy.

## Discussion

When conducting this study, there were a couple of limitations. One of the limitations was the variety of experience each student had previously with learning anatomy. For example, in previous courses, some students had been familiar with human cadavers and the anatomage table. In contrast, others had little to no experience with either. Although towards the end of the module, students felt more comfortable using the anatomage table, a suggestion would be to have the students become more familiar with the anatomage table earlier in their programs. Many students felt uncomfortable touching the table and did not understand how to navigate to different menu items. Introducing the anatomage table to students early in the program will allow the SRNAs to feel more confident when using the table and encourage learning. In addition, having the anatomage table become a more accessible resource for SRNAs can improve their knowledge and understanding of human anatomy leading to better care as a CRNA in the future. Increasing neuroanatomy knowledge will increase the success rates of administering neuraxial anesthesia in the future. Conducting a study on whether previous experience with cadavers or the anatomage table could be helpful when determining the anatomage table's effectiveness.

Another limitation expressed was the set time limit. Each group had the same time with the modules and anatomage table. While each group size was the same, some required more time to become familiar with the table, causing them to rush to complete the modules. In the future, a study analyzing the amount of time one spends learning the modules may be of consideration. Overall, this

analysis exposed that each participant's past experience with the anatomage table dictated the ease with which they could navigate the learning modules in a timely manner.

## Impact On Practice

Human cadavers used in schools to study anatomy can be costly and difficult to maintain. The anatomage table offers a more cost-effective and readily available resource to help students learn human anatomy. The modules created to help students navigate the anatomage table and improve their knowledge of the anatomy and administration of neuraxial anesthesia was highly effective. This resource available to SRNA students will significantly impact their learning and, eventually, their care of patients. The use of the anatomage table will improve the SRNA's knowledge and skills in a more effective and cost-efficient manner. This knowledge improvement can promote patient safety and satisfaction with students administering neuraxial anesthesia.

## Conclusion

The SRNAs at the host Nurse Anesthesia Program felt more knowledgeable and confident when identifying the anatomy necessary for administering neuraxial anesthesia after completing modules associated with the anatomage table. The students stated that having a better understanding of neuroanatomy will assist them when performing neuraxial anesthesia. Incorporating the anatomage table showed significant improvements in the student's knowledge and is a highly effective resource. As previously discussed, recommendations for future efforts of learning anatomy with the anatomage table for SRNAs would be to demonstrate the anatomage table earlier in the program leading to students being more comfortable with the table and allow the students to take more time if needed. Given the students' little experience with the anatomage table previously, and a limited amount of time; the SRNAs showed significant improvement in their knowledge of neuroanatomy, which will benefit them in the clinical setting.

**Author Contact Information**

Domenica Camaci-Douleh, SRNA dcamaci@siue.edu

Nicole Gorris, SRNA ngorris@siue.edu

Dr. Mary Zerlan, CRNA mzerlan@siue.edu

**References**

Anand, M. K., & Singel, T. C. (2014). A comparative study of learning with “anatomage” virtual dissection table versus traditional dissection method in neuroanatomy. *Ind J Clin Anat Physiol*, *4*, 177-180.

Ida, M., Enomoto, J., Yamamoto, Y., Onodera, H., & Kawaguchi, M. (2018). Factors associated with anesthetic satisfaction after cesarean delivery under neuraxial anesthesia. *JA clinical reports*, *4*(1), 66.

Periya, S. N., & Moro, C. (2019). Applied learning of anatomy and physiology: virtual dissection tables within medical and health science education. *The Bangkok Medical Journal*, *15*(1), 121-121.