

Use of Narrative Drawings to Improve the Understanding of Threshold Concepts in Cranial Nerve Anatomy

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Introduction

- Knowledge of the structure and function of the human body is fundamental to the development of a competent physician.¹
- However, early health professionals consistently face difficulty understanding anatomy.²
- Integration of innovative teaching strategies and modern educational technology has been proposed as a means to enhance learner engagement and retention of anatomical knowledge.³
- Learner-generated drawings have shown to be effective in anatomy education.⁴
- Evidence suggests that drawing may improve comprehension of anatomical relationships and structures when compared with traditional methods such as dissection alone.⁵
- We sought to determine if presenting threshold concepts related to anatomy through narrative drawings improves medical student comprehension and retention.

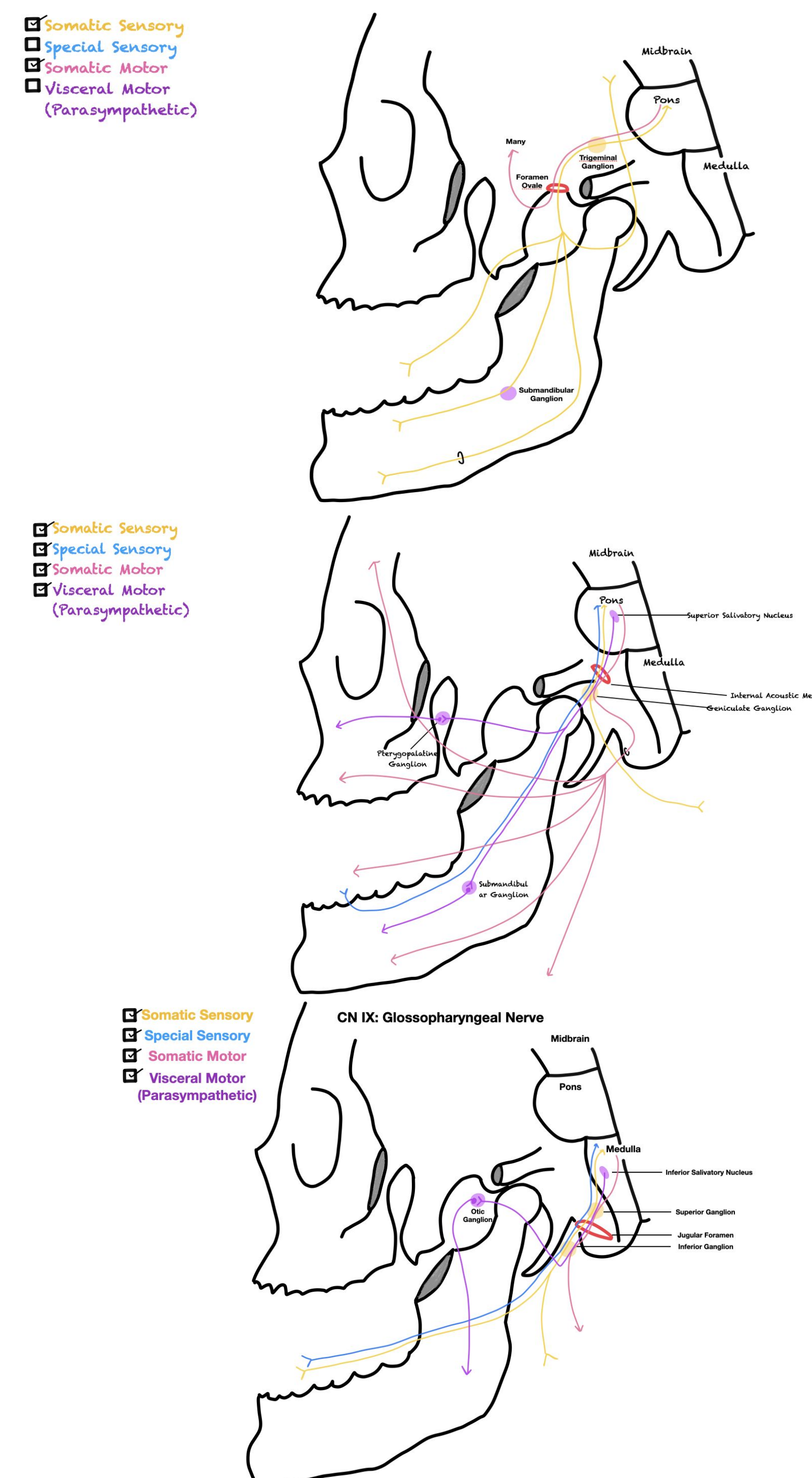
Aims and Objectives

- Identify threshold concepts⁶ related to cranial nerve anatomy and create narrative drawing videos illustrating these concepts.
- Assess the effectiveness of narrative drawings on students' comprehension and retention of cranial nerve anatomy.
- Assess students' perception of their understanding of cranial nerve anatomical concepts.
- Create and implement a lasting resource in the Anatomical Foundations of Clinical Practice 2 (AFCP2) course.

Methods



- **Study Population:** First year medical students (n=127) enrolled in Anatomical Foundations of Clinical Practice 2 (AFCP2) at Oakland University William Beaumont School of Medicine
 - **Experimental Group:** Students who utilized ≥ 1 module(s)
 - **Control Group:** Students who utilized 0 modules
- **Learning Modules:** Students were offered 7 modules for Cranial Nerves



Figures 1, 2, 3. Examples of cranial nerve video modules (V3, 7, 9)

Results

- Average post-module scores improved from pre-module scores across cranial nerve modules

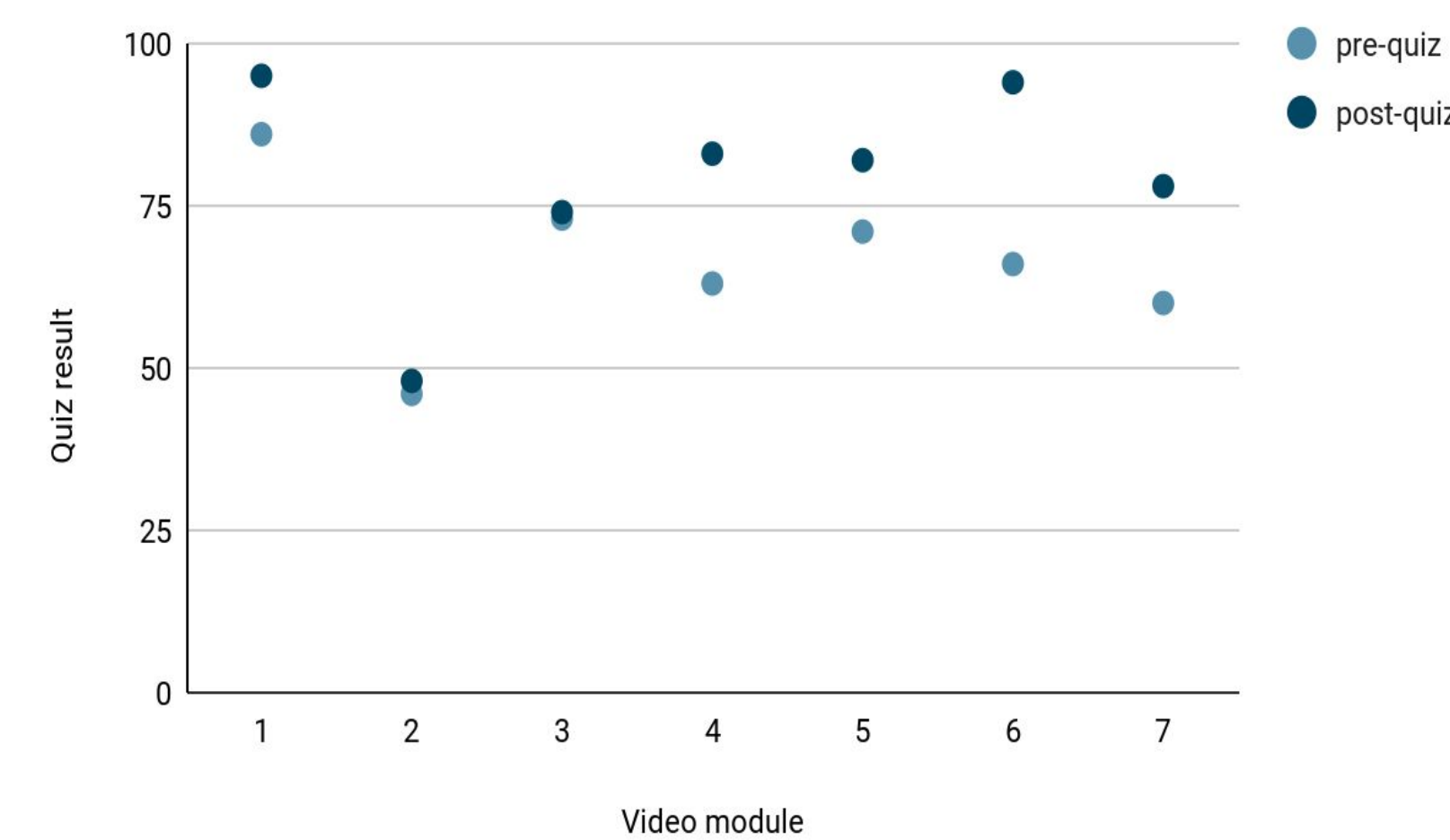


Figure 4. Pre- and post- module quiz scores

Number of Participants	Module Number	Module Topic	p-value
50	1	CN III	0.048
46	2	CN V1	0.743
43	3	CN V2	0.623
44	4	CN V3	0.001
41	5	CN VII	0.004
39	6	CN IX	0.001
41	7	CN X	0.001

Figure 5. Statistical analysis of pre- and post-module quiz scores

- **Survey Results:**
 - A majority of survey respondents (91.7%) agreed or strongly agreed that narrative drawings enhanced their understanding of anatomy, with 41.7% strongly agreeing that these drawings are beneficial at the start of a block.
 - Most respondents (83.3%) agreed that the narrative drawings provided a stronger foundation for understanding additional anatomy concepts. In contrast, responses were more variable regarding the usefulness of narrative drawings at the conclusion of a block for consolidation and integration.
 - A significant percentage (75%) strongly agreed that they wish for additional learning modules featuring narrative drawings for other anatomy topics.

Conclusions

- Post-test scores significantly increased from pre-test scores across the majority of modules, indicating the cranial nerve modules were effective in helping students attain short-term comprehension.
- Analysis of survey results further demonstrated that narrative drawing videos have a positive impact on students' understanding of cranial nerve anatomy.
- Most respondents agreed that these videos enhanced comprehension and provided a stronger foundational framework for learning additional anatomy concepts.
- Responses were more variable regarding the optimal timing of narrative drawings within a block, with no clear consensus on whether they are more beneficial at the beginning or conclusion of instruction.
- **Limitations:** The optional nature of the study may select for participation from more motivated students.
- **Application:** This study supports the integration of visual and interactive modalities into anatomical education for medical students. These findings could help educators adapt the medical school curriculum to more effectively address the preferences of medical students.

References



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