

# Drawing BRAINS: Infusing Neuroscience Education with Health Humanities

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## BACKGROUND

- Duke medical students learn the foundation for clinical practice in neurology and psychiatry during a first-year course, called *Brain and Behavior*, which is allocated 17-20 days of contact during the month of January. Of necessity, the course progresses through a large canon of knowledge in the medical neurosciences at an accelerated pace. Despite these limitations, the course has been well received and highly rated by students.
- However, we believe that the “fast learning” demanded by an accelerated survey of neurophysiology, clinical neuroanatomy, and the biological foundations of human behavior would be enhanced by infusion of “slow learning” inherent in the humanities.
- As an extension of the *Anatomy Drawing Program*, sponsored by the Trent Center for Bioethics, Humanities & History of Medicine, we encouraged students to engage human brain specimens as objects worthy of ‘close reading’ and ‘re-presentation’ in artistic form.

## OBJECTIVES

- Our primary objective was simply to invite medical learners to see the human brain through their metacognitive lenses of perception, attention, reflection and empathy<sup>1</sup>.
- Secondly, we aspired to bring learners to a cognitive place where imagination and subjectivity engage objectivity in the creation of visual re-presentations of brain structure and function in health and in injury or disease.

## APPROACH

- Medical students were invited to participate in two optional “Drawing Brains” sessions in evening hours during the month of January in the Duke Institute for Brain Sciences (DIBS).



- The sessions included a dinner for orientation and preliminary discussion.
- Media were provided for the creation of visual art, including charcoal, pastel chalks, acrylic and watercolor paints, and a variety of paper stocks.

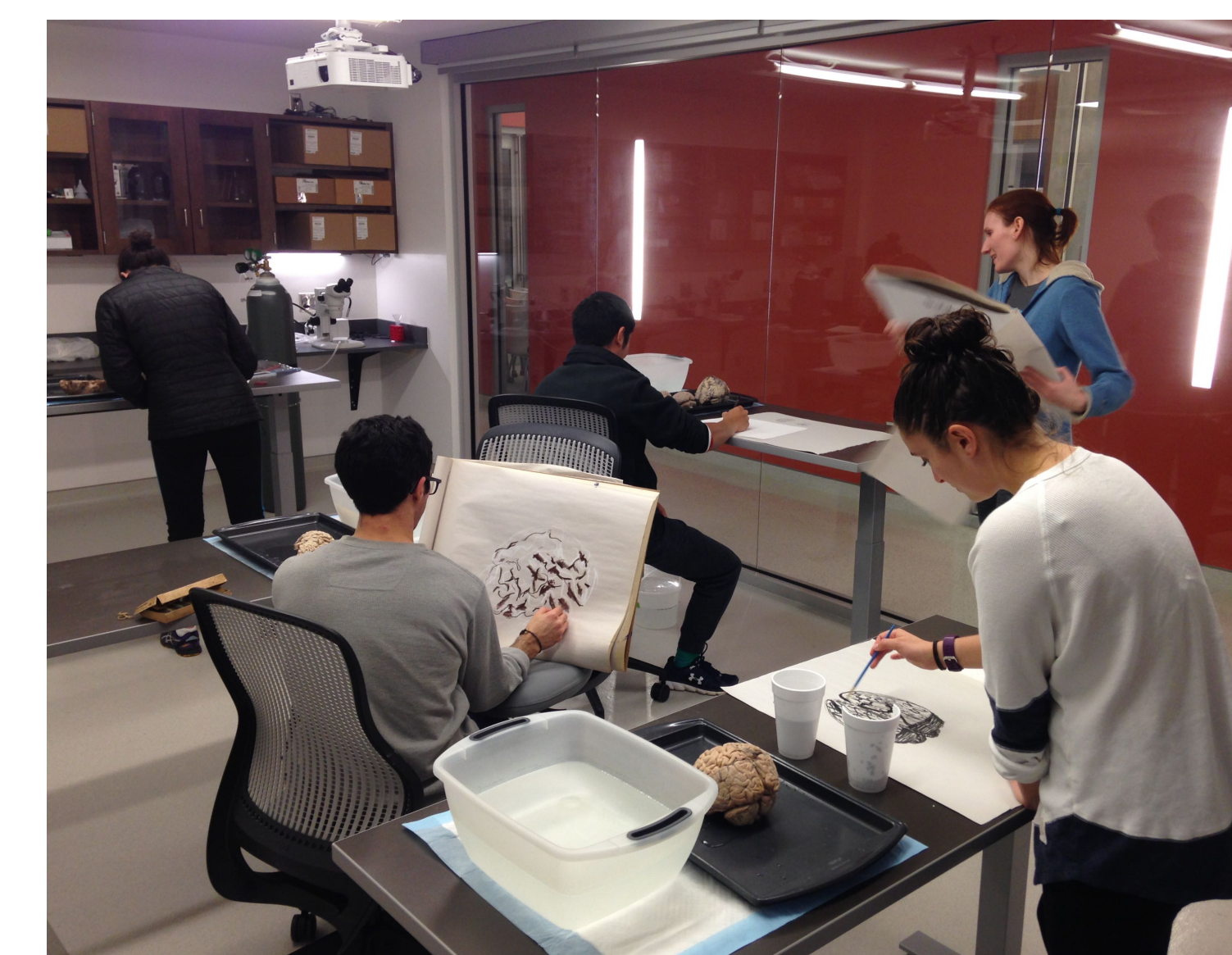
## OUTCOMES

- In the first session, learners were presented with a variety of human brain specimens, including whole brains, brains sectioned in the midsagittal plane, samples of dura mater, and histological slides with thin sections stained for the demonstration of cell bodies (Nissl stains) or myelin (silver/gold salt stains).
- In the second session, specimens from individuals who died with grossly visible pathologic alterations in the brain are examined and drawn, with encouragement to reflect deeply and imaginatively on the human impact of brain injury and neurological disability.

## SUMMARY & CONCLUSIONS

- ✓ “Drawing Brains” provided opportunity for first-year medical students to slow their pace of learning, see the brain through their metacognitive lenses, and explore neurological pathology by means of artistic visualization and re-presentation of human brain structure.
- ✓ Learners to engaged the depth and meaning of human experience by closely reading so-called typical human brains and those that have been transformed by injury and disease.
- ✓ We contend that such creative encounters with the “awe-fullness” inherent in biomedical education<sup>2</sup> will contribute in some small but formative way to a deepening appreciation of the necessity of metacognitive proficiencies for the humanistic practice of medicine.

## SESSION 1: DRAWING, PAINTING & PRINTING BRAINS

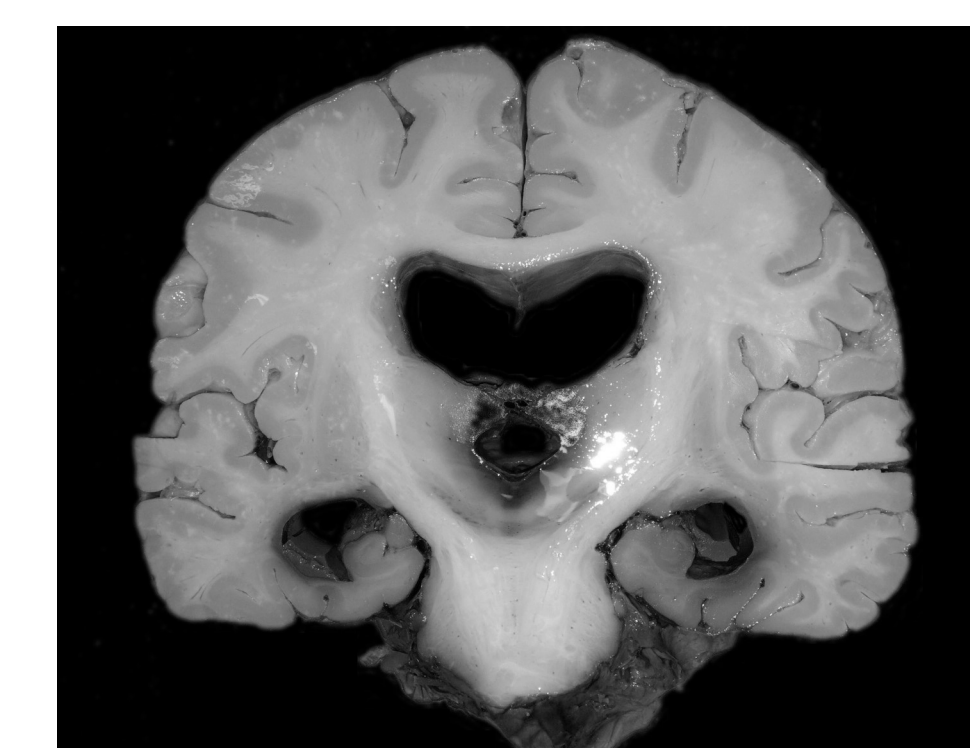


Following an orientation dinner and discussion in the Duke Institute for Brain Sciences, first-year medical students observed whole brains, brains bisected in the mid-sagittal plane, brains prosected in coronal, parasagittal and axial planes, and histological preparations on glass slides that were viewed on light boxes and under brightfield microscopy. Students then availed themselves of a variety of media for creating reflective renderings in charcoal, pencil, watercolor, or acrylic paint on various papers.



One activity involved printing brain slabs. This was done by applying black ink to individual slabs (upper left), gently and respectfully pressing the slabs against newspaper paper (upper right), and repeating with varying ink coverage and pressure to create a montage of images that reflect the internal anatomical structures of the human brain. Jasmine McNeill created one such montage bringing to mind the American artist, Andy Warhol's repetitions of iconic faces.

## SESSION 2: REFLECTIONS OF VISIBLE BRAIN INJURY & DISEASE



Students interacted with human brain specimens from individuals who died with visible pathological conditions. Raeann Whitney reflected upon the presumed suffering of the individual who experienced an intraparenchymal hemorrhage and created a charcoal sketch of a coronal slab from this person's brain (upper left). She represented the slab in an inverted orientation with the enlarged, blood-filled ventricles drawn to resemble a human face (recalling the 1893 painting, “The Scream”, by the Norwegian expressionist, Edvard Munch).



Medical students displaying their artistic creations at the conclusion of the first Drawing Brains session.



Rebecca Fabbro represented the coronal slab below, which lacks the left amygdala (white arrow) explained presumably by a past focal stroke. Rebecca's illustration in water color of this slab itself presents a duality, with the right side of the illustration representing the slab as a visual object (in gray tones) and the left side evoking a more fanciful (and colorful) representation of living life without an amygdala—a brain structure that serves to detect threat and increase vigilance.



### References:

1. Eichbaum, Q.G. (2014) Thinking about thinking and emotion: the metacognitive approach to the medical humanities that integrates the basic and clinical sciences. *The Permanente Journal* 18:64-75.
2. Eichbaum, Q.G., White, L.E., Masukume, G., Pena, G. (2019) The ‘awe-full’ fascination of pathology. In, *Handbook of the Medical Humanities* (A. Bleakley, ed.). Routledge.