



Letter to the Editor

Rituals and superstitions in neurosurgery

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Dear Editor,

The discipline of neurological surgery presents a multifaceted landscape characterized by profound details and extreme challenges, necessitating from neurosurgeons a meticulous combination of cognitive acumen and physical dexterity. To ensure that they remain focused and oriented during high-pressure surgical tasks, neurosurgeons may practice certain routines, rituals, and habits before and during surgical procedures. These practices might include wearing specific uniforms or shoes, playing certain types of music, or even making jokes to help them relax and stay on track, ensuring that they are in the right state of mind to perform the surgery successfully.

Rituals have physical and psychological features and lack direct instrumental purpose. They consist of predefined sequences characterized by rigidity, formality, and repetition. They are embedded in a larger system of symbolism and meaning, and these actions often lack overt practical purpose and are not causally linked to their stated goals. In rituals, most of the mundane gestures become transformed into a symbolic expression, which has important regulatory functions to help manage emotions by constraining thinking, sharpening up attention, and satisfying the need for order. Rituals can improve performance by boosting confidence, embodying motivational states, and facilitating automatic imitation of scripted behaviors and they enhance social connections through joint attention, emotional synchrony, and behavioral coordination.^[5]

There are minimal discussions in the literature regarding the reasons why neurosurgeons believe in some rituals and traditions; however, the habits of these practices are still present, gaining a deeper insight into the interplay of culture, superstitions, and beliefs in operative neurosurgical settings. The role of these factors in shaping the operative experience may offer insight into an interesting perspective of practicing neurosurgery.

HISTORICAL CONTEXT

Traces of rituals and superstitions can be found in the roots of every society. The prevalence of such beliefs can be stretched from old native cultures in the form of paranormal, magical, and superstitious activities.^[3] Furthermore, all ancient human societies have medical beliefs

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that provide explanations for and answers to processes such as birth, death, and illness. Throughout the world, diseases have often been attributed to witchcraft, demons, adverse cosmological influence, or the will of gods.^[13]

Ritualistic practices in neurosurgery have their roots in ancient civilizations, where medicine, in general, and neurosurgery, in particular, often intertwine with religious or spiritual beliefs. It's believed that the first neurosurgical intervention was used under the umbrella of religion, mystics, and therapy during the ancient Egyptian era; according to Filler, in ancient Egyptian mythology, the Mother Goddess Isis and the God of Medicine Toth worked together to resurrect the God of the underworld, Osiris, who had suffered a damaged cervical spine. Filler believed that traction was used to successfully treat Osiris' cervical spine injury, which dates back 7000 years ago.^[4]

Both rational inquiry and religious beliefs influenced ancient Greek medical practices. Hippocrates, who is often considered the father of Western medicine, emphasized natural causes and empirical observation in medical treatment. However, religious rituals, including prayers and offerings to gods such as Apollo and Asclepius, were also common in healing ceremonies. Temples known as Asclepieions were dedicated to the god of healing, where patients sought cures through dreams, rituals, and sometimes surgical interventions.^[11] The commonly used symbol of the medical practices, which are illustrated by serpents intertwined around the rod of Asclepius denoted the belief that serpents could restore themselves and had the capacity of knowing the healing power of plants.^[10,13]

In Mesoamerica civilizations such as the Maya and Aztecs, medical practices were deeply intertwined with religion and spirituality. Shamanic rituals and ceremonies played a significant role in healing practices, including surgeries such as trepanation, which is equivalent to performing a burr hole in modern neurosurgery, was performed for various reasons, including the treatment of head injuries, migraines, and spiritual ailments. Shamans or priests conducted these procedures within ceremonial contexts, often invoking the aid of deities or ancestors.^[1]

During the Middle Ages in medieval Europe, medical practices were heavily influenced by the Catholic Church. Surgery, including neurosurgery, was often performed by barber surgeons or monks. Religious rituals and prayers were common before and after surgical procedures, with the belief that divine intervention could aid in successful outcomes.^[2]

Across these diverse cultures and civilizations, the practice of neurosurgery was not only a medical intervention but also a deeply spiritual and ritualistic endeavor. It reflected the beliefs, cultural backgrounds, and religious practices of each society, highlighting the complex interplay between medicine, spirituality, and cultural heritage throughout history.

PSYCHOLOGICAL SIGNIFICANCE

The neurosurgical rituals can serve a purpose beyond just being a tradition to be followed repeatedly. They can act as a form of coping strategy that helps neurosurgeons deal with the immense stress and pressure of their profession. It was suggested that these practices generally assist individuals in stress reduction, giving a sense of optimism and self-fulfilling prophecy, which is likely to promote task performance.^[7,9]

There is sparse mention of science-based evidence regarding the substantial effect of rituals that need to be explained from a psychological perspective. It was suggested that when people wear a particular piece of clothing that embodies a symbolic meaning, they are more likely to trigger associated psychological responses. For example, wearing a laboratory coat signifies a scientific focus and an emphasis on being careful and attentive; for neurosurgeons, this can be applied to certain scrub sets or their favorite head caps. Such minimal actions can be attributed to paying attention to the task at hand and optimizing focus to avoid errors.^[9]

In addition, there is a strong assertion that rituals play a crucial role in reducing stress and anxiety levels by providing a sense of control and predictability in uncertain situations.^[8] This is particularly vital in high-pressure environments like neurosurgery, where effective stress management is essential for peak performance and best patient outcomes.

In the context of cognitive psychology, "Daniel Kahneman" has emphasized the significance of familiarity and comfort in decision-making and performing under pressure. Rituals such as wearing a familiar scrub cap or listening to preferred music can create a sense of familiarity and comfort, which can enhance cognitive performance and decision-making abilities.^[6] Furthermore, provoking a positive mood, as reported in neuroscientific research studies, which include models using functional magnetic resonance imaging, has demonstrated that having a positive mood can enhance reward-related neural activity and help achieve desired outcomes in all major aspects of life.^[12]

This suggests that following rituals can help regulate emotions and improve subjective well-being, which is crucial for maintaining concentration during complicated tasks such as neurological interventions. Although superstitions are described in the literature as unsupported beliefs with a lack of justified rationale, it was mentioned that such beliefs provide a path for illusions that one possesses the prowess to control the situation, and this illusionary control is associated with psychological benefits as it was mentioned that they contribute to overall improved psychological health of individuals.^[3]

DEBATE AND CHALLENGES

Despite their prevalence, the efficacy of these rituals and traditions in improving patient outcomes remains uncertain.

It is often argued that relying on superstition or habit may detract from evidence-based practice, potentially leading to inefficiency in performance or overlooking more critical aspects of patient care. Moreover, the perpetuation of certain rituals may inadvertently reinforce cultural biases or hinder innovation in surgical techniques. Therefore, there is a growing call within the neurosurgical community for a reevaluation of these practices and their implications for patient safety and surgical outcomes.

CONCLUSION

Rituals and superstitions observed by neurosurgeons reflect a complex interplay of historical, cultural, and psychological factors. While these practices may provide comfort and structure in the high-pressure environment of the operating room, their impact on patient outcomes remains undefined. As the field of neurosurgery continues to evolve, it is increasingly imperative for practitioners to examine the rationale behind these rituals critically and to embrace evidence-based approaches to patient care. By doing so, neurosurgeons can ensure that they are providing the best possible care to their patients while honoring the traditions and heritage of their profession.

Ethical approval

The Institutional Review Board approval is not required.

Declaration of patient consent

Patient's consent was not required as there are no patients in this study.

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Use of artificial intelligence (AI)-assisted technology for manuscript preparation

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REFERENCES

1. Carrillo-Ruiz JD, Muratti-Molina EB, Cojuc-Konigsberg G, Carrillo-Márquez JR. Trephinations, trephines, and craniectomies: Contrast between global ancient civilizations and pre-hispanic Mexican cultures. *World Neurosurg* 2023;179:49-59.
2. Donaldson IM. How blood was let in the sixteenth century: Jacques Guillemeau, La Chirurgie Française. 1594. *J R Coll Physicians Edinb* 2012;42:375-7.
3. Faiza A. Social and psychological factors for superstition: A brief literature review. *Int J Adv Study Res Work* 2018;1:81.
4. Filler AG. A Historical hypothesis of the first recorded neurosurgical operation: Isis, Osiris, Thoth, and the origin of the djed cross. *Neurosurg Focus* 2007;23:E6.
5. Hobson NM, Schroeder J, Risen JL, Xygalatas D, Inzlicht M. The psychology of rituals: An integrative review and process-based framework. *Pers Soc Psychol Rev* 2018;22:260-84.
6. Kahneman D. *Thinking fast and slow*. New York: Farrar, Straus, and Giroux; 2011. Available from: https://www.pdcnet.org/collection/fshow?id=inquiryct_2012_0027_0002_0054_0057&pdfname=inquiryct_2012_0027_0002_0055_0058.pdf&file_type=pdf [Last accessed on 2025 Jan 10].
7. Keinan G. The effects of stress and desire for control on superstitious behavior. *Personal Soc Psychol Bull* 2002;28:102-8.
8. Lyrakos DG. The Impact of stress, social support, self-efficacy and coping on university students, a multicultural European study. *Psychology* 2012;3:143-9.
9. Oyatoogun GO. Inclusive fashion for women with mobility disabilities in the UK. Master's thesis. University of Mälardalen; 2023. Available from: <https://www.diva-portal.org/smash/get/diva2:1777662/FULLTEXT01.pdf> [Last accessed on 2025 Jan 10].
10. Subbarayappa BV. The roots of ancient medicine: An historical outline. *J Biosci* 2001;26:135-43.
11. Yapijakis C. Hippocrates of Kos, the father of clinical medicine, and asclepiades of Bithynia, the father of molecular medicine. *Review. In Vivo* 2009;23:507-14.
12. Young CB, Nusslock R. Positive mood enhances reward-related neural activity. *Soc Cogn Affect Neurosci* 2016;11:934-44.
13. Žuškin E, Lipozenčić J, Pucarín-Cvetković J, Mustajbegović J, Schachter N, Mučić-Pučić B, et al. Ancient medicine-a review. *Acta Dermatovenerol Croat* 2008;16:149-57.

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Commentary

This is a Review Article or Editorial and a welcomed addition to the history of neurosurgery with its novel reinterpretation of surgical methods and procedures as “rituals.” However, the word “superstition” in the title does not apply and there is no evidence provided in this paper that there are any truly superstitious practices (real or symbolic) in modern neurosurgery—at least that I can recognize or classify as such. The term does make us curious and entices us to read the essay more carefully. Moreover, I cannot recognize “wearing specific uniforms or shoes, playing certain types of music, or even making jokes,” as rituals. Instead, as the author(s) further recognized these are behaviors that may “help neurosurgeons relax and stay on track, ensuring that they are in the right state of mind to perform the surgery successfully.” Furthermore, while “(R)ituals have physical and psychological features,” the author(s) state that they do not “lack direct instrumental purpose.” And while “rituals” do consist of predefined sequences characterized by formality (not necessarily rigidity), and repetition, I would say that positioning and setting up a patient for a complicated posterior fossa operation or stereotactic surgery, actually requires not only thoughtful planning but also careful sequential steps—that although may be considered ritualistic maneuvers—are necessary to be followed to avoid missteps and prevent injury to patients. They are not “embedded in a larger system of symbolism and meaning,” and they do have overt practical purpose linked to their stated goals, that is, the performance of a successful surgical procedure. In short, the author(s) have placed too much emphasis on symbolism and ritualism in this engaging article, neglecting the fact that necessity is the mother of invention, that practicality is important, and that one must keep and build upon what works in surgical methodology. The author(s) are correct that ancient and Medieval medical history was imbued with myth, religion, spirituality, and even superstition. But progress took place as knowledge was gained, sometimes by trial and error. The scientific method came much later. This paper gives us food for thought reminding us we must look back to medical history to see where we have been, where we are, and where we are headed in neurosurgical practice.

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