

Reply to ‘Limitations of neurocentric models for near-death experiences’



We thank O’Grady and Varghese for their comments on our recent Review (Martial, C. et al. A neuroscientific model of near-death experiences. *Nat. Rev. Neurol.* **21**, 297–311; 2025)¹. We appreciate their engagement (O’Grady, G. & Varghese, C. Limitations of neurocentric models for near-death experiences. *Nat. Rev. Neurol.* <https://doi.org/10.1038/s41582-025-01117-3>; 2025)² and agree wholeheartedly that near-death experiences (NDEs) “remain one of the most intriguing experiences in modern clinical science.”

We recognize the need for multidisciplinary discourse that considers all available evidence. However, such inclusivity must extend to contemporary knowledge from neuroscience and cognitive psychology – key fields for understanding NDEs. Intellectual honesty and methodological rigour are essential in this belief-laden field. In this spirit, our NEPTUNE model¹ was not intended to diminish the phenomenological richness or personal value of NDEs, but rather to propose a cognitive-neurobiologically plausible integrative framework grounded in empirical findings. Far from precluding neuroscientific explanation, the compelling phenomenology and profound impact of these experiences call for investigation into how such effects can emerge from extreme states, thereby motivating our evolutionary perspective^{1,3}.

We also agree that NDEs should not be equated with subjective entities such as routine nightly dreams, but we challenge the assertion that they are entirely distinct from hallucinations². The DSM-5 defines hallucinations as “sensory perceptions that have the compelling sense of reality of a true perception but that occurs without external stimulation of the relevant sensory organ,” which is consistent with NDEs. The core features of NDEs, such as immersive imagery, emotional intensity, temporal distortion and coherent narratives, are also common in hallucinatory and dissociative phenomena.

We acknowledge reports of ‘veridical perceptions’, as highlighted by O’Grady and Varghese², but no study has yet provided robust evidence of real-world perception that cannot be explained by neurophysiological explanations during unresponsive states. That said, we do not dismiss this possibility; rather, we find it plausible

that some perceptual access might persist in these critical states, though not necessarily visual, and not through extracorporeal mechanisms. Such phenomena align with the concept of ‘connected consciousness’, which is defined as covert awareness of the environment despite behavioural unresponsiveness^{4,5} and has been observed in situations in which people were previously assumed to be entirely unconscious, such as general anaesthesia⁶. In addition, cognitive psychology shows us that memory reconstructions, especially under ambiguous conditions, are shaped by prior expectations and cultural and internal models⁷. As Engmann⁸ has noted, ‘secondary reprocessing’ might contribute to the distinctiveness of the NDE memory.

Although our understanding of how complex consciousness emerges from brain matter remains incomplete, we are surprised by the resistance to recent neuroscientific models in this field. This resistance could reflect values that diverge from scientific epistemology, including suggestions that consciousness persists independently of a functioning brain, which remain unsupported by empirical evidence. We are particularly concerned by assertions that NDEs occur during ‘absent cortical activity’², often inferred from EEG silence. We reiterate the inherent limitations of EEG in terms of depth and spatial resolution, and the fundamental diagnostic criteria for clinical and brain death. Similarly, we express reservations about interpretations such as those by van Lommel et al.⁹, as cited by the authors², in which the term ‘clinical death’ was used to signify the consequence of transient cardiac dysrhythmia. In near-death cases, the brain that supports consciousness has not died, and the conflation of cardiac dysrhythmia and clinical death fuels ongoing ambiguity about what constitutes death in such contexts.

In summary, we share the authors’ commitment to honouring the complexity of NDEs and avoiding oversimplification. However, we respectfully submit that such complexity must include – not dismiss – empirical data. An open-minded yet evidence-based approach will bring us closer to understanding these remarkable experiences.

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Competing interests

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