Psychiatric Neurosurgery

Surgical interventions such as stereotactic radiosurgery and magnetic resonance-guided focused ultrasound, and neuromodulatory interventions such as deep brain stimulation (DBS) and vagal nerve stimulation, are under investigation to remediate psychiatric conditions resistant to conventional therapies involving drugs and psychological supports.

Given the complicated history of psychiatric neurosurgery and its renaissance today, we sought to examine current perceptions and predictions about the field among practicing functional neurosurgeons.

We designed a 51-question online survey comprising Likert-type, multiple-choice, and rank-order questions and distributed it to members of the American Society for Stereotactic and Functional Neurosurgery (ASSFN). Descriptive and inferential statistical analyses were performed on the data.

We received 38 completed surveys. Half (n = 19) of responders reported devoting at least a portion of their clinical practice to psychiatric neurosurgery, utilizing DBS and treating obsessive compulsive disorder (OCD) most frequently overall. Respondents indicated that psychiatric neurosurgery is more medically effective (OR 0, p = 0.03242, two-sided Fisher's exact test) and has clearer clinical indications for the treatment of OCD than for the treatment of depression (OR 0.09775, p = 0.005137, two-sided Fisher's exact test). Seventy-one percent of all respondents (n = 27) supported the clinical utility of ablative surgery in modern neuropsychiatric practice, 87% (n = 33) agreed that ablative procedures constitute a valid treatment alternative to DBS for some patients, and 61% (n = 23) agreed that ablative surgery may be an acceptable treatment option for patients who are unlikely to comply with postoperative care.

This up-to-date account of practices, perceptions, and predictions about psychiatric neurosurgery contributes to the knowledge about evolving attitudes over time and informs priorities for education and further surgical innovation on the psychiatric neurosurgery landscape [1)]

Cabrera et al. analyzed 1142 comments from 108 articles dealing with psychopharmacological and psychiatric neurosurgery interventions on websites of major circulation USA newspapers and magazines published between 2005 and 2015. Personal anecdote, medical professional issues, medicalization, social issues, disadvantages, scientific issues and cautionary realism were among the main themes raised by commenters. The insights derived from the comments can contribute to improving communication between professionals and the public as well as to incorporating the public's views in policy decisions about psychiatric interventions [2)].

Reviews

In a Review article Torres Díaz et al. from Hospital Universitario de La Princesa, Madrid published in the Journal Brain Sciences a comprehensive review of recent advances in psychiatric neurosurgery, particularly neurotechnologies (DBS, lesion-based procedures), connectomic targeting, AI-assisted planning, closed-loop systems, and wearable minimally invasive devices, while examining mechanisms and ethical implications. They assert that psychiatric neurosurgery is transitioning toward “connectomic precision” with AI-integrated, minimally invasive neuromodulation approaches.

They emphasize the need for rigorous clinical validation and robust ethical safeguards to ensure patient autonomy and safety [3)].

Content Accuracy & Depth

- Mechanistic claims (DBS effect on synaptic plasticity/network-level modulation) are accurate, but no novel pathways or new preclinical data are cited.
- Connectomic targeting is correctly described as emerging, but the article lacks details on specific circuits or validated outcomes.
- The section on AI for surgical planning lacks performance data or validation trials.
- References to wearable and closed-loop systems are superficial, with no device specs or trial evidence presented.

Tone & Structure

- Language is promotional (“profound transformation”, “emerging field”) without sufficient critical analysis.
- Structure is disorganized—ethical topics are interspersed with tech discussions without thematic cohesion.

Utility to Practicing Neurosurgeons

- Broad thematic update but lacks actionable content—no target selection criteria, no procedural techniques, and no clinical protocols.
- Ethical insights are generic—no model consent templates, outcome tracking recommendations, or regulatory comparisons.

Weaknesses

1. Overly conceptual and vague.
2. Lacks detailed or validated data supporting AI or connectomic claims.
3. No statistical outcomes or RCTs cited.
4. Not useful as a clinical guide.

Overall Verdict

A *marketecture-style* overview emphasizing promise over evidence. Limited use for neurosurgeons seeking practical guidance.

Takeaway for Neurosurgeons: Awareness of trends is useful, but clinical adoption requires data. Seek better-grounded sources before changing practice.

Bottom Line: Trendy, concept-heavy, and clinically thin. Proceed with caution.

Rating: 4/10

Article Title: Shaping the Future of Psychiatric Neurosurgery: From Connectomic Precision to Technological Integration **Citation:** Cristina V Torres Díaz et al. *Brain Sci.* 2025 Jun 16;15(6):647. doi:10.3390/brainsci15060647. PMID: 40563817 **Corresponding Author Email:** cristinavictoria.torres@salud.madrid.org

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Torres Díaz CV, Navas García M, Pulido Rivas P, Lara Almunia M, Fernández Alén JA. Shaping the Future of Psychiatric Neurosurgery: From Connectomic Precision to Technological Integration. Brain Sci. 2025 Jun 16;15(6):647. doi: 10.3390/brainsci15060647. PMID: 40563817.