Rapid technological evolution has transformed clinical practice, constituting big data and artificial intelligence as omnipresent tools in the medical arsenal and creating extraordinary potential and unprecedented challenges. The paradigm shift witnessed by the healthcare sector as a result of the mass digitization of information has organically permeated neurosurgery. In recent years, surgical innovation compounded by clinical expertise, in conjunction with novel data-processing techniques, has enabled meaningful advancements in the application of machine learning in neurosurgery.

This issue of Neurosurgical Focus embodies a representation of the progress in translating machine learning algorithms into clinical practice. The articles included in this issue invariably resonate with the drive to recruit artificial intelligence to address impactful questions, derive meaningful outcomes, and achieve personalized patient management. The authors study current machine learning models, evaluate novel algorithms, and discuss approaches to appraising machine learning techniques in neurosurgery.

Machine learning in neurosurgery extends beyond the mere synthesis of existing research and exemplifies the power of merging information technology with medical science to transition clinical practice to a new era of contemporary medicine. In our attempt to open this Pandora’s box, we hope to provide a long-lasting reference for clinicians and scientists, stimulate scientific thought, and provide a framework for a fruitful conversation on a highly complicated and challenging topic. We immensely appreciate the contributing authors’ work in undertaking the formidable task of unraveling the highly convoluted role of machine learning in neurosurgery.

https://thejns.org/doi/abs/10.3171/2023.3.FOCUS23210

Disclosures
The authors report no conflict of interest.

Correspondence
Mohamad Bydon: bydon.mohamad@mayo.edu.