INTRODUCTION

The neurosurgeon as roboticist

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SINCE Karel Capek's introduction of the word "robot" to the English language in his play, *R.U.R.* in 1921, our imagination has run wild. While commonly described in early science fiction, the reality of robots in medicine is now firmly entrenched in the surgeon's armamentarium. In this issue of *Neurosurgical Focus*, cutting-edge examples of how robots are being devised and implemented to help us in surgery are detailed. We begin with a timely discussion of the ethical and medicolegal vulnerabilities of robotic technologies. This is an important framework to consider as we develop, evaluate, and ultimately deploy these devices into practice. This is followed by an assessment of how these rapidly growing technologies are being used in the spine, where robotic assistance holds the promise of increasing our accuracy in placing instrumentation as well as potentially decreasing radiation exposure and operative time. Other image-guided robotic applications, including placement of ventriculostomies, brainstem biopsies, and skull base surgeries, are described as well. In addition, the early uses of robotic assistance for endovascular procedures are detailed.

The field of neurosurgery is evolving rapidly, and enabling technologies such as image guidance, robotics, and

others will hopefully continue to improve the outcome of our patients. No longer the topic for futuristic fiction, robotics in neurosurgery is here to stay and will, as our specialty does, continue to be refined and perfected.

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Disclosures

Dr. Theodore is the inventor of the ExcelsiusGPS robot manufactured by Globus Medical and is entitled to royalty payments. He is a consultant for Globus Medical and Misonix and a patent holder with and receives royalties from DePuy Synthes. Dr. Zygourakis is a consultant for Stryker and 7D. Dr. Jiang is a consultant for Globus Medical, and part owner of Petal Surgical. Dr. Protopsaltis is a consultant for Globus, NuVasive, Stryker K2M, and Medtronic. He receives royalties from Altus and has stock with SpineAlign and Torus Medical.

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