Surgical robots have captured the interest-if not the widespread acceptance-of spinal neurosurgeons. But successful innovation, scientific or commercial, requires the majority to adopt a new practice. “Faster, better, cheaper” products should in theory conquer the market, but often fail. The psychology of change is complex, and the “follow the leader” mentality, common in the field today, lends little trust to the process of disseminating new technology. Beyond product quality, timing has proven to be a key factor in the inception, design, and execution of new technologies. Although the first robotic surgery was performed in 1985, scant progress was seen until the era of minimally invasive surgery. This movement increased neurosurgeons' dependence on navigation and fluoroscopy, intensifying the drive for enhanced precision. Outside the field of medicine, various technology companies have made great progress in popularizing co-robots (“cobots”), augmented reality, and processor chips. This has helped to ease practicing surgeons into familiarity with and acceptance of these technologies. The adoption among neurosurgeons in training is a “follow the leader” phenomenon, wherein new surgeons tend to adopt the technology used during residency. In neurosurgery today, robots are limited to computers functioning between the surgeon and patient. Their functions are confined to establishing a trajectory for navigation, with task execution solely in the surgeon's hands.

In a review, the authors discuss significant untapped technologies waiting to be used for more meaningful applications. They explore the history and current manifestations of various modern technologies, and project what innovations may lie ahead [1)].

1)
Madhavan K, Kolcun JPG, Chieng LO, Wang MY. Augmented-reality integrated robotics in neurosurgery: are we there yet? Neurosurg Focus. 2017 May;42(5):E3. doi: 10.3171/2017.2.FOCUS177. Review. PubMed PMID: 28463612.