



Current trends and advancements in spine surgery

In this focused issue of *Annals of Translational Medicine*, world-renowned leaders, academics, and physicians contribute their expertise and knowledge regarding the latest cutting-edge developments in the field of spine surgery. Trends discussed in this issue include the various ways in which the changing financial aspects and models of spine surgery are affecting the care delivered to patients. For instance, increasing physician ownership and equity in hospitals may empower physicians who aim to optimize efficiency and save healthcare costs. Additionally, the ownership of ambulatory surgery centers by spine surgeons may also enable improved optimization of patient care and the surgical workflow. The transition from the fee-for-service financial reimbursement model to the newer bundled payments model is also becoming more widely implemented in healthcare systems.

The rapid advances in technology we have seen in recent years have also led to exciting discoveries and avenues in which the field of spine surgery can drastically progress. The significant rise in the use of mobile devices and applications has shown promise in enhanced patient adherence to postoperative rehabilitation and medication regimens that can result in better surgical outcomes. The use of 3D printing in the production of spine surgery implants can allow for templates and guides that are customized and specific to each patient, which is in line with the increasing popularity of personalized medicine. Besides the da Vinci robotic system which has gained traction within surgery, new robotic systems that have been developed for spinal procedures may increase the precision of surgical techniques such as pedicle screw placement.

Improvement of intraoperative surgical techniques while performing spinal procedures are owed to advances in the surgical instruments, optics, and approaches. Endoscopic surgery is one such technique that can enable minimally invasive decompression to take place, which may potentially lead to greater patient safety. Innovations in refined anesthetic protocols utilized while performing lumbar fusion without general endotracheal anesthesia represent a promising way to achieve conscious sedation, which may improve patient outcomes and prevent early postoperative complications. Other advances in the agents and medications used during surgery, such as tranexamic acid and orthobiologics, may help to mitigate intraoperative blood loss and lead to greater rates of fusion, respectively. Breakthroughs in virtual and augmented reality may also aid in the education of trainees and intraoperative visualization during surgery.

In conclusion, we hope that readers of our collection of articles are able to satisfy their intellectual curiosities and gain an appreciation for the new and exciting discoveries that are occurring on a daily basis in spine surgery. As Guest Editors, we would like to express our sincere gratitude to our colleagues and leaders who have generously contributed to our issue, and to patients and their families for whom we devote our careers and dedicate our research pursuits in the betterment of their health.

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Footnote

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