Special Issue

Spine Surgery: Current Challenges and Opportunities

Message from the Guest Editor

Spine surgery has progressed greatly in recent decades, driven by a deeper understanding of spinal function and advances in technology. Surgeons now approach the spine with less trauma to surrounding tissue, stabilize it while preserving natural biomechanics, and restore alignment during reconstruction. Modern fixation systems and hardware provide more secure stabilization, while spinal navigation improves safety and accuracy. Biological innovations have also enhanced bone healing and fusion outcomes. Beyond surgical techniques, research has expanded knowledge of back pain origins, spinal cord injury mechanisms, and axonal regeneration. Despite these achievements, major challenges remain. These include preventing disk degeneration, identifying precise causes of back pain, preserving spinal motion, and avoiding complications such as adjacent-level disease or instability after decompression. Spinal cord injury, in particular, continues to lack effective treatments to restore lost function. This Special Issue highlights the latest advances in spine surgery, new biological insights, and the unresolved challenges shaping the field's future.

Guest Editor

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