

INTRODUCTION

Biologics in spine surgery

Allan D. Levi, MD, PhD,¹ Christopher I. Shaffrey, MD,² Regis W. Haid, MD,³ Scott D. Boden, MD,⁴ Michelle J. Clarke, MD,⁵ and Marcus D. Mazur, MD⁶

¹Department of Neurosurgery, University of Miami Miller School of Medicine, Miami, Florida; ²Department of Neurosurgery and Orthopaedic Surgery, Duke University Medical Center, Durham, North Carolina; ³Department of Neurosurgery, Atlanta Brain and Spine Care, Atlanta, Georgia; ⁴Department of Orthopaedics, Emory University, Atlanta, Georgia; ⁵Department of Neurosurgery, Mayo Clinic, Rochester, Minnesota; and ⁶Department of Neurosurgery, University of Utah, Salt Lake City, Utah

IN this issue, we explore the role of biologics in spinal fusion. The treatment of spinal disorders has been revolutionized over the last 25 years with the introduction of biologics to enhance bone density in preparation for surgery and to promote bony arthrodesis in spinal fusion surgery. The use of these products has become even more important in the era of minimally invasive spinal surgery, where bone graft surface area for fusion is at a premium.

Use of osteobiologics for bone fusion is known to promote migration, differentiation, cellular division, or replacement of bone-forming cells, ultimately resulting in spinal fusion that can be quantitated on imaging studies. Commercial products designed to substitute or augment bone graft materials include growth factors, bone marrow aspirate with stem cells, demineralized bone matrix, and ceramics, as well as combinations of these. Because commercialization of these products may involve approval for its use in a specific procedure or designation as equivalent to a known product, gaps in knowledge regarding safety, efficacy, and clinical outcomes may exist when looking at the spinal surgery landscape.

The current issue of *Neurosurgical Focus* focuses on the clinical indications, safety, cost, and surgical outcomes of many commonly used spine osteobiologics on the market. Insights are provided on a range of topics, including dosage, cost, and use of bone morphogenetic protein to treat pediatric patients and those with deformity, as well as the use of cellular allograft materials and bone graft

substitutes. An excellent review of the impact of medications used to treat osteoporosis in the perioperative fusion period is also presented.

In summary, this issue of *Neurosurgical Focus* features high-quality analysis and review of the current status of osteobiologics used in spinal fusion.

<https://thejns.org/doi/abs/10.3171/2021.3.FOCUS21171>

Disclosures

Dr. Shaffrey is a consultant for Medtronic, NuVasive, and SI-Bone; receives royalties from NuVasive and Medtronic; owns stock in NuVasive; and holds patents with Medtronic, NuVasive, and Zimmer Biomet. Dr. Haid is a consultant for NuVasive; receives royalties from NuVasive, Globus Medical, and Medtronic; and owns stock in NuVasive, Globus Medical, Spine Wave, and Remedy Health Media (formerly Vertical Health). Dr. Boden is a consultant for and receives royalties from SeaSpine.

Correspondence

Allan D. Levi: alevi@med.miami.edu.