

Non-fusion technology? Genetics? 3D printing? What's the next big clinical innovation in spine?

Written by [Anuja Vaidya](#) | Thursday, 30 October 2014 14:43

This year has seen a number of spine surgery "[firsts](#)" which could potentially change the industry as we know it. Five spine surgeons discuss these innovations as well as what they see as the next big clinical innovation in spine.

Ask Spine Surgeons is a weekly series of questions posed to spine surgeons around the country about clinical, business and policy issues affecting spine care. We invite all spine surgeon and specialist responses. Next week's question: **What are your biggest concerns regarding the future of spine surgery?**

Please send responses to Anuja Vaidya at avaidya@beckershealthcare.com by Wednesday, Nov. 5, at 5 p.m. CST.

Question: What will be the next big clinical innovation in spine surgery? What excites you most?

Neel Anand, MD, Clinical Professor of Surgery, Director, Spine Trauma, Cedars-Sinai Spine Center, Los Angeles: It doesn't matter what scientifically is the next big thing. It will be dominated by so many outside forces — insurance regulations, for example. The main thing is to continue doing multi-center studies that can hopefully help develop paradigms that work for everybody.



Artificial discs to me were one of the biggest game-changing technologies in the industry. It is sad to me that it has not advanced. It just hasn't been able to take.

William Taylor, Director, Spine Surgery, Vice Chairman, Division of Neurological Surgery, University of California, San Diego: Continued effort to promote, describe and research treatments for adult degenerative scoliosis. This is opening up a whole new treatment paradigm for elder patients who a few years ago would have been ignored. The ability of thought leaders and surgeons to successfully understand the tenets of balance, correction and applications to this patient population is exciting. It will have continued growth and expand into how we view our everyday 'simple cases' soon.



Brian R. Gantwerker, MD, The Craniospinal Center of Los Angeles: I feel continued improvement and development of non-fusion techniques and technology will be at the forefront. With the evolving marketplace and constraints payers are placing on fusion, those companies and surgeons who can minimize the number of or shorten the length of fusion procedures will be regarded as at the forefront of the field.

Purnendu Gupta, MD, Director, Chicago Spine Center, Weiss Memorial Hospital, Chicago: As a scoliosis specialist, the most exciting innovation is the ability to modulate the growth of the spine in a developing child. This would allow manipulation of an abnormal curvature to straighten or prevent progression of the deformity.

We now have spinal instrumentation which can be lengthened without the need for open surgery. Another alternative is vertebral body tethering, which may be a fusion-less treatment option. The combination of these two technologies could be used to modulate the growing spine. In addition to the possibility of significantly reducing spinal fusions, this technology would be an alternative to multiple annual surgeries that are currently done on children with growing rods instrumentation.



These innovations would also mean fewer complications from scoliosis in adulthood, and fewer surgeries as patients grow older. Thus it may have a huge impact on the overall care of pediatric and adult scoliosis patients.

Genetic research into the disease is thrilling. Currently, snips of genes that effect the growth and development of adolescent idiopathic scoliosis — the most common form of scoliosis — have been identified. Initial research points to a combination of genetic and environmental factors in etiology disease. Although we are likely years away from applying these findings to the clinical setting, eventually these discoveries will help clinicians to get a better perspective on the causes and possible prevention of scoliosis.



Isador Lieberman, MD, MBA, Director, Scoliosis & Spine Tumor Center, Texas Back Institute (Plano): The first successful implantation of a 3D printed vertebra in China is one of the most exciting clinical developments in spine surgery today. As far as I know, this is the first time such a procedure has been done. This represents an important new trend in medicine.

Additionally, in the very near future, we may be able to regenerate the spinal cord. Instead of implanting artificial devices, we will be able to apply genetic knowledge, combined with biologic materials to stimulate cell growth. This material won't be

metal or plastic. It will be composed of the patient's own cells.

Another exciting area for spine surgery in the future involves using robotics to integrate the brain with the nervous system. With these types of advances, there will come a time in the future when no one will be paralyzed. We will be able to biologically or robotically correct this condition.

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