

## 5 Core Concepts on the Biggest Strides in Complex Spine Today

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Kyle Colle, DO, a neurosurgeon with Regional Brain and Spine in Cape Girardeau, Mo., discusses trends in complex spine surgery.

**1. Minimally invasive approaches.** Technology has evolved to provide less invasive procedures for more complex spine surgery, including scoliosis. "We are able to correct scoliosis or spondylolisthesis, or other degenerative spine conditions, with minimally invasive approaches," says Dr. Colle. "Instead of doing the big, wide open decompression surgeons used to do, they are able to get to the spine through direct lateral or transforaminal approaches, which are muscle-sparing."

The smaller incisions don't disrupt the soft tissue around the spine, making recovery easier and less painful than before. However, it's not necessarily easy to incorporate less invasive procedures into practice, even for experienced spine surgeons. "There is a learning curve," says Dr. Colle. "Open surgery has much easier visualization. You have to understand the anatomy through an endoscope, microscope or tube, which could cause some surgeons not to use it."

**2. Pain management advances.** Pain management during spinal procedures has come a long way from just epidurals. There are now multiple techniques surgeons can employ depending on the patient's situation, and new innovation is on the horizon. "I think the future is going to be topical aids, even intraoperative topical aids, for pain management," says Dr. Colle. "When the surgeon finishes the procedure, he'll be able to place something in the wound that will help the healing process and give postoperative pain relief."

Pain management specialists and surgeons are now working together on which techniques to utilize — whether they are pain pumps, nerve stimulators or another device — to make the patient as comfortable as possible.

**3. Biological solutions.** Several research and development projects in spine are currently examining biologic and stem cell solutions for spinal procedures. Some use stem cells from fat or cadaver bone, but Dr. Colle says the future is in amniotic stem cells. "There is a lot of excellent healing protein across the glands inside the amnion that we have found beneficial," he says. "There needs to be more studies, but I think we'll find stem cells will help with the patient's pain management."

In orthopedics and spine, injectable stem cells are becoming more accepted, especially in the facet and sacroiliac joints for pain relief. "They help the healing process," says Dr. Colle. "We'll see more work looking into stem cells to see how they could benefit spine patients because they have both anti-inflammatory and regeneration potential."

**4. Disc nucleus regeneration.** Disc nucleus regeneration has been in the background of research projects for years, but now researchers are making bigger strides to learn more about genetics and the ability to regenerate soft tissue. "That's one of the things we're getting excited about, and the ability to regenerate the disc will be very helpful," says Dr. Colle. "We aren't there yet — there's still a ways to go — but this will be a huge benefit to spine patients."

**5. Advanced training.** A trend toward advanced training and spreading knowledge about spinal developments has brought better treatment to the more remote areas of the United States. "You used to just have centers of excellence for complex spine, but now you get more highly-trained surgeons going to blue collar areas and physicians are becoming more facile with the technique to help their patients," says Dr. Colle. "As a result, more patients are returning to their daily activity after spine surgery and benefiting society. There is a much improved technique and understanding of how to balance the spine."


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