



THE SPINE INSTITUTE TACKLES CHRONIC BACK PAIN

BY KAY RIOS

Friends don't let friends get fused." For Ken Pettine, M.D., that phrase says it all. And because he so strongly supports that idea, he has trademarked the verbiage as the tagline for The Spine Institute, which he co-founded with Jeffrey Donner, M.D.

At The Spine Institute, Dr. Pettine and his cohorts are working hard to prove that fusion may not be the best option for those with spinal injuries and chronic pain. "Spine fusion has a 70 percent clinical success rate. Fusion results in permanent loss of movement which may accelerate degeneration on the disc above and

below the fused area."

Many back issues, aside from trauma, are the result of the natural process of aging. "The enemy is gravity. It wears us all out," he says.

For about half of the population over 40, the process of degenerative disc disease causes symptoms ranging from back pain to nerve root pathology to spinal cord compression. The symptoms stem from worn out discs that don't function as well as they once did. The gel-like discs act as shock absorbers between each of the bones of the spine and, as they shrink, the space available for the nerve roots and the spinal cord also shrinks.

Spinal fusion is the most common form of

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surgery for treating degenerative disc disease in the lumbar spine region. In a fusion procedure, the degenerated disc is removed and a bone graft is inserted between the two vertebrae located above and below the removed disc. Metal implants are often then attached to the two vertebrae to stabilize the area until the bone graft fuses to the vertebrae and creates one solid piece of bone.

"But, if you fuse part of the spine, you still have the same forces acting on the spine. You just transfer the pressure above and below the fused area," Dr. Pettine says.

Dr. Pettine has experienced great success in relieving his patients' pain and, at the same, restoring and preserving mobility through the use of disc and facet replacement devices. He is the chief investigator for 13 different FDA studies, all using non-fusion technology. In addition, Drs. Pettine, Donner and Carlton Reckling are actively involved in research and constantly exploring new treatments in treating spine issues. They are three of only a handful of surgeons nationwide experienced with implanting artificial discs and non-fusion spine devices.

Through their work, the Institute has garnered some top-level achievements. Dr. Pettine performed the first two-level, three-level and four-level NeoDisc™ cervical arthroplasties in the world, the first surgery of the Hydraflex™ nucleus arthroplasty system in the U.S., and implanted the first two-level Coflex™ device in the U.S. In addition, Dr. Pettine's work at the Institute has accomplished the first U.S. DSS™ spine stabilization system procedure, and the first Kineflex™ lumbar artificial disc surgery in the U.S. With offices in Loveland and Cheyenne, Wyo., The Spine Institute serves patients regionally, nationally and internationally. Surgeries by The Spine Institute surgeons are performed at the Loveland Surgery Center and local hospitals.

Along with those impressive "firsts" that speak to the accomplishments by doctors at The Spine Institute, many patients are singing their praises. Tom Aurand is one of those. Aurand, in October 2009, became the twentieth patient in the world to receive a facet replacement. An electronic engineer in Colorado State University's department of Electrical and Computer Engineering, he says he had long-term degenerative injuries. "It was from everything I do – skiing, softball and golf – and some genetic degeneration."

Now, almost six months later, Aurand says, "It's a miracle. I was in-patient overnight and then I walked out of the place the next day and went to lunch. Recovery time was rather swift and not terribly unpleasant. I had a little bit of slow healing of the surgical site but it was probably my fault for being too active. I felt so good that I was up and around too quickly and that slowed the healing of the exterior wound a bit."

The wound healed quickly and, after about a month, he was running and in mid-January of this year, Aurand and his daughter went skiing. He credits Dr. Pettine with his newfound freedom from pain. "He got me into the clinical study. I was the first to get this installed by him."

Aurand didn't take much convincing. "I'm not young but am really physically active and I



Above: The revolutionary Maverick and Prestige artificial replacement discs, based on Dr. Pettine's own patents.

didn't want a fusion. He showed me a model of the device and my engineering head said 'this is really cool' and I wanted it right away."

The results were more than he hoped. "All the pain I had – that's all history. Dr. Pettine saved my life."

Lacy Kasten came to The Spine Institute after a car accident. In August 2003, Pettine implanted the Maverick Disc in 31-year-old Kasten and, over six years later, she's still enjoying the results. "I love this thing. Three months after the replacement, I was back at Copper [Mountain ski resort] snowboarding."

It was an easy decision for Kasten as well. "When I went to him, I said 'I work out, play softball, snowboard, climb and I don't want to stop doing those things,'" Kasten says.

Dr. Pettine told her about the current study on the Maverick and she jumped at the chance. "I was walking 45 minutes after the surgery and

out the next day. Since then, I've run the Bolder Boulder, played softball all three seasons, spring, summer and fall. I've climbed the third flatiron in Boulder. I've climbed four Fourteeners and I'm planning on running a half marathon in April."

Kasten, who is the manager of Justine's Pizza in Fort Collins, is so impressed that she's waiting for the next opportunity. "His disc is amazing and I hope there's more. I previously had a fusion in my neck and I keep pushing Dr. Pettine to get one for the neck so I'll have full range of motion there, too."

Cindy Copper, a debt settlement company paralegal, was the first patient in the U.S. to have the Discover disc implanted. That was in June 2009, and Copper says, "It's awesome. I had no idea how much pain I was in until it was gone. Before that, I had constant severe headaches 24 hours a day and tingling down both arms."

Her pain was the result of an injury and Copper's insurance was pushing for a fusion, but she was reluctant. "A fusion takes months to recover from and, as I learned more, I decided there was no way I was doing that. So Dr. Pettine got me into a clinical study. The recovery was amazing. I woke up the next morning, had a little bit of a sore throat but I was eating, drinking and doing everything in two days. I was amazed at how quick the recovery was and how full a recovery I made."

The success stories and rave reviews are as plentiful as the list of "firsts" in Dr. Pettine's career. Raised in Fort Collins, Dr. Pettine was the first Head Boy at Blevins Junior High. He graduated from the University of Colorado School of Medicine with Honors in 1981 and followed that with a five-year residency at the Mayo Clinic in Rochester, Minn., and a spine fellowship at the Institute for Low Back Care in Minneapolis in 1990.

That's when it hit him. "Right in the middle of the spine fellowship, I woke up at 3 a.m. with this idea. That's really how it started," he says. That wee hour idea turned into the designs for the Maverick lumbar artificial disc, which Dr. Pettine later patented and which is about to receive formal FDA approval.

He says his spine fellowship occurred at the beginning of the modern era of spine surgery. "Two things happened. First, magnetic resonance imaging (MRI) dramatically improved our ability to diagnose spine problems. Second, the first spine implants improved the results of surgery in cervical and lumbar spine. I was fortunate to be at the right place at the right time."

Dr. Pettine returned to Colorado and opened Rocky Mountain Associates in Orthopedic Medicine. In 1990, he and Dr. Donner opened The Spine Institute and began to grow its reputation as one of the top spine facilities in the nation and moved into clinical trials. The Spine Institute



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"The research we're doing here in terms of FDA clinical trials is more than is being done at the Mayo Clinic or the Cleveland Clinic," Dr. Pettine says.

The FDA clinical trials compare the outcomes of patients who receive an artificial disc or non-fusion implants with those of patients who have a lumbar fusion. The clinical studies are the precursor to FDA approval. Companies who produce the discs interview research centers like The Spine Institute. "To be one of these centers is extremely competitive," Dr. Pettine says.

"Out of probably 500 centers that apply, the company selects twelve." Dr. Pettine credits his staff and his research coordinator for putting The Spine Institute at the top of the list. "One of the main selection criteria for a company is your research coordinator and his or her experience. Nicole Rittenhouse, our certified clinical research coordinator, is the main reason we are consistently selected," Dr. Pettine says. "Now that we've done enough research over a long period of time, we have a record of success and demonstrated follow-up, so companies are now seeking us out."

The Spine Institute team will be presenting eight research papers at the upcoming American Academy of Neurosurgery's annual conference. The Institute's team members have presented 68 papers in the last three years at national and international spine meetings.

But Dr. Pettine and group are not standing still or focusing on matters already finished. The Spine Institute is venturing into stem/cartilage research. The research, which began this month, will look at the possibility of adult stem cell therapy for bone fractures and spinal disease and for regeneration of damaged joint cartilage and intervertebral discs.

"It's about staying ahead of the curve and always looking for new and better ways to help patients," Dr. Pettine says. "This was the vision from the beginning. It's so exciting, I've lost sleep thinking about it."

And, if history repeats itself, those sleepless nights might just lead to another great idea. ✚

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