

# Moving Back Care Forward

By last fall, Pauline Chisamore’s back pain was making everyday housework anything but routine. “It bothered me to run a vacuum, clean my home,” she says. “I had to give up after a short amount of time and stop and rest, or continue the next day, because my back and legs were in such pain.”

An MRI revealed that Chisamore’s spinal column had narrowed, a condition called spinal stenosis, which can often cause back and leg pain. So, in November 2010, she traveled from her home in Chester, Vt., to DHMC, where she met with Dr. William Abdu, an orthopaedic surgeon and the medical director of DHMC’s Spine Center. Chisamore recalls that Abdu explained the possible treatments, including surgery, and he warned that if she did have surgery, the recovery would not be easy. In addition to talking to Abdu, Chisamore visited DHMC’s Center for Shared Decision Making, where she was given a video to watch that included more information about spinal stenosis and the treatment options available to her.

Like Chisamore, most Americans experience back pain at some point in their lives. Usually, the pain goes away without treatment within a few weeks or months. For those unfortunate enough to suffer persistent pain, there are many possible treatments but no perfect solution. One common approach is surgery. Every year, hundreds of thousands of Americans undergo one of many different back operations. In some cases, as with Chisamore, there is a specific diagnosis—such as spinal stenosis—that is the likely cause of the pain. In other cases, the cause of the pain is not entirely clear. And even when an MRI or some other imaging test reveals an imperfection, that imperfection may not be what’s causing the pain, meaning surgery won’t necessarily leave the patient feeling better. That’s one of the vagaries that make chronic back pain notoriously difficult to treat.

When Dr. James Weinstein founded the Spine Center in 1997, he had three priorities he hoped would lead to better care of spine problems:

- Measuring the use and effectiveness of different treatments,
- Incorporating shared decision-making into the treatment process, and
- Bringing together providers from all of the different disciplines involved in spine care.

Those priorities have served as a guide for the Spine Center ever since.

Weinstein already had a history of questioning traditional approaches to medicine. As a resident in orthopaedic surgery in the late 1970s, he began to

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wonder whether surgery was always the best option for patients. “I saw people having surgery that weren’t doing well,” he says. After practicing for years at the University of Iowa, he came to Dartmouth in 1996 in part because of Dartmouth’s history of challenging conventional wisdom about the delivery of health care.

Although the Spine Center would not have gotten off the ground without support from a wide range of doctors, administrators, and others, Weinstein says that not everyone was an immediate fan. “I think there was some skepticism about the value added by nonsurgical approaches,” he says. But it did not take long for the benefits of a different approach to become clear. Weinstein says that bringing many types of providers—including nurses, therapists, and doctors from various specialties—closer together “gave them a chance to think about how to practice differently than they did.”

Weinstein served as medical director of the Spine Center until 2002, when he became chair of the Department of Orthopaedics. He is now copresident of Dartmouth-Hitchcock.

Abdu took over as medical director in 2002. He was a resident at DHMC in the late 1980s and joined the faculty in 1991, so he has experienced firsthand the changes brought about by the creation of the Spine Center. “It centralized care in one spot,” he says. “It’s a whole lot less confusing for people from the outside, as well as people internally, about what to do with spine patients—they send them to the Spine Center.”

Dr. Jonathan Lurie, an internist who specializes in treating patients with back pain, likewise witnessed a shift in the way patients were treated after the Spine Center opened. Prior to 1997, he says, the care patients received depended largely on what provider they happened to see. Now, he says, “we have a much more coherent approach.”

Dartmouth researchers have shown that, nationwide, spine care is far from coherent. “What you get depends on who you see and where you live,” Weinstein says. “That’s true everywhere.” In 2006, he, Lurie, and other investigators reported on variations in the use of surgery to treat low back pain. They found that from 1992 to 2003, the use of surgery increased significantly, but patients were far more likely to undergo surgery in some areas of the country than in others.

Their study of Medicare data showed that by 2003, surgeons were performing 4.0 spine surgeries for every 1,000 people enrolled in Medicare, an increase from 2.5 per 1,000 in 1992. The increase was particularly noticeable in surgeries involving fusion, which involves using a bone graft to fuse together

**Patients and providers have a number of options when it comes to dealing with chronic back pain, but all of them come with caveats and qualifications. So at the Dartmouth Spine Center, information is an essential part of the prescription. That means conducting research to weigh the effectiveness of the various treatment options, giving patients the tools they need to make the decision that is right for them, and collecting data to continuously improve the delivery of care.**

Story by Amos Esty  
Photographs by Jon Gilbert Fox  
Illustrations by Russell Thurston

For a **WEB EXTRA** with more about Dartmouth-Hitchcock’s Spine Center, see [dartmed.dartmouth.edu/f11/we03](http://dartmed.dartmouth.edu/f11/we03).



The variation in the use of surgery to treat back pain highlights one of the major problems in the field—a lack of evidence about what works and what does not. “I think every surgeon who operates thinks that they’re doing the right thing, but we can’t all be doing the right thing if we’re all doing something different,” Abdu says.



William Abdu, who has been the director of DHMC’s Spine Center since 2002, joined the Dartmouth faculty in 1991 and over the years since then has made many contributions to the research about back pain that’s come out of Dartmouth.

adjacent vertebrae. Using this technique stabilizes that portion of the spine, but also limits its flexibility by making it immobile. From 1992 to 2003, the national rate of fusion surgeries more than tripled, from 0.3 per 1,000 Medicare enrollees to 1.1 per 1,000. In some regions of the country, surgeons performed as many as 4.6 fusion surgeries per 1,000 Medicare enrollees, while in other regions they performed only 0.2 per 1,000 enrollees. There don’t seem to be big differences in patient populations (such as socioeconomic status) that might explain this wide variation. So Weinstein, Lurie, and others have concluded that the preferences of doctors and the way spine care is approached locally make a huge difference in the care patients receive.

Those different approaches to care have significant consequences for patients. Dr. Dilip Sengupta, a surgeon at the Spine Center, explains that he believes fusion surgery can be very effective. But, he adds, it has limitations that patients need to understand. “We can almost certainly achieve fusion with modern gadgets and modern surgical techniques,” he says. “But you cannot guarantee that the pain will go away.”

The high use of fusion in back surgery also adds

to the rising cost of back care. From 1992 to 2003, the amount Medicare spent on fusion surgeries increased from \$75 million to \$482 million.

More recent studies have found that the amount spent on such fusion surgery, as well as the use of such procedures, continues to increase. Nationwide, the annual number of spinal fusions increased from about 175,000 in 1998 to more than 400,000 in 2008.

The variation in the use of surgery to treat back pain highlights one of the major problems in the field—a lack of evidence about what works and what does not. “I think every surgeon who operates thinks that they’re doing the right thing, but we can’t all be doing the right thing if we’re all doing something different,” Abdu says.

Dr. Sohail Mirza, who in 2010 succeeded Weinstein as chair of orthopaedics and who also specializes in spine care, points out that “it’s hard to get consistency when there isn’t a solid evidence base.” To make things more complicated, he adds, there are variations not just in the use of surgery but in the results. “There are wide variations in outcomes,” he says. “Some patients benefit greatly; other patients don’t benefit at all.”

In fact, just diagnosing the cause of back pain is

far from straightforward. “A lot of people have disc herniations without symptoms,” Lurie says. On the other hand, “a lot of people have symptoms in their legs without disc herniations. So the link between diagnosis and treatment is a complicated one.”

But progress is being made, and much of it is the result of a long-term study led by Weinstein. For more than a decade, the \$21-million Spine Patient Outcomes Research Trial (SPORT) produced data, gathered from 13 medical centers nationwide, regarding the results of surgical versus nonsurgical care for low-back pain. SPORT enrolled about 2,500 patients with a diagnosis of spinal stenosis or disc herniation. The patients were followed for more than four years after they’d received either surgery or nonsurgical treatment, and their outcomes were assessed using standardized questionnaires to measure their pain and ability to function.

Overall, patients who underwent surgery experienced better outcomes than those who did not, in both the spinal stenosis and the disc herniation groups. But patients who did not have surgery also improved, just not to the same degree.

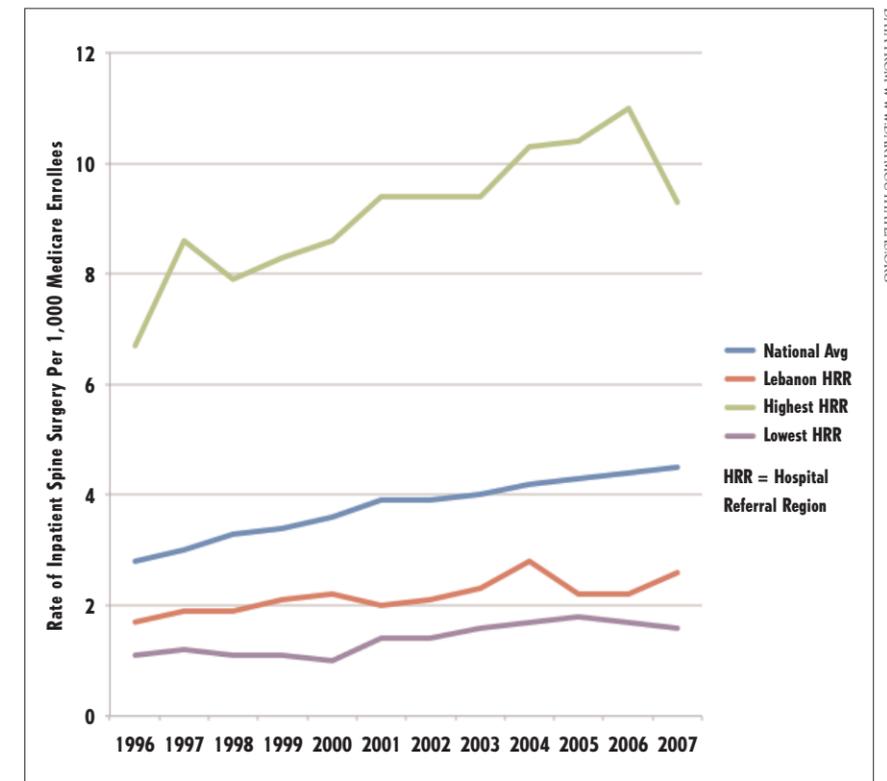
Lurie, who was one of the investigators involved in SPORT, says that a lot has been learned from the study. For example, he compares the findings for disc herniation to those for spinal stenosis. “The disc herniation study showed that the majority of people do really well without surgery,” he says. In that cohort, both those who did and those who did not have surgery tended to improve significantly, though those who had surgery improved a bit more. But the outcomes for spinal stenosis were a little different. Those treated nonsurgically generally stayed about the same or improved only slightly, while those who underwent surgery showed somewhat more improvement.

Weinstein points out that the study showed that, overall, patients were satisfied with their care whether they had surgery or not, even though those who had surgery had somewhat better outcomes. “So the doctor shouldn’t decide what the patient wants,” he says. “The patient should decide.”

That lesson reinforced something Weinstein has believed for a long time—the importance of closely involving patients in decisions about their care. “When patients are well informed with real data, they tend to make really good decisions,” he says.

That’s why, two years after creating the Spine Center, he led the creation of the Center for Shared Decision Making at DHMC, which seeks to help patients make difficult health-care choices.

The Center for Shared Decision Making offers patients individual counseling, as well as videos



From 1996 to 2007, the use of spine surgery among Medicare enrollees increased about 60%, from 2.8 to 4.5 for every 1,000 enrollees (blue line). It varied significantly across the country, however. The rate in Lebanon, N.H., which includes DHMC (red line), was well below the national average.

about their condition—called decision aids—that provide an abundance of information. The goal is to give patients the facts they need to make the decision that is right for them.

There is no single right answer when it comes to back pain, emphasizes Lurie. And providers tend to focus on what they do. So a surgeon is more likely to think surgery is the best remedy, while a physical therapist tends to believe exercise and stretching are the solution to back pain.

“It’s not like pneumonia,” Lurie says, where doctors agree that patients should be given antibiotics. “There aren’t straightforward best treatment options [for back pain]. . . . What you have to do is to think about your symptoms and what makes sense to you and what your preferences are.”

Colleen Olson, a nurse practitioner at the Spine Center, agrees that it’s crucial to establish what patients hope to accomplish. “What’s their goal?” she says. “Is their goal strictly symptom management, or is it that they want to be able to do more things?” Sometimes, she says, patients are determined to have a certain treatment, such as surgery. Others want to avoid surgery at all costs. And some don’t have any idea what to do.

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Often patients aren't aware of the limitations of back surgery, Sengupta points out. "They believe there is a surgical 'fix,'" he says. "In other words, the surgeon will make it back to normal. That's a big misconception." A guiding principle of the Spine Center is that patients benefit from multiple sources of information.



Susan Berg, left, is interim director of DHMC's Center for Shared Decision Making, which has numerous "decision aids" to help patients with back pain make the treatment choice that's right for them. At right is Sherry Thornburg, the research coordinator of the Center for Informed Choice at the Dartmouth Institute for Health Policy and Clinical Practice.

As a surgeon, Sengupta tries to explain what surgery entails and what it can and cannot accomplish. Often patients aren't aware of the limitations of back surgery, he points out. "They believe there is a surgical 'fix,'" he says. "In other words, the surgeon will make it back to normal. That's a big misconception."

A guiding principle of the Spine Center is that patients benefit from multiple sources of information. That's where the multidisciplinary staff and the Center for Shared Decision Making's decision aids can make a difference.

"We can't take our biases out of discussions with our patients sometimes," Weinstein says. "But shared decision-making offers them independent information."

Susan Berg, the interim director of the Center for Shared Decision Making, says that patients with back pain are some of the most common visitors to the center. There, they will find a number of decision aids, including individual videos about disc herniation and spinal stenosis, chronic back pain, and chronic pain generally. The videos were developed by the nonprofit Foundation for Informed Medical Decision Making (FIMDM)

and the company Health Dialog, both of which have ties to Dartmouth. FIMDM was cofounded by Dr. John Wennberg, an internationally known health-policy expert and the founder of the Dartmouth Institute for Health Policy and Clinical Practice, and by Dr. Albert Mulley, who is now the director of Dartmouth's Center for Health Care Delivery Science. And Health Dialog grew out of Wennberg's pioneering research on variations in the delivery of health care.

The videos explain the treatment options available to patients and include testimonials from patients about the choices they made. Berg says that patients often lean toward one treatment or another before watching a decision aid but that even in those circumstances the videos can be helpful. "The purpose of these is not to tell people that they shouldn't have surgery or to change their minds," she says. "The purpose really is to make people comfortable with their decision."

Catherine Clay, the former director of the Center for Shared Decision Making and now DHMC's director of shared decision-making education and outreach, says that "one of the reasons that our doctors here really love the videos, particularly our surgeons, is that they really do a good job of helping

people to have realistic expectations of what the outcomes of surgery might be. And they see that as a huge benefit."

Clay worked for years as a nurse, and she says it was not easy when she joined the center to understand how she could best help patients. "In health care, we're trained to tell people what to do, to teach them what to do," she says. "And you have to say, 'Wait a minute, this is not about me.'"

Like almost all Spine Center patients with low-back pain, Pauline Chisamore was referred to the Center for Shared Decision Making. She says she already thought she wanted to have surgery, but watching the spinal stenosis decision aid and talking to a counselor at the center reinforced her decision. "Talking to the people at the shared decision center gave me a lot of relief and took an awful load off my shoulders," she says.

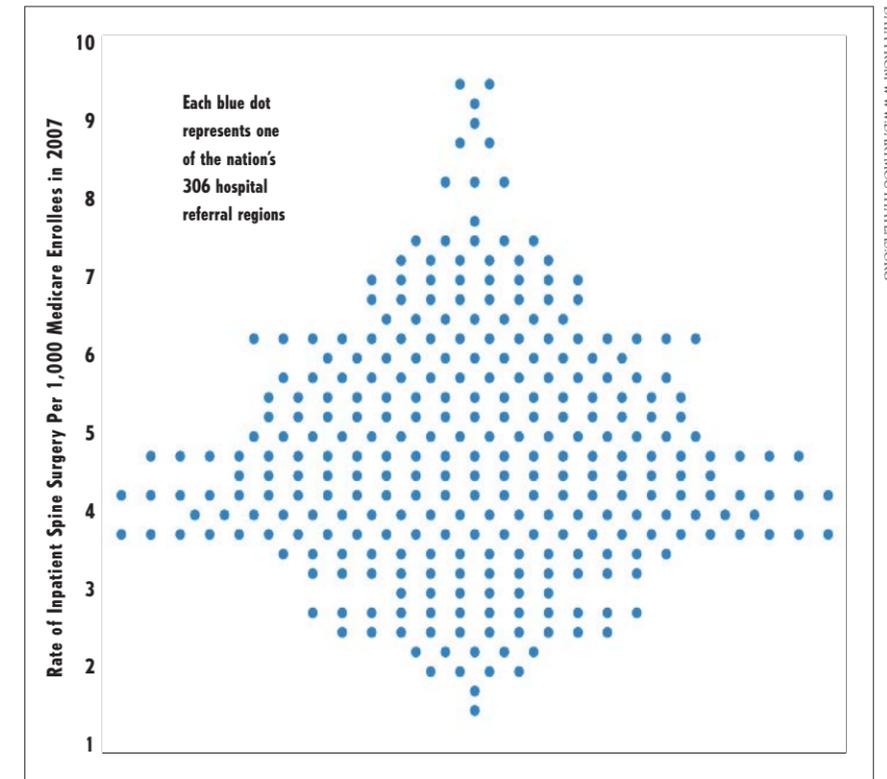
Lurie says that affirming a patient's choice is an important part of shared decision-making. "I think helping people be more confident in their decisions is as important as helping them make a decision," he says.

For Chisamore, surgery was clearly a possibility. But for other patients, surgery may be out of the question. "We never tell patients they should have surgery," Abdu says. "If somebody came in thinking that they're going to have surgery, and we did not feel that they met the indications for surgery, we wouldn't do the surgery. On the other hand, if they met all the indications for surgery, that becomes an option."

From the beginning, Weinstein wanted to have nonsurgical treatments available. "A patient would never come to Dartmouth-Hitchcock, into the Spine Center, and not have some sort of opportunity to be helped," he says.

One of those opportunities is a three-week outpatient immersion program that uses structured exercises, stretches, and discussions to try to help patients regain some of the functioning that they have lost due to chronic pain. This program, the Functional Restoration Program (FRP), kicks off about once a month with a new group of patients. Back pain is the most common problem they are dealing with, but some patients may have other types of chronic pain—either instead of, or in addition to, back pain.

Colleen Olson, who spends much of her time working with the FRP, says that the program tries to help patients look at pain in a different way. "A lot of people think they have to get rid of pain before they can function, and we actually look at it the other way around," she explains. The program might not get rid of their pain, but it can still help



A lack of evidence about the effectiveness of spine surgery contributes to wide variation in its use. This scatter diagram shows that in 2007, the spine surgery rate ranged from a low of 1.6 to a high of 9.3 per 1,000 Medicare enrollees. The rate for Lebanon, N.H. (which includes DHMC), was 2.6.

them improve their quality of life significantly.

The first step comes when a patient meets with either a physical or occupational therapist for an assessment of goals. It is important, Olson says, that the patient can identify what he or she hopes to achieve. Often the goals are fairly simple, such as wanting to be able to do a load of laundry or work in the garden. After the meeting, the therapist leads the patient through a series of tests of strength, endurance, and motion to establish a baseline level of function. After watching a video about the program, the patient meets with either Olson or Dr. Rowland Hazard, the director of the FRP, to talk about the program.

Olson and Hazard try to make sure the patient understands that the focus of the program is on improving function, not alleviating pain. Dealing with chronic pain is certainly a large part of the decline in patients' quality of life, Hazard says, but regaining function is frequently overlooked as a beneficial goal. "What often gets lost in that shuffle of MRIs and CT scans and shots and pills and surgeries is the fact that the person can't function, can't either work or take care of his family or do recreational things," he says.

"We never tell patients they should have surgery," Abdu says. "If somebody came in thinking that they're going to have surgery, and we did not feel that they met the indications for surgery, we wouldn't do the surgery." But in other cases, surgery may be a viable option.



Hazard points out that it doesn't make sense to force every patient to attain the same level of function. Some may just want to be able to go for a walk. But the program is also open to patients who need to regain a high level of fitness, including military veterans who would like to return to active duty.



Dartmouth-Hitchcock's Functional Restoration Program offers an individualized, nonsurgical approach to treating back pain. Above, occupational therapist Lydia Bryce, rear, keeps an eye on patient John Orr as he works at a peg board. Below, patients Keith Landry, rear, and Whitney Stratton, front, work out, respectively, on a treadmill and with weights.

On one recent morning, Raynee Carlson, a physical therapy assistant with the FRP, led six patients through a series of stretches and warm-ups in a small exercise room. The patients, who were finishing their first week in the program, joked with each other about the stretches. "I tied my shoes today, so that's a win," says one, only half joking. Eric Hartmann, a physical therapist, says that it seems helpful just to work with patients in a group, so they can support each other. "These guys are pushing through pain every day, so it's not easy for them," he says.

Once the hour-long warm-up is over, the patients start work on individual exercises, such as walking on a treadmill or using a weight machine. Hartmann says that the FRP team tries to figure out what the demands are of the activities people want to be able to do—whether at work, around the house, or recreationally—so their exercises can be tailored to those goals. "It's amazing the change people can make in three weeks," he says.

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veterans who would like to return to active duty. Lydia Bryce, an occupational therapist, walks the patients through exercises intended to mimic daily activities. One patient lifts crates from the floor to a shelf. Another bends down to pick up pegs, then straightens to place them on a board. Bryce says it's unusual to find a medical facility so supportive of a focus on function rather than pain. She adds that the exercises help patients overcome their fear of pain, in part by proving to them that there is a difference between experiencing pain and causing harm to their bodies.

This sentiment is echoed by just about every Spine Center provider. Sengupta tells patients there's a difference between hurt and harm. "If you have an infection and you don't treat it, it can do harm to your body," he says. "But if you have back pain, regardless of how much you suffer, it's not going to do damage to your body."

Patients often assume or are told they shouldn't be active if activity causes pain, Hazard notes, so they end up gaining weight and losing conditioning. By the end of the FRP, he says, patients typically more than double their lifting capacity. "Many people are much more limited by their fear of pain than they are by the actual pain," he says.

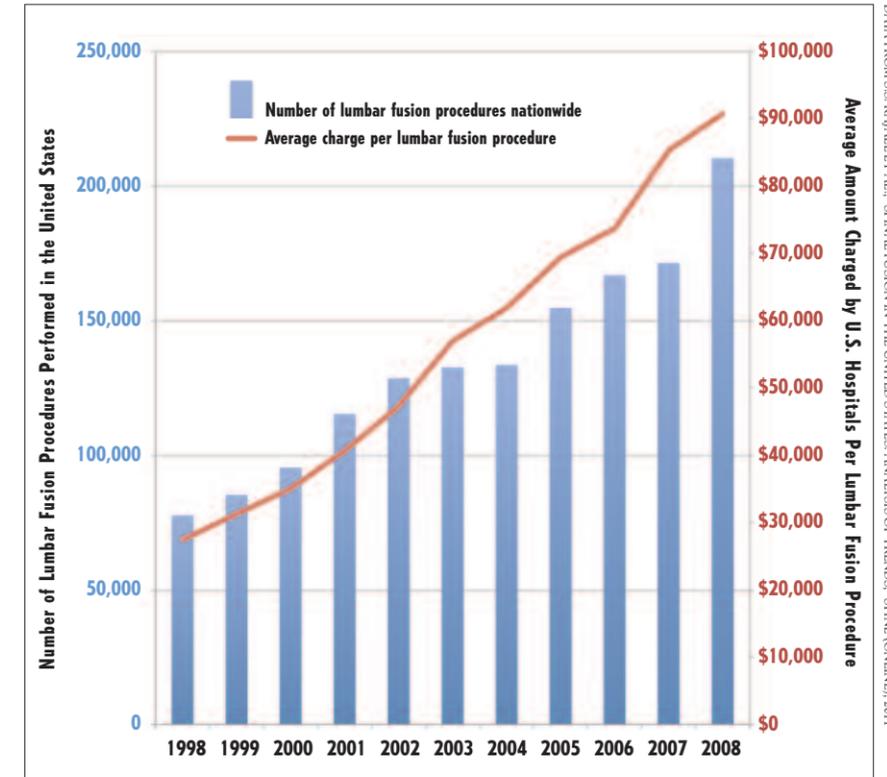
As at the Spine Center, the FRP keeps a sharp eye on data. "We show ourselves our outcomes every month," Hazard says. After each three-week session, the team meets to compare that group's outcomes to the average for previous groups.

"I think it's really important for doing practice in this area to be as transparent as I possibly can about the outcomes [patients are] getting," Hazard says. "We really stare ourselves in the face and say, 'Are we doing a good job here?' We have to, because the Functional Restoration Program is not mainstream medicine."

As with the entire Spine Center, much of that data is freely available online. The information available includes data on pain and function in patients, both those who underwent surgery and those who did not. For example, FRP patients in 2008 and 2009 improved, on average, from being able to lift 28 pounds at the beginning of the program to being able to lift 57 pounds at the end.

And among Spine Center patients with a diagnosis of a herniated disc, 91% of patients who had surgery were satisfied with their care, as were 67% of those who did not undergo surgery.

Abdu says it was not difficult to make the decision to post such data online. "We're proud of it for several reasons," he says. "One is we were a leader in transparency of being able to show what our results are, and number two . . . our results are good."



The number of fusion surgeries has risen steadily, as has the amount charged by hospitals for each such procedure (these figures include all Americans, not just Medicare enrollees). In 2008, the cost of lumbar fusion surgery nationwide totaled more than \$19 billion, for over 200,000 procedures.

Chisamore is among those satisfied with her care. "I feel so much better," she says, three months after her surgery. "I'm pretty much back to normal as far as doing my own housework."

And she's not the only one who will benefit from her care. She is taking part in a study to assess the best way to support patients facing treatment choices. And her responses to questionnaires used in the Spine Center will also help other patients.

The Spine Center has been a pioneer in innovative uses of such questionnaires. Patients answer standard questions about pain and functioning every time they visit, and providers monitor the responses to track changes in patients' physical and mental well-being. They're at least as important a source of information, Weinstein says, as high-tech tests like MRIs. The Spine Center's success with patient-reported data has led other health systems to mimic these practices and policymakers to examine how patient-reported data could be used effectively nationwide.

"The beauty of the Spine Center is it's really a clinical laboratory for testing out good ideas for innovative ways to practice and measure our ability to care for patients," Abdu says. "If you measure every data point, you can learn from every patient." ■

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DATA FROM S.S. RAJASEETI ET AL., "SPINAL FUSION IN THE UNITED STATES: ANALYSIS OF TRENDS," SPINE (ONLINE), 2011