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The Pain May Be Real, but the Scan Is Deceiving

Cheryl Weinstein's left knee bothered her for years, but when it started clicking and hurting when she straightened it, she told her internist that something was definitely wrong.

It was the start of her medical odyssey, a journey that led her to specialists, [physical therapy](#), Internet searches and, finally, an [M.R.I.](#) scan that showed a torn cartilage and convinced her that her only hope for relief was to have surgery to repair it. But in fact, fixing the torn cartilage that was picked up on the scan was not going to solve her problem, which, eventually, she found was caused by [arthritis](#).

Scans — more sensitive and easily available than ever — are increasingly finding abnormalities that may not be the cause of the problem for which they are blamed. It's an issue particularly for the millions of people who go to doctors' offices in pain.

The scans are expensive — [Medicare](#) and its beneficiaries pay about \$750 to \$950 for an M.R.I. scan of a knee or back, for example. Many doctors own their own scanners, which can provide an incentive to offer scans to their patients.

And so, in what is often an irresistible feedback loop, patients who are in pain often demand scans hoping to find out what is wrong, doctors are tempted to offer scans to those patients, and then, once a scan is done, it is common for doctors and patients to assume that any abnormalities found are the reason for the pain.

But in many cases it is just not known whether what is seen on a scan is the cause of the pain. The problem is that all too often, no one knows what is normal.

“A patient comes in because he's in pain,” said Dr. Nelda Wray, a senior research scientist at the Methodist Institute for Technology in Houston. “We see something in a scan, and we assume causation. But we have no idea of the prevalence of the abnormality in routine populations.”

Now, as more and more people have scans for everything from headaches to foot aches, more are left in a medical lurch, or with unnecessary or sometimes even harmful treatments, including surgery.

“Every time we get a new technology that provides insights into structures we didn’t encounter before, we end up saying, ‘Oh, my God, look at all those abnormalities.’ They might be dangerous,” said Dr. David Felson, a professor of medicine and epidemiology at [Boston University](#) Medical School. “Some are, some aren’t, but it ends up leading to a lot of care that’s unnecessary.”

That was what almost happened with Mrs. Weinstein, an active, athletic 64-year-old who lives in New London, N.H. And it was her great fortune to finally visit a surgeon who told her so. He told her bluntly that her pain was caused by arthritis, not the torn cartilage.

No one had told her that before, Mrs. Weinstein said, and looking back on her quest to get a scan and get the cartilage fixed, she shook her head in dismay. There’s no surgical procedure short of a [knee replacement](#) that will help, and she’s not ready for a knee replacement.

“I feel that I have come full circle,” she said. “I will cope on my own with this knee.”

In fact, Mrs. Weinstein was also lucky because her problem was with her knee. It’s one of only two body parts — the other is the back — where there are good data on abnormalities that turn up in people who feel just fine, indicating that the abnormalities may not be so abnormal after all.

But even the data on knees comes from just one study, and researchers say the problem is far from fixed. It is difficult to conduct scans on people who feel fine — most do not want to spend time in an M.R.I. machine, and CT scans require that people be exposed to radiation. But that leaves patients and doctors in an untenable situation.

“It’s a concern, isn’t it?” said Dr. Jeffrey Jarvik, a professor of radiology and neurosurgery at the University of Washington. “We are trying to fix things that shouldn’t be fixed.”

As a rheumatologist, Dr. Felson saw patient after patient with [knee pain](#), many of whom had already had scans. And he was becoming concerned about their findings.

Often, a scan would show that a person with arthritis had a torn [meniscus](#), cartilage that stabilizes the knee. And often the result was surgery — orthopedic surgeons do more meniscus surgery than any other operation. But, Dr. Felson wondered, was the torn cartilage an injury causing pain or was the arthritis causing pain and the tear a consequence of arthritis?

That led Dr. Felson and his colleagues to do the first and so far the only large study of knees, asking what is normal. It involved M.R.I. scans on 991 people ages 50 to 90. Some had knee pain, others did not.

On Sept. 11, Dr. Felson and his colleagues published their results in *The New England Journal of Medicine*: meniscal tears were just as common in people with knee arthritis

who did not complain of pain as they were in people with knee arthritis who did have pain. They tended to occur along with arthritis and were a part of the disease process itself. And so repairing the tears would not eliminate the pain.

“The rule is, as you get older, you will get a meniscal tear,” Dr. Felson said. “It’s a function of aging and disease. If you are a 60-year-old guy, the chance that you have a meniscal tear is 40 percent.”

It is a result that paralleled what spine researchers found over the past decade in what is perhaps the best evidence on what shows up on scans of healthy people. “If you’re going to look at a spine, you need to know what that spine might look like in a normal patient,” said Dr. Michael Modic, chairman of the Neurological Institute at the Cleveland Clinic.

After Dr. Modic and others scanned hundreds of asymptomatic people, they learned abnormalities were common.

“Somewhere between 20 and 25 percent of people who climb into a scanner will have a herniated disk,” Dr. Modic said. As many as 60 percent of healthy adults with no back pain, he said, have degenerative changes in their spines.

Those findings made Dr. Modic ask: Why do a scan in the first place? There are some who may benefit from surgery, but does it make sense to routinely do scans for nearly everyone with back pain? After all, one-third of herniated disks disappear on their own in six weeks, and two-thirds in six months.

And surgeons use symptoms and a physical examination to identify patients who would be helped by operations. What extra medical help does a scan provide? So Dr. Modic did another study, this time with 250 patients. All had M.R.I. scans when they first arrived complaining of back pain or shooting pains down their leg, which can be caused by a herniated disc pressing on a nerve in the spine. And all had scans again six weeks later. Sixty percent had herniated disks, the scans showed.

Dr. Modic gave the results to only half of the patients and their doctors — the others had no idea what the M.R.I.’s revealed. Dr. Modic knew, though.

In 13 percent of the patients, the second scan showed that the herniated disk had become bigger or a new herniated disk had appeared. In 15 percent, the herniated disk had disappeared. But there was no relationship between the scan findings at six weeks and patients’ symptoms. Some continued to complain of pain even though their herniated disk had disappeared; others said they felt better even though their herniation had grown bigger.

The question, though, was whether it helped the patients and their doctors to know what the M.R.I.’s had found. And the answer, Dr. Modic reported, is that it did not. The patients who knew recovered no faster than those who did not know. However, Dr.

Modic said, there was one effect of being told — patients felt worse about themselves when they knew they had a bulging disk.

“If I tell you that you have a degenerated disk, basically I’m telling you you’re ugly,” Dr. Modic said.

Scans, he said, are presurgical tools, not screening tools. A scan can help a surgeon before he or she operates, but it does not help with a diagnosis.

“If a patient has back or [leg pain](#), they should be treated conservatively for at least eight weeks,” Dr. Modic said, meaning that they take pain relievers and go about their normal lives. “Then you should do imaging only if you are going to do surgery.”

That message can be a hard sell, he acknowledged. “A lot of people are driven by wanting to have imaging,” Dr. Modic said. “They are miserable as hell, they can’t work, they can’t sit. We look at you and say, ‘We think you have a herniated disk. We say the natural history is that you will get better. You should go through six to eight weeks of conservative management.’ ”

At the Partners Healthcare System in Boston, spine experts have the same struggle to convince patients that an M.R.I. scan is not necessarily desirable, said Dr. Scott Gazelle, director of radiology there.

“The consensus is that you are a surgical candidate or not based on your history and physical findings, not on imaging findings,” he said.

Dr. Gazelle had a chance last year to test his own convictions. He had the classic symptoms of a herniated disk — shooting pains down his left leg, a numb foot and difficulty walking.

Dr. Gazelle went to see his primary-care doctor but, he said, “I didn’t get an M.R.I.” That decision, he added, “was the right thing to do.”

About three months later, he had recovered on his own.

In 1998, two medical scientists, writing in *The Lancet*, proposed what sounded like a radical idea. Instead of simply providing patients and their doctors with the results of an [X-ray](#) or an M.R.I. scan, he said, radiologists should put the findings in context. For example, they wrote, if a scan showed advanced disk deterioration, the report should say, “Roughly 40 percent of patients with this finding do not have back pain so the finding may be unrelated.”

It is an idea that only would work for back pain, because that is the one area where radiologists have enough data. But it made eminent sense to Dr. Jarvik. “It gives referring physicians some sort of context,” he said.

So, a few years ago, with some trepidation, his radiology group starting including epidemiological data in their reports. “We thought, ‘What’s going to be the reaction among referring physicians?’ ” Dr. Jarvik said. Their fear was that doctors would start choosing other places for M.R.I.’s and that Dr. Jarvik’s group would lose business.

Because of the way the university’s records are kept, it’s hard to know whether the new reporting system had that effect, Dr. Jarvik said. But he was heartened by the responses of some doctors, like Dr. Sohail Mirza, who recently moved to Dartmouth Medical School.

“We often see patients who have already had M.R.I. scans,” Dr. Mirza said. “They are fixated on the abnormality and come to a surgeon to try to get the abnormality fixed. They’ll come in with the report in hand.”

The new sort of report, Dr. Mirza said, was “very helpful information to have when talking to patients and very helpful for patients to help them understand that the abnormalities were not catastrophic findings.”

Others, like Dr. Modic, are hesitant about reporting epidemiology along with a patient’s scan findings.

“It’s an interesting idea,” he said. But, he added: “The problem isn’t what happens after they get their imaging. It’s that they get the imaging in the first place.”

That was what happened with Mrs. Weinstein.

When she started looking up her symptoms on the Internet, she decided she probably had a meniscus tear. “I was very forceful in asking for an M.R.I.,” she said.

And when the scan showed that her meniscus was torn, she went to a surgeon expecting an operation.

He X-rayed her knee and told her she had arthritis. Then, Mrs. Weinstein said, the surgeon looked at her and said, “Let me get this straight. Are you here for a knee replacement?”

She said no, of course not. She skis, she does aerobics, she was nowhere near ready for something so drastic.

Then the surgeon told her that there was no point in repairing her meniscus because that was not her problem. And if he repaired the cartilage, her arthritic bones would just grind it down again.

For now, Mrs. Weinstein says she is finished with her medical odyssey.

“I continue to live with this, whatever they call it, this arthritic knee,” she said.

This article has been revised to reflect the following correction:

Correction: December 10, 2008

An article on Tuesday in the Evidence Gap series, about M.R.I. scans that can lead to incorrect diagnoses, misidentified the hometown of a patient who received such a diagnosis, and at one point misstated the knee injury detected by the scan. The patient, Cheryl Weinstein, lives in New London, N.H., not London. The scan, as noted elsewhere in the article, showed torn cartilage, not a torn ligament. Because of an editing error, the article also omitted the given name and title of an expert who said such diagnoses should take better account of epidemiological studies. He is Dr. Jeffrey Jarvik, a professor of radiology and neurosurgery at the University of Washington.