

# Molecular imaging pinpoints source of chronic back pain

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A study introduced at SNM's 58th Annual Meeting shows potential relief for patients who suffer chronic pain after back surgery. A molecular imaging procedure that combines functional and anatomical information about the body is able to zero in on the site of abnormal bone reaction and provide more accurate diagnoses and appropriate pain management for patients who have received hardware implants or bone grafts.

"With PET/CT we can pinpoint the exact screw or rod that was loose or failing. We can help doctors and patients accurately decide whether surgical and nonsurgical treatment is the best option," says Andrew Quon, MD, assistant professor of radiology and chief of clinical PET/CT for the [molecular imaging](#) program at Stanford University, Stanford, Calif. "This eliminates unnecessary or erroneous hardware replacement surgeries and provides a surgical map for patients who need further operations to treat their chronic [pain](#)."

Serious spinal instability and disease often necessitate the implantation of hardware such as plates, cages, rods and screws or [bone grafts](#) to support the spine. There are many reasons why patients experience pain after initial surgery, including hardware failure and infection, or both. Determining the source of pain can be difficult, especially when patients have complex medical histories. In this study, a combination of positron [emission tomography](#) and computed tomography (PET/CT) and F18 NaF, an injected radiotracer that uses sodium fluoride to target "hot spots" or areas of high bone turnover and inflammation during imaging, was used to evaluate patients with back pain after spinal surgery. This form of molecular imaging was shown to be highly accurate in determining the culprit of patient's chronic pain by highlighting both the structure of the bone and the physiological processes involved in inflammation, an indication of injury and infection.

For this prospective study, 20 patients presenting with spinal pain were evaluated with PET/CT using F18 NaF at least eight months after surgery. A total of 24 bone or tissue abnormalities were found in 17 of the 20 subjects. Of the original 20 patients, 12 received exploratory surgery and four participants received local anesthetic nerve blockade, a common and minimally invasive treatment that numbs the affected nerve, providing short-term pain management as an alternative to surgery. The research indicates that F18 NaF PET/CT is highly effective for the evaluation of pain after spinal [surgery](#)-in more than 85 percent of cases, this form of molecular imaging was able to identify the exact source of patient's pain.

**More information:** Scientific Paper 457: A. Quon, C. Sprinz, M. Rodrigues de Abreu, J. Maria Alves Neto, A. Iagaru, S. Hennermann, Stanford University, Stanford, CA; Hospital Mãe de Deus, Porto Alegre, Brazil; "Integrated F18 NaF PET/CT scanning for the evaluation of patients with chronic pain after spinal surgery," SNM's 58th Annual Meeting, June 4-8, 2011, San Antonio, TX.

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