Wake Radiology Musculoskeletal Imaging
Tackling Sports Injuries with a Team Approach
When an Olympic-level track athlete developed a painful mass in the gluteal region, the condition was being clinically treated as probable bruising or hematoma. But Russell (Rusty) Wilson, M.D., director of imaging for Wake Radiology’s musculoskeletal (MSK) section, didn’t see it that way. “We were more concerned that it was actually a solid mass or a cancer,” he recalls. He believed the mass should be biopsied. Yet, as an athlete himself, he was mindful of the timing. “You are dealing with a patient who has reached a very short-term window in her life. She has dedicated extensive training and wants desperately to compete. The trials were quite near—there would be nothing lost in allowing this athlete to complete what she had prepared for. The main thing we wanted to emphasize was that this patient should not be lost to care.”

Wilson learned later that the mass was cancer, and the athlete was undergoing the appropriate treatment. He was relieved. “If you’re able to use your experience and training to have implications not just for a patient’s quality of life — participating in a sport they enjoy — but for the patient’s life itself, that’s rewarding.”

This is but one example of how Wake Radiology’s MSK radiologists team with the area’s physicians to help treat athletes who include Olympic hopefuls, professional hockey players; and college, high school, and recreational players. Gymnasts and dancers have their share of problems, too.

Wake Radiology’s sizable MSK group includes seven radiologists, all with in-depth musculoskeletal experience, who are headquartered in a state-of-the-art musculoskeletal and sports imaging center at 4301 Lake Boone Trail in Raleigh. At that office, two fellowship-trained musculoskeletal radiologists are always available for consultation and for real-time monitoring of complex cases. All MSK cases are filtered to this office for review.

“What makes Wake Radiology such a unique group is not only the quality of the scan, but the quality and precision of their reading of the scan, which is really appreciated in a high-volume sports medicine practice,” says orthopedic surgeon Douglas J. Martini, M.D., of Cary Orthopaedic & Sports Medicine Specialists. “The MSK group is by far the most superb group I’ve ever worked with. A quality MRI is one thing, but skilled people reviewing it for the subtleties of some of these complex injuries is incredibly helpful in making a diagnosis and considering treatment options.”

Often, he says, the subtleties make a big difference in preoperative planning and execution of the surgery. “Examples would be identifying subtle intraarticular pathologies. That may give you a chance to talk to your patient in preoperative planning — which is far superior to reacting to it when it’s found at the time of surgery.”

In another case, an MRI of a recreational soccer player revealed not only an ACL tear, but also a high-grade musculotendinous injury that had occurred at the same time. “It was unanticipated. After an ACL tear, the knee is always big and swollen. I was surprised because the degree of soft tissue injury exceeded my expectations,” Martini says. “The soft tissue injury could have delayed his ultimate rehabilitation. So we waited, prior to performing surgery, until this had healed. We eliminated that as a possible complicating factor.”

The combination of a precise history and physical examination with a high-quality MRI scan is enormously helpful in fine-tuning management decisions, especially when considering surgery. Martini says, “For instance, there’s a partial rotator cuff tear versus a high-grade tear. Even though both are incomplete tears, one can be managed much more successfully non-operatively than the latter. So often it [MRI] can set the treatment options.”

Pro athletes are frequently on Wake Radiology’s roster, and time is usually of the essence. “As the team physician for the Carolina Hurricanes, there have been many occasions when I have needed an MRI scheduled quickly for one of our players as well as a quick read from the radiologist,” says William M. (Marty) Isbell, M.D., an orthopaedic surgeon at Raleigh Orthopaedic Clinic, a practice that cares for North Carolina State University and Carolina Hurricanes pro hockey players, among many others.

“Often times, the scan is integral to formulating a rehab or surgical plan for these athletes as well as to give some idea of how long a player might miss. The musculoskeletal radiologists at Wake Radiology are always more than willing to stop what they are doing...”

to discuss these often-complicated cases. There have been many times that I have gone over specific cuts on the computer while the radiologist is reviewing them with me over the phone. This allows me to make confident decisions about when these athletes are allowed to return to play or what treatments they are going to require.”

He continues, “There has never been an occasion when I have needed to talk to someone that they have not been available. In doing this, the folks at Wake Radiology allow me to provide high-level care for high-level athletes, as well as for my weekend warriors.”

When athletes fly through the air and come crashing to earth, their extended hand often takes the impact. That is when orthopaedic surgeon Wallace F. (Wally) Andrew Jr., M.D., a partner at Raleigh Orthopaedic Clinic, may see them. He treats injuries to the hand, wrist, and upper extremities below the shoulder. If he has a choice, Andrew says, he sends his patients to Wake Radiology. "I think they’re outstanding. I’d compare them favorably to any academic group anywhere.”

The MSK radiologists at Wake Radiology have been exceedingly easy to work with over the years, Andrew says. “I’d call Charles Pope and say, ‘The patient has this, this, and this. You do whatever imaging you feel is appropriate to make the diagnosis.’ He’d say, ‘Let me have him over at West Raleigh where I can do an MRI or a CT scan or whatever.’ Then the patient comes back with the appropriate study and the correct diagnosis.

“The other thing I like is that if they’re doing a study and something looks a little odd — it doesn’t fit the clinical information or this, that, or the other — they pick up the phone and give you a call. Which is, I think, very unusual and very helpful, to get you thinking what they’re thinking—that type of approach.”

That’s the kind of rapport Wake Radiology nurtures. “Certainly, the surgeons often have very specific clinical questions. Sometimes, however, the history provided is simply “pain” or something vague. In that case, we can typically anticipate the clinical question. We know what they are looking for because we’ve become familiar with our orthopedic colleagues and we speak their language,” says musculoskeletal radiologist William (Bill) J. Vanarthos, M.D.

**Bone Density Screening Helps Save Lives**

People who have low bone density are at high risk of death as a consequence of osteoporotic fractures. That established medical fact is the driving force for Wake Radiology’s comprehensive approach to high-quality DXA screening, a key to preventive care.

“Osteoporosis is a silent disease; I compare it to hypertension. You don’t necessarily know that you have it until you experience some of the negative outcomes as a result of it,” says Joseph W. Melamed, M.D., who has led Wake Radiology’s DXA program for a dozen years. Today, the practice performs more than 6500 scans annually.

Osteopenia and osteoporosis are preventable and treatable, Melamed points out, yet DXA is under utilized by those most at risk: post-menopausal women.

Through Melamed’s leadership, Wake Radiology has become the nation’s only multi-site DXA provider to be certified by the International Society for Clinical Densitometry (ISCD). Patients can receive the same high-quality DXA screening at any of seven Wake Radiology locations.

Equally important, all of Wake Radiology’s DXA technologists are dual-certified by both the ISCD and the American Registry of Radiologic Technologists.

The quality of the test is vital, Melamed emphasizes. “With DXA, if the test is done wrong, you may get the wrong answer and not even realize it. You may tell the patient they’re normal when in fact they have osteoporosis. The legitimacy of numerical data is dependent on whether or not the study is done correctly. So we are very dependent upon the technologists, and Wake Radiology’s technologists are second to none.”

Improving the screening even more, Wake Radiology’s DXA reports now provide FRAX® data based on the World Health Organization’s fracture risk assessment tool. This takes into account not simply bone mineral density, but also key demographic information.

Men as well as women can benefit from DXA screening, as can younger people with diseases such as malabsorption, chronic steroid use (patients with asthma), anorexic patients, and those who are immobilized.

* Research literature seem to indicate that for every 1 standard deviation decrease in bone density, there is approximately a 10 percent to 40 percent increase in mortality. Also, according to the National Osteoporosis Foundation, “The rate of hip fractures is two to three times higher in women than men; however, the one year mortality following a hip fracture is nearly twice as high for men as for women.”

**A practice highly attuned to the needs of physicians and their patients**

Wake Radiology’s musculoskeletal section has fine-tuned its procedures to dovetail effortlessly with the needs of area doctors. Here is a bird’s eye view.

- On a daily basis, more MSK radiologists providing outpatient and hospital-based diagnostic and interventional services than at many tertiary care institutions
- Cross-consultation, thanks to having at least two MSK radiologists at all times in the reading room at a state-of-the-art musculoskeletal and sports imaging center in West Raleigh. The overall size of the practice – more than 50 radiologists – is also beneficial, as the broad experience they bring from training at the nation’s finest universities and teaching hospitals.
- Standardized reports that always present the same information in the same spot. Both ready-read summaries and detailed reports are provided.
- Highly experienced technologists who offer a welcome combination of compassionate care and wise efficiency. Patients experiencing pain are especially grateful.

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**The Triangle Physician**
The Triangle Physician

leaps and bounds. MRI can uncover structural and functional sports-related problems that are otherwise very difficult to distinguish. “We are picking up abnormalities that were largely unrecognized by both radiologists and orthopedists until recently,” explains MSK radiologist Nik P. Wasudev, M.D., a joint intervention specialist. “A good example would be active people in their teens or twenties who will present to their orthopedist or to their primary care doctor with hip pain. They are often referred for MRI to rule out a stress fracture or a labral tear. “In some of these patients, the MRI shows normal marrow signal and is otherwise unimpressive. But some of these patients will have relatively subtle anatomic abnormalities such as in the femoral neck, which can cause femoroacetabular impingement. Recognizing this abnormality, if it is appropriately managed and is treated early on, can prevent accelerated degenerative joint disease later in life. Or it can help preserve an otherwise limited athletic career,” Wasudev says. Moreover, “it is generally a diagnosis that a non-MSK radiologist is unfamiliar with and will therefore probably not make routinely. The radiologists in our section look for it. We have optimized our protocols to fully characterize it whenever necessary.” Making a diagnosis like that, he adds, is “one thing I find particularly satisfying about sports imaging.”

Wasudev recalls a 12-year-old dancer with persistent hip pain. The initial imaging workup was negative, and an MRI was grossly unremarkable. But Wasudev found “a very subtle abnormality in her quadratus femoris muscle, which has recently been recognized as a manifestation of ischiofemoral impingement.” The good news for the dancer was that there are effective treatments for the condition.

“That’s an example of why we think it’s important to have sub-specialty reads on all our MSK MRIs,” Wasudev notes. Particularly in the context of sports injuries, expert imaging can help establish a diagnosis that was unsuspected clinically. “Not infrequently, we’ll pick up an osteochondral lesion in the talar dome, an injury to the bone and cartilaginous portion of the ankle joint. This can be a cause of persistent pain following an ankle sprain, but may not have been suspected clinically, particularly if the plain film is normal.”

In the case of a football injury to the knee, he says, “The orthopedist may know there is a medial collateral ligament tear. But he or she may not have suspected that the ligament has retracted and is now in a position in which it may not heal down.”

MSK radiologists can also help orthopedists in surgical planning by providing more specific characterizations of an injury with MRI. “The choice of an autogenous graft for an ACL repair could be influenced by how we characterize the patellar tendon. If the patellar tendon looks abnormal or short, it may guide them to use a hamstring graft rather than a patellar tendon graft,” Wasudev explains.

Ultrasound guides surgery—or helps athletes avoid it

When an Olympic hopeful experienced Achilles tendon and heel problems, MSK radiologist Charles V. Pope, M.D., helped the orthopedist localize the abnormality and then perform the least invasive surgery. “We basically showed him where the problem was and exactly where to go, so he wouldn’t have to explore up and down the tendon. He could go right where he needed to, do what he needed to, and get back out without having a big invasive procedure,” says Pope.

In that case, Pope used musculoskeletal ultrasound techniques, uncommon in much of the country, but a valuable procedure that Wake Radiology began offering when Pope initiated the MSK section in 1986. Soon, they were performing 200–300 MSK ultrasounds a year. “Probably the first thing I did was shoulder ultrasounds for rotator cuff tears,” he remembers. “Unfortunately, prior to MRI, the only way to diagnose those was to perform a dye injection in the shoulder and do an arthrogram. A lot of people with painful shoulders were not up to having someone stick a needle in their shoulders.”

Used as a screening tool, ultrasound can obviate the need for
a patient to have an MRI. “It was not a widely practiced procedure,” Pope recalls, but “it was really good for the patients and orthopedists because it’s a relatively quick exam, it’s not extensive, it doesn’t cost a lot, and we could and if you’re treating just one of the bursa and not others that are involved, it’s likely that you’re going to get an incomplete response,” Wilson says. “We can use MRI to identify inflammation around specific tendons and the machine rather than the patient to achieve the most optimal angle.” Vanarthos explains.

The MSK radiologists also provide peripheral joint injections on virtually every joint in the body, including the small joints of

accurately screen patients who needed to have surgery.”

Ultrasound has been very helpful, orthopedic surgeon Andrew says. “I think most radiologists would just do an MRI. You can bill more for an MRI and make more money, whereas the Wake Radiology guys will do an ultrasound, if that’s the thing to do, and then you get the appropriate information for much less expense than an MRI.”

Ultrasound also can help patients avoid surgery, Dr. Wilson points out. “In calcific tendonitis, or hydroxyapatite deposition disease, a build up of this type of calcium in, say, a rotator cuff, can be debilitating and be very painful. We are one of the few practices where we can go in under ultrasound guidance, put a needle into the calcium and try to aspirate or get out as much of the calcium as possible, then locally target it with therapeutic medication to offer pain relief.” Otherwise, the patient has to endure the pain for perhaps six to 12 months, or undergo surgical debridement. “Lots of people would love to have the option of something in between.”

Wake Radiology offers uncommon procedures to help patients find pain relief

Ultrasound and MRI make a powerful combination in identifying the source of chronic pain. A good example using both imaging modalities is for chronic lateral hip pain. “There are multiple bursae in the hip, bursae, and then we can go in with ultrasound or fluoroscopy and specifically target those fluid-filled sacs so that people can get more optimal pain relief.”

Success with pain relief is gratifying. “You hear feedback from the patient, ‘I slept for the first time without waking up with significant pain,’ or ‘I walked around the block and was able to be outside in nice weather.’ Those are rewarding comments to hear. The high-end athletes are glamorous and fun, but it’s the everyday patients that really keep us invigorated.”

Wake Radiology offers a number of interventional pain management procedures not common to most practices. Among them is a caudal epidural injection for patients with unexplained low back, sacrococcygeal, or hip pain, or sciatica. The procedure is performed at the West Raleigh MSK office with the aid of a specialized C-arm fluoroscopy unit.

“We put a needle right into the epidural space through an opening or hiatus in the sacrum,” says Vanarthos, who specializes in joint and spine intervention. “This is very effective for pain related to the lower lumbar spine, pelvis, and hips.” The procedure is not well known except among pain management groups and anesthesiologists.

Usually reserved for hospital settings or high-end angiography, C-arm fluoroscopy is an extraordinarily useful tool for procedures related to the spine and the low back. “The patient lies flat on his or her belly and doesn’t have to move. The C-arm allows us to rotate the feet and hands, which proves especially helpful for patients suffering from arthritis.

“Patients who have an arthritic joint can get some relief with a steroid injection,” says Pope. But very few practices have offered therapeutic injections of the joints. “We’ve built a large following of people who need to have hip replacement surgery, but either aren’t quite ready to have the surgery or can’t have it. Those people are good candidates for corticosteroid hip injections for pain relief.

“The other group of patients we frequently treat are those with arthritis in their feet. If you’ve got a painful foot, you don’t have many options.”

Patients of Sarah E. DeWitt, M.D., of Orthopedic Surgery of the Foot and Ankle in Raleigh, are among those who have benefited
from therapeutic joint injections. “If you diagnose the problem correctly, patients respond beautifully to the injections,” she says. She has been working with Wake Radiology’s MSK team for the last decade. “They are a pleasure to work with, and their staff are really nice to my patients. That makes our job so much easier,” she says. “It’s also convenient to get someone scheduled because they have so many radiologists and locations. And they’re just really skilled at what they do. The MSK radiologists attend our ortho conferences, so they are actively involved in the care of our patients.

“The Wake Radiology doctors add huge benefit to me with their skill and knowledge. I am very grateful to have such competent MSK radiologists in this community.”

FRAX is a registered trademark of the World Health Organization Collaborating Centre for Metabolic Bone Diseases

Meet the MSK Physicians

CHARLES V. POPE, MD
Musculoskeletal Radiologist
Joint and Spine Intervention Specialist

Dr. Pope joined Wake Radiology in 1986 and founded the MSK imaging program. He holds a certification in diagnostic radiology from the American Board of Radiology. A native of Mooresville, NC, Dr. Pope received his medical degree from the University of North Carolina School of Medicine. He served as chief resident in diagnostic radiology at Duke University Medical Center in Durham.

JOSEPH W. MELAMED, MD
Musculoskeletal Radiologist
Joint Intervention Specialist

Dr. Melamed is chairman of the Department of Radiology at Maria Parham Medical Center in Henderson. His special clinical interests include bone densitometry and musculoskeletal imaging. He is board certified in diagnostic radiology by the American Board of Radiology and also is a certified clinical densitometrist. Dr. Melamed joined Wake Radiology in 1996. He is a native of New York City and a graduate of Yale University School of Medicine in New Haven, CT. At Duke University Medical Center in Durham, he completed his residency and a fellowship in musculoskeletal radiology. Dr. Melamed is a certified Clinical Densitometrist through the International Society for Clinical Densitometry (ISCD).

WILLIAM J. VANARTHOS, MD
Musculoskeletal Radiologist
Joint and Spine Intervention Specialist

Dr. Vanarthos has clinical interests in musculoskeletal imaging and emergency radiology. He joined our practice in 1999 and is board certified in diagnostic radiology by the American Board of Radiology. A native of Forest Hills, NY, Vanarthos received his medical degree from New York Medical College in Valhalla, NY. He was a resident in diagnostic radiology at the University of Pennsylvania School of Medicine in Philadelphia. He is a certified Clinical Densitometrist through the International Society for Clinical Densitometry (ISCD).

LYNDON K. JORDAN III, MD
Musculoskeletal Radiologist
Joint Intervention Specialist

Dr. Jordan, whose expertise is in musculoskeletal imaging, has been with Wake Radiology since 1999. He is board certified by the American Board of Radiology and is also a certified clinical densitometrist. He serves on the liaison committee of the North Carolina Industrial Commission. Dr. Jordan is a native of northern California and a graduate of Duke University School of Medicine in Durham. He completed his residency in diagnostic radiology and a fellowship in musculoskeletal imaging at Duke University Medical Center. Dr. Jordan is a certified Clinical Densitometrist through the International Society for Clinical Densitometry (ISCD).

RUSSELL (RUSTY) C. WILSON, MD
Musculoskeletal Radiologist
Director of Musculoskeletal Imaging
Joint Intervention Specialist

Dr. Wilson, who joined our practice in 2005, is director of musculoskeletal radiology at Wake Radiology. Dr. Wilson is board certified in diagnostic radiology by the American Board of Radiology. He is a native of Dallas, TX, and a graduate of Duke University School of Medicine. Dr. Wilson was a resident in diagnostic radiology at Brigham and Women’s Hospital in Boston, and he completed a fellowship in musculoskeletal imaging at the University of California at San Francisco. He is a certified Clinical Densitometrist through the International Society for Clinical Densitometry (ISCD).

PETER L. LEUCHTMANN, MD
Musculoskeletal Radiologist
Joint and Spine Intervention Specialist

Dr. Leuchtmann joined Wake Radiology in 2006. He is board certified in diagnostic radiology by the American Board of Radiology. Dr. Leuchtmann is a native of Florissant, MO, and he received his medical training at Indiana University School of Medicine in Indianapolis. He completed a residency in diagnostic radiology at the University of Maryland School of Medicine in Baltimore and a fellowship in vascular/interventional radiology at Johns Hopkins Hospital in that city. He also was a fellow in musculoskeletal radiology at University of North Carolina Hospitals. Dr. Leuchtmann is a certified Clinical Densitometrist through the International Society for Clinical Densitometry (ISCD).

NIK P. WASUDEV, MD
Musculoskeletal Radiologist
Joint Intervention Specialist

Dr. Wasudev joined our practice in 2007 and is certified in diagnostic radiology by the American Board of Radiology. Dr. Wasudev was born in London, England. He is a graduate of the University of Pennsylvania School of Medicine in Philadelphia. Dr. Wasudev trained in orthopedic surgery at University of Michigan Medical Center in Ann Arbor and his residency in diagnostic radiology at the University of California San Francisco. He was a fellow in musculoskeletal magnetic resonance imaging at National Orthopedic Imaging Associates in San Francisco. Dr. Wasudev is a certified Clinical Densitometrist through the International Society for Clinical Densitometry (ISCD).