SPRING 2007

CORE INK

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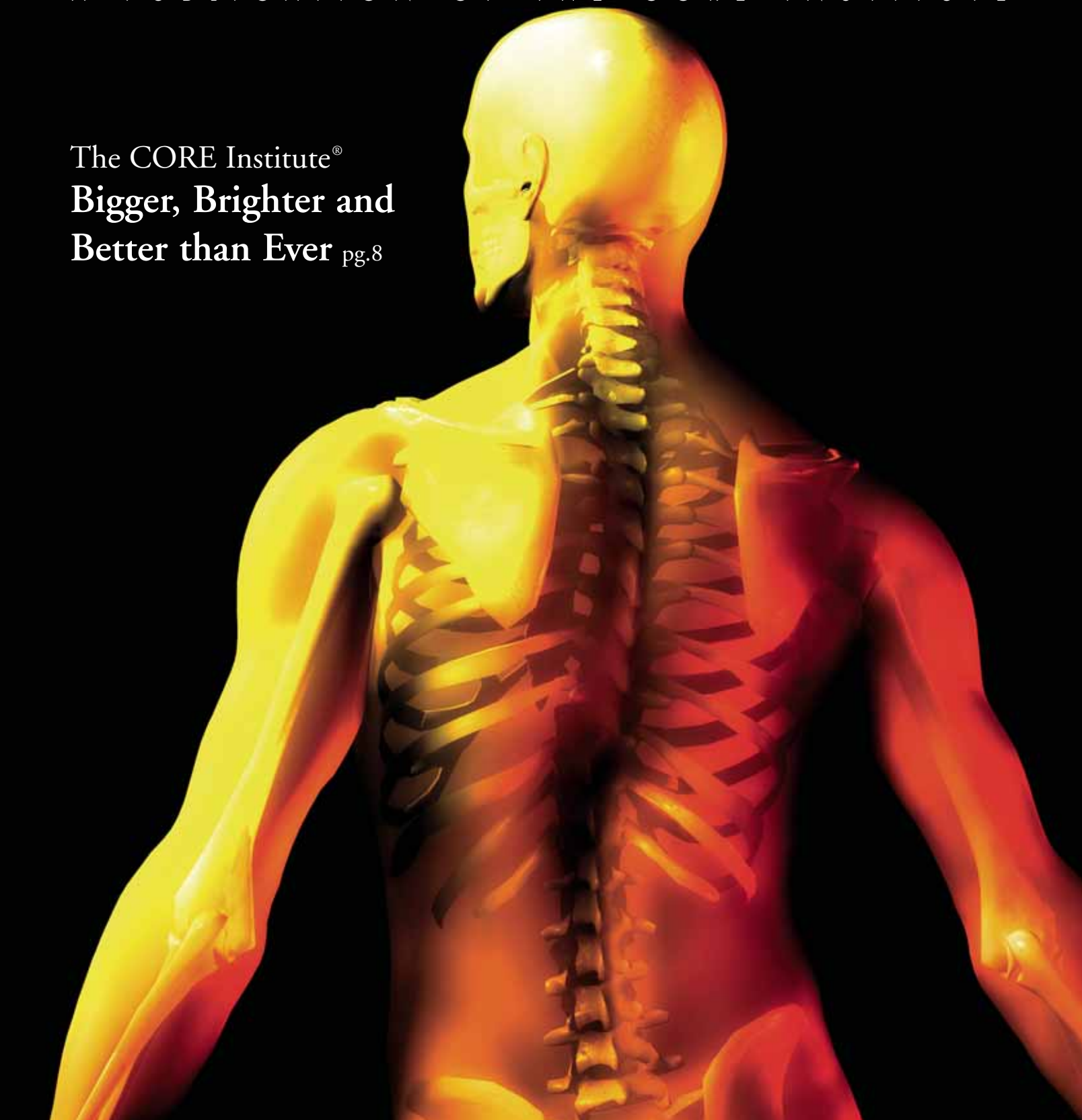

The CORE Institute®
Bigger, Brighter and Better than Ever pg.8

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New Knee Designed to Replicate Natural Movement

More than 300,000 knee replacements are performed each year in the United States according to 2003 data from the National Institutes of Health. The new Triathlon® Knee System is an innovative knee implant designed for natural motion, which may help to relieve pain and restore independence for patients wishing to return to work, or other day-to-day activities.

Triathlon® Knee System Offers Patients the Ability to Return to Normal, Everyday Activities

When patients receive a knee implant they may lack the confidence to engage in some of the activities of daily life, especially those that require bending – like tying shoes or putting socks on. Stryker, a leading manufacturer of joint replacement technology, designed the Triathlon® implant to imitate the natural movement of the

knee joint resulting in a natural feel for the patient. Not only does this implant bend and rotate, but it is also designed for natural motion. The design addresses patients' concerns, increasing the extent to which patients can bend their knee after the knee implant.

"Right after the operation, I felt that it had been a success… I have my life back again."

Cindy Goodfellow, 64
Stryker Knee Recipient, 2005

Cindy Goodfellow from Temple, Texas, experienced the benefits of Triathlon® firsthand. An active senior with six grandchildren, Goodfellow's arthritis affected her knees so severely that she had trouble performing routine activities.

"Every time I climbed, stood, or even sat in one place for a while, the pain was excruciating," said Goodfellow. "I felt like I was living a part-time life." She knew that she needed to take action before her pain forced her to miss the things she enjoyed most.

After consulting with her physician on possible treatments, Goodfellow decided to undergo surgery and receive a Stryker Triathlon® knee replacement.

What is a bearing surface?

One of the key components of a knee system is its bearing technology. The bearing surface is defined as the two parts of the knee that glide together throughout motion. The stronger and smoother the bearing surface, the better it will glide together, and the more likely it is to resist wear. Wear is what may eventually loosen the joint and cause it to break down. Stryker's new, advanced bearing technology, called X3®, has demonstrated up to 96% decrease in wear in laboratory testing compared to standard bearing surfaces – so it's anticipated that these improved wear characteristics may improve the life of the implant and give ease of mind to patients like Goodfellow for many years to come.

"At first, knee replacement surgery seemed like a scary procedure," said Goodfellow. "But after receiving the Triathlon and having the ability to do things like kneeling in the garden and playing with my grandkids, I can't envision my life any other way."

Increased Knee Motion: How Much Flexion Do You Need?

Restoring motion in the knee is one of the reasons many people consider knee replacement. The Triathlon® Knee System allows for natural knee motion and up to 150° of flexion.

- Walking 0-67°
- Climbing stairs 0-83°
- Descending stairs 0-90°
- Sitting down 0-93°
- Tying shoe 0-106°
- Lifting your grandchildren 0-117°
- Gardening 0-125°
- Triathlon provides 150°

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10,000,000

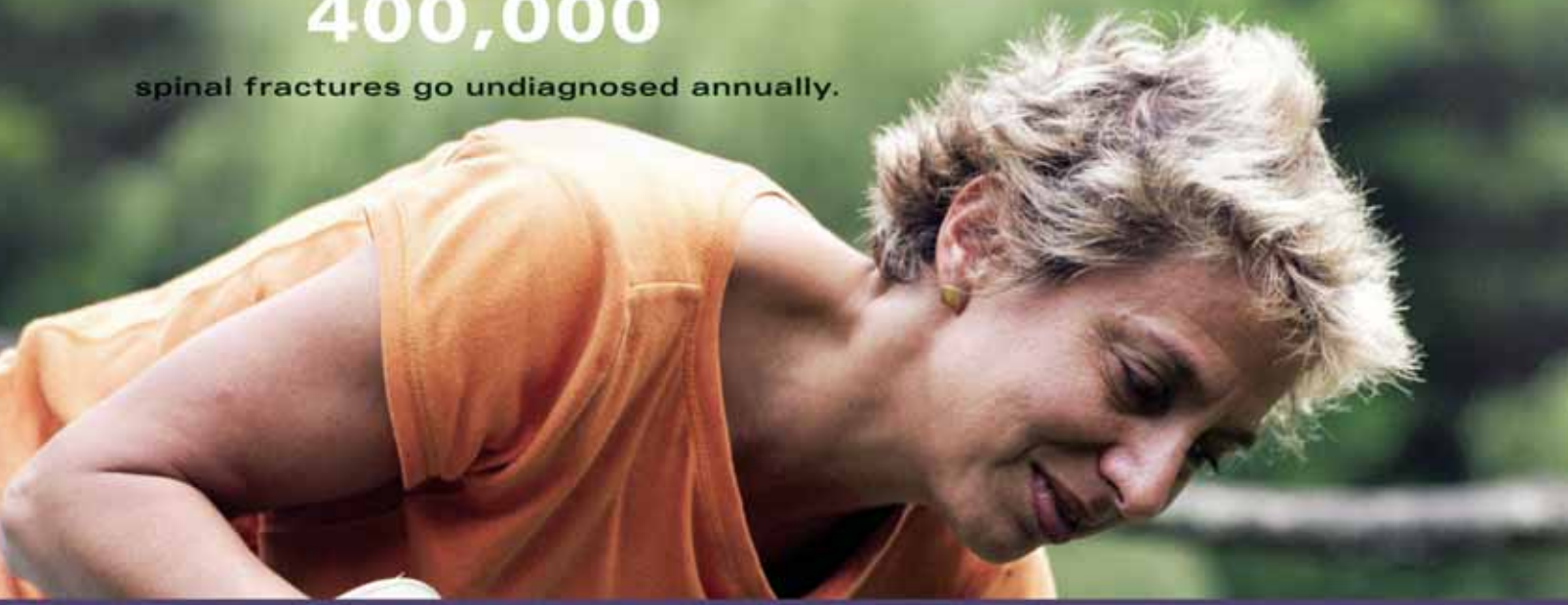
Americans have osteoporosis, which causes

700,000

spinal fractures each year. At least

400,000

spinal fractures go undiagnosed annually.



If your patients are at risk for fracture, they have a lot on their backs.

Balloon Kyphoplasty lifts the burden of spinal fractures.

The US Surgeon General warns that by the year 2020, half of all Americans over 50 will be at risk for fractures due to osteoporosis.

Spinal fractures are twice as common as hip fractures and incredibly, the majority of spinal fractures go undiagnosed. If left untreated, multiple spinal fractures can lead to kyphosis, which may result in serious medical complications.

Balloon Kyphoplasty is a minimally invasive treatment designed to repair spinal fractures. Performed on over 250,000 people worldwide, Balloon Kyphoplasty:

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Spinal Fracture

Balloon Kyphoplasty

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LETTER FROM THE CHAIRMAN

David Jacofsky, MD

Colleagues and friends,

January 15, 2007, marked The CORE Institute's two-year anniversary. It's been a wonderful beginning to our continuing mission of providing cutting-edge excellence in musculoskeletal health and wellness. Through the two years that have quickly passed, we have been afforded the opportunity to welcome: 22 orthopedic physicians, a plastic surgery and wellness division, an expanded physical therapy department, four new orthopedic centers across the Valley and numerous key research projects. We are proud to have introduced the latest techniques in surgery, from minimally invasive, computer-navigated joint replacement to hip resurfacing. And now we are excited to keep you on the forefront of orthopedic innovation with *CORE Ink*.

Welcome to the inaugural issue of *CORE Ink*. As we continue to break orthopedic news, lead industry developments, and grow our comprehensive services, *CORE Ink* will keep you on the brink of innovation right along with us. Our advances in medicine are now your advances in health.

Keep life in motion.

David Jacofsky, MD

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John Brown, MD; David Jacofsky, MD; Mark Campbell, MD
photo by King Lawrence

The CORE Institute®

Bigger, Brighter and Better than Ever

by Jessica Cerretani

If one of the keys to success is the ability to change, The Center for Orthopedic Research and Education is thriving. Also known as The CORE Institute®, the center has undergone a big transformation since first opening its doors in January 2005. The institute's staff has skyrocketed from just three physicians last year to more than 30 clinicians — including surgeons, physician assistants, PhDs, medical students and graduate students from Arizona State University — as of October 2006. And the space that houses this staff has expanded, too: What was once a single center has expanded to six offices. Two new medical buildings at Boswell Hospital and Del E. Webb Hospital with a total of more than 50,000 square feet have joined CORE's first office, based in Sun City West.

Del E. Webb Hospital and The CORE Institute - Sun City West

With this additional space come more advantages for CORE's patients. The group, which *M.D. News* first spotlighted two years ago (spring 2005), now boasts an MRI scanning machine on site, houses occupational and physical therapy services, provides its own durable medical supplies including braces and casts, and has expanded its clinical offerings to include cosmetic and reconstructive surgery, as well as osteoporosis treatment.

What's responsible for these changes? Dr. David Jacofsky cites The CORE Institute's diverse patient demographic as a driving force behind the group's growth. What began as a regional orthopedic surgery practice has quickly gained a strong national reputation as the go-to group for musculoskeletal health by offering services that combine state-of-the-art technologies with compassionate, patient-centered care. These days, CORE is considered Phoenix's premier center for excellence in orthopedics and is attracting a growing patient base from throughout North America. In fact, some 40 percent of CORE's patients hail from outside of Arizona, traveling from locales as diverse as New Mexico, Hawaii and even Canada to seek treatment, whether that treatment involves a hip replacement, arthroscopic knee surgery or correction of a congenital pediatric anomaly.

These patients are also no doubt drawn to The CORE Institute's unique approach to the practice of medicine. Led by best-in-class orthopedic surgeons and other trained clinicians, CORE not only focuses on top-level patient care, but also strives to share their skills, whether that means acting as physicians to local sports teams, conducting cutting-edge research in their on-site labs, or spreading information about orthopedics by offering lectures for both doctors and patients. Here's how these "CORE values" make the institute one-of-a-kind.

A Dedication to Excellence

Behind CORE's standout care is a group of clinicians that includes many of this country's leading orthopedic surgeons. Heading the group is Jacofsky, the doctor primarily responsible for conceiving and founding The CORE Institute. A native New Yorker, Jacofsky graduated *magna cum laude* from the Medical College of Pennsylvania, did his orthopedic surgery residency at the Mayo Clinic in Rochester, Minnesota, and completed a fellowship in orthopedic oncology and adult reconstruction at Johns Hopkins in Baltimore, Maryland. Before founding CORE, he was director of the Orthopedic Trauma Service and assistant residency director of Rochester's Mayo Clinic. Jacofsky is also board-certified by the American Academy of Orthopaedic Surgeons.

In order to provide patients with the best care possible, Jacofsky's colleagues are similarly accomplished. Most have graduated in the top 1 or 2 percent of their medical school class and are fellowship-trained, which ensures that they have the most specific skills necessary. "The fact that our surgeons are super sub-specialized allows patients access to a different standard of care," Jacofsky says. "When a physician has specific training in only knee or only hip surgery, for example, he or she is able to understand all the literature and research on related disorders and can perfect those surgical techniques."

This dedication to excellence forms the culture of The CORE Institute. The synergy of a large group of top academic-trained physicians encourages an atmosphere of healthy competition between the surgeons, who are faced with the challenge to be the best in the field. The result of this peer pressure: a drive for excellence that "escalates patient care to new levels," Jacofsky says.

The commitment to provide the best service possible extends to CORE's other clinicians. The institute's on-site physical therapists typically have received more training than their peers. Many have earned doctorates of physical therapy and are extremely sub-specialized so that they can better focus on patients' needs — a benefit that leads to better outcomes. Most recently, CORE has unveiled The CORE Institute® PLUS, a new in-house group of plastic surgeons that Jacofsky says is meant to act as an extension of CORE. In addition to offering cosmetic plastic surgery, the new group includes experts trained in reconstructive surgery, such as post-traumatic and microvascular techniques. The goal, Jacofsky explains, is for CORE to eventually act as a one-stop center for complete musculoskeletal health and wellness.

State-of-the-Art Technology

The CORE Institute prides itself not only on its surgeons' impressive training but also on its dedication to using innovative techniques, as well. "We are able to offer advanced equipment long before it is available elsewhere, which allows patients access to the most state-of-the-art technology," Jacofsky says. One example of this is CORE's Stryker i-Suites operating rooms, located at the institute's Del E. Webb Hospital location. Designed with the most advanced equipment for minimally invasive surgery, the i-Suites use a state-of-the art computer navigation system. Also known as "smart suites," these operating rooms are the most advanced suites of their kind in the world.

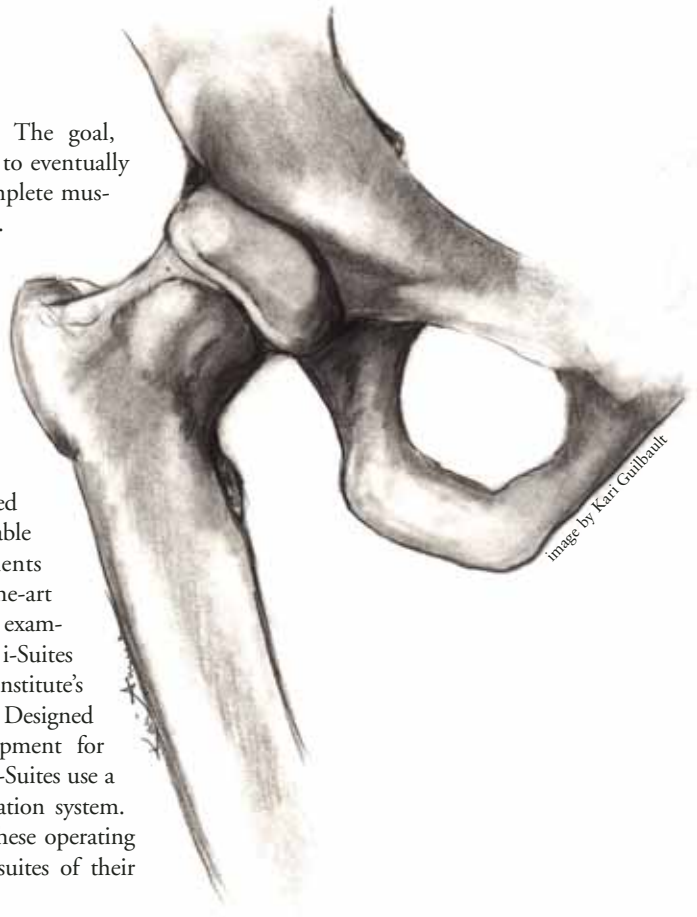


image by Kari Guilbault

The Stryker i-Suites offer several advantages over traditional operating rooms — both to physicians and patients. The i-Suites combine image-guiding technology; voice activation; real-time documentation of the procedures; and consultation between the i-Suite, the surgeons' offices and elsewhere. The voice activation and new video technologies allow CORE's surgeons greater control over medical equipment and diagnostic image movement. To view X-rays or other diagnostic images, the surgeon need only vocally request them — and the images immediately appear on the suite's flat-panel screen, even if they are physically located at the physician's office or another location. Likewise, the surgeon can document the procedure with words and images to be sent back to his or her office electronically.

Another benefit of CORE's Stryker i-Suites is their navigation system. This permanent, ceiling-mounted computerized navigational system, or NavSuite, lets surgeons perform image-guided joint replacement surgeries by helping them position their equipment through small, minimally invasive incisions. Because this approach can tell surgeons the alignment of their cuts within one degree, it takes less time than conventional techniques and reduces wear and tear on the joint replacement, which makes the replacement last longer.

CORE's technically savvy i-Suites also allow them to share their skills with physicians throughout the country — and the world. With its equipment wired to the Internet and a camera on site, the i-Suite actually transmits real-time images from the operating room to groups of physicians viewing the procedure from afar. That means that CORE's surgeons can show their techniques to interested audiences, even a roomful of surgeons in Beijing, for example. By doing so, Jacofsky says, CORE is able to expand the rate at which the institute can educate other surgeons.

In-Depth Research

In fact, it is The CORE Institute's commitment to pioneering research that has given its physicians early access to such cutting-edge equipment and techniques. CORE was the first group in Arizona to have a fully integrated Stryker i-Suite and the first practice in Phoenix to have access to hip resurfacing, an alternative to total hip replacement that leaves the more natural bone (femoral head and canal) preserved. That's because CORE's physicians have teamed with the companies behind these innovations to do the necessary research on them and perfect the techniques and equipment. "By getting involved in the development and research of new technology early on, CORE has gained access to these techniques

and procedures sooner than other practices," Jacofsky explains.

But The CORE Institute's dedication to research doesn't end there. CORE has partnered with the Sun Health Research Institute (SHRI), a tenured research organization located in Sun City, as well. SHRI is a nationally and internationally renowned center for excellence for research in Alzheimer's disease, pioneering both the cholesterol and anti-inflammatory origins of the disease process. When Jacofsky and his colleagues founded The CORE Institute, they wanted it to include a state-of-the-art research center so they could continue the research interests they had developed during their fellowship training. By teaming with SHRI, they were able to create the SHRI-CORE Orthopedic Research Labs. Located adjacent to The CORE Institute, the two labs include a motion analysis laboratory and a biomechanical testing facility and are staffed by bioengineers, scientists and CORE physicians. The SHRI-CORE Orthopedic Research Labs are a non-profit venture and currently have more than a dozen different studies under way, Jacofsky says. SHRI-CORE is focusing on six research areas: sports medicine and arthroscopy, adult reconstruction (such as joint replacement techniques), pediatric orthopedics (such as gait changes in children with cerebral palsy), gait analysis, motion analysis and osteoporosis. Aside from furthering scientific knowledge through their findings, the SHRI-CORE Orthopedic Research Labs offer specific benefits to patients: The labs are located in the same building as CORE's medical offices. By basing their research on site, CORE's physicians can ensure that patients have one point of contact for all of their clinical needs. This also allows researchers to more easily contact and interact with the practice's orthopedic surgeons and physical therapists, creating a synergy that gives patients the best possible team of experts attending to their needs.

Spreading the Word

With The CORE Institute's research findings and access to high-tech, innovative equipment and procedures, it might be expected to hold these benefits close in order to gain a competitive edge. Yet, CORE's physicians are more than willing to share their knowledge — both with the public and with other physicians. In fact, one of the group's "CORE values" is education. Indeed, the institute's surgeons are the doctors who train other physicians in new surgical techniques. In addition to sharing real-time footage of the various orthopedic surgical procedures they perform with other surgeons via the Stryker i-Suites, CORE's physicians also educate health care providers with lectures and conferences. "We have a diverse audience that includes both small and large groups of other physicians, athletic trainers, paramedics, nurses and other health care staff," Jacofsky explains. CORE's surgeons also spread their knowledge about orthopedics by publishing journal articles and authoring book chapters. Jacofsky alone has traveled worldwide to lecture other physicians on the latest orthopedic breakthroughs, addressing thousands of surgeons every year.

CORE also aims to educate patients by offering lectures, programs and other events to the general public. Their educational community program "Big on Bones," for example, provides free orthopedic health care lectures and question-and-answer sessions that give both active and aging people information and tips on topics, such as coping with neck and back pain; avoiding sports-related injuries; and understanding the latest technologies, like computer-assisted joint replacement surgery.

Commitment to Community

A dedication to giving back joins education and research as another of the institute's "CORE values." The CORE Institute is a cornerstone of support for the Greater Phoenix and Scottsdale communities, not just through educational efforts such as "Big on Bones" but also through outreach programs and service projects. For instance, CORE acts as a sponsor for several regional high school sports programs, such as state wrestling. CORE's physicians also provide medical coverage to athletes at local high schools and at Glendale Community College, and they give orthopedic care to Glendale's professional lacrosse team, the Arizona Sting. And last spring, CORE's surgeons volunteered their services as part of Sun Cities "Doctor on Call" program, a free community service to area residents.

CORE Values Benefit Patients

When The CORE Institute first opened its doors to the public in early 2005, the goal of Jacofsky and its other founders was to fulfill a vision of orthopedic excellence encompassing the entire spectrum of orthopedic services. Today, that dream has been realized. CORE's elite, fellowship-trained surgeons and physical therapists are some of the best

Arash Araghi, DO, examines a patient's shoulder.

in their field. The institute has expanded to include the latest technology that allows these physicians to perform innovative procedures with precision accuracy and impressive outcomes. Their shared research partnership gives them the ability to do pioneering research in the same location as their medical practice, providing patients with the best "one-stop shop" for premier clinical care. CORE's surgeons share their knowledge both with other physicians around the world and with the general public. And CORE's commitment to giving back has made it a driving force in the community. "We believe that CORE's combination of outstanding surgical skills with state-of-the-art technology can really change the way orthopedic surgery is practiced," Jacofsky says. "We've been able to take very invasive, often debilitating procedures and make them far less invasive, with rapid recovery and less pain. The field is likely to change exponentially over the next 10 years — and we hope to be a part of that."

The CORE Institute may be reached at 623.537.5600 or www.thecoreinstitute.com.

Jessica Cerretani is a Boston-based writer and senior editor at a medical information company. She may be reached at jessicacerretani@yahoo.com.

PHYSICIAN SPOTLIGHT

Michael N. Desvigne, MD, FACS

DR. MICHAEL DESVIGNE

Dr. Michael Desvigne is the director of The CORE Institute® PLUS, CORE's newest division, offering comprehensive plastic and cosmetic surgery procedures to complement the musculoskeletal health and wellness services offered by The CORE Institute®. As a board-certified plastic and reconstructive surgery specialist, Dr. Desvigne also has extensive experience in minimally invasive plastic surgery procedures, laser surgery, universal wound care and hyperbaric medicine. He is dedicated to only the highest standards of personalized patient care and safety.

Dr. Desvigne received his undergraduate degree from the University of Maryland, where he was awarded membership into the prestigious Omicron Delta Kappa leadership honor society. He received his medical degree from the Uniformed Services University of the Health Sciences (USUHS) in Bethesda, Maryland. He then completed his general surgery internship, followed by a research fellowship and surgical residency at David Grant USAF Medical Center in California. As an active-duty Air Force member, he spent two years in Korea as a general surgeon and flight surgeon commander, where he was awarded the honor of Pacific Air Forces "Flight Surgeon of the Year" (1997-1998). He then completed his plastic surgery residency at the University of Texas Health Science Center, San Antonio. He continued his education by completing an aesthetic fellowship at Maui Plastic Surgery in Hawaii. Additionally, he obtained advanced training in hyperbaric medicine in South Carolina and Florida.

He is a diplomat of the American Board of Plastic Surgery and the American Board of Surgery and a fellow of the American College of Surgeons. He is also an active member of the American Society of Plastic Surgery, the American Medical Association and the Undersea & Hyperbaric Medical Society.

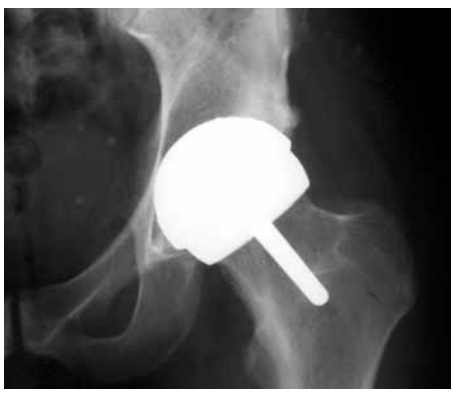
Dr. Desvigne is also active in academic medicine, having lectured to medical professionals as well as the general public on topics such as: advanced wound care and bariatric body contouring.

Latest Techniques: Birm

by M. Wade Shrader, MD

In summer 2006, the Food and Drug Administration approved the Birmingham Hip Resurfacing (BHR) System, a remarkable product and hip replacement technique. It has been used in Europe for 10 years with an excellent success rate, and The CORE Institute® has one of the first surgeons in this country to be trained in the system.

For the first time in the United States, patients have access to a proven alternative to total hip replacement surgery. Rather than replacing the entire hip joint, as in total hip replacement, hip resurfacing simply shaves and caps a few centimeters of bone within the joint. The bone-conserving approach of the BHR System preserves more of the patient's natural bone structures and stability, covering the joint surfaces with an all-metal implant that more closely resembles a tooth-cap than a hip implant. This approach reduces the post-operative risks of dislocation and inaccurate leg-length that happens occasionally with total hip replacement. Also, because the all-metal implant is made from tough, smooth cobalt chrome, it has the potential to last longer than traditional hip replacements.



Post-operation X-ray

The Birmingham Hip implant is intended for patients suffering from hip pain due to osteoarthritis, hip dysplasia or avascular necrosis and for whom total hip replacement may not be appropriate due to their increased level of activity. The operation is primarily intended for use in people who are in need of a hip replacement at a younger age — typically people under age 60 who live non-sedentary lifestyles.

In general, conventional total hip replacement is a very successful procedure for the treatment of hip arthritis. For younger, more active people needing a hip replacement, there is a higher chance that a traditional hip replacement will wear out during their lifetime and need to be replaced again. A second replacement, called a revision, is much more difficult and consequently may last a shorter time than the original replacement. The Birmingham Hip was designed for these younger patients.

Wear of the hip replacement and dislocation are two of the most common reasons for failure of a traditional total hip replacement. The BHR System addresses both of those failure modes. The Birmingham Hip implant's all-metal components are finely machined to produce a very high-quality surface with a low-friction finish, thus allowing for very low wear. The Birmingham Hip implant more closely matches the size of a patient's natural femoral head (hip ball). This is substantially larger than the femoral head of a traditional total hip

ingham Hip Resurfacing

Total hip replacement surgery cuts

Birmingham Hip replacement surgery cuts

Total hip replacement

Birmingham Hip replacement

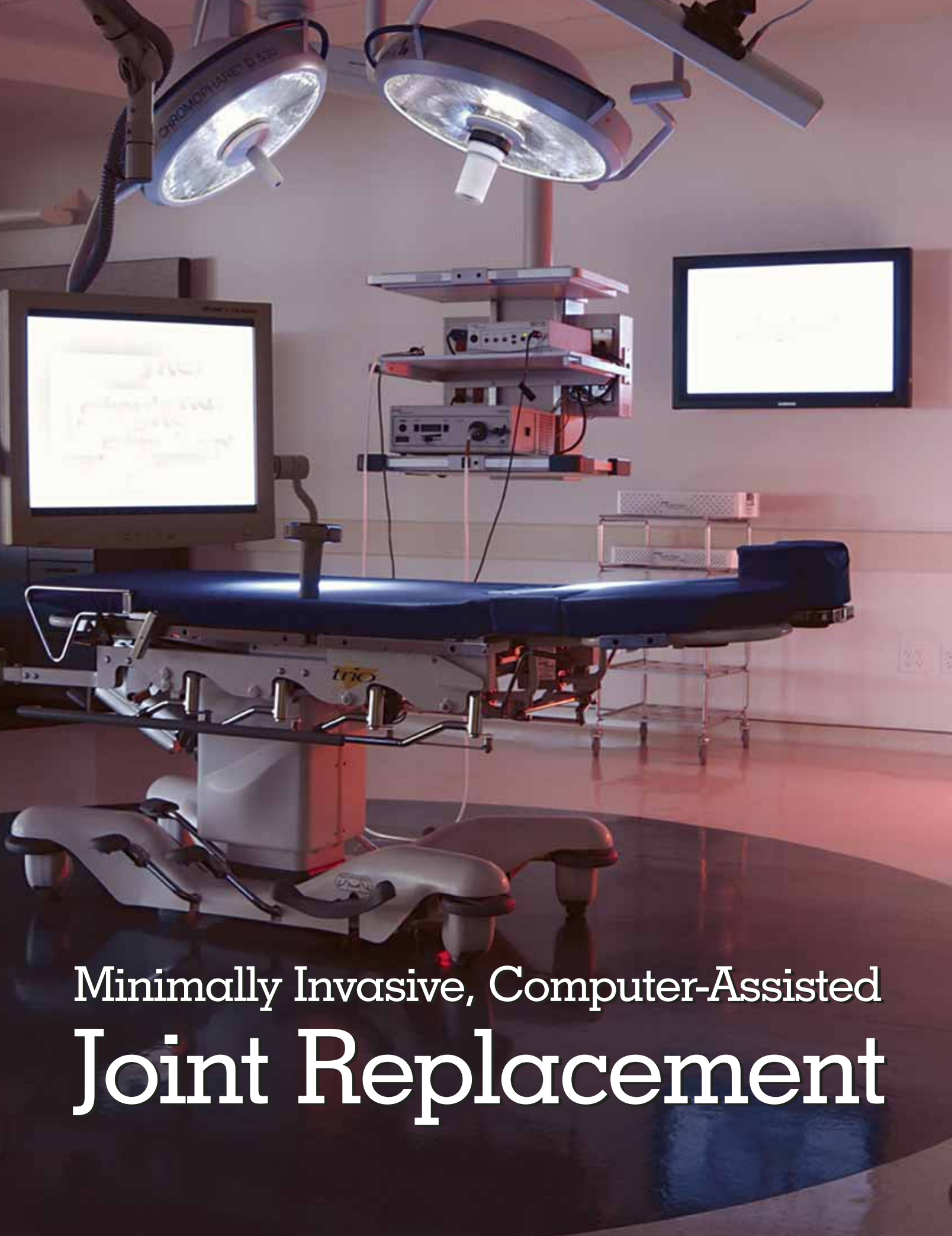
replacement implant. This increased size translates to greater stability in the new joint, and it decreases the chance of dislocation of the implant after surgery. With decreased wear and decreased dislocations, the Birmingham Hip allows for significantly improved outcomes.

Total hip replacement involves the removal of the entire femoral head and neck. The Birmingham Hip resurfacing technique, however, leaves the head and neck untouched. It is this neck length and angle that determine the natural length of a patient's leg after surgery. Since these parts of the patient's natural hip are not removed and replaced with an artificial device, there is a greater likelihood of maintaining accurate leg length. Also, since the procedure is very bone-conserving, should the patient ever need a revision to a second replacement, this surgery is much simpler, since so much of the patient's normal bone is still present.

The procedure was first developed in Birmingham, England, by Drs. McMinn and Tracey. Now, the surgery is being performed throughout Europe with excellent success rates. With the proper patient selection, current data show a more than 95 percent success rate at 10 years after the surgery.

As with any surgery, there are risks associated with the Birmingham Hip. One of the main risks involves the unknown performance of the implant after ten years. While the 10-year success rate is very good and often better than that of conventional total hip replacement, we don't have the data to confirm that success rate beyond 10 years, yet. The long-term reliability of the implant will not be known until is has been in widespread usage for 15 to 20 years. Some concerns have been raised about the release of metal ions into the body. However, no correlations with long-term systemic problems have been demonstrated from these metal ions, although work is still ongoing. It is worth noting that in patients with historical metal-on-metal devices, some of which have been implanted for a very long time, no adverse reactions have been highlighted. Finally, the risks associated with any major operation or anesthetic are still present with this operation.

The Birmingham Hip is the only hip resurfacing system approved by the FDA for use in the United States. In the past, American patients who wanted this procedure typically had to travel overseas and pay for the operation out of their own pockets. Because the device is relatively new to American medicine, the FDA has a very strict policy for who can use this implant. I am proud to have been personally trained by Drs. McMinn and Tracey and their team before being given the official endorsement and approval for using the device here in Arizona.



Minimally Invasive, Computer-Assisted

Joint Replacement


photo by Olivia Reyes

Michael Anvari, MD, demonstrates how computer navigation is used for knee replacement.

Since the introduction of total joint replacement surgery by Sir John Charnley more than 40 years ago, there have been considerable changes in the materials used and the techniques of surgery. Surgical replacement of the hip and knee are now two of the most commonly performed elective orthopedic procedures, with more than 600,000 cases performed in the United States each year.

Recent innovations in joint replacement surgery offer the potential for improved results and more reproducible outcomes.

Minimally invasive surgery (MIS) has generated tremendous interest amongst patients, surgeons and health care providers and also has had widespread coverage in the medical and lay press. Computer-assisted surgery (CAS) is another recent innovation in joint replacement surgery and has been shown by numerous studies to improve the position of the implants as well as the mechanical alignment of the lower limb.

The benefits of MIS joint replacement surgery are well known to orthopedic and rehabilitation specialists. By decreasing the amount of tissue dissection performed around the hip or knee, intra-operative blood loss is decreased, as is the need for post-operative blood transfusion. Furthermore, post-operative pain is reduced, and in-patient hospital stays are shorter with patients often discharged home, as opposed to a rehabilitation facility. Most importantly, patients typically recover quicker and with less pain. This will allow them to return to their work or daily activities sooner.

Unfortunately, the advantages of MIS joint replacement surgery are not without potential pitfalls. With the length of the incision often half that used in conventional joint replacement surgery, the ability of the surgeon to visualize the anatomical landmarks critical for implant positioning may be compromised. This carries the potential risk of short-term implant failure as opposed to long-term functional success.

The solution to implant positioning lies in computer-assisted navigation. By allowing surgeons to "see" surgical landmarks that cannot be visualized, computer-assisted navigation improves implant placement accuracy to a level greater than that attained with conventional joint replacement surgery. Ultimately, this gives the surgeon visual confirmation, enabling more accurate bone resection and more precise component implantation.

Minimally invasive, computer-assisted joint replacement is difficult and time consuming for surgeons to learn. Depending upon surgeon experience, the first few cases may take an extra 15 to 30 minutes to perform. However, as the surgeon and operating room staff become more comfortable with the navigation system, surgical time decreases dramatically. Overall, the surgical learning curve is short, with most surgeons comfortable after 15 to 20 cases.

I believe the advantages of MIS and CAS joint replacement surgery are too great to ignore. By decreasing the amount of soft tissue injury at the time of surgery, patients experience the short-term gains of less pain and earlier return of function. Combining this with the increased accuracy that CAS provides for implant positioning, early implant failure due to malposition should be eliminated. Surgeons and patients should expect to see an increasing number of excellent long-term outcomes after total joint replacement surgery.

by Steven Myerthall, MD

Steven Myerthall, MD, is an internationally trained specialist in minimally invasive, computer-navigated hip and knee reconstruction and arthroscopy.

photo by King Lawrence

The Forefront of Or

by Kristine Csavina, PhD

The CORE Institute® is at the forefront of orthopedic innovation in the establishment of the orthopedic research labs housed in their clinical facility. In a joint partnership with Sun Health Research Institute (SHRI), the physicians at The CORE Institute built the Motion Analysis and the Biomechanical Testing Labs for research and design projects to advance orthopedic care and overall knowledge in the orthopedic arena.

The Motion Analysis Lab is a state-of-the-art facility that enables researchers to evaluate human movement of any kind. Under the direction of David Jacofsky, MD; M. Wade Shrader, MD; and myself, the research has three centers of concentration. One center focuses on studies related to joint replacements, fracture fixations and non-operative orthopedic treatments. This group of patients ranges in age from 55 to older, and studies focus on surgical treatments used in orthopedic care. The second application includes assessing patients with cerebral palsy, both children and adults. Here, we evaluate how three-dimensional motion analysis aids orthopedic surgeons in their clinical decision-making. Finally, our third arm encompasses the athletic world, from the weekend warrior to the collegiate and pro athletes. Motion analysis is used as a tool for evaluating mechanisms of injury and for assessing performance. This multi-faceted approach allows The CORE Institute physicians to propose studies in their primary training area, from pediatric orthopedic surgeons, to joint specialist and sports medicine — all have an opportunity to engage in research they see as critical to orthopedic care.

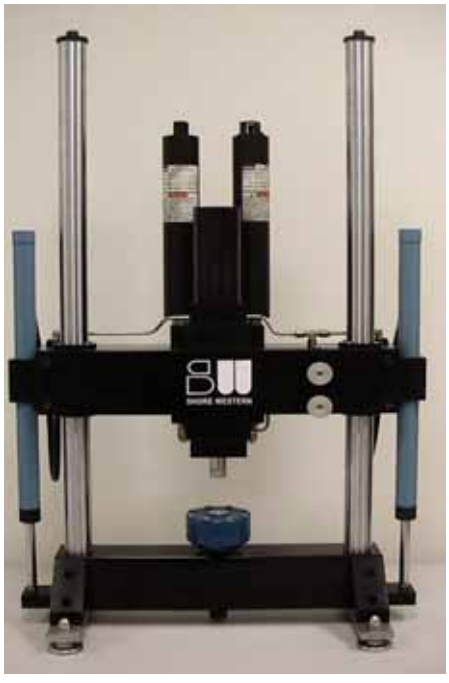
Though the Motion Analysis Lab is in its infancy, opened in February 2006, we already have had more than 75 volunteers enroll for our studies. Among them include our oldest patient, at 99 years young, and our youngest volunteer, at age 10. Our patients perform "activities of daily living" in our lab, including walking, climbing stairs, and rising from a chair. We have watched our patients pre-operatively, many who were not able to climb stairs prior to surgery; we have learned

thopedic Innovation

their life stories as they visit us several times post-operatively; and we have seen their improvements in the lab. The data we collect in the lab will be used to determine quantitatively how well and how quickly function returns after surgery. In order to evaluate the results of these studies, we need to compare these trials to those of healthy, age-matched subjects, whom we call "control subjects."

Opportunities for collaboration with other research centers are abundant and important to overall orthopedic care. Gait assessment of Parkinson's disease patients is an important tool to facilitate understanding of this disease, and collaboration with Dr. Marwan Sabbagh's clinical program at Sun Health Research Institute (SHRI) will help motivate studies in this area. Dianne Lorton's Arthritis Center at SHRI is already working on a project that addresses prevention of infection in implants. Work has started with Penny Pulz, golf pro at Sun City Country Club, to not only address performance in golf but to study mechanisms of injury related to aging. We also have a pipeline of students from Arizona State University (ASU) working in the labs, and opportunities exist to work with the many researchers of the Bioengineering Department and other programs at ASU.

The Biomechanical Testing Lab directly tests various orthopedic fixation devices and implants. The purpose of these tests is to improve surgical planning and patient outcome by comparing different surgical approaches, implants and fixation techniques. The lab includes servo-hydraulic mechanical testing frames that load samples in tension, compression or torsion in order to determine how well a particular orthopedic application is performing. Current studies involve evaluation of femur, tibia, pelvis and knee fractures. We will soon develop a second generation of a shoulder motion controller, designed by Matthew Hansen, MD. With this unique and novel apparatus, lifelike motions can be performed on cadaveric shoulders while parameters of interest are measured and later analyzed. As a non-profit research group, our goals are to contribute to and publish new scientific knowledge in the area of biomechanical testing.



As the director of Orthopedic Research at SHRI-CORE Orthopedic Labs, Dr. Kristine Csavina's main research interests are in clinical gait assessment and biomechanical testing. She received her PhD in bioengineering from Arizona State University and also holds a bachelor of science degree in mechanical engineering from the University of Dayton.

Golfers Hitting the Gym *before Hitting the Links*

by Steve Fall

Two decades ago, you'd never catch a football player and a golfer in the same weight room. Then a golfer by the name of Tiger Woods came along. Now times have changed.

"We're pushing them like football players," said Steve Heller, the fitness director for the Westin Kierland Resort & Spa in Scottsdale, Arizona. Their FORE-MAX training program puts golfers through a series of grueling workouts, treating them like football and basketball players in many respects.

Why go through all that? Both the pros and casual golfers now realize that it leads to more distance off the tee.

"You're able to get so much more distance from your body once you start working out," Heller said. "It pays off for golfers that are doing it right."

Lee Brandon, who became the NFL's first female strength coach when she joined the New York Jets in 1990, has observed the change up close. Instead of training 300-pound linemen, she now works with golfers, other athletes and celebrities.

"There's been a trend in every sport that generates circumferential speed," said Brandon, a certified strength and conditioning specialist based in Santa Monica, California. "In the past, baseball players and boxers avoided weightlifting because they thought big muscles made you slow. That whole trend has changed with the advances in sports medicine and exercise physiology research. Basically, a stronger core foundation has the predisposition to generate more potential speed."

On the golf course, greater speed translates to more distance. Heller explained how the trainers focus on core development by strengthening abs, backs and hips. While the trainers may push their FORE-MAX participants like football players, the workouts themselves are customized for golfers. And not everything they do involves heavy barbells or expensive, modern equipment. They've recently modified the program to include more time in the swimming pool, of all places.

"We're getting clubs in the water and doing different things that get them to use the water's resistance through their golf swing," Heller said. "The 40- or 50-year-old guys with bad backs have just exploded with their flexibility and strength gains. When that happens, their distance comes back."

Golf's fitness movement continues to gather momentum. Heller estimates that more than 80 percent of golfers on the PGA tour now participates in some type of exercise program. Jeff Quinney, who finished in the top 10 in three of his first four 2007 PGA tournaments, has worked out with Heller for the past four years.

Fitness also helps golfers avoid and, in some cases, recover from injuries. That's a huge benefit for players of all levels, since weekend golfers get the same aches and pains as the professionals.

"Golf is a one-sided sport that sets up one-sided imbalances. You have to hit the weights hard to undo the imbalances that the golf game creates," said Brandon, who has had many golfers come to her with compromised spines.

Brandon, the 2003 Women's World Long Drive Invitational champion, believes in personalizing programs for individuals, not just by sport. There's no perfect "golf workout" that fits all players. Brandon assesses golfers based on their age, spinal stability and core strength.

photo by James M. Phelps Jr.

Fitness also helps golfers avoid and, in some cases, recover from injuries.

A Mission to Ukraine

David Greene, MD

David Greene, MD, spine specialist with The CORE Institute®, was given the opportunity to travel on a medical mission to Kiev, Ukraine, in October 2006 to bring some of the latest surgical techniques to a couple of the most complex scoliosis cases Ukraine had ever seen. Far behind Western medicine, Ukrainian physicians gained advanced knowledge from the team of U.S. medical professionals leading the cases with cutting edge surgical skills. Outside the operating rooms, though, the U.S. team gained some lessons in culture, life abroad and the conveniences we sometimes take for granted in the medical field.

Kiev Journal Day One

Our team consists of Joe Verska, an orthopaedic spine surgeon from Boise, Idaho; Ken Metcalf, Stryker Spine regional manager in Denver; and Brian McKie, an American who is one of Stryker's Russian region sales folks.

We initially meet Professor Levitsky, the head orthopaedic surgeon at the Kiev Children's Hospital. He speaks no English, so there's Natalia, the translator. There's also a surgeon who speaks very good English. He is not a professor yet. One of the surgeons mentioned to me that it can take about 15 years to become a professor.

I learned a lot on this initial visit. One is that medicine in Russia is 99 percent socialized. The rest is private. The hospital doesn't have the resources to utilize commercial instrumentation, so they have a company here in Russia that makes them. The country has plentiful mineral resources, including titanium, so the production is pennies on the dollar compared to the States. Sterilization is a problem because during production the instrumentation becomes oily, prohibiting conventional techniques. They then have to boil the instrumentation (screws and rods), and then it often becomes brittle, so breakage is a problem. We don't have that issue in the States.

Ken shipped over the instruments he packed in his suitcase. I was actually happy to hear this when I asked, because surgical-grade instruments can cost hundreds to thousands of dollars, more than many countries can afford.

Kids for scoliosis surgery come in about a week or two ahead of time, with their families in tow. The kids are then four to a room. After a typical scoliosis surgery in Kiev, the patients don't get out of bed for six days and then are in the hospital for weeks afterwards. In the United States, we are much more aggressive. Physical therapy starts on the day after surgery, and kids go home between days five and seven. Then, I have the kids back in school at the two-week point.

The boy, our patient, arrives. His curve is much worse, and his pelvis is severely offset. It's much more grossly obvious. He looks nervous and is very quiet. We discuss his x-rays, and the debate is how many levels to fuse at the bottom of the curve. We reach the conclusion to try and stop at L4, but we reserve the right out loud to go one more level. Any time you can save a level in a 15-year-old, it can help minimize future problems.

Then, we ask to meet the parents, and we are taken down the hall. Once again, I notice just how old the structure and its rooms are. It actually reminds me a bit of the orphanage facility in *The Cider House Rules*. The mother of the boy comes out to greet me, we hug, and she immediately offers to roast me a pig at a family barbecue. I wonder, "Am I back in Virginia?" She says she has two pigs at home and, after the surgery, would be honored to roast one for me and the other surgeons.

Kiev Journal Day Two

We all ate a huge breakfast at the hotel buffet and then headed off to the hospital. They were in no rush to get started with surgery. We were given starchy lime scrubs to change into, and then they explained to us that the anesthesiologists needed time with the patients, and they would be going slow because they were nervous. Evidently a LOT of surgeons were coming in to watch.

After a couple hours, we were taken upstairs to the OR. On the way up, we passed by a room where three nurses were assembling the gauze to be used during surgery. They don't have autoclave machines there — they use big pots that get steamed or boiled somehow for sterilization.

The instrument setup in the OR was interesting. They only had one large table and one small. In my typical operating room, we have at least five tables, and everything is laid out super-neat. Not here, not possible. The instruments were all dumped on top of each other.

Scrubbing our hands consisted of washing them with soap in the sink and then putting our hands into a big bowl of some sort of disinfectant for 60 seconds. This was strange because we all successively used the same bowl. I'm sure it was some sort of alcohol.

The patient's back was scrubbed with what looked like betadine, and the draping consisted of cloth drapes. Everything was cloth — our gowns, drapes, instrument covers. They reuse everything. They did use the iodine impregnated sticky cover. Then, everybody put on gloves. Prior to the incision, we all doused our gloves with "spirits," which evidently is a form of strong alcohol — much stronger than Ukrainian vodka, I was told. That's pretty darn strong, so I knew nothing could possibly be living on my gloves at that point.

Once I made the incision and started working, thankfully I got into a zone, and the 18 people all crowded into the room began to disappear. All I could think about was the task at hand.

Right in the middle of the case, something unbelievable happened. Dr. Levitsky came in, still scrubbed in across the hall. Hands and gown bloodied, he came in asking to borrow an instrument. We weren't using it, so he reached onto the table to borrow it, nodded his head to say thanks, and left. I paused for a second and thought, "No way he actually just did that!!" He sure did, nobody blinked at all, so I continued. I was reassured numerous times during the day that their infection rates are very low.

Dr. Greene records the severity of his patient's scoliosis before surgery.

After six hours of surgery, we got our patient's curve from more than 90 degrees to 30 degrees. Normally in the United States, we use neurologic monitoring to tell us if the spinal cord sustains injury from the scoliosis correction. Not in the Ukraine. We did it the old fashioned way, by doing a wake-up test. The anesthesiologists lightened up the patient, then asking him to move his feet. That was a nerve-wracking 10 minutes, waiting for him to do that. We put the other rod in, tightened up everything, and evaluated. It looked great, except the rib hump was still prominent. We elected to perform a rib hump resection,

Left to right: Brian McKie, Stryker European Sales; David Greene, MD, The CORE Institute; Professor Levitsky, head of the Children's Hospital in Kiev; Joe Verska, orthopedic surgeon from Boise, Idaho; Kenneth Metcalf, Midwest Regional sales director, Stryker Spine

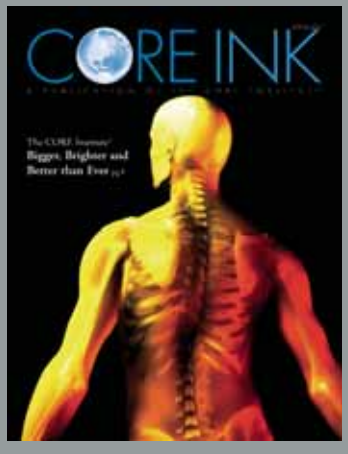
which the Ukrainian surgeons know how to do, so Joe and I elected to scrub out.

After a while, we were taken to a separate conference room, where we saw a table full of one of the most beautiful spreads imaginable waiting. Wine, cheese, ham, vodka, fruit, breads, olives, salami and more vodka were beautifully laid out! Once all the surgeons arrived, the toasts started. First they toasted us. Then to the patients and their families. Then, as is customary, the third toast involved the left hand and toasting all the women.

Eventually, we went back to the hotel and then went to meet everyone at a Ukrainian restaurant. I learned more at dinner than I had during the whole surgery. Turns out, these physicians work really hard and make next to nothing. The professor I was working with comes from a different city, Kharkov. They tend to do extremely difficult cases because patients wait and wait until seeking care. There is no school screening program, very little insurance (1 percent of the population) and only four spine surgeons in the whole country. For 47 million people!! And one of those surgeons works in a private clinic, so he only treats those with insurance or private payors. It became very apparent that these surgeons are practicing pure medicine, where insurance and benefits mean nothing. The only thing that matters is the service provided to better the lives of their patients, with whatever means necessary. Families have to scrape together about $4,000 for their surgeries. Half of that money goes to pay for the implants, and the rest goes to the hospital for all the IVs, suture, medicines, etc.

Then, the toasting started again. Take the post-surgery toasting and put that to the power of three, and that represented the extreme of it. We participated, and so did the chief of surgery from the hospital. The heartfelt gratitude expressed by these guys further cemented the fact that they care so deeply and just want to help their citizens. Being able to see U.S. methods, implants and to now have contacts in the States for them was very important and special. I explained in my toast that I had learned just as much from them as they could possibly have learned from me. Sometimes when practicing medicine in the United States you can lose sight of the most basic dogma we live by — patient first. This trip reinforced every bit of that.

All in all, this was a trip that ranked as one of my best experiences ever. To meet surgeons working in a system of "pure" medicine and just to be focused on what's best for the patient was a truly heartwarming feeling. I plan to definitely do it again many times and am very thankful to have been given the opportunity to play such a small role in making someone's life better.



STRESS

How to Let Go and Reduce St

The 90/10 secret is incredible! Very few know and apply this secret. The result? Millions of people are suffering undeserved stress, trials, problems and heartache. They never seem to be a success in life. Bad days follow bad days. Terrible things constantly seem to be happening.

Theirs is constant stress, lack of joy and broken relationships. Worry consumes time, anger breaks friendships, and life seems dreary and is not enjoyed to the fullest. Friends are lost. Life is a bore and often seems cruel. Does this describe you? If so, do not be discouraged. You can be different! Understand and apply the 90/10 secret. It will change your life!

What is this secret?

Only 10 percent of life is made up of what happens to you. 90 percent of life is decided by how you react.

What does this mean? We really have no control over 10 percent of what happens to us. We cannot stop the car from breaking down. The plane may be late arriving, which throws our whole schedule off. A driver may cut us off in traffic. We have no control over this 10 percent.

The other 90 percent is different. You determine the other 90 percent! How? By your reaction.

You cannot control a red light, but you can control your reaction to it.

Don't let people fool you; YOU can control how you react! Let's use an example.

You're eating breakfast with your family. Your daughter knocks over a cup of coffee onto your business shirt. You have no control over what just happened. What happens next will be determined by how you react.

You curse. You harshly scold your daughter for knocking the coffee cup over. She breaks down in tears. After scolding her, you turn to your spouse and criticize him or her for placing the cup too close to the edge of the table.

A short verbal battle follows. You storm upstairs and change your shirt.

Back downstairs, you find your daughter has been too busy trying to finish breakfast to get ready for school. She misses the bus. Your spouse must leave immediately for work. You rush to the car and drive your daughter to school. Because you are late, you drive 40 miles an hour in a 30 mph speed limit.

After a 15-minute delay and throwing away $60 (traffic fine), you arrive at school. Your daughter runs to the building without saying good-bye. After arriving at the office 20 minutes late, you find you forgot your briefcase. Your day has started terribly. As it continues, it seems to get worse and worse. You look forward to going home. When you arrive home, you find a small wedge in your relationship with your spouse and daughter.

Why? Because of how you reacted in the morning.

RELIEF

ress with the 90/10 Method

Why did you have a bad day?

A) Did the coffee cause it?

B) Did your daughter cause it?

C) Did the police officer cause it?

D) Did you cause it?

The answer is D. You had no control over what happened with the coffee. How you reacted in those five seconds is what caused your bad day. Here is what could have and should have happened.

Coffee splashes over you. Your daughter is about to cry. You gently say, "It's OK, honey. You just need to be more careful next time." Grabbing a towel, you rush upstairs. After grabbing a new shirt and your briefcase, you come back down in time to look through the window and see your child getting on the bus. She turns and waves. You and your spouse kiss before you both go to work. You arrive five minutes early and cheerfully greet the staff. Your boss comments on how good a day you are having.

Notice the difference. Two different scenarios. Both started the same. Both ended differently. Why? Because of how you REACTED. You really do not have any control over 10 percent of what happens. The other 90 percent is determined by your reaction.

Here are some ways to apply the 90/10 secret.

If someone says something negative about you, do not be a sponge. Let the attack roll off like water on glass. You don't have to let the negative comment affect you! React properly and it will not ruin your day. A wrong reaction could result in losing a friend, being fired, getting stressed out, etc.

How do you react if someone cuts you off in traffic? Do you lose your temper? Pound the steering wheel? (A friend of mine had the steering wheel fall off!) Do you curse? Does your blood pressure skyrocket? Do you try and bump them? WHO CARES if you arrive 10 seconds later at work? Why let the other driver ruin your drive? Remember the 90/10 principle, and do not worry about it!

You are told you lost your job. Why lose sleep or get irritated? That won't help you get your job back or find a new one. Use your "worrying" energy and time to find another job.

The plane is late. It is going to mangle your schedule for the day. Why take out your frustration on the flight attendant? She has no control over what is going on. Use your time to study, get to know the other passengers, etc. Why get stressed out? It will just make things worse.

You now know the 90/10 secret. Apply it and you will be amazed at the results.

PILATES

A New Way to Look at Exercise

If an hour of aerobics leaves you feeling more tired than refreshed, it may be time to discover something new in fitness — Pilates.

The Pilates (pronounced pul-LAH-tees) method of body conditioning is an exercise system using specially designed equipment to improve flexibility, strength, circulation and muscle mass without building bulk. The method involves a series of slow, controlled movements, most done while lying down, that bring together the mind and body, an experience that some liken to yoga.

"The emphasis is on the quality of the movement as opposed to the quantity of the movement," says Amy Matton, owner of Body Work in Westport, Connecticut, and a certified Pilates method instructor. "A few quality movements done properly are better than more done sloppily."

Not Just Another Passing Fad

While Pilates may be gaining in popularity, it's not a fad that will come and go. The method has been around for 70 years. It was started by a German immigrant who wanted to build up his own body, and it was later embraced by the dance community.

Dancers have used the Pilates method for years because it concentrates on the "powerhouse" area of the body — the abdomen and lower back — and builds a strong back while toning muscles.

Celebrities such as Candice Bergen and Glenn Close, as well as professional athletes, including Kristi Yamaguchi and the San Francisco 49ers, have also implemented the technique.

The Mind/Body Connection

The key to Pilates is using spring-resistant machines, such as the Universal Reformer, Cadillac, Spine Corrector Barrel, Chair, Tower and Trapeze Table. Certified instructors help people learn how to breathe properly and concentrate on their muscles while doing exercises that target different areas of the body.

"You're focusing on using several different muscle groups at one time, which requires a

lot of thought," Matton explains. "But, in life, you rarely use one muscle group at a time. Because it requires more thought, some people think it has a meditative quality. You really have to focus and work hard to execute the exercise properly."

Matton say Pilates exercises can be done by anyone, from couch potatoes to pregnant women to people in rehabilitation programs to active sports enthusiasts.

"Some people are very athletic and find Pilates helps them with their sport or activity," she says. "Other people are post-partum and are looking to get back into shape or stay in shape."

Pilates has been credited with eliminating or helping heal backaches, slumped shoulders, potbellies and torn ligaments.

The Pilates Studio in New York City certifies instructors after 600 hours of classroom time and hands-on experience. Matton's instructors are all Pilates-certified. Because the Pilates method is becoming so popular ("Every Pilates teacher I know is struggling to keep up with the amount of people who want to take classes," Matton says), several facilities are teaching Pilates without the equipment and sometimes without certified instructors.

A Trained, Knowledgeable Source

The Westport YMCA offers a "mat class" in Pilates that is taught by a Pilates-certified instructor. "It's a different type of class without the equipment," explains Suzy Gregory, director of group exercise at the YMCA.

"The exercises are designed to use the body's weight and gravity to tone the body. It is a wonderful method of training the body to be strong and supple."

The Westport YMCA has offered a well-attended Pilates method class for several years. "People are intrigued by it because movie stars use it, and it's becoming popular everywhere," Gregory says. "It's a good complement to the way people are thinking these days because it's not pounding your body to death."

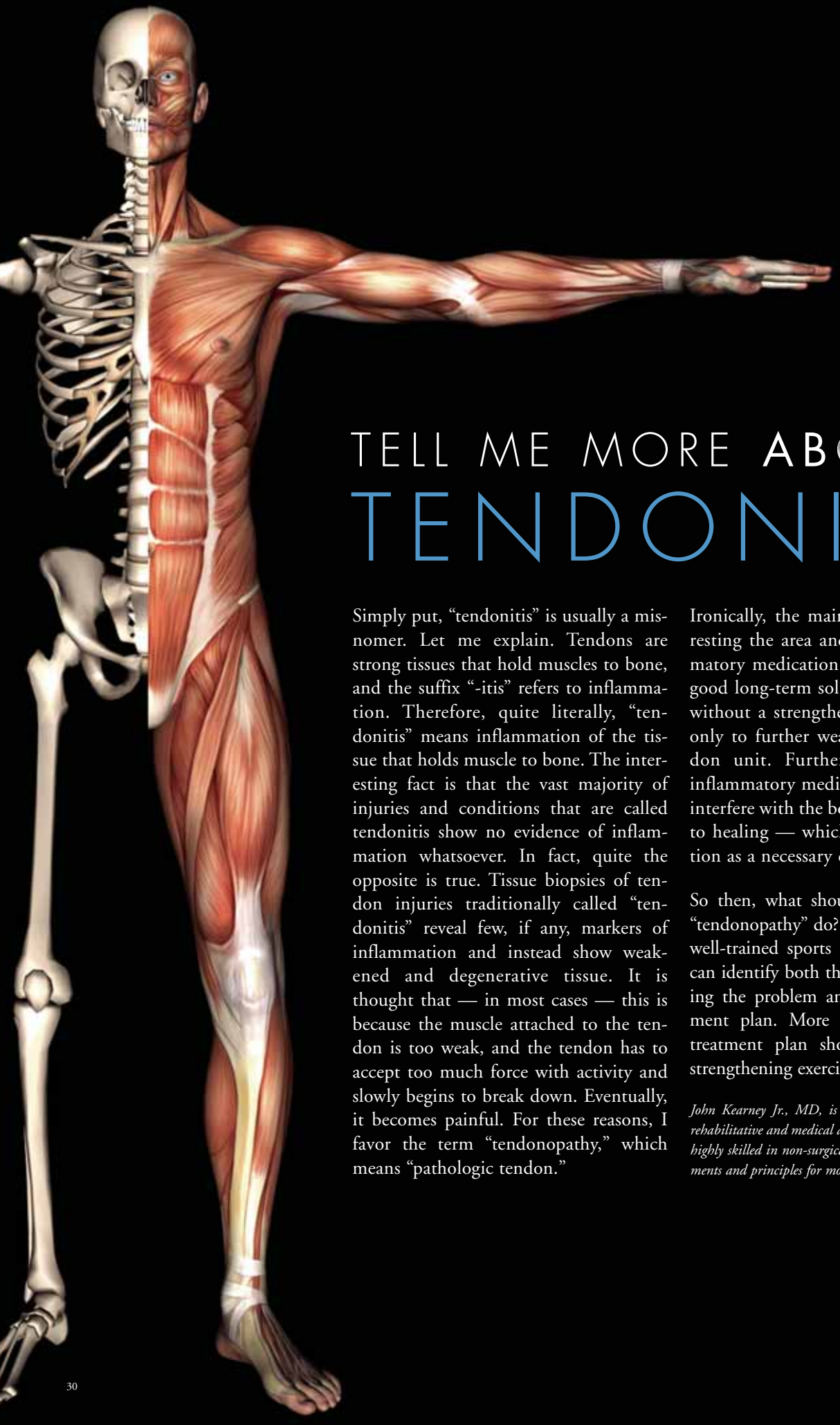
Matton agrees. "In the '80s, people did a lot of aerobics and high-impact stuff. But, ultimately, bodies took some wear and tear. People are looking for something that is effective and can make them strong and give them an appearance they're looking for, but that's also a little more serene and leaves you feeling invigorated and not wiped out."

Join the Pilates Movement

Matton gives new clients a one-on-one session, then offers them mat classes for Pilates floor work and small-group classes (one to four people with an instructor) to use the equipment. Unlike many fitness centers, Body Work does not play music in the background.

"I often hear people say how they develop an increased awareness of their body, how they're walking, standing and moving," Matton says. "We've gotten more sedentary, spending more time behind desks all day and getting out of touch with our bodies."

People who can't get into a class immediately may benefit by watching the videos "Working Out the Pilates Way," and "Working Out the Pilates Way II" (for both, call 505.988.1990 and "Pilates-Based Reformer Techniques" with Elizabeth Larkam (call 800.PILATES).



by John Kearney Jr., MD

TELL ME MORE ABOUT...
TENDONITIS

Simply put, "tendonitis" is usually a misnomer. Let me explain. Tendons are strong tissues that hold muscles to bone, and the suffix "-itis" refers to inflammation. Therefore, quite literally, "tendonitis" means inflammation of the tissue that holds muscle to bone. The interesting fact is that the vast majority of injuries and conditions that are called tendonitis show no evidence of inflammation whatsoever. In fact, quite the opposite is true. Tissue biopsies of tendon injuries traditionally called "tendonitis" reveal few, if any, markers of inflammation and instead show weakened and degenerative tissue. It is thought that — in most cases — this is because the muscle attached to the tendon is too weak, and the tendon has to accept too much force with activity and slowly begins to break down. Eventually, it becomes painful. For these reasons, I favor the term "tendonopathy," which means "pathologic tendon."

Ironically, the mainstream treatment of resting the area and taking anti-inflammatory medication might not be a very good long-term solution. Prolonged rest without a strengthening program serves only to further weaken the muscle-tendon unit. Furthermore, taking anti-inflammatory medication might actually interfere with the body's natural response to healing — which involves inflammation as a necessary component.

So then, what should a poor soul with "tendonopathy" do? Well, in most cases, a well-trained sports medicine professional can identify both the activity that is causing the problem and a reasonable treatment plan. More often than not, this treatment plan should include specific strengthening exercises.

John Kearney Jr., MD, is a specialist in non-operative, rehabilitative and medical aspects of sports medicine. He is highly skilled in non-surgical rehabilitative options, treatments and principles for most musculoskeletal injuries.

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