

photo: John Kelly

## PATIENTS IN THE NEWS

### Dale Waters, M.D.: When the Patient Is a Surgeon

By Jim Brown, Ph.D., Executive Editor, *Sports Performance Journal*

Dale Waters knows operating rooms. He is a retired cardiac surgeon who performed hundreds of operations over a 20-year career shortened by bad knees. That's right, bad knees. He was trained at the University of Wisconsin, the Texas Medical Center, New Orleans Charity Hospital, and Emory University in Atlanta, among other places. He served in the U.S. Army Special Forces, training military medics, and he later started the cardiac surgery program in Grand Junction, Colorado. An avid skier, cyclist, and runner, he spent part of one year as physician for the U.S. Women's Ski Team.

When Dr. Waters observes surgical procedures such as microfracture and high tibial osteotomy (HTO), both either developed or refined at the Steadman♦Hawkins Research Foundation, he does so from an objective, operating-room perspective. He understands the delicate nature of surgery and weighs the benefits against the risks, both for patients and himself.

#### BAD KNEES

He began having knee problems during the 1980s and his condition gradually deteriorated. A partial meniscectomy

(continued on page 2)

## INSIDE

- ◆ page 4  
Dual Fluoroscopy
- ◆ page 6  
Exercise for Arthritis Sufferers
- ◆ page 9  
Hydration and Cold Weather Exercise
- ◆ page 10  
New Foundation CEO: J. Michael Egan
- ◆ page 11  
Foundation and Ossur Team Up
- ◆ page 14  
Frequently Asked Questions
- ◆ page 15  
Join Us for Foundation Events



*Dale Waters, M.D.*

(continued from page 1)

(removal of part of the meniscus in his right knee) in 1986 helped, but not much. X-rays over a four-year period revealed significant narrowing of joint spaces. The reason he retired early is that his knees were so wracked by malalignment, injuries, arthritis, stiffness, and pain, he couldn't stand at an operating table long enough to do his job. He couldn't walk 200 yards without having to sit down, and he couldn't work around the house. He had to find parking spaces close to the building he was about to enter. "One leg was longer than the other and my knees were so bowed," he recalls, "that I could stand with my ankles touching each other and have enough room to stick a

football between my knees." In short, his knees were in terrible shape and getting worse.

#### **THE STEADMAN-HAWKINS OPTION**

As his ability to perform normal daily activities continued to diminish, total knee replacement seemed likely. Then a colleague and orthopaedic surgeon told him about Dr. Richard Steadman and the work being done at Steadman-Hawkins in Vail. Dr. Waters scheduled an appointment and met with Dr. Steadman and Dr. William Sterett. "They asked me what I wanted to be able to do in terms of physical activity," says Dr. Waters. "They told me that many of the things I wanted to do would not be possible after knee replacement surgery. They made it clear that their objective is to preserve joints, not to replace them, and that their plan for me would require a total commitment to the rehabilitation process."

In 2003, Drs. Steadman and Sterett performed microfracture and a high tibial osteotomy on Dr. Waters' right knee, then did the same procedures on the left one in 2004. Microfracture, developed by Dr. Steadman, involves punching small holes in the bone to trigger a cartilage resurfacing process. In the HTO procedure, a wedge is created in the medial side (inside) of the tibia to be filled naturally as it would in a fracture to correct the malalignment and to

## ***Give IRA Assets in 2007 Without Tax Penalties***

On August 17, President Bush signed into law the Pension Protection Act of 2006. If you are age 70½ or older, legislation passed last year allows you to make cash gifts totaling up to \$100,000 a year from your traditional IRAs or Roth IRAs to qualified charities without incurring federal income tax on the withdrawal. This is great news if you have wanted to make a gift to the Foundation from your retirement assets but haven't done so because of the income tax penalty. The legislation is effective for tax years 2006 and 2007 only, so to take advantage of this opportunity for 2007 you must act before December 31.

### **Creating a Tax-Free Gift**

By creating a tax-free gift, individuals can freely tap this asset pool for charitable giving. Previously, this process was cumbersome and created a taxable event for the individual.

### **How To Make Your Gift**

The distribution must be made directly from the account plan to the Foundation. You will need to contact your plan administrator for information on how to initiate your gift. This legislation is requiring plan administrators to implement new procedures, and we encourage you to act as soon as possible to ensure your 2007 gift.

While gifts from retirement accounts other than IRAs—such as 401k, 403b, and SEP accounts—are not eligible, you may be able to make qualified transfers of money from other accounts to your IRA and then make a charitable gift from your IRA. Check with your tax adviser if you are considering this.

maintain leg length in order to distribute the stress of weight-bearing more evenly. Ever the surgeon and student, Dr. Waters requested spinal anesthesia so he could be awake during the operation. He observed the procedures, conversed with Drs. Steadman and Sterett, and even heard the unnerving sounds created by the procedures — sounds most of us would not care to hear, spinal anesthesia or not.

Says Dr. Waters, “The rehabilitation process has been exactly what they had promised for someone who was to have both procedures at the same time. It was a program that did not permit weight-bearing for two months after each of the surgeries, plus 8-10 hours a day on a passive-motion machine. But I am absolutely convinced that I made the right decision.” Now he can ride a bicycle without limitation, walk 3-5 miles, and could, he thinks, probably run and ski. He knows that running would put too much stress on his now healthier knees, but he does plan to ski soon.

#### **FOUNDATION EDUCATION**

“When I went to Steadman-Hawkins the first time, I didn’t know that it was also a research center,” Dr. Waters admits. “I read their newsletter and began to realize that they are conducting high-level research that is second to none. The surgeons are world-class and the six Steadman-Hawkins

fellows are the best young orthopaedic specialists in the country, chosen each year from more than 100 applicants.

“I will support the Steadman-Hawkins Research Foundation and encourage others to do the same because the baby boomers are moving into an age group that is going to have arthritis. They need to know about the options that are available to preserve joints. The Foundation’s research will make it possible to continually improve on microfracture, high tibial osteotomy, and other cutting-edge procedures. I learned that the Foundation is the leader in the development of dual fluoroscopy, which will help scientists observe what is happening inside the knee in real-time. With so many bright people and state-of-the-art facilities, the advances they are making will continue for years to come.”

#### **RIDE ACROSS IOWA**

Back to Dr. Waters’ knees for a moment. He has one more goal that he would never have been able to consider without the procedures that have preserved his knees. He wants to participate in an event called RAGBRAI — The (Des Moines) Register’s Annual Great Bicycle Ride Across Iowa. It is one of the longest, largest, and oldest touring bicycle rides in the United States. Seven days, 472 miles, 10,000 riders. Dr. Waters

(continued on page 4)

#### **Who Is Most Likely To Benefit?**

- Individuals who take mandatory minimum withdrawals but don’t need additional income.
- Individuals who wish to give more than the deductibility ceiling (50 percent of AGI).
- Individuals who are subject to the 2 percent rule that reduces their itemized deductions.
- Individuals whose major assets reside in their IRAs and who wish to make a charitable gift during their lifetime.
- Individuals who intend to leave the balance of their IRA to charity at death.

#### **Additional Details**

- Because the distribution goes directly to the Foundation, individuals are not eligible for income tax deductions.
- Only outright gifts are eligible. Distributions to charitable gift annuities, charitable remainder trusts, pooled income funds, and other split-interest arrangements do not qualify for special tax treatment.
- Qualified contributions may be counted toward the Minimum Required Distribution (MRD) for a donor’s IRA accounts.
- These contributions are not subject to the 50 percent deductibility ceiling or the 2 percent reduction rule.
- Distributions can be excluded from gross income for federal income tax purposes. However, certain states may not exclude gifts withdrawn from an IRA for state income tax purposes. We encourage you to contact your tax adviser.
- Individuals who do not itemize their federal income tax returns may make qualified IRA gifts and exclude such gifts from their reportable income.

For more information, contact John McMurtry, Vice President for Program Advancement, at [john.mcmurtry@shsmf](mailto:john.mcmurtry@shsmf) or 970-479-5781.

(continued from page 3)

participated in the ride three times before his knees began to fail him. Now he wants to do it a fourth time — a testament to his discipline, competitive spirit, and two knees healthy enough to meet the challenge.



#### RESEARCH UPDATE

## Dual Fluoroscopy: An Inside-the-Body View of a Moving Shoulder Joint

By Peter J. Millett, M.D., M.Sc.; Erik Giphart, Ph.D.;  
Kevin B. Shelburne, Ph.D.; Mike Torry, Ph.D.; and  
Nils Horn

**P**atients with osteoarthritis of the shoulder have pain and loss of function that significantly affect their quality of life. When the disease becomes more advanced and the symptoms do not respond to conservative methods, total shoulder arthroplasty (TSA) is the preferred surgical treatment. The number of TSAs performed annually in the United States has increased from about 5,000 in the early 1990s to more than 20,000 in 2005. This is largely because an aging population wants to stay active, but it may also be due to better prosthesis designs, better surgical techniques, and better training of surgeons.

While the overall outcomes after shoulder replacements are excellent, the motions of the bones or implants inside the shoulder joint during motion in living subjects are not well known because we haven't been able to "see" inside the joint.

### DUAL FLUOROSCOPY

Now we are able to study shoulder motion in normal subjects, in those with arthritis, and among those who have had a shoulder joint replacement by using a dual fluoroscopy system that captures images of bones and implants in living patients and in real-time to accurately measure joint motion. These measurements will lead to a deeper understanding of normal shoulder motion, of shoulder motion in those with osteoarthritis, and of implant motions following total shoulder arthroplasty. From these studies we hope to discover better

ways of preventing arthritis and better ways of treating it once it develops. We also hope to develop improved surgical methods for implanting prostheses, perhaps in less-invasive ways, and to develop better designs for the implants so they will be more functional and will last longer.

### TOTAL SHOULDER ARTHROPLASTY

Depending on the cause of the arthritis, one of two types of prostheses is typically used: the primary shoulder replacement and the "reverse" or "inverse" shoulder replacement.

### PRIMARY TOTAL SHOULDER ARTHROPLASTY

Osteoarthritis (OA) is the most common condition that requires a primary replacement (nearly 60 percent of people over the age of 65 are affected by OA). OA patients complain of joint pain, stiffness, and swelling, which are a result of loss of joint space, an enlargement of the head of the humerus (the long bone in the upper arm), and limited joint movement. A properly performed TSA will lead to complete pain relief, functional improvement, and high patient satisfaction.

The goal of primary TSA is to return to normal function by restoring the original anatomy of the shoulder. The primary prosthesis consists of two parts (see Figure 1): the glenoid fossa, which is fitted with a polyethylene component and inserted into

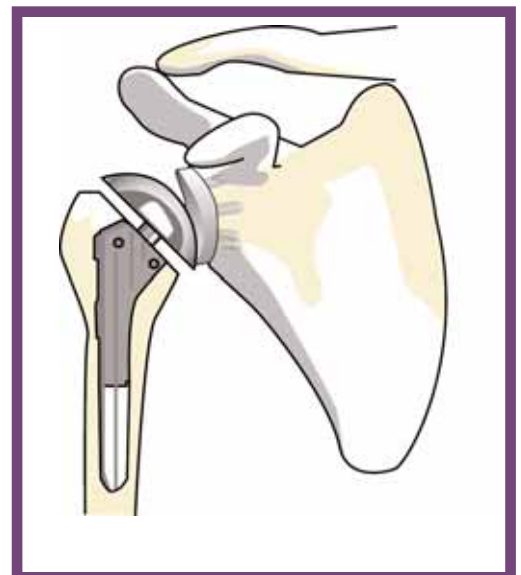


Figure 1: Primary Total Shoulder Arthroplasty

Illustration: Marty Bee

the scapula; and the humeral head, which is removed and replaced with a prosthesis specifically designed to match the humerus. In these studies, we hope to demonstrate how shoulder motion can be restored with a properly performed replacement. We also believe that we will be able to predict how long the implant will last using this technique.

### REVERSE TOTAL SHOULDER ARTHROPLASTY

The Reverse Shoulder is implanted when there is no functioning rotator cuff. This could happen in cases such as rotator cuff tears with arthritis, failed fracture repairs with loss of rotator cuff, massive rotator cuff tears resulting in an inability to raise the arm, failed shoulder replacement surgery, and failed partial arthroplasty for a shoulder fracture. It is called “reverse” because the ball is placed on the scapula (socket) and the cup is placed where the head of the humerus was located, inverting or reversing the ball and socket joint. Patients who need this type of replacement suffer from severe pain and have difficulties raising their arms and performing their activities of daily living.

The goal of a Reverse TSA is to get these patients back to an independent lifestyle and to restore normal daily activities. The Reverse Shoulder consists of two parts (see Figure 2): a large glenoid ball and a humeral cup, or socket. This implant is constrained and restores a stable structure around which the humerus can rotate. An



photo: John Kelly

intact deltoid muscle is a prerequisite that allows for active motion. Due to the state of the soft tissues and/or bone, the unique configuration of the prosthesis, and the challenge of inserting the prosthesis correctly, it should only be performed by experts. It has been used in Europe for more than 15 years, but little is known about the biomechanics and loading patterns that occur with this type of implant. We plan to study shoulder motion after the Reverse TSA using dual fluoroscopy to measure joint motions and loading in actual patients. We believe that we will be able to discover certain variables and limits that can predict the outcome of the TSA, and that these variables will be different from those found in the primary TSA group. We also believe we will be able to improve the surgical implantation and make recommendations to improve the design of the implant.

### MEASURING SHOULDER MOTION AS IT HAPPENS

Measuring accurate shoulder joint motion in living patients by attaching markers or sensors to the skin is impossible because the shoulder blade (scapula) moves a great deal under the skin. Even attaching optical markers to pins inserted directly into bones will result in measurement errors, making it impossible to measure the subtle

(continued on page 6)

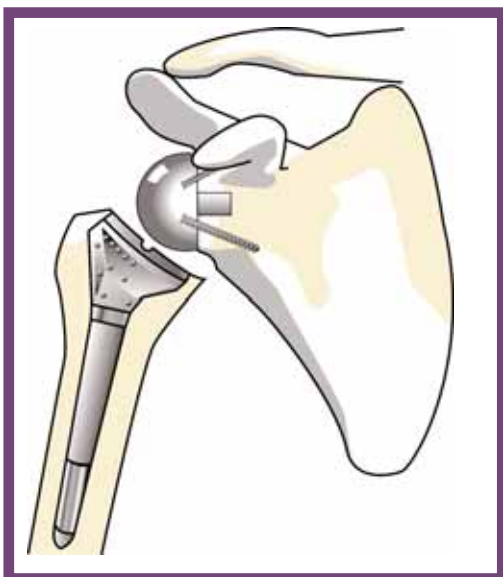


Illustration: Marty Bee

Figure 2: Reverse Total Shoulder Arthroplasty

## Dual Fluoroscopy Project

Fluoroscopy is a technique that uses x-radiation to create a movie of moving bones as opposed to the still snapshot that a regular x-ray system produces. Using fluoroscopy, the locations of the bones, implants, or implanted beads can be measured with an accuracy of better than 1.0 mm in general, and with accuracies of 0.14 mm or better in specific instances. Highest accuracy is obtained when two fluoroscopy units with crossing x-ray beams are used simultaneously (dual fluoroscopy system). With this system, the research possibilities will be limitless, ranging from comparing ACL reconstruction techniques to understanding the effect of post-surgical scarring/adhesions on the development of osteoarthritis in the knee. The system may even measure cartilage indentation in the knee during walking, running, and landing from a jump.

(continued from page 5)

motion changes that are anticipated after TSA. Because of these limitations, even in healthy shoulders, the bony motions are largely unknown. In recent years, however, new techniques have been developed that use fluoroscopy to measure the motion of bones during activity. True joint measurements with accuracies of less than one millimeter are possible using computer-guided techniques that map three-dimensional bone positions. We will use such a high-resolution dynamic fluoroscopy system to measure the movement of the shoulder bones and implants.

The analyses of shoulders from a variety of studies have helped us understand the complexity of this joint in general. But our goal is to further understand the shoulder by using our fluoroscopy system during real-time motions to quantify how the joint components interact with each other in a three-dimensional way. By identifying these differences and changes based on the degeneration from osteoarthritis and surgery, we hope to improve the technical points of the surgical procedure and also improve prosthesis design. In this way, we will also improve the patient's outcome in function, range of motion, pain relief, and satisfaction.



## SPORTS & WELLNESS

### Exercise for People Suffering from Arthritis

By Matt Pokorney, D.P.T., O.C.S., A.T.C.

Editor's note: Matt Pokorney is an outpatient orthopaedic and sports physical therapist at Howard Head Sports Medicine Center in Vail, Colorado.

Osteoarthritis is an inflammatory condition of the joints that results in pain, swelling, and loss of function. Symptoms typically develop slowly over several years, beginning with stiffness and pain after strenuous activity or overuse. Morning joint stiffness usually follows and the disease can progress to constant aching pain. The degenerative changes to the actual joint itself include loss of articular cartilage, abnormal bone growth (bone spurs), and inflammation of the synovial membrane (joint lining). This results in joints that are stiff, tender, swollen, and painful.

Treatments for arthritis fall into three main categories: pain control, joint protection, and exercise. Because arthritis is a progressive disease of the joints, it results in a downward spiral — pain or stiffness leads



photo: John Kelly

## Treatments for arthritis fall into three main categories: pain-control, joint protection, and exercise.

to inactivity, which predisposes us to weight gain, loss of muscle endurance and strength, more stiffness, and then more pain. If you can break the cycle or prevent it from starting in the first place, you have the ability to keep your body healthy and enjoy the activities that matter most to you.

Pain control and anti-inflammatory medicines are an important part of preventing arthritis progression, and you should consult your doctor regarding this aspect of arthritis treatment. Additionally, choosing a low-impact sport as an exercise option is also a good choice to prevent overuse. However, the best way to treat the early stages of arthritis and prevent the progressive deterioration is an exercise program designed to address the three aspects of physical fitness: flexibility, muscle strength, and cardiovascular fitness.

### STRETCHING

Because a main symptom of arthritis is range-of-motion loss, we should start here in beginning an exercise regimen. Stiffness and pain will cause you to keep your affected joint in a bent position and thus lead to more stiffness and pain. Break that cycle by first stretching the joint in all normal directions. Stretch into each of these positions for about 20 seconds, 2-3 times. The knee is easy, with just straightening and bending, but the hip, shoulder, and ankle also involve in and out motions, as well as rotating toward the body and away from it. Stretching all of these motions is important, and don't forget about the muscles. If any muscle groups are tight, they can also limit joint range-of-motion and contribute to progressive joint stiffness. For the legs, hamstrings, quadriceps, calves, hip flexors, and the piriformis are the main culprits that can lead to problems. In the shoulder, the chest (pectoral) and internal rotator muscles have the tendency to get tight. I recommend

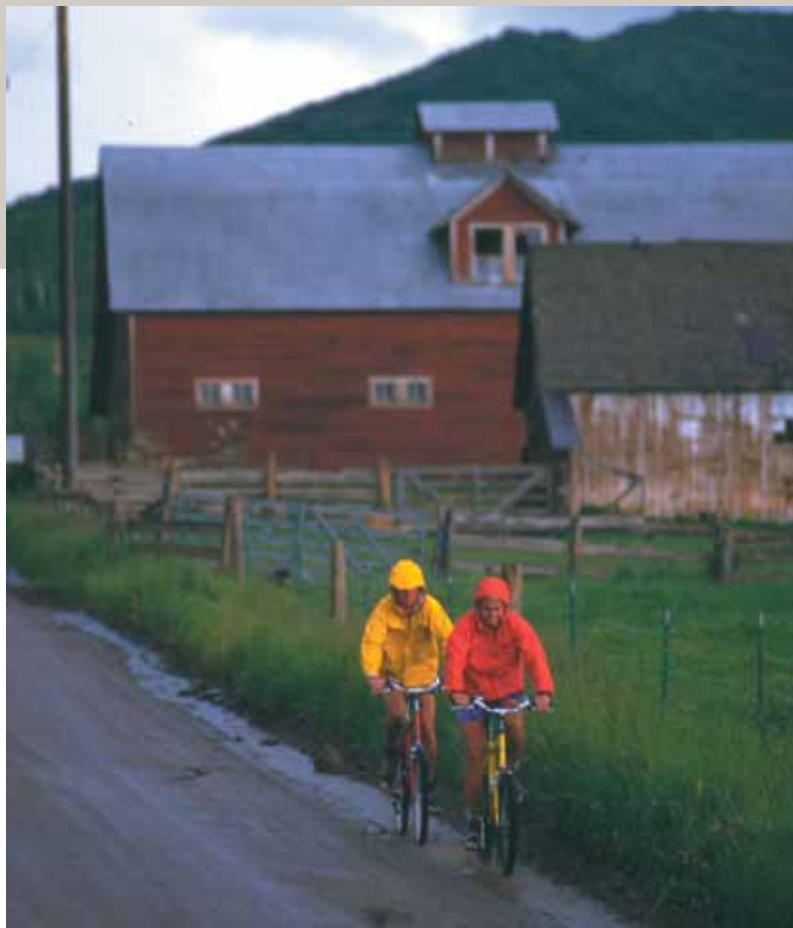


photo: John Kelly

stretching for about 10 minutes 1-2 times a day, five days a week.

### STRENGTHENING

Now that your joints are moving optimally, you should add muscular strengthening to your exercise routine. By strengthening the muscles around the affected joint, you will support the joint and help take the pressure off the injured areas. Typically, isotonic exercises geared toward strengthening the muscles around the joint are appropriate. However, an irritated joint that is painful to move may not tolerate isotonic exercises, which involve moving the limb against resistance or gravity. In this case, isometric exercises may be a useful tool. This type of strength training is performed by tightening alternate muscle groups against a fixed object without moving the joint. In this way, the muscles are strengthened while the joint is kept in a safe position of comfort. Strength exercises should be performed 2-3 days per week for maximum benefit.

(continued on page 8)

(continued from page 7)



**AQUATHERAPY**

Aquatherapy is a very useful tool in the treatment of arthritis. It provides the properties of buoyancy, resistance and warmth, and it's just plain fun. Flexibility, strength, and cardiovascular exercises can all be performed in the pool with the added benefit of virtual weightlessness. By exercising in water, you can get all of the benefits of exercise without the forces on your joints that you normally experience on dry land. If accessible, aquatherapy is a superb form of exercise for arthritis management.

**CARDIOVASCULAR TRAINING**

The last component of an exercise program for arthritis treatment should be cardiovascular fitness (endurance) training. By adding this to your routine, you will make your heart and lungs more efficient, build stronger muscles, and keep off extra weight that could add additional stress to those irritated joints. Endurance activities such as swimming, cross-country skiing, biking, walking, and the elliptical trainer are all terrific aerobic activities that will

help your body be more efficient at using oxygen and burning calories. A typical cardio routine involves 20-30 minutes of continuous activity three days per week. Perform at a steady, comfortable intensity that does not aggravate your symptoms. Include a five-minute warm-up and cool-down and don't forget to wear supportive, shock-absorbing running shoes for the elliptical trainer or walking.

As with any exercise program, you should check with your doctor before beginning a new routine. Consult your physical therapist or athletic trainer to get individualized guidance for applying the principles discussed here to your fitness routine.

For arthritis sufferers, exercise can help maintain joint movement, increase muscle flexibility and strength, maintain weight, maintain bone and cartilage health, and increase cardiovascular fitness. If you can find the time and motivation to incorporate these principles into your daily routine, you will be able to maintain an active, healthy, and fun lifestyle for years to come.

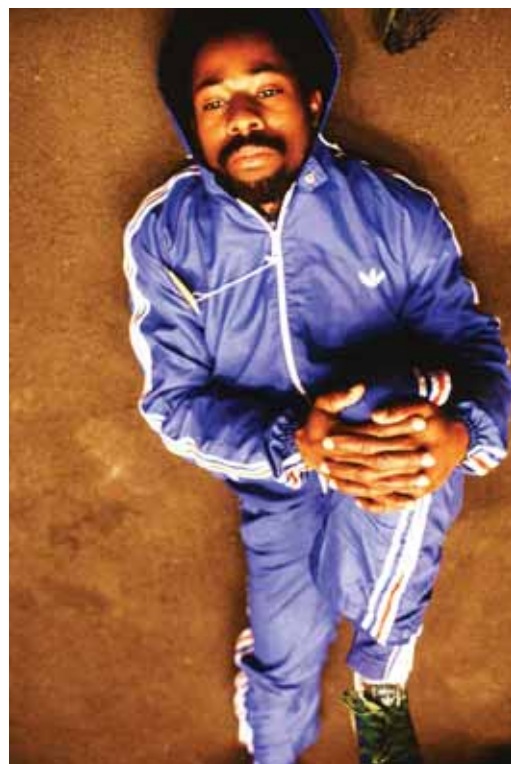


photo: John Kelly



More fluid is lost when breathing out, and when blood vessels near the skin react to cold weather by constricting, blood flow is reduced. This could increase the risk of frostbite.

## Gatorade Sports Science Exchange: Don't Ignore Hydration During Cold Weather Exercise

Everyone knows the benefits of taking in lots of fluid while exercising during warm-weather months, but not as many understand that proper hydration is just as important in winter sports. The Gatorade Sports Science Exchange asked a group of exercise scientists this question: How important is hydration during exercise in the cold? Following is a summary of their answers:

- Hydration is extremely important. Due to the dry environment that generally accompanies cold weather, significant body fluid is lost. Unlike in a hot environment, when visible sweat drips off the body, in a cold/dry environment sweat can evaporate so quickly that the exerciser does not have a clear picture of how quickly fluid loss occurs. More fluid is lost when breathing out, and when blood vessels near the skin react to cold weather by constricting, blood flow is reduced. This could increase the risk of frostbite.
- If athletes are properly clothed in cold weather, they are likely to be sweating and losing body fluids. This can cause the same problems as when exercising in a hot environment. Problems occur when the person stops exercising and his or her body produces less heat. If the person is exposed for a long time and the clothes are wet from sweat and/or rain, body heat loss can be accelerated, and



photo: John Kelly

hypothermia (low body temperature) becomes a real risk.

- Skiers may lose up to 3 percent of their body weight during a race. In one study, skiers who drank water only when they felt thirsty during 90 minutes of easy ski training lost 2 percent of their body weight. When the same skiers maintained a schedule of fluid feedings during the 90-minute ski, weight loss was less than 1 percent of body weight. Those who supplemented with a carbohydrate-electrolyte solution maintained significantly better fluid balance.

Some athletes neglect replenishing fluids in the cold and consequently suffer the same ill effects as they would in the heat. Serious dehydration causes decreased blood volume and increases susceptibility to cold injury. In very cold environments it might be beneficial for exercisers to drink a room-temperature or warmed-fluid replacement.





photo: John Kelly

## Steadman♦Hawkins Research Foundation Announces New CEO J. Michael Egan Brings 29 Years of Medical Business Development and Investing Experience to the Vail-Based Nonprofit



The Board of Directors of the Steadman♦Hawkins Research Foundation has recruited and hired J. Michael Egan as Chief Executive Officer (CEO) of the Vail-based, nonprofit, orthopaedic research organization.

Egan brings to the Foundation an extensive business background with tenure primarily in the orthopaedic medical device industry, developing, financing, staffing, and launching start-ups for state-of-the-art medical and surgical device companies. He has extensive business acumen in research, sales management, marketing, financing, and operation of 14 companies.

Companies have ranged from orthopaedic, to electro- and micro-surgery,

to sports medicine. Many pioneered devices and systems for less-invasive arthroscopic surgery. Others included automated stitching devices for cardiac surgery, magnetic-based steering technology, and high-strength composite wheelchairs for active, athletic users.

A graduate of Colorado College, which he attended on an ice hockey scholarship, Egan's background includes a number of board memberships, including several chairman roles. Past and present board and committee memberships include involvement with the advisory board of University of Colorado, Leeds School of Business; Venture Lending & Leasing, LLC, in California; and board membership on several NASDAQ-listed companies.

Egan has maintained a 20-year relationship with Dr. Steadman. Believing in the value of Steadman's work, his company was the first corporate sponsor of the Steadman♦Hawkins Research Foundation.

"We are extremely happy to announce the addition of Mike as CEO of this Foundation," said Dr. Richard Steadman, founder of the Steadman♦Hawkins Research Foundation. "He brings a wealth of business knowledge and experience to the helm of our organization and has a proven track record as an innovative, forward-thinking, and qualified leader."



## Publications, Presentations, and Research

Peter Millett, M.D., reports that the featured article in October's *Journal of the American Academy of Orthopaedic Surgeons* was produced and written by the Foundation's Clinical Research staff. Dr. Millett thanked and congratulated the research staff, particularly Marilee Horan, who helped in writing this article.

In the article, "Rehabilitation of the Rotator Cuff: An Evaluation-Based Approach," the authors review the basic science associated with rotator cuff disease, as well as guidelines for nonsurgical management.



## Bracing Research: Steadman◆ Hawkins Research Foundation and Ossur Team Up Plus: If 15,000 Knees Could Talk

Common objectives and a shared vision make the Steadman◆Hawkins Research Foundation and Ossur Americas a natural match. Ossur — a leader in the development and marketing of bracing, support products, and prosthetics — acquired long-time Foundation sponsor Innovation Sports in 2006. Now the parent company has demonstrated genuine enthusiasm for continuing and expanding that relationship by supporting our research and education programs.

"We are very pleased to develop and nurture a relationship with Ossur," says John Welaj, COO of the

Foundation. "There's an obvious synergy between our two organizations."

Palmi Einarsson, vice president of research and development for Ossur Americas, agrees. "Ossur is dedicated to helping people live a life without limitations, and the Steadman◆Hawkins Research Foundation has a mission to provide physically active individuals with information and care that can improve their overall quality of life. It's a good fit."

Headquartered in Reykjavik, Iceland, and with operations throughout the world, Ossur has developed more scientifically advanced innovations in recent years than any other company in its field. The Unloader One knee brace for sufferers of knee osteoarthritis and related problems is one such example. Ossur's Unloader brand name has been so successful within the orthopedic world that the terms "unloader" and "unloading" have become common, widely used terms for bracing technology.

### A New Brace for Knee Osteoarthritis

Unloaders work by separating the knee bones when the cartilage or ligaments are damaged. They also effectively prevent further joint deterioration and make it possible for knee osteoarthritis sufferers to remain physically active.

Ossur's forward-thinking designs resulted in Ossur being recognized as a *2006 World Economic Forum Technology Pioneer*. The company also has garnered numerous awards, including *Time's* "Coolest Inventions of the Year," *Fortune's* "25 Best Products of the Year," and *Popular Science's* "Best of What's New" two years running, as well as Frost & Sullivan's number one ranking in the Medical Devices Technology Innovation category for both 2005 and 2006. Ossur's products have been

(continued on page 12)



(continued from page 11)

featured and highly praised on CBS Evening News, and in *The New York Times* and *The Wall Street Journal*, just in the latter half of 2006.

While awards and accolades are undoubtedly gratifying, "What drives us is partnering with health practitioners like Steadman-Hawkins, which uses our products to deliver successful clinical outcomes to patients," says Einarsson.

And there are plenty of patients. Knee osteoarthritis is the most common form of arthritis and one of the most prevalent chronic health problems in the United States today. That's not going to improve anytime soon as baby boomers reach the "arthritis years." More active for longer than any previous generation, they are also more prone to arthritis and sports injury.

### What Can 15,000 Knees Tell Us?

The Foundation is utilizing its data base of 15,000 past and present knee patients to undertake an ongoing clinical study to determine if Unloader bracing can delay total knee replacement, as well as the effects of bracing on short- and long-term pain management for these knee osteoarthritis sufferers. This means that the types of solutions that the Steadman♦Hawkins Research Foundation and Ossur are researching are going to dramatically affect how engaged people are in living full, active, and pain-free lives into the future.



## Local Students Get a Look at a Real Knee

### Research Foundation Provides Students with Up-Close Look at Medicine

By Scott N. Miller

Kate McAtavey thought she might be the one to run out of the room, but she did fine. McAtavey and a group of students from an anatomy class at Colorado Mountain College were recently invited to a special presentation in the depths of Vail Valley Medical Center. There, Dr. Brett Cascio would stick an arthroscope into a real human knee, then dissect the joint. The knee came from someone who donated his or her body to science after death.

"I was a little nervous about it," McAtavey said of watching Cascio explain how the knee joint works. "But I'm doing all right now."

In fact, as Cascio got deeper into the anatomy of the joint, the students gathered around for a closer look at the tendons, arteries and nerve bundles.

"This is taking what we read and making it real," McAtavey said.



Photo: Preston Utley/Vail Daily

*Dr. Brett Cascio shows Colorado Mountain College students the inside of a knee at the Vail Valley Medical Center.*

The chance to look at real body parts up close is an experience usually reserved for students at universities and teaching hospitals. This class got the chance because of the Steadman♦Hawkins Research Foundation.

The Foundation, which works with, but is separate from the Steadman-Hawkins Clinic, brings in doctors from around the world to study surgical techniques at the clinic, then do their own research projects.

The doctors' work also includes some teaching sessions. Classes from local high schools take part in those sessions once or twice a year. Matt Smith's Colorado Mountain College students have started coming only recently, thanks to a connection. "One of my students worked at the hospital and arranged this," Smith said.

Several of Smith's students work at the hospital this semester. One of those students, Heather Thomson, cares for patients before and after surgery. Thomson plans to attend nursing school starting next year and was excited to see some up-close medical work.

"It really helps make the connection between class work and reality," Thomson said.

The reality, seen from just one joint, is that human anatomy is complex, and any surgery has little room for error.

"If this looks hard, that's because it is," Cascio said as students watched on a video screen as he examined the knee joint with the tiny, flexible arthroscopic camera. "If it looks easy, that's because I practiced."

Because it's so easy to leave scars or damage nerves, much of that practice is done on donated body parts, when doctors are still in training, Cascio said.

After orthopaedic residency, many physicians apply for "fellowships." The Steadman-Hawkins Fellowship Program is one of the most sought after in orthopaedics. Of the approximately 600 physicians who graduate from

orthopaedic residency programs in the United States, approximately 120 apply (135 applied in 2006) for the Steadman-Hawkins Fellowship. From this pool of applicants, only six per year are selected.

Coming to Vail has been a good experience for Cascio, whose own research has focused on regenerating human cartilage, something that not long ago couldn't be done. Some of that work involves "microfracture" knee surgery, a procedure that, in many cases, can get professional athletes playing again.

"People are working on a lot of things," Cascio said. "But nothing really works better than microfracture."

That work, with research conducted by the Foundation and surgery performed by the Clinic, has applications far beyond stadiums and arenas.

John Welaj, the Foundation's chief operating officer, has had microfracture surgery, and the research done at Steadman-Hawkins is also helping people with arthritis.

"This is the perfect place to have a Foundation like this one," Welaj said. "People here are so active, and our mission is to keep people active. The way the people in this community are, at some point you, or someone you know, is going to see some benefit from the work we do here."

For Smith, that benefit is filtering down to his students.

"This kind of thing is huge," Smith said as Cascio continued his work in another room. "To get in here and see a real human knee, it's a unique experience."

Reprinted with permission from the *Vail Daily*, Vail, Colorado



## Board of Directors in the News

### FOUNDATION TRUSTEE NAMED TO U.S. TEAM FOUNDATION BOARD



Steven Read has been named a trustee of the U.S. Ski and Snowboard Team Foundation, announced Foundation Vice President Trisha Worthington.

"We are thrilled to add Steven Read to our board," said Worthington. "He is a well respected businessman and avid skier. In addition, his

expertise will be an incredible asset to the Foundation's efforts to support the athletes of the U.S. Ski Team and U.S. Snowboarding."

Steven Read is co-founder, co-owner, and co-chairman of Grocery Outlet, Inc., a retail chain of non-perishable-

food stores in the Western states, Hawaii, Louisiana, and Texas. Currently, he serves as partner of Read Investments, specializing in commercial real estate development.

Read also is a trustee for the Fine Arts Museums of San Francisco and the San Francisco Opera. He serves on the executive committee of DeYoung Art Museum, is a board member of the Steadman-Hawkins Research Foundation, and is a former Duke University trustee.

The U.S. Ski and Snowboard Team Foundation is the nonprofit, fundraising arm of the U.S. Ski and Snowboard Teams that are managed by the U.S. Ski and Snowboard Association (USSA), the national governing body of Olympic skiing and snowboarding.



## Media

### THE FOUNDATION HAS BEEN MENTIONED OR FEATURED RECENTLY IN NATIONAL AND INTERNATIONAL MEDIA.

The December 17 *The Sunday Times* (London) edition reported on the return to action of professional soccer player Joey O'Brien (Bolton Wanderers). Team Manager Sam Allardyce says, "O'Brien has gone under the knife of the Colorado surgeon Richard Steadman, who was responsible for rescuing the careers of Ruud van Nistelrooy and Alan Shearer.

"Joey will be back soon," Allardyce said. "Steadman spotted a small area of scar tissue under Joey's knee that was so small it could be easily missed by a scan. He has cleaned the knee out and given Joey a rehab program. He has no problems at all now."

Dr. Steadman and the Foundation were featured in the November 16 issue of the German news magazine *Focus*. The article is titled "Audience with the Knee Pope." "He has treated Kahn, Ronaldo, Deisler, and Klitschko. When the knees of the stars are in a pinch, they fly to the Rocky Mountains to see Richard Steadman, the famous knee surgeon."

In the article Dr. Steadman remarked that the satisfaction is incredible when a patient wins a gold medal. But it is much better when you know you have improved the lives of millions of recreational athletes.

"Since 1990, Steadman-Hawkins, with 90 employees and physicians in the Clinic and the separate Research Foundation, has developed and perfected many new procedures such as the meniscus implant and microfracture."

Dr. Steadman and the Foundation were cited in the January 11 edition of *The New York Times* in an article "When It's O.K. to Run Hurt." In Dr. Steadman's view, movement is important for healing. "If the injury is not severe, resting it will probably prolong recovery."



MEET OUR STAFF

## Lauren Matheny

photo: John Kelly



Lauren Matheny, originally from Toledo, Ohio, received her degree in zoology and neuroscience in 2005 from Miami University of Oxford, Ohio. One year during undergraduate study, her sister invited her on a trip to Colorado. They drove cross-country, visiting various regions, and finally ended up in Vail. "I remember driving into the Rocky Mountains for the first time. I was in awe of the vast beauty. At that moment, I knew I would end up in Colorado."

Lauren joined the Steadman♦Hawkins Research Foundation in September of 2005 as a clinical research intern and then, in November 2005, joined the team as a full-time clinical research assistant to Dr. Sterett. In the past year, Lauren has been engaged in new studies involving patient satisfaction, outcomes, and expectations. Since joining the team, Lauren has been a part of three studies that will be presented at the American Academy of Orthopaedic Surgeons in 2007. Lauren plans to earn her master's degree in public health and continue on to medical school. "I have learned so much being a part of this incredible team."

Being able to contribute to the medical field is amazing, and if I can contribute by putting new medical information out there, then I've done my job."

In her spare time, Lauren enjoys traveling, good wine, mountain biking, horse-back riding, and snowboarding. "I had only been skiing two times before moving to Colorado. In fact, that is how I ended up at Steadman-Hawkins." Lauren was skiing in Snowmass and was injured on the mountain. After inquiring about clinics in the area, Steadman-Hawkins was mentioned. The injury was not serious, but the outcome was. She found out about the internship and the rest is history.



FREQUENTLY ASKED QUESTIONS

### WHAT KIND OF RESEARCH IS STEADMAN-HAWKINS DOING REGARDING DUAL PLANE FLUOROSCOPY?

Fluoroscopy is a technique that uses x-rays to create a movie of moving bones, as opposed to the still snapshot that a regular x-ray system produces.

We have already begun an ambitious research project in which we are applying this technology to better understand how knee adhesions (scarring) can cause and/or accelerate the degeneration of the cartilage in the knee and how certain surgical procedures can spare the knee from this type of degeneration. Without this new technology, this type of study would not be scientifically possible.

With this system, the research possibilities are limitless. They range ....

- (1) from comparing ACL reconstruction techniques to understanding the effect of post-surgical scarring/adhesions on the development of osteoarthritis in the knee;
- (2) from validating clinical examinations to understanding joint instability in the hip;
- (3) from recording joint motion in unstable shoulders to comparing rotator cuff repair techniques and joint prostheses function in the shoulder;
- (4) from showing the effects of spinal manipulations and herniated disk surgery on spine mobility to understanding



photo: John Kelly

the intricate interplay of the multitude of bones in the foot and hand.

The system may even measure cartilage indentation in the knee during walking, running, and landing from a jump.

#### **WHAT HAPPENS TO UNDESIGNATED GIFTS RECEIVED BY THE STEADMAN♦HAWKINS RESEARCH FOUNDATION?**

Undesignated gifts go into the general fund and are applied to the greatest need at the time of the gift. The greatest need could be a research project, a piece of equipment, or overhead.

#### **HOW DO PEOPLE NOT ASSOCIATED WITH THE FOUNDATION BENEFIT FROM ITS RESEARCH?**

The Foundation has profoundly influenced the practice of orthopaedics—from diagnostics to rehabilitation. For example, the microfracture technique is now accepted as a treatment that may make it possible to postpone or even eliminate the need for knee replacement surgery.

A new surgical treatment package currently under development shows great promise as a treatment for arthritis.

The Foundation's biomechanics researchers are providing evidence-based information for Little League baseball players, parents and their coaches to prevent injuries. One finding showed that pitching mechanics may be responsible for "Little League elbow." A recommendation resulting from this study emphasizes the importance of teaching proper techniques as early as 13 years of age.



## **Save the Date**

### **STEADMAN-HAWKINS SANCTUARY GOLF TOURNAMENT SET FOR AUGUST 16, 2007**

The Steadman♦Hawkins Research Foundation is pleased to announce the *Pepsi 2007 Steadman-Hawkins Golf Classic, presented by RE/MAX International* at the Sanctuary Golf Course, a premier golf resort located south of Denver near Sedalia. Proceeds from the fourth annual tournament will support the development of new procedures and methodology to battle degenerative arthritis. The team event will include a shotgun start with a modified scramble. The tournament



is open to the public and has previously included invitees from the Denver Broncos, local celebrities, and Colorado golf pros. Sanctuary organizes and hosts charitable events to support organizations devoted to the arts, children, health care, and crisis management. To date, more than 161 charities have raised more than 28 million dollars to benefit the constituents they serve.

Renowned course architect Jim Engh, *Golf Digest's* first-ever "Architect of the Year" in 2003, designed the course that protects a private oasis of 220 acres, effectively complementing the 40,000 surrounding acres of dedicated open space.

*Golf Digest* listed Sanctuary as the best new private course in 1997. Gary McCord, CBS golf analyst and senior PGA tour professional, has said, "Sanctuary is simply the most spectacular golf course I have ever seen."

The Steadman♦Hawkins Research Foundation is grateful to Dave and Gail Liniger, owners and co-founders of RE/MAX International, who created this unique opportunity for the Foundation to develop and enhance relationships with those who support our mission.

Sponsorship opportunities and team slots are available now. More information can be obtained by visiting our website ([shsmf.org](http://shsmf.org)) under "Upcoming Events," or by calling the Development office at (970) 479-5809 or (970) 479-5788.

To request an invitation or for more information on other upcoming Foundation events, please contact Rachele Palmer at the Steadman♦Hawkins Research Foundation (970-479-5809).



## **Habervision Is Here!**

The Steadman♦Hawkins Research Foundation would like to offer all our supporters and their families and friends the opportunity to purchase the new and exciting line of Habervision Polarized Eyewear products and accessories at a 50 percent savings! A portion of the proceeds from each sale goes to the Foundation.

The sunglasses and ski goggles incorporate the very best polarized technology available. There is something for everyone. Go to [www.habervision.com](http://www.habervision.com) and enter Affinity Member Code: FOUNDATION, or click-on the link below. There is no expiration date. Share the code! Shop and enjoy.

Click on the Habervision link now and save 50 percent on all Habervision Polarized Eyewear and Accessories while supporting the research that benefits all of us.

<http://www.habervision.com/CodeResult.aspx?code=FOUNDATION>

The Steadman♦Hawkins Research Foundation is dedicated to keeping people of all ages physically active through orthopaedic research and education in the areas of arthritis, healing, rehabilitation and injury prevention.

**ADMINISTRATION**

J. Michael Egan  
Chief Executive Officer  
John Welaj, M.B.A.  
Chief Operating Officer  
Amy Ruther  
Human Resources Manager

**DEVELOPMENT**

John G. McMurtry, M.A., M.B.A.  
Vice President for Program Advancement  
Rachele Palmer  
Development Coordinator

**BASIC SCIENCE**

William G. Rodkey, D.V.M.  
Director

**CLINICAL RESEARCH**

Karen K. Briggs, M.B.A., M.P.H.  
Director  
Marilee Horan  
Research Associate  
Lauren Matheny  
Research Associate  
Sarah Kelly-Spearing  
Research Associate  
James Bennett  
Research Intern  
Rebecca Glassman  
Research Intern

Sophia Hines  
Research Intern  
David Koppersmith  
Research Intern  
Brian Maxwell  
Research Intern

**BIOMECHANICS RESEARCH LABORATORY**

Michael Torry, Ph.D.  
Director of Biomechanics Research Laboratory  
Kevin B. Shelburne, Ph.D.  
Senior Staff Scientist  
J. Erik Giphart, Ph.D.  
Staff Scientist  
Takashi Yanagawa, M.A.  
Staff Scientist  
Feng Zhang, M.S.  
Staff Scientist

Nils Horn  
Research Intern  
Ted O'Leary  
Research Intern

**EDUCATION**

Greta Campanale  
Coordinator  
Ashley King  
Educational/Development Program Assistant

**TECHNICAL RESOURCES  
VISUAL SERVICES**

Joe Kania  
Coordinator

**Mark Your Calendar:**

**AUGUST 16**

*Pepsi 2007 Steadman-Hawkins Golf Classic, presented by RE/MAX International at Sanctuary in Sedalia, Colorado.*

For more information, contact Rachele Palmer at (970) 479-5809, rachele.palmer@shsmf.org



photo: John Kelly

*To request an invitation, or for more information on Foundation events, please contact Rachele Palmer at the Steadman♦Hawkins Research Foundation (970-479-5809).*



Steadman♦Hawkins  
Research Foundation

181 West Meadow Drive  
Suite 1000  
Vail, Colorado 81657  
970-479-9797  
970-479-9753 FAX  
<http://www.shsmf.org>