

photo: John Kelly

FOUNDATION FOCUS

Evidence-Based Medicine

By Mike Egan, Chief Executive Officer, Steadman♦Hawkins Research Foundation

“Evidence-Based Medicine” has become a “buzzword” in the media and you will hear it often during the next few years. Evidence-based medicine will affect changes in this country’s health care system because of the way health insurance is tracked and monitored, and it has already become an important subject in the 2008 presidential election campaign.

Nineteen years ago, Dr. Steadman had the vision to create the best clinical research group in the world for sports medicine and evidence-based medicine. It is something we have been practicing at the Steadman♦Hawkins Research Foundation ever since.

With this in mind, here are some questions and answers that might offer a better understanding of evidence-based medicine (EBM) and its role at the Foundation.

WHAT IS IT?

A definition that has been used in previous Foundation publications defines evidence-based medicine as the conscientious, explicit, and judicious use of best current evidence in making decisions about the care of individual patients. “Best current evidence” is the key concept. At the Foundation, EBM is the essence of all research. Whether it is finding and using

(continued on page 2)

INSIDE

- ◆ page 3
Aetna Hall of Champions Unveiled
- ◆ page 4
Meet Our Team: Paige Prill and Marc Prisant
- ◆ page 6
Research Update: Moving Forward on FAI
- ◆ page 7
Patients in the News: Photographer John Kelly
- ◆ page 9
Sports and Wellness Hip Health
- ◆ page 12
Welcome 2007-08 Fellows
- ◆ page 16
Curbing Muscle Cramps

(continued from page 1)

evidence at the basic science level, in our clinical research, or in biomechanics, we are constantly in the process of developing evidence that will tell us whether a procedure is better or worse for the patient. We want to know, based on extensive and current medical evidence, the best course of treatment to take with each patient.

DOESN'T EVERY DOCTOR OR MEDICAL CARE PROVIDER USE EVIDENCE-BASED MEDICINE?

Very rarely and, in sports medicine, never to the level of detail collected and managed here. Many physicians and others treat patients based on what they've been doing for years or what they've read in the medical literature. The difference is that the Clinic bases its patient care not only on medical literature but also on our Foundation's comprehensive data. This is the best and truest care a patient can receive. It is the ultimate report card for a physician.

WHAT KIND OF EVIDENCE DOES THE FOUNDATION COLLECT?

Since 1993, we have collected more than 13,500,000 data points on patients' knees and shoulders. That's 670 pieces of information for every knee and shoulder treated at Steadman-Hawkins. In the past two years we've collected data on more than 1,000 hips, and we recently began

gathering evidence on spines, as well as adding radiological images to the database. We constantly review our data, looking for ways to improve the overall care of our patients. We publish our results and present them at the leading conferences around the world.

HOW DOES THE FOUNDATION COMPARE TO OTHERS REGARDING EBM?

We think we are the world leader in the depth and detail of our patient database. We have the highest level of integrity in our data because of the rigorous standards we use in collecting it. We are contacted every week by orthopaedic and other medical specialists from around the world wanting to know how we have established, managed, and supported our database. Frankly, we believe that our systematic and well-established EBM approach gives us a sustainable competitive advantage, regardless of the impact of government intervention on our health care system. Those who have a firm grasp on EBM will be the ones to separate themselves from all others.

WHAT DOES THIS MEAN TO THE PATIENT?

It means you can be assured that when one of the Steadman-Hawkins physicians suggests a course of action for your injury or condition, it will be justified based on a tremendous amount of evidence that has been collected by the Foundation and not

Legislation To Use IRA Assets for Tax-Free Giving Ends in 2007

Legislation giving you the opportunity to make cash gifts from your traditional or Roth IRA to the Steadman♦Hawkins Research Foundation without incurring federal income tax on the withdrawal is set to expire December 31, 2007.

Create A Tax-Free Gift

The key to the tax-free aspect of the legislation (the Pension Protection Act of 2006) is that the transfer of funds goes directly from your plan administrator to the Foundation. Because no income goes directly to you, a gift can be made without having to pass through the "income tax window" that existed in the past. This is great news if you have wanted to make a gift to the Foundation from your retirement assets, but haven't because of the income tax consequence.

How To Make Your Gift

To take advantage of this opportunity, you must be 70½ or older. You can give up to \$100,000 from your IRA directly to the Foundation by contacting your plan administrator and directing a check be sent to the Foundation. Or the funds may be transferred automatically if you have your administrator contact John McMurtry (see below) for instructions to electronically transfer the funds.

What About 401k, 403b And Other Plans?

Even if your retirement plan is a 401k, 403b, or an SEP account, there are steps you can take to use these plans to fulfill your philanthropic wishes and benefit from the legislation. While these plans are not directly eligible under the legislation, you may be able to make qualified transfers from other plans into an existing or newly created IRA and then make charitable gifts from that IRA. Importantly, remember to allow plenty of time for paperwork and transfers to take place. You may want to check with your tax advisor as well.

just something he or she read in a journal or heard about elsewhere. It also means you will receive an entire medical, surgical, and rehabilitation program that applies directly to you, and one that has been proven through years of rigorous review of clinical data.

IS AN EVIDENCE-BASED MEDICINE APPROACH EXPENSIVE?

Yes. The investment in money and people is tremendous, but we must continue to find those resources in order to support such a detailed system. Your support has allowed us to become a world leader in this approach, and that's why you are going to be hearing and reading those words — evidence-based medicine — frequently as we move forward during this decade and beyond.

WHAT DOES THE FUTURE HOLD FOR THE FOUNDATION'S APPROACH TO EBM?

We will be expanding our clinical research into the hand and foot and ankle, and we will be gathering more extensive rehabilitation and imaging data on all patients. Ultimately, we will expand into every subspecialty that the Foundation represents, and we will add more data per patient. We already stand apart from other groups, and with your help, we expect to maintain or increase that distance.



Aetna Hall of Champions Unveiled

As patients step out of the elevator on the third floor of the Vail Valley Medical Center, they walk down a long corridor leading to the Steadman-Hawkins Clinic. Photos, posters and jerseys of famous patients hang on the walls leading to the Clinic reception area. Foundation board member Earl G. Graves approached the Aetna Foundation to consider naming this corridor the *Aetna Hall of Champions*. The proposal resulted in a \$200,000 grant from the Aetna Foundation. A small portion of the grant will be used to complete the Hall of Champions and the remainder will be used to fund research projects. The Hall will be completed by the end of 2007.

Publications, Presentations & Research

Mike Torry, Ph.D., director of the Biomechanics Research Laboratory, reports that six publications and four abstracts have been accepted in 2007 by peer-review journals and for presentation at various scientific meetings.

Publications

Kernozek TW, Torry MR, Iwasaki M.

Gender Differences in Lower Extremity Landing Mechanics Caused by Neuromuscular Fatigue.

American Journal of Sports Medicine (in press).

Lawrence R, Kernozek T, Miller E, Torry MR, Reutemann P.

Influences of Hip External Rotation Strength on Knee Mechanics during Single-Leg Drop Landings in Females.

Archives Physical Medicine and Rehabilitation (in press).

(continued on page 15)

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 two 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 the Foundation 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 for a donor's IRA accounts.
- These contributions are not subject to the 50 percent deductibility ceiling or the two 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 advisor.
- Individuals who do not itemize their federal income tax returns may make qualified IRA gifts and exclude such gifts from their reportable income.

At press time, the House Ways and Means Committee had passed the Temporary Tax Relief Act to extend, among other items from the original legislation, the deadline for charitable gifts through IRAs. The Act must still be considered and passed by the full House and Senate. We cannot speculate on that outcome and therefore continue to encourage you to take advantage of this opportunity while it we know it exists. For more information, contact John McMurtry, Vice President for Program Advancement, at john.mcmurtry@shsmf.org or 970-479-5781.

MEET OUR TEAM

Paige Prill and Marc Prisant: Two Journeys, Same Destination, New Goals

By Jim Brown, Ph.D., Executive Editor

Injuring your leg in a ski accident and being treated at the Steadman-Hawkins Clinic is not a prerequisite for joining the administrative team at the Steadman♦Hawkins Research Foundation, but it was part of the process for Paige Prill and Marc Prisant.

In March, Prill was named Vice President of Development and Communications for the Foundation, and on May 1, Prisant began his work as Executive Vice President and Chief Financial Officer. The career paths these two executives took before finally arriving in Vail, for something other than skiing, are as interesting as they are different.

PAIGE PRILL: FROM WASHINGTON TO SEATTLE TO VAIL

A native of Atlanta, Prill graduated from the University of Maryland and began her career with the biggest real estate developer in Washington, D.C. After several years, she went in a totally different direction. "As a big news junkie, I wanted to learn the media business," she recalls. "I worked as an intern for Larry King Live for six months and later became the CNN publicist for its Washington bureau. I pitched the DC bureau's programming, handled all of the talent, and spent a lot of time with the media, even though we were the media."

Paige's boss left CNN and things got even more interesting. She took a lead role in her department, arranged interviews at the White House, managed CNN's political programming, and coordinated the network's marketing and public relations for the Democratic and Republican presidential conventions. "At CNN, part of what I did was crisis communication," says Prill. "At the time, CNN was a hot topic for other media outlets, and every day presented a new set of interesting circumstances."

Paige gets calls from very interesting people. "In 1996, I kept getting calls from Michael Kinsley, a political pundit who left CNN to start a current events magazine in cyberspace," she remembers. "He wanted me to come to Seattle and meet the Microsoft people. Twenty-four interviews later, I accepted a position as marketing manager for its Interactive Media Group, promoting their online content, including *Slate Magazine* and *MSNBC.com*."

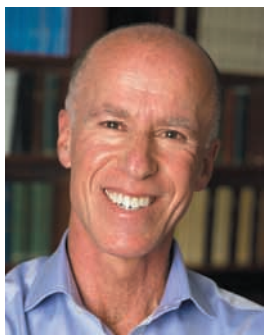
The next not-your-average call was from Paul Allen's team. Allen was a co-founder of Microsoft and founder of Vulcan, Inc., a media, sports, real estate, and entertainment conglomerate. That call resulted in a position for Prill as Communications and Community Relations Director for Experience Music Project. It is an interactive music museum that combines hands-on experiences with exhibits that tell the story of the creative process in American popular music.

"Six years later," says Prill, "it was time to take a break, and I moved to Vail, where I had spent every Christmas holiday for the past 25 years. I came to Vail to work on a real estate project with my Dad. When that work was finished, I decided to take time off and enjoy the ski season." It didn't turn out to be that much fun. In March 2006, Paige "had a wreck" and broke just about everything in her lower leg. She was treated by Dr. William Sterett of the Steadman-Hawkins Clinic, and by January 2007, she was ready to get back in the game. During the course of interviewing for jobs, she introduced herself to Dr. Richard Steadman, later met Steadman♦Hawkins Research Foundation CEO Mike Egan, and was offered the position at the Foundation.

"I am very happy to have been given the opportunity to help the Steadman♦Hawkins Research Foundation achieve its current development goals," says Prill. "The mission of the Foundation is one with which I have a personal connection. I was a patient of the S-H Clinic and know from first-hand experience the value of evidence-based medicine. Dr. Steadman and his team's passion for furthering education and research in the field of sports medicine greatly benefits the Clinic's patients, as well as doctors and patients around the world."



Paige Prill



Marc Prisant

photo: Joe Kania

photo: John Kelly

In addition to her duties with the Foundation, Prill also manages marketing and communications for the Steadman-Hawkins Clinic.

MARC PRISANT: TO VAIL VIA SPAIN

Marc Prisant took a totally different route to get to Vail. With more than 20 years of venture capital experience, he has an extensive finance and business background, including work with numerous biotechnology and medical device portfolio companies in the United States and Europe, several of which went public. In his last position, he served as the Executive Vice President and CFO of Bluebird Development, LLC, where he worked with Mike Egan. "Marc and I have a successful business track record together," says Egan. "This spring I recruited Marc to join me because I knew he could help us reach our goals as a foundation."

"I've known Richard Steadman since the early '90s and have always been impressed with his dedication to improving medicine," says Prisant. "I simply couldn't say no to this unique opportunity. My criteria for returning to work were simple. It had to be a worthy pursuit that involved stimulating work with intelligent and interesting people. I've found this at the Foundation."

An avid cyclist and skier, during the past two years, he was living in Girona, Spain, before accepting the position with the Foundation. Prisant inadvertently became a patient at Steadman-Hawkins earlier this year. "After sustaining a partial tear of the ACL in my right leg while skiing in Zermatt, I learned first-hand how the work done at the Foundation can be applied to benefit anyone who wishes to stay active in life. I also learned that Dr. Steadman's reputation extends to the medical community worldwide." While being attended to immediately following his injury in Switzerland, Marc mentioned to the clinician that he would be seeing Dr. Steadman, to which came the reply, "So you'll be much better taken care of than if you stayed here."

The procedure used to treat Prisant's injury was the "healing response." Dr. Steadman developed the procedure in an effort to minimize the complications associated with the treatment of specific types of

ACL injuries, and to jump-start the body's own healing process. It involves producing 3-10 microfracture holes into the bone at the origin of the ACL, as well as perforating the stump of the remaining ACL with the microfracture awl. No other intervention is performed, and the blood clot from the bleeding bone at the end of the ACL holds the ligament in place while the healing occurs. Of his outcome, Marc says, "I have fully recovered, and I'm back on my bicycle riding as hard as I did before the injury. I am now waiting for the ski season to begin."

Prisant has also served on the board of directors of the Northern California Chapter of the National Kidney Foundation, and he has been a volunteer firefighter and first responder for the La Honda Fire Brigade in San Mateo County, California.

POSITIONED FOR GROWTH

The Steadman♦Hawkins Research Foundation is being positioned for major growth in the next three-five years, and Prisant and Prill have already become important players in that initiative.

Prisant's responsibilities include overseeing all financial aspects of the Foundation, including instituting a three-year forecast, preparing financial reports, and supporting fund-raising efforts. Additionally, he will also oversee contracts and their compliance, but like every other person at the Foundation, he will be part of a Steadman-Hawkins team that tackles scores of projects designed to take the Foundation to an even higher level.

Prill will direct efforts to make sure the community of Vail, the rest of the country, and the world know about the Foundation, understand its mission of keeping active people active for the rest of their lives, and support the kind of evidence-based medical research that makes the Steadman♦Hawkins Research Foundation unique and one of the world's most prominent research institutions.

Dr. Richard Steadman and Mike Egan literally searched all over the world to find the most qualified people to oversee the Foundation's finances and communications. Marc Prisant and Paige Prill are glad they did.



RESEARCH UPDATE

Research Moving Forward on Femoroacetabular Impingement

By: Karen Briggs, M.B. A., M.P. H.,
 Director of Clinical Research, and
 Dave A. Koppersmith, B.S.

Patients with hip pain may suffer from femoroacetabular impingement, or FAI, in which bony abnormalities of both the femur and acetabulum irregularly and repetitively contact each other, creating damage to the articular cartilage and labrum. This may lead to a more rapid onset of osteoarthritis, which is the leading cause of disability in the United States. In the past, the treatment for FAI was an open surgical dislocation procedure to repair this pathology. It has shown good mid-term results, but it is a highly invasive procedure. The recovery from this open surgical dislocation procedure may limit activities for nine months. This length of postoperative inactivity is not feasible for the recreational or professional athlete. Dr. Marc J. Philippon has developed an arthroscopic technique to repair this hip joint disease that allows individuals to return to activities, including athletics, as early as three months.

Dr. Philippon recently published his first peer-reviewed research article in the *Journal of Knee Surgery, Sports Traumatology, and Knee Arthroscopy*. This landmark paper comes just two years after his joining the Steadman-Hawkins team, and it is truly a milestone accomplishment. The article, titled "Femoroacetabular Impingement in 45 Professional Athletes: Associated Pathologies and Return to Sport Following Arthroscopic Decompression,"

focused on professional athletes who underwent minimally invasive arthroscopic hip surgery due to persistent hip pain and an inability to participate in their sport. All patients had treatment for FAI. After undergoing surgery, 42 (93 percent) returned to their professional sport, and 35 (78 percent) remained active at average 1.6-year follow-up.

Following the publication of this article, another article was accepted for publication in the *Journal of Knee Surgery, Sports Traumatology, and Knee Arthroscopy*. The paper, titled "Clinical Presentation of Femoroacetabular Impingement," was written to describe patients' symptoms and how they respond to specific tests in the office. The study looked at 301 patients of Dr. Philippon's with hip pain. The most frequent complaint was pain, with 85 percent of patients reporting moderate or marked pain. The most common location of pain was the groin (81 percent). Patients showed decreased ability to perform activities of daily living and sports. When examined by the physical therapist, patients had reduced hip flexion, hip abduction, hip adduction, and hip rotation (see figures). Patients with osteoarthritis of the hip had even greater reduction in motion of their hip. The anterior impingement test and the FABER test are specific measurements used to determine impingement in the hip. In this study, these tests were positive for 98 percent of the patients when the physician evaluated them. This study concluded that patients with FAI most commonly had pain and functional limitations.

Significant limitations in sports and activities of daily living were usually present in patients with FAI. Limitations of hip range of motion were common, and a positive anterior impingement test was seen almost universally, as was a positive

Figure 1. Dr. Philippon assessing internal rotation of the hip on a patient in the Clinic

Figure 2. Dr. Philippon assessing hip extension

Figure 3. Fellow assessing hip abduction

Figure 4. Fellow assessing hip adduction



Figure 1



Figure 2



Figure 3

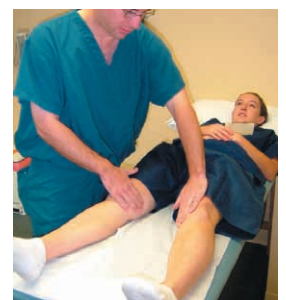
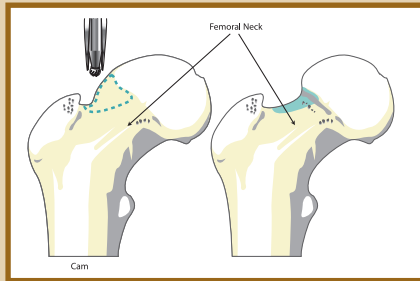


Figure 4

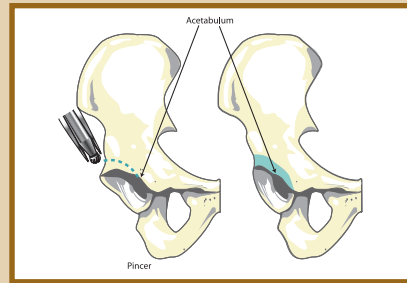
What Is FAI?

Femoroacetabular impingement or FAI occurs when abnormally shaped bones of the hip repetitively hit into each other during movement. As a result, soft tissue structures of the hip, including the acetabular labrum and the articular cartilage, are often entrapped and injured. Impingement is particularly common in hip flexion and internal rotation, a position frequently encountered during activities of daily living. A study by Dr. Philippon at the Foundation showed that FAI directly correlates to large articular cartilage injuries of the acetabulum. Femoroacetabular impingement is thought to be a significant cause of osteoarthritis in the hip.

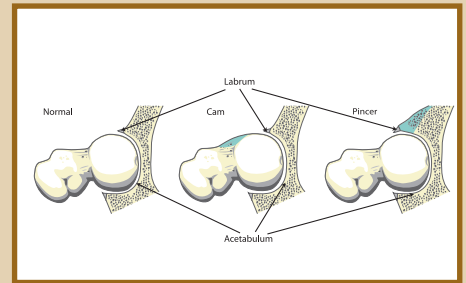
There are two distinct types of femoroacetabular impingement, cam and pincer. Most commonly, patients have a combination of the two types of impingement. Cam impingement results from excess bone located on the femoral neck. Pincer impingement results from excess bone located on the acetabulum. The precise cause of the impingement is unknown; however, it likely has both developmental and activity-related components.



With cam impingement, the burr, a small cutting instrument, is used to remove excess bone from femoral neck.



With pincer impingement, the burr, a small cutting instrument, is used to remove excess bone from acetabulum.



Illustrations: Marty Bee

FABER test. This study will provide physicians, physical therapists, and patients new information in the diagnosis of this common hip problem.

Dr. Philippon joined the Steadman-Hawkins Clinic in March of 2005. Through the Steadman♦Hawkins Research Foundation, he has made it a priority to validate the procedures he performs in the operating room, determine factors that are associated with patient satisfaction, and continue to improve patient outcomes following hip arthroscopy.



PATIENTS IN THE NEWS

John Kelly: An Elite Photographer Takes His Shoulder, His Hip, and His Talent Into a Steadman-Hawkins Operating Room

By Jim Brown, Ph.D., Executive Editor

You've seen a John Kelly photograph. It might have been a movie star (Robert Redford, Brad Pitt), a famous athlete (Palmer, Nicklaus, Watson, McEnroe, Borg), British royalty (Princess Diana), or a rock star (Mick Jagger). A different kind of John

Kelly image might be locked in your mind forever. It could be the Golden Gate Bridge, scenes from the American West, the Winter Olympics, a child's face, or even an old cat sitting on a fence post at Kelly's End of the Road Ranch in Western Colorado.

But the John Kelly photos you have not seen are the X-rays of his dislocated hip and the pictures of his torn rotator cuff that took him from friend and supporter of the Steadman♦Hawkins Research Foundation to a patient who needed treatment. "I had been doing photographs for the Foundation for a long time, but the high point was putting on the scrubs and watching the Steadman-Hawkins doctors perform surgery," says Kelly. "It was like watching a world-class event. I was amazed at how good and how calm they were. When you observe a tennis champion like Borg or McEnroe, it seems like every serve is perfect. It's that way with these doctors, but they can't have a double fault."

A BAD SKI WRECK

Kelly, a self-taught photographer who began taking pictures while serving as a first lieutenant in Vietnam, was shooting a national advertising campaign in Breckenridge, Colorado, when he suffered a 100 percent dislocation of his right hip in a "bad ski wreck," as he describes it. He

(continued on page 8)

JOHN KELLY ON HIS

Most challenging shoot

"The Winter Olympics because of the cold weather and because I have to work my way around 100,000 people to get the shots I want."

Most rewarding shoot

"There is a reward for every job. My reward is making clients happy."

Most interesting celebrity shoot

"Robert Redford. It has been an absolute thrill to be associated with him. He is a gentleman, an award-winning actor and filmmaker, and a person who can talk sports, history, and politics just as easily as he can talk about show business."

Most recognized photograph

"It would have to be either Tom Watson's chip to win at Pebble Beach, Jack Nicklaus's birdie putt to win the 1980 U.S. Open, John McEnroe's first win at Wimbledon, or Bjorn Borg on his knees after a five-set victory to win his fifth Wimbledon in a row."

Best advice for amateur photographers

"You have to go out and shoot. All cameras are about the same, but everyone has a different eye. Practice. There is an opportunity for every amateur photographer to take a dramatic photo. I took a picture of a cat sitting on top of a fence post that sold in Europe for \$25,000."

(continued from page 7)

got immediate medical care at Steadman-Hawkins but was warned that the injury would come back to haunt him. It did. His hip degenerated over an eight-year period, making it difficult to do things he liked to do personally and professionally — trekking across mountain ranges, cycling, riding horses, working on his ranch.

But it was a recurring shoulder injury that resulted in Kelly's first visit to a Steadman-Hawkins operating room. Over the years, his adventure-heavy lifestyle resulted in a torn rotator cuff. It was repaired in February 2005 by another young Steadman-Hawkins surgeon named Dr. Tom Hackett, a specialist in the arthroscopic treatment of sports who trained under Dr. Frank Jobe, the famed physician who developed the "Tommy John" procedure. Dr. Hackett's skills and reassuring manner dispelled many of the doubts Kelly would have toward a more complicated surgery he would face in the future.

In the meantime, another world-class professional, Dr. Marc Philippon, had left Pittsburgh, joined the staff at Steadman-Hawkins, and was one of the pioneers of a procedure to address a condition known as femoroacetabular impingement (FAI). FAI causes damage to the hip socket's labrum, as well as to the articular cartilage in the hip. Kelly underwent hip surgery in December 2005 to repair the labrum, but the procedure also involved cleaning out a "debris field" around the hip joint and performing microfracture on the top of the femur.



John Kelly and Mookie dog.

photo: John Kelly

Through all of this, one of the lessons learned was the importance of rehabilitation. You can have a great surgical repair, but it is the rehab that will give you a great result. "Rehab is crucial," says Kelly; "you've got to do the rehab. Having a stationary bike and sport cord at home is essential."

For 30 years, he has known Dr. Steadman's innovative therapists, John Atkins and Topper Hagerman, when they were directing the conditioning and rehabilitation programs for the U.S. Ski Team. They teamed up with Steve Stalzer of Howard Head Sports Medicine Center to supervise his rehab regimen while he was on the mend. "You blow any advantage you gain from the world-class surgeons upstairs if you don't take advantage of the boys downstairs," advises Kelly.

MULTI-LAYERED RELATIONSHIP

So John Kelly's relationship with Steadman-Hawkins involves several layers. He has known Steadman-Hawkins Founder and Chairman of the Board Dr. Richard Steadman, John Atkins, Topper Hagerman, and Vice President for Program Advancement John McMurtry from the old days when he was doing "shoots" with the U.S. Ski Team. He has been treated for two major injuries at the Steadman-Hawkins Clinic, and he has provided photos to the Foundation for newsletters, annual reports, and other S-H publications.

"I can't give them \$100,000," explains Kelly, "but I can give them \$100,000 in free photographs. I wanted the Steadman♦Hawkins Research Foundation to succeed long before I needed its help, then all of a sudden, I needed the kind of treatment the Foundation's research had made possible."

"Every year when I do the annual report, I get to meet the Steadman-Hawkins staff," adds Kelly. "You realize that this group of professionals, including some of the brightest interns in orthopaedic research, come from all over the world. When they want to know if something new is happening, they don't have to read about it. They can go downstairs and watch cutting-edge science in real time."

"Now I get to photograph the work of highly skilled physicians performing procedures in the operating room that have either been developed or refined at Steadman-Hawkins. I can take photos of

athletes moving on a \$60,000 specially constructed treadmill that could result in injury prevention and treatment for years to come. I saw Dr. Sterett taking time in the middle of the day to film the movement of a knee so he could better understand the forces placed on it during athletic performance.”

John Kelly has lived an exciting life and there is a lot more adventure in his future. But he seems to get just as excited about photographing the work inside the Steadman♦Hawkins Research Foundation as he does in shooting images of celebrities or taking pictures of breathtaking landscapes around the world.

He has a world-class reputation as a photographer, he has experience as a patient who has benefited from the research conducted by the Foundation, and he contributes valuable works of photographic art so that the rest of the world can get a glimpse into the world of orthopaedic research being conducted at Steadman-Hawkins. This triple-threat combination gives Kelly a unique perspective and a powerful platform as an advocate for the Steadman♦Hawkins Research Foundation.



SPORTS AND WELLNESS

Hip Health!

By Ted Weber, PT, and Mike Wahoff, PT.

Editor's note: Ted Weber and Mike Wahoff are outpatient orthopaedic and sports physical therapists at Howard Head Sports Medicine Center in Vail, Colorado.

YOUR HIP AND NORMAL FUNCTION

From the sublime grace of ballet to the brutal force of a football lineman, the range of human movement potential is astounding. As one of the few species capable of producing upright ambulation, humans owe much of this ability to the unique architecture of the hip joint. The structure of this joint provides the extraordinary stability required to support impact forces several times body weight while simultaneously allowing a tremendous range of motion. Although the strong bony support provided by the hip was commonly assumed to reduce the incidence of injury, recent advances in diagnostic



photo: John Kelly

imaging and arthroscopic instrumentation have identified structures in the hip that are being injured and producing a significant source of pain and disability.

A recent study found that over 14 percent of persons over 60 years old suffer from severe hip pain on most days. Furthermore, 1 percent to 3 percent of persons older than 65 will have a hip replacement, and this number is expected to grow with increases in life expectancy. Identification of damaged structures in the hip that may be torn or cause pain at an earlier age and the ability to repair these structures are hopeful advances being used to potentially reduce the need of hip replacement at later stages of life. These conditions have been found to cause weakness and/or loss of range of motion at the hip. Weakness and insufficient range of motion can also contribute to pain or injury at the lumbar spine or knee. Given the importance of the hip to many of the activities intrinsic to our enjoyment of life and well-being, a basic understanding of its structure and preventive measures can arm a person with the knowledge to keep the hips functioning at a high level for a lifetime.

STRUCTURE OF THE HIP

The hip joint is comprised of a ball-shaped femoral head at the end of the thigh bone and a socket-shaped acetabulum on the pelvic bone. Both the head of the femur and the acetabulum are lined
(continued on page 10)

(continued from page 9)

with cartilage that serves as a cushion and a smooth interface between the bones. The labrum, a crescent-shaped structure along the rim of the acetabulum, serves to deepen the socket and provides a suction seal for added structural integrity to the joint. For added stability to the joint, strong ligaments blend with the joint capsule that surrounds the joint to connect the femur to the pelvis. Twenty-seven muscles and tendons cross the hip joint and, under healthy conditions, serve to produce coordinated and efficient movement about the joint. Due to close proximity to the pelvis and lumbar spine, there is a close interaction between movements of all three areas. Strong core stability provides the best solid foundation for the hip to function.

Injury to the hip can result from congenital deficiencies, trauma, or strength and range-of-motion imbalances. Structural deficiencies include bony anomalies such as dysplasia (shallow socket), coxa profunda (deep socket), or femoral-acetabular impingement (FAI). FAI may include an acetabulum (socket) that covers too much of the femoral head (pincer impingement) or the neck of the femoral head that has a bone spur that does not allow sufficient clearance for movement within the acetabulum (cam impingement). This impingement leads to stress and potential injury to other structures within the joint, specifically the labrum. Overt trauma, ligament laxity, or repetitive wear, including continual impingement, can damage the labrum or cartilage. Disruption to any of these structures can impair the mechanical stability of hip and lead to degeneration and osteoarthritis. Surgical intervention for any of the structural deficiencies is most likely the only way to help prevent damage to the other structures such as the labrum and cartilage. We do believe, however, that a sound exercise program may help in reducing the risk of a debilitating injury. An exercise program will not compensate for the structural deficiencies or already disrupted tissues, but improvements in core and hip strength may help maintain integrity of the joint in our active lifestyles.

EXERCISE PROGRAM

For the active person with “anatomically correct” hips, an exercise program consisting of lower extremity flexibility, hip strengthening, and core stabilization would be perfect. However, there is no way of knowing whether you have these bony anomalies unless assessed by a qualified physician. Therefore, it is our recommendation to focus your program on core stability and hip strengthening and only gentle stretching. Aggressive hip stretching will stress tissues in the joint if you have any structural issues and is not recommended. An example of the type of program we might prescribe follows. It is designed to serve as a preventive maintenance regimen for persons with healthy hips. Good form is critical to obtaining the most benefit from these exercises.

Performing a strengthening program three to four times a week is recommended. Prior to performing exercises, we suggest a warm-up of ten minutes or more of light exercise, such as walking, jogging, or cycling. Finish the workout with the gentle stretching exercises for 30 seconds each.

Transverse abdominal isometrics

Lie on your back with your knees bent and feet on the floor. Place your fingers just inside your pelvic bone. Draw belly button in toward spine without moving pelvis. Do NOT flatten your spine. Try to feel the muscles contract gently under your fingers—hold while taking five breaths. Try this exercise on your side, stomach, and standing/sitting.

This exercise is the basis for all core stabilization exercises. If you practice this all the time, whether you are doing exercises, Pilates, or around the house, you are strengthening your core.

Heel slides Lie on your back with your legs straight. Attempt to slide your heel up along the floor to the position of knee bent and feet still on floor. The goal is to slide your foot without any movement at the low back (no arching or flattening spine). Repeat with opposite leg.

Heel slide to a march Perform the above heel slide exercise, then lift your heel off the table so the hip is bent to 90 degrees, keeping the spine stable, then return leg to starting position. Alternate legs.

Rose wall slides Lying on your side with your back up against the wall, stack your shoulders, hips, and heels flush up against a wall. Push the heel of your top leg into the wall then slowly slide top leg along wall without moving pelvis.

Prone heel squeeze Lie on your stomach. Slightly separate your legs then bend your knees about 45 degrees, placing your heels together (froggie position). Draw transverse abdominals in and squeeze heels together for five seconds. Increase difficulty by lifting your thighs off the mat while squeezing heels and maintaining a stable pelvis. Do not arch your back.

Bridge on Swiss ball Lying on your back, place feet up on Swiss ball. Keep knees straight and core stable as you raise your buttocks, hold five seconds, then lower. Progress to lying with shoulders on ball and feet on floor, then lowering and raising your buttocks.

Double 1/3 knee bends Start standing with feet shoulder width apart, bend at the knees to 60 degrees. Do not allow knees to go past toes. Always avoid greater than 70-degree squats to avoid impingement. Progress by using a sport cord for resistance.

PILATES

A good Pilates class or program is a highly recommended way of gaining core stability with hip mobility.

STRETCHES:

Piriformis stretch Cross the ankle of one leg over the knee of the opposite leg. Reach behind the leg that is still on the ground and pull it toward your chest until you feel a light stretch in the posterior buttock on the side that is crossed over your knee. Avoid pinch in groin.

Quadriceps stretch Standing, bring your foot up behind you (heel to your buttocks) feeling a stretch in front of thigh. Do not arch your back.

Kneeling hip flexor stretch In a half-kneeling position with one knee on the floor, draw in transverse abdominal muscles. Shift weight forward while keeping trunk upright, feeling stretch in front of hip/thigh.



Transverse Abdominal Isometrics



Prone Heel Squeeze



Heel Slides



Bridge on Swiss Ball



Heel Slide to a March



Piriformis Stretch



Rose Wall Slides



Kneeling Hip Flexor Stretch



photos: Joe Kania

Where are they now?

The graduating class of 2006/2007 Steadman-Hawkins Fellows are busy establishing new careers in orthopaedics.

Brett Cascio, M.D., has returned to his hometown and has joined the faculty and practice of academic medicine at Louisiana State University Department of Orthopaedic Surgery.

Mike Huang, M.D., has joined a private practice in Grand Junction, Colorado (remaining in his home state; he grew up in Denver).

Ben Huffard, M.D., has joined a private practice in Portland, Maine (he grew up in New England).

Dave King, M.D., has joined a private practice in St. Louis, Missouri.

Colin Looney, M.D., has joined a private practice in Franklin, Tennessee.

Tom Viehe, M.D., is completing a Foot and Ankle Fellowship with Dr. Roger Mann in Oakland, California.

Yi-Meng Yen, M.D., is completing a Pediatric Orthopaedic Fellowship at Boston Children's Hospital.

EDUCATION

Welcome 2007-08 Fellows Six New Physicians Introduced

Six new members of the incoming "class" of Steadman-Hawkins Fellows have had a busy schedule refining their skills as they make final preparations for a career as orthopaedic surgeons. Regarded as one of the most prominent and rigorous academic fellowship programs in orthopaedic sports medicine, six new orthopaedic surgeons are selected from a pool of more than 140 applicants.

Steadman-Hawkins Fellows spend their year refining skills and learning new surgical techniques that include an opportunity to participate in research with Foundation scientists. Each Fellow will be actively involved in Clinical Research, Basic Science and Biomechanics, and Rehabilitation research.

The stream of knowledge and information flows both ways. The Fellows, having completed their formal training in leading orthopaedic programs, share knowledge they have gained from years of training with the physicians and scientists of the Foundation.

2007-08 STEADMAN-HAWKINS FELLOWS

Casey D. Taber, M.D., graduated cum laude from Louisiana State University with a degree in zoology and was a letterman on the LSU football team. He attended medical school at University of Texas – San Antonio where he was awarded the Charles A. Rockwood Scholarship for Top Orthopaedic Student. Dr. Taber completed his general surgery internship and orthopaedic residency at University of Texas – Southwestern (Parkland Hospital). His research projects include hip arthroscopy and investigating the economic impact of orthopaedic trauma.

Douglass R. Weiss, M.D., earned his bachelor of arts degree in economics from Dartmouth College and captained the Dartmouth hockey team. Before deciding to pursue a career in medicine, Dr. Weiss played professional hockey in the United States and Europe and also participated in the U.S. Olympic hockey program. He then completed medical school at Dartmouth and his residency in

orthopaedic surgery at the University of Massachusetts. Dr. Weiss has presented his research on the accuracy of a computer-aided guidance system and has studied cryocuff therapy following ACL reconstruction, as well as SLAP lesions in the presence of rotator cuff tears. Deeply involved in youth and adult hockey schooling and community volunteer work, Dr. Weiss looks forward to honing his sports medicine skills in Vail to prepare for a career in caring for both the recreational and competitive athlete.

Brian J. White, M.D., graduated magna cum laude from Washington and Lee University and went on to medical school at Georgetown University, where he earned the distinction of membership in the Alpha Omega Alpha Medical Honor Society. He completed his internship and orthopaedic residency at New York University — Hospital for Joint Diseases, where he worked with the New York Mets, Alvin Ailey Dance Theater, and New York City high school football. Dr. White's numerous research projects include investigating revision reconstruction of pectoralis major rupture, flexion limits in total knee replacement, and contact locations in the knee during deep squatting.

Andrew B. Wolff, M.D., studied history and Spanish and played varsity football at Amherst College. He received his medical training at Washington University and completed his internship and orthopaedic residency at Yale University. Well accomplished in research, Dr. Wolff has participated in a number of orthopaedic papers in the areas of surgical techniques and soft tissue reconstruction. He has been published in such journals as *Journal of Pediatric Orthopaedics (British)*, *Journal of Orthopaedic Trauma*, *Arthroscopy*, and *Journal of Bone and Joint Surgery*.

Chad T. Zehms, M.D., graduated magna cum laude with a degree in biology from the University of Wisconsin – Milwaukee, where he also was a record holder in distance running. At the Medical College of Wisconsin, he earned membership in the Alpha Omega Alpha Medical Honor Society. An officer in the U.S. Navy, Dr. Zehms completed his surgical internship and orthopaedic residency at the Naval Medical Center in Portsmouth, Virginia. He has published papers on PCL reconstruction, humeral shaft fractures,

and return to active military duty following open versus arthroscopic shoulder stabilization.

Bojan B. Zoric, M.D., after playing professional soccer in Sweden, majored in biology-molecular genetics and minored in chemistry at the University of Rochester, graduating magna cum laude and earning distinction as a scholar and soccer athlete. He then attended medical school at the University of California – Los Angeles and received numerous academic excellence awards. Dr. Zoric completed his residency at the Harvard Combined Orthopaedic Residency Program. He is active in research, and his studies of pediatric ACL reconstruction and ACL and PCL graft reconstructions have been published in *American Journal of Sports Medicine*, *Journal of Orthopaedic Research*, and *Arthroscopy*.



Yi-Meng Yen, M.D. A Case Study in Preparation

By Jim Brown, Ph.D., Executive Editor

His father is a physician with ties to USC and UCLA. His mother has a Ph.D. in psychology and teaches Chinese at the university level. His sister has a degree in journalism from Stanford, was a writer for *Sports Illustrated*, and recently joined *Business 2.0* as chief of reporters. His brother has an M.B.A. from Yale and left eBay to help build an Internet startup company called Adbrite.

If you are Yi-Meng Yen, how can you possibly measure up to the high standards set by your parents and siblings? You start

by graduating cum laude from UCLA with degrees in chemical engineering and economics. Then you complete a master of engineering degree before entering the Medical Scientist Training Program at UCLA. Next, you earn a Ph.D. in biological chemistry and you are accepted into Alpha Omega Alpha Honor Medical Society — the “Phi Beta Kappa” for medical schools — at UCLA on your way to becoming a doctor of medicine.

Is that enough? No, not if you’re Dr. Yen. You complete your residency at UCLA, become published in medical and scientific journals, receive awards for basic and clinical science, and then you are accepted for not one, but two of the most prestigious medical fellowship programs in the world, including the one at the Steadman♦Hawkins Research Foundation.

“I remember visiting Vail while I was still in school, taking a picture in front of the Foundation’s building, and thinking I’d never be able to get into the Steadman-Hawkins program,” Dr. Yen recalls. “But eventually I applied and went through the process of trying to become one of seven applicants (out of a field of 160) chosen for the 2006-2007 class of Steadman-Hawkins Fellows. During one of the interviews, Dr. Steadman asked me what I thought about molecular markers for osteoarthritis. That blew me away. Here I was sitting at a table with some of the most accomplished physicians and scientists in the world. I was nervous, but I tried not to show it.”

THE GENEALOGY

Apparently, Dr. Yen’s answer to Dr. Steadman’s question was satisfactory. He was accepted and recently finished his year of advanced training at the Foundation.

(continued on page 14)



Yi-Meng Yen, M.D.

photo: Joe Kania

Thank you

A special “thank you” to our sponsors who make the Fellowship Program possible. We’d like to recognize those individuals and foundations that support the entire Fellowship Class through the sponsorship of Academic Chairs.

Chair sponsors of the 2007/2008 Steadman-Hawkins Fellowship Class are **Mr. and Mrs. Harold Anderson, Mr. and Mrs. Lawrence Flinn, The Gustafson Foundation (Biomechanics Research Laboratory), Mr. and Mrs. Jay Jordan, Mr. and Mrs. Peter Kellogg, Mr. and Mrs. Al Perkins, Mr. and Mrs. Steven Read, and Mr. and Mrs. Brian P. Simmons.**

Fellowship Benefactors fund the research of one Fellow for one year. Each benefactor is assigned a Fellow who provides written reports and updates of his or her work. We extend our gratitude to the following individuals for their generous support: **Mr. J. Michael Egan, Mr. Ronald V. Davis, Mr. and Mrs. Milledge Hart, the Fred and Elli Iselin Foundation, Mr. and Mrs. John W. Jordan, Mr. and Mrs. S. Robert Levine, Mr. and Mrs. Kent Logan, Mr. Tim McAdam, Mr. and Mrs. Jay Precourt, and Mr. and Mrs. Stewart Turley.**



photo: John Kelly

Dr. Yi-Meng Yen, left, assists Dr. Philippon, center.

(continued from page 13)

“You have to experience it to really understand what sets the Steadman-Hawkins program apart,” explains Dr. Yen. “First is the Steadman-Hawkins genealogy — the reputation of Dr. Steadman and his colleagues who have come here to practice medicine and conduct research.”

THE ENVIRONMENT

“Then there is the environment,” Dr. Yen continues. “It has a lot of intangibles that you don’t get at other places. It shows in the way patients are treated and how the doctors interact with them, whether they are famous athletes, entertainers, leaders in the business world, or just average people who want to stay active in spite of their injuries or conditions.”

THE TEAM APPROACH

“At Steadman-Hawkins there is a team approach to almost everything,” says Dr. Yen. “You do your rounds with the attending physician, as well as with physical therapists. They allow you to formulate your own plan, then compare it to that of the attending physician. There is no miscommunication.”

THE CLINIC AND THE FOUNDATION

“One of the most important differences is that there are two Steadman-Hawkins

entities — the Clinic and the Foundation. Although they are separate, they are intertwined. What we did in the Clinic was based on the work done in the Foundation. For example, I worked with Dr. Philippon to analyze about 300 X-rays taken one year after surgeries to determine the parameters that will affect the eventual outcome of a patient’s treatment. As a result, we have concrete data that can help us tell a patient exactly how likely he or she is to need certain procedures over the next few years.”

THE OPPORTUNITY

Finally, the Steadman♦Hawkins Research Foundation gave Dr. Yen the opportunity to participate in a variety of medical research projects. “I would like to stay in academic medicine, and I’ll be expected to publish. My training here has prepared me to practice medicine, conduct surgical procedures, engage in research, and publish the results of those studies.”

Although he could have gone into any of several medical directions, he has chosen surgery over medicine and children over adults. Why? “I don’t like medicine as much because the results can’t be seen immediately. Medicine takes time. You can see the results of surgery right now, and orthopaedic surgery allows me to use some of my training in engineering. I like using my hands, and I don’t mind using a drill in the operating room.”

Dr. Yen has also decided to concentrate on pediatric sports medicine. Again, why? “Because you may be able to make a difference in children and young people that will last a lifetime,” he answers. He and his wife, Kate, have three children of their own.

To further prepare for that specialty, he is now participating in a pediatric orthopaedic fellowship program at Children’s Hospital Boston, and he hopes to eventually settle into a career of teaching at Harvard and practicing at Children’s Hospital. It is a reasonable goal. After all, he is arguably one of the best-prepared young pediatric orthopaedic surgeons in the country, if not the world. And he has to keep up the Yen family tradition of excellence, whether it’s in medicine, education, or business.



(continued from page 3)

Elvin N, Elvin A, Arnoczky SP, Torry MR.

The Correlation of Segment Accelerations and Impact Forces with Knee Angle in Jump Landing. *Journal of Applied Biomechanics*.

Torry MR.

Scientific and Clinical Advances Leading to Improved Treatment of Knee Osteoarthritis. *Medicine Science and Sports and Exercise* (in press).

Shelburne KB, Pandy MG, Torry MR.

Effect of Foot Orthoses and Knee Bracing on Medial Compartment Loading During Gait. *Clinical Biomechanics* (in review).

Pandy MG, Shelburne KB, Torry MR.

Contributions of Muscles and Ligaments to Knee Joint Stability During Gait. *Computer Methods in Biology and Biomedical Engineering* (in press/available online).

Abstracts

Shelburne KB, Torry MR, Pandy MG, Steadman JR.

The Effect of Valgus Bracing and Lateral Wedge Orthotics on Intra-Articular Knee Loads during Gait. *American College of Sports Medicine 54th Annual Meeting, New Orleans, La., May 29-June 2, 39:5: May 2007.*

Giphart JE, Kaptein BL, Shelburne KB, Torry MR.

A Calibration Method for Stereo Fluoroscopic Imaging Systems. *American Society of Biomechanics, Stanford University, Palo Alto, Calif., Aug 22-25.*

Yanagawa T, Torry MR, Shelburne KB, Pandy MG.

The Effect of Hand Position on Subscapularis Force during the Belly Press Test. *American Society of Biomechanics, Stanford University, Aug 22-25.*

Yanagawa T, Millett PJ, Torry MR, Shelburne KB, Pandy MG.

Glenohumeral Joint Reaction Forces Following Latissimus Tendon Transfer. *American Society of Biomechanics, Stanford University, Aug 22-25.*

Invited Lectures

Torry MR, Shelburne KB, Pandy MG

Biomechanics of Drop Landing: Effects of Muscle Forces on ACL Loads, AOA Traveling Fellows Visit, Steadman♦Hawkins Research Foundation, Vail, Colo., Feb 12.

Karen Briggs, M.B.A., M.P.H., director of Clinical Research, announced that the first manuscript in the English literature to document the outcome of



photo: John Kelly

arthroscopic treatment of femoroacetabular impingement was published in the July 15 issue of *Knee Surgery, Sports Traumatology, and Arthroscopy*. Congratulations to Dr. Marc Philippon and authors Maria Schenker, Karen Briggs and David Koppersmith for the article, "Femoroacetabular Impingement in 45 Professional Athletes: Associated Pathologies and Return to Sport Following Arthroscopic Decompression." (See page 6.)

Karen also reports that the World Congress on Osteoarthritis has accepted three podium presentations and four posters at its annual scientific meeting, December 6-9, Ft. Lauderdale, Fla. More than 1,000 of the world's leading scientists, clinical investigators, rheumatologists, clinicians, radiologists, orthopaedists, and others interested in osteoarthritis research are expected to attend the World Congress on Osteoarthritis and take advantage of this global forum, presented annually by Osteoarthritis Research Society International. This year an outstanding program will focus on pain, inflammation, animal models, cartilage breakdown and repair, molecular markers, imaging, cell therapy, health services research, and joint replacement.

Media

The September 23 *Denver Post* sports section featured Dr. Steadman and the Foundation in the article "Steadman Knee-Deep in Healing Powers," by Jason Blevins. "By the early '90s, Vail's Steadman♦Hawkins Research Foundation, a scientific base for pioneering joint research formed by Steadman in 1988, had refined the microfracture technique and proved it successful. He has since lured some of the top orthopedic surgeons in the world to his research foundation."

In the article, Dr. Steadman remarked, "We have great people looking at things that would take me ten years to figure out (before) and now we can figure them out in weeks and months."



SPORTS & WELLNESS

Curbing Muscle Cramps: More than Oranges and Bananas

By E. Randy Eichner, M.D., University of Oklahoma

Adapted and published with permission of the Gatorade Sports Science Institute (GSSI)

Everyone has seen heat cramps — the painful muscular spasms that can take an athlete out of the game. Common in football "two-a-days," heat cramps can also strike in tennis matches, long cycling races, and late in other endurance events. A com-

The first line of evidence
is 100 years of history.
Every generation, it seems,
rediscovers the role of salt
depletion in heat cramping.

mon denominator here seems to be "salty sweating." Yet the causes and mechanisms of heat cramps continue to perplex.

Not all cramps are alike. Writer's cramp, fiddler's cramp, and golfer's yips are not from salty sweating. But three lines of evidence implicate salty sweating - along with muscle fatigue - as the root cause of whole-body heat cramping.

The first line of evidence is 100 years of history. Every generation, it seems, rediscovers the role of salt depletion in heat cramping. In the early 1900s, stokers on ocean liners fought cramping with sea water in their drinking water. British coal miners added salt to beer and water. Their salty water was "about the composition of sweat." Salty milk cut cramps in men building the Hoover Dam. And the U.S. military gave a saline drink to WWII soldiers in desert heat.

The second line of evidence comes from research in athletes. We and others observed clinically that crampers in football and tennis seemed to be "early, heavy, and salty sweaters." Researchers at GSSI and elsewhere gauged sweat rate and sweat sodium in individuals - runners, cyclists, tennis players, football players, and other athletes - and found that crampers tend to have high sweat rates and/or high sweat sodium concentrations. Working with GSSI researchers, in what may be the first on-field metabolic study in Division 1 football, we studied fluid balance, sweat rates, and sweat sodium, and potassium levels during summer workouts and two-a-days in five known heatcrampers versus five matched noncrampers. We showed that crampers



photo: John Kelly



lose more sweat sodium and dehydrate more than noncrampers. It seems likely that the three-fold cause of whole-body muscle cramping is salt depletion, dehydration, and muscle fatigue.

The third line of evidence is therapeutic success. We find "the solution is saline." In general, heatcrampers tend to be lean and fit, intense and explosive, able to stay in action for hours, heavy sweaters, and "salt-cakers." Paradoxically, some of them eat low-salt diets. We urge them to salt their food and eat salt-rich foods. We put pretzels in team meetings. Onfield for crampers, we rotate Gatorade with GatorLytes (about 3- or 4-to-1), with water only as a "chaser." If players do "lock up," we reverse it with the above sports drinks or in the face of vomiting, with intravenous normal saline. Even widespread, severe cramping usually subsides after 2-3 hours and 2-3 L of normal saline.

In conclusion, to prevent heat cramping in athletes, forget potassium, calcium, magnesium, and phosphate. The prevention — and the cure — of heat cramping is salt and fluids. The solution is saline.



FREQUENTLY ASKED QUESTIONS

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

Our goal is to publish the results of all of our research in peer-reviewed medical and scientific journals. Through these publications, our findings are disseminated throughout the world of medicine and science. For example, the Foundation validated and developed microfracture after Dr. Steadman invented this procedure to treat cartilage defects in the knee. The results of the research and the validation process were published in the leading peer-reviewed medical journals. Today, more than one million patients around the world have benefited from microfracture. This and other new procedures and protocols are now in the research pipeline with results to be published soon.

WHAT HAPPENS TO UNRESTRICTED GIFTS RECEIVED BY THE STEADMAN◆HAWKINS RESEARCH FOUNDATION?

Unrestricted gifts are applied to areas of "greatest need." This may include a specific research project, supplies, overhead costs, or support of our Fellowship Program.



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 and enter Affinity Member Code: FOUNDATION, or click on the link below. There is no expiration date. Share the code! Shop and enjoy.

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

SAVE THE DATES

The Beaver Creek Snowshoe Adventure Series, Presented by Pepsi

This family-oriented snowshoe event attracts everyone from the first-time snowshoer to the world's premier snowshoe athletes. Foundation special events benefit the arthritis research and education programs of the Steadman♦Hawkins Research Foundation. In 2007, 34 states and 6 countries were represented in the series. The series is the largest of its kind in North America and will consist of four events throughout the 2007-08 winter season — Sundays, December 16, January 13, February 10 and March 2. The adventure series features 5- and 10-K races, walks and runs, slope-side sponsor expos, and post-event plaza parties.

The North American Snowshoe Championships, the final event in the series, wraps up the season with the highest profile event in the sport.

Steadman♦Hawkins Research Foundation Celebrates 20 Years of Excellence

WINTER WINE FESTIVAL, PRESENTED BY US BANK, IS COMING FEBRUARY 9, 2008.

The fifth annual Steadman-Hawkins Winter Wine Festival, Saturday, February 9, 2008, will celebrate the Foundation's 20th anniversary by bringing together one of the Napa Valley's finest wineries, Silver Oak Cellars, and one of the world's great chefs, Thomas Salamunovich.

During this elegant evening, the award-winning wines of Silver Oak Cellars will be paired with a specially prepared menu created by award-winning Larkspur Restaurant chef, Salamunovich.

In its first four years of existence, this high-end event has been oversubscribed and has attracted some of the world's finest wines and winemakers from Bordeaux, Napa, and Sonoma. The festival has featured principals and winemakers from Château Angélu, Caymus, Château Cos



photo: John Kelly



photo: John Kelly

d'Estournel, Harlan Estate, Château Smith Haut-Lafitte, Château Latour, and Château Pichon.

Reservations for this event are being taken now at the Steadman♦Hawkins Research Foundation's Development office (970) 479-5809 or (970) 479-5788.

Steadman-Hawkins On the Links

**THE PEPSI STEADMAN-HAWKINS
SANCTUARY GOLF TOURNAMENT,
PRESENTED BY RE/MAX INTERNATIONAL,
SET FOR AUGUST 14, 2008**

Proceeds from the fifth 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 209 charities have raised more than 39 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) under "Upcoming Events," or by calling the Development office at (970) 479-5809 or (970) 479-5781.

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



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
Marc Prisant
Executive Vice President and Chief Financial Officer
Amy Ruther
Human Resources Manager
Rachele Palmer
Administration

DEVELOPMENT

John G. McMurtry, M.A., M.B.A.
Vice President for Program Advancement
Paige Prill
Vice President for Development and Communications

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
Melissa Gorden
Bioskills Coordinator
Connor Hay
Research Intern

David Kupper-Smith
Research Intern
Greg Lichtman
Research Intern
Katie Maland
Research Intern
Tiffany Tello
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

Tyler Anstett
Research Intern

John Brunkhorst
Research Intern

Nils Horn
Research Intern

EDUCATION

Greta Campanale
Coordinator

VISUAL SERVICES

Joe Kania
Coordinator
Tage Plantell
Coordinator

Mark Your Calendar:

DECEMBER, 2007 - MARCH, 2008

The Beaver Creek Snowshoe Adventure Series, Presented by Pepsi

This family-oriented snowshoe event attracts everyone from the first-time snowshoer to the world's premier snowshoe athletes. The series will consist of four events throughout the 2007-08 winter season — December 16, 2007; January 13, 2008, February 10, 2008, and March 2, 2008.

FEBRUARY 9, 2008

Fifth Annual Winter Winemaker Festival, presented by US Bank, featuring the wines of Silver Oak Cellars. For more information, contact John McMurtry at (970) 479-5781, john.mcmurtry@shsmf.org

MARCH 5, 2008

Steadman♦Hawkins Research Foundation Celebrates 20th Anniversary at the de Young Museum in San Francisco

For more information, please contact Paige Prill at (970) 479-5788

AUGUST 14, 2008

Pepsi 2008 Steadman-Hawkins Golf Classic, presented by RE/MAX International at Sanctuary in Sedalia, Colo.

For more information, contact John McMurtry at (970) 479-5781 or rachele.palmer@shsmf.org

Executive Editor:

Jim Brown, Ph.D.

Your Legacy, Our Future. Please remember Steadman♦ Hawkins Research Foundation in your will, trust, or other estate plan.



Steadman♦Hawkins
Research Foundation

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

