



photo: John Kelly

PATIENTS IN THE NEWS

C. Wayne McIlwraith: A View From the Top

By Jim Brown, Ph.D., Executive Editor, *UCLA Arthritis Update; Sports Performance Journal*

The first question was a simple one: How did you get from New Zealand to Fort Collins, Colorado? But when his answer began with, "I left New Zealand to lead an Alpine mountain-climbing expedition in Peru," it was clear this was not going to be an ordinary interview.

In fact, there is very little that is ordinary about C. Wayne McIlwraith, D.V.M., Ph.D., Director of the Equine Orthopaedic Research Center at Colorado State University, and a lot that is extraordinary. He holds three doctoral degrees from universities in his native New Zealand and the United States and three honorary degrees from prestigious schools in Austria, New Zealand, and Italy. He was awarded a Diploma of Fellowship at the Royal College of Veterinary Surgeons in London for Meritorious Contributions to Learning and a Diploma of Surgery at the University of Guelph in Canada, where he began to specialize in equine surgery. He has operated on more than 10,000 horses around the world, including a former Kentucky Derby favorite (Indian Charlie) and winner (Spend A Buck). Type his name into Google and you'll get more than 900 entries. In short, Dr. McIlwraith is arguably the foremost equine orthopaedic surgeon in the world.

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Join Us This Summer for Foundation Events

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An avid mountaineer, Dr. McIlwraith is ice-climbing east of Vail this past March, seven months post-total hip replacement.



Fortunately for the Steadman♦Hawkins Research Foundation, he has collaborated with the staff on groundbreaking research projects and he serves as a member of the

Foundation’s Scientific Advisory Committee. And fortunately for Dr. McIlwraith, he has been a beneficiary of Foundation research and the patient-first approach of the Steadman-Hawkins Clinic. On August 9, 2005, he underwent total hip replacement. The osteoarthritis in his hip may have started with a mountain-climbing accident 30 years ago. The surgery took 55 minutes (“skin to skin,” as he calls it) and was performed by Steadman-Hawkins orthopaedic surgeon and hip specialist, Dr. Marc Philippon. “I didn’t select my surgeon overnight and I was confident I was in the best hands. He is a whole new revelation as far as treatment is concerned for hip osteoarthritis. If I had run into him when I first had symptoms, then maybe I wouldn’t have needed surgery.”

Dr. McIlwraith is also quick to acknowledge the connection between the Foundation and the treatment he received. “I couldn’t have gotten the care, and others wouldn’t benefit from the advances Dr. Philippon will continue to make, without research. And research could not be done without support from the Foundation.” The

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To illustrate: An individual funds a CRAT with \$100,000 with a payout rate of 6.0 percent. For the term of the trust, which can be the individual’s lifetime or a number of years, the annual income will be \$6,000 (6.0 percent of \$100,000).

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To illustrate: Using the above example, the income payment the first year is \$6,000. However, if the CRUT’s value increases to \$110,000, the income payment also increases to \$6,600 (6.0 percent of \$110,000).

For information on these benefits and more, please contact John McMurtry at (970) 479-5781 or john.mcmurtry@shsmf.org.

entire process has affected his perspective both as a surgeon and a patient. "I've seen surgery from the other side and it has enhanced my experience.

"The research at the Foundation and the application of that research in other clinics around the world removes many of the limitations on what you can do," says McIlwraith. "Twenty or 30 years ago, doctors wouldn't have repaired a cruciate ligament on an older person. Now Steadman-Hawkins physicians are working on 60- and 70-year-old patients so they can go skiing again. They ask you what you want to do and then do their best to help get you there. I'm doing so well, I plan to rock-climb and ski again. I'll still be able to have fun."

Earlier in the journey that led him to Fort Collins, Dr. McIlwraith got a master of science degree at Purdue University as part of a Ph.D. program. "It gave me an opportunity to do something for the horse." He later went to Michigan State University to study human arthroscopy in the knee. He was the only vet among 120 orthopaedic surgeons, and he eventually started doing diagnostic arthroscopic surgery on the horse.

"My relationship with Dr. Steadman began when Steadman-Hawkins moved to Vail. Bill Rodkey (William G. Rodkey, D.V.M., Director of Basic Science Research at Steadman-Hawkins) got me together with Dr. Steadman and we started doing research on the horse as a model for human orthopaedics."

What would Dr. McIlwraith like the public to know about the Foundation? "Without basic research, we wouldn't have had the advances in improving cartilage repair, getting rid of calcified cartilage during microfracture, or studying ways to use gene therapy on top of the microfracture procedure. The results of Foundation research are fed right back into finding better ways to help people. We're continually finding a better mousetrap."

C. Wayne McIlwraith has seen the top of the world as a mountain climber and he is at the top of his professional world as an equine orthopaedic surgeon and scientist. His contributions as a Scientific Advisory Committee member and his experience as a recipient of Steadman-Hawkins research has



AP/Wide World Photos

Dr. McIlwraith operated on Spend a Buck prior to its winning the 1985 Kentucky Derby, as pictured here with Angel Cordero, Jr., down the stretch to win the third-fastest Derby ever run at the time.

given him a unique perspective. He is more than a "Patient in the News." He is a former patient who makes news that is benefiting both humans and horses.



Special Recognition and Thank You

From time to time, The Steadman◆ Hawkins Research Foundation organizes special fundraising events and auctions that offer unique and varied travel experiences. Proceeds from these activities support the research and educational programs of the Foundation. We are indebted and grateful to several corporations, resorts and tour-guiding organizations for supporting our special events.

Since 2003, **Pepsi Cola** has been an active supporter of the Foundation's efforts to find solutions—through research and education—to help people keep active and mobile by reducing or eliminating the disability and pain associated with arthritis and other joint diseases and injuries.

Earlier in 2006, **WestStar Bank** and the Foundation formed a partnership through common interest and civic duty. Through community fundraisers, WestStar and the Foundation are generating funds for more orthopaedic research and development to better the lives of people in Colorado and beyond.

We also wish to express appreciation to **American Express, HealthONE, Vail Valley Medical Center, RE/MAX International,**

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photo: John Kelly

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and **Vail Resorts** for sponsorship of the Foundation's special events.

This support has played a major role in our ability to conduct critical research, develop leading-edge procedures, and document our procedures and findings for the benefit of the entire medical community. By making our research available to physicians worldwide, the Steadman♦Hawkins Research Foundation is helping to change the way patients are treated.

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SPORTS & WELLNESS

Common Cycling Injuries and How to Prevent Them

By Scott Bartel, M.S.P.T., and Steve Stalzer, M.S.P.T.

Editor's Note: The authors are outpatient orthopaedic and sports physical therapists at Howard Head Sports Medicine Center in Vail, Colorado.

Spring is here and many of us are already putting away the skis and getting out the bicycles. Although a winter full of downhill activities may feel like it has kept you fit, cycling requires a different set of muscle groups and fiber types. As with skiing, if proper off-season training is not performed, your body will usually feel a little beat up following your initial spring cycling sessions. If unprepared, a cycling season with chronic injuries and less enjoyable rides is probable. Three of the most important factors that play into a successful season of cycling (recreational or competitive) include proper off-season training, appropriate pre- and post-riding stretching, and proper bicycle fitting.

OFF-SEASON STRENGTHENING

Off the bike, strength and conditioning training can be a crucial addition to a cycling program and will promote a more enjoyable and successful cycling season. Among the benefits are prevention of over-use injuries, increased endurance, and a more powerful pedal stroke to get up those long mountain passes.

A balanced weight program should include gluteal, hamstring, quadriceps, and calf muscles. Prior to each leg-strengthening workout, begin with a 10- to 15-minute

warm-up and proper stretching. Strength training should be performed two-three times per week during the off-season. Start with three sets of 30-50 repetitions to build endurance. Over time, increase resistance while decreasing repetitions as you focus more on strength and power.

Double/single leg knee bends: This exercise will work the gluteals, quadriceps, and hamstrings. Start with the feet shoulder width apart and toes pointed slightly outward. Perform a squatting motion within a pain-free range for three sets of one-three minutes. Try to stay between 30 and 70 degrees of knee flexion. Progress to single knee bends once three sets of three minutes is achieved.

Leg press: The leg press is an alternative to double or single knee leg bends. Remember to perform the exercise in a pain-free range of motion and to maintain 30 to 70 degrees of knee flexion throughout the exercise.

Carpet drags / hamstring curls: These can be performed with a sport cord in a seated position or by using fitness equipment in either a prone or seated position. Hamstring strength can significantly enhance pedal efficiency by improving on the upward portion of the pedal stroke.

Standing calf raises: While standing with feet shoulder width apart, rise on the toes of both or one leg to work the gastrocnemius and soleus muscles of the calf. Seated calf raises are an alternative to work the soleus, but not the gastrocnemius muscle.

In addition to strength training, aerobic conditioning should be performed three-five times per week for 20-60 minutes each session. Stationary biking, walking on an inclined treadmill, rowing, stair-climbing, and exercising on an elliptical trainer are all great methods for aerobic conditioning and cardiovascular exercise.

STRETCHING

Stretching prior to and after riding is critical to maintaining an injury-free season. Remember to hold all stretches for 20-30 seconds and perform each three times before and after riding.

Standing quadriceps stretch: Stand on one leg while bringing the heel of the other leg toward your buttocks. Maintain



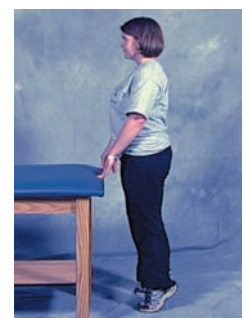
Double/single leg knee bends



Leg press



Carpet drags/hamstring curls



Standing calf raises

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Standing quadriceps stretch



Hamstring stretching



Standing calf stretch

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balance by leaning against a wall if needed. Alternate sides as you provide a gradual stretch to the quadriceps as well as the patella tendon.

Hamstring stretching: While sitting on the ground with one leg extended, maintain the natural curve in your low back as you lean forward and reach toward your toes. Avoid rounding in the low back, as it puts additional stress on the back muscles and discs.

Standing calf stretch: Place one foot behind the other as you lunge forward to stretch the back calf muscle. Bend the back leg as an alternative stretch.

IT band stretch: Stand with the right side next to a wall, cross the left leg over the right leg, and gently push the hip away from the wall. A stretch should be felt near the left hip on the lateral side.

BIKE FIT

Proper bike fit is a critical factor in preventing chronic cycling injuries. While a comprehensive bike fit can be performed at most bike shops, here are some general guidelines:

1. Frame size can be determined by straddling the bike and lifting the top tube up to your crotch. The wheels of a road bike should be about one or two inches off the ground — three-six inches for a mountain bike.
2. Seat height should result in a knee angle of approximately 25-30 degrees when the crank is at bottom dead center.
3. Seat fore and aft position can be found by placing the cranks parallel to the ground. Hang a plumb bob from the kneecap and it should pass through the pedal axle.
4. Seat angle should be approximately level to the ground so that weight is distributed evenly.
5. Handlebar position can be determined by getting down into the drops. If your vision of the front hub is obscured by the handlebar, then you are in approximately the right position.

These guidelines vary with individual goals and specific type of cycling to be performed. For example, a time-trial cyclist will tend to be in a more aerodynamic position and therefore further forward and tucked.

A cross-country tourist is in a more upright position, putting less pressure on the arms due to long hours in the saddle. A bike set-up that distributes too much pressure to the upper extremities may result in wrist, elbow, and shoulder overuse injuries.

These tips should help make the riding season much more enjoyable and should help you attain personal goals in cycling. Be sure to have any injuries addressed by a physician and physical therapist to get you back on the road as quickly and safely as possible. See you on the road!



RESEARCH UPDATE

Bone and Joint Research: The Human-Horse Connection

By Jim Brown, Ph.D.

It is not a coincidence that three of the 13 members on the Steadman♦Hawkins Research Foundation Scientific Advisory Committee (SAC) are veterinarians. Horses, like humans, suffer trauma to the limbs in general and joints in particular. Similar diseases occur in both species. Sixty percent of cases in which horses are retired are due to osteoarthritis. In order to investigate these common problems and develop procedures to treat them, a collaborative research effort has emerged between the Foundation and the Equine Orthopaedic Research Center at Colorado State University.

The men behind the initial arrangement were J. Richard Steadman, M.D., Founder and Chairman of the Foundation; C. Wayne McIlwraith, D.V.M., Ph.D., Director of the Equine Orthopaedic Research Center at Colorado State; and William Rodkey, D.V.M.; Chairman of the Advisory Committee and Director of Basic Science at Steadman-Hawkins. A third veterinarian and SAC member is Steven P. Arnoczky, D.V.M., Director of the Laboratory for Comparative Orthopaedic Research at Michigan State. Pioneering work by Dr. Arnoczky has been important in the development of treatment for meniscus injuries. "In December of 1990," recalls Dr. McIlwraith, "Dr. Rodkey introduced me to



Dr. McIlwraith (right) operating on a horse's stifle (knee) joint.

Dr. Steadman. He had developed the straightforward but brilliant idea of microfracture to access healing elements in the bone marrow underneath cartilage defects. But he also needed to provide scientific validation with control subjects and we had the horses to fulfill that role. I had been frustrated with previous methods of bone marrow access, so a research project was begun by the Foundation and our Orthopaedic Research Center. It was initially funded by NFL Charities, the philanthropic arm of the National Football League."

Horses are bigger and stronger than humans, but the thickness of cartilage in their equivalent of the human knee is very similar. Research at CSU showed that, in the long term, there was significantly more repair tissue in defective areas after microfracture. In the short term, microfracture caused an increase in the production of the specific collagen contained in articular cartilage. Dr. Steadman's clinical findings have made microfracture a primary technique used around the world for promoting the repair of defects in articular cartilage.

"Other techniques used in equine research can be useful to humans," says Dr. McIlwraith. "We can control the exercise routine of horses and we can submit them to athletic exercise. It's pretty tough to get sheep to trot on a treadmill. We can also do things arthroscopically, which is not possible with smaller species. The only criticism is that the horse doesn't stand on its hind legs, but it still has the same weight-bearing

area where defects in the cartilage occur."

Equine research at Colorado State was able to demonstrate that some of the changes occurring as a result of microfracture could not happen without it. It has also shown that, for microfracture to be more effective, the calcified layer of cartilage has to be removed. Without removing it, healing is inferior. This kind of basic research has changed the way Dr. Steadman and his colleagues at Steadman-Hawkins conduct surgery. Now, research funded by the Foundation and conducted at the Equine Orthopaedic Research Center is investigating ways to further enhance healing through gene therapy. The process has not made its way into the clinical arena for horses or humans, but it's coming. "We're still trying to find an agent to carry the gene into the joint without triggering an immune reaction," says Dr. McIlwraith. In addition, researchers are looking into the effectiveness of using electrostimulation following the microfracture procedure. If it works in horses, it will be tried in humans.

"Others are doing equine research," concludes Dr. McIlwraith, "but the relationship between the Steadman-Hawkins Research Foundation and the Equine Orthopaedic Research Center is unique. No other groups have so many world-class physicians and researchers like Drs. Steadman, Hawkins, Feagin, Philippon, Sterrett, and their colleagues. The combination of our two groups working together and the support we get from individuals and organizations have advanced medicine, as well as the fields of human and equine orthopaedics."



MEET OUR STAFF

Erik Giphart, Ph.D.

Erik Giphart joined the Steadman-Hawkins Research Foundation staff in January of 2004 as an intern and currently holds the position of Motion Analysis Laboratory Coordinator. His primary focus this year is on designing and building a second-in-the-world, high-speed biplane fluoroscopy system in the Biomechanics Research Laboratory. With this sophisticated

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x-ray system, which creates movies of moving bones, joint motion can be tracked with sub-millimeter accuracy. This allows for the measurement of ligament lengthening and perhaps even cartilage indentation during activities such as walking, running, and throwing a ball. Not only are these measurements currently unknown, they are critical in understanding ligament and cartilage function and their surgical reconstruction or repair, as well as their contribution to the development and progression of osteoarthritis. This project will open entirely new avenues of research for

the Foundation and will greatly improve ongoing research projects.

Erik, a Dutch citizen, earned his M.S. degree in Electrical Engineering from Delft University of Technology in 1994 with a focus on Computer Science and Information Theory. As part of his M.S. program he was required to complete a three-month internship outside of the university. He found an internship at the NeuroMuscular Research Center (NMRC) in Boston and has been in the United States ever since. "You have to be flexible to take advantage of great opportunities. I was going to visit the U.S. for three months plus a vacation. That was 12 years ago." In 2001 he received his Ph.D. in Biomedical Engineering at Boston University after performing his dissertation work at the NMRC on postural control. After graduation, he created a virtual reality laboratory at Sargent College of Health and



photo: John Kelly

Rehabilitation Sciences, Boston University, to study how perceptual deficits modify locomotion in patients who suffer from various diseases.

"I feel that with my new position I have essentially come full circle with my training. I almost completed my M.S. thesis in medical image processing in the Netherlands, but decided to stay and complete my thesis work at the NMRC in Boston, instead. This got me involved with human movement studies and biomechanics. After working with 3D VR environments for three years and furthering my skills in motion analysis, I found out about the great work the Biomechanics group does at the Foundation. With the advanced image processing, 3D modeling, as well as cutting-edge biomechanics required to analyze the fluoroscopy data, I feel I have found my home."

Applying his engineering skills to medical and orthopaedic problems is very fulfilling for Erik and is inspired by his family. Erik's mother, Johanna, suffers from post-polio syndrome, and she had her ankle fused many years ago. He clearly remembers her suffering after countless surgeries on her ankle and foot. Being able to understand her limitations and to give her some advice based on his current knowledge is satisfying for him. Erik's sister, Anja, is an MD-MPH who has lived and worked in Africa for most of the past 14 years. After being the only Western doctor in small regional hospitals in Zambia and Mozambique, saving lives every day, she now lives in Dar es Salaam, Tanzania, with her husband and adopted children, and works for the Elizabeth Glaser Pediatric AIDS Foundation to prevent transmission of HIV from mother to child. Erik draws a lot of inspiration from his sister's work.

Erik and his wife, Courtney, an architect for Morter Architects in Vail, moved to Courtney's home state of Colorado in the summer of 2003 after deciding it was time to start a family. They currently live in Edwards with their two children. They enjoy skiing, hiking, and snow-shoeing with their dog Brooke, and all other activities the mountains bring.



Awards

Congratulations to the Clinical Research Department and to former Steadman-Hawkins Fellows Drs. Kevin Crawford and Peter Millett. The Arthroscopy Association of North America presented the **2006 Resident Fellow Essay Award** to **Kevin Crawford, M.D.**, for the paper *Reliability, Validity and Responsiveness of the IKDC Score for Meniscus Injuries of the Knee*. Co-authors included Karen Briggs, M.B.A., M.P.H.; William G. Rodkey, D.V.M.; and J. Richard Steadman, M.D.



Peter J. Millett, M.D.

Former Fellow and current Steadman-Hawkins partner **Peter Millett, M.D.**, was a co-recipient of the **2005 George J. Davies - James A. Gould Excellence in Clinical Inquiry Award** for the article *Rehabilitation Following Total Shoulder Arthroplasty*. The award is given annually by the *Journal of Orthopaedic & Sports Physical Therapy* for the best article published in the Journal during a calendar year.



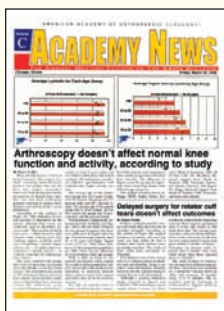
photo: John Kelly

STEADMAN-HAWKINS UPDATE

Publications, Presentations, and Research

The Steadman♦Hawkins Research Foundation has been making headlines in 2006 with numerous papers being accepted by prestigious medical and scientific societies and journals.

The year started off with a very significant acceptance. *The Journal of Knee Surgery* published the first Foundation paper on a procedure pioneered by Dr. Steadman and developed and validated by the Foundation, *A Minimally Invasive Technique (Healing Response) to Treat Proximal ACL Injuries in Skeletally Immature Athletes*.



Another paper produced, *Patient Knee Function and Activity Level Five-Year Post-Arthroscopy Compared to Normal Values*, was the featured headline article in the March 24 issue of "Academy News," the daily publication of the 73rd Annual Meeting of the American Academy of Orthopaedic Surgeons held in Chicago.

2006 International Cartilage Research Symposium January 2006, San Diego, California

The symposium is organized by the International Cartilage Repair Society. The society is a professional scientific and medical organization established to promote excellence in cartilage research, to foster integration of basic and clinical science, and to facilitate the translation of that science to healthcare and clinical practice.

The society has accepted three podium and three poster presentations:

Podium

Association between Patellar Mobility and Patellofemoral Chondral Defects. J. Richard Steadman, M.D.; Karen K. Briggs, M.B.A., M.P.H.; and William G. Rodkey, D.V.M.

Factors Associated with Large Cartilage Defects in the Hip Identified at Arthroscopy. Marc J. Philippon, M.D.; Karen K. Briggs, M.B.A., M.P.H.; and Allston Stubbs, M.D.

Tissue Gain after Placement of a Collagen Meniscus Implant Following Partial Medial Meniscectomy. William G. Rodkey, D.V.M.; and J. Richard Steadman, M.D.

Poster

Second-Look Arthroscopy of Chondral Lesions of the Acetabulum Treated with Arthroscopic Microfracture. Marc J. Philippon, M.D.; Mara Schenker; Karen K. Briggs, M.B.A., M.P.H.; and A. Stubbs, M.D.

Psychometric Properties of the Lysholm Knee Score and Tegner Activity Scale for Meniscus Injuries of the Knee. K. Crawford, M.D.; Karen K. Briggs, M.B.A., M.P.H.; and J. Richard Steadman, M.D.

Development and Use of the "Tegner Index" to Assess Effectiveness of Arthroscopic Treatment of the Knee Meniscus on Return to Activity. William G. Rodkey, D.V.M.; and J. Richard Steadman, M.D.

2006 Annual Meeting of the American Academy of Orthopaedic Surgeons

The 73rd Annual Meeting of the American Academy of Orthopaedic Surgeons (AAOS), Chicago, March 22-26, 2006, accepted four podium and five poster presentations highlighting Foundation research, and three teaching videos.

The academy provides education and practice management services for orthopaedic surgeons and allied health professionals. The academy also serves as an advocate for improved patient care and informs the public about the science of orthopaedics. Founded as a not-for-profit organization in 1933, the academy has grown from a small organization serving less than 500 members to the world's largest medical association of musculoskeletal specialists. The academy now serves about 24,000 members internationally.

Podium

Return to Sport Following Arthroscopic Decompression for Femoroacetabular Impingement in Athletes. Marc J. Philippon, M.D.; Karen K. Briggs, M.B.A., M.P.H.; and Mara Schenker.

Patient Knee Function and Activity Level Five-Year Post-Arthroscopy Compared to Normal Values. Karen K. Briggs, M.B.A., M.P.H.; Sophie Hines; and J. Richard Steadman, M.D.

Detection of Partial Tears of the Ligamentum Teres of the Hip Using MR Arthrography. Marc J. Philippon, M.D.; D. Armfield; and R. R. Martin.

Tissue Gain after Placement of a Collagen Meniscus Implant Following Partial Medial Meniscectomy. William G. Rodkey, D.V.M., and J. Richard Steadman, M.D.

Poster

Lysholm Score and Tegner Activity Level in Normal Knees. Karen K. Briggs, M.B.A., M.P.H.; S. Hines; and J. Richard Steadman, M.D.

Psychometric Properties of the IKDC Score for Meniscus Injuries of the Knee. Kevin Crawford, M.D.; Karen K. Briggs, M.B.A., M.P.H.; William G. Rodkey, D.V.M.; and J. Richard Steadman, M.D.

Three-to-Five-Year Follow-up of Hip Arthroscopies in Professional Golfers. Marc J. Philippon, M.D.; and Kevin Crawford, M.D.

Can Hip Pain Distribution Distinguish between Labral Tears and ITB Syndrome? Marc J. Philippon, M.D.; and R. R. Martin.

Arthroscopic Hip Labral Repair: A New In Vivo Model. Marc J. Philippon, M.D.; A. S. Turner, B.V.Sc., M.S.; T.N. Trumble, D.V.M., M.S.; D.L. Wheeler; A. Torrie; B.T. Kelly; and Steven P. Arnoczky, D.V.M.

Additionally, **The American Orthopaedic Society for Sports Medicine Specialty Day** accepted three podium presentations:

Return to Sport Following Arthroscopic Decompression for Femoroacetabular Impingement in Athletes. Marc J. Philippon, M.D.; Karen K. Briggs, M.B.A., M.P.H.; and Mara Schenker.

Complete Proximal Adductor Longus Ruptures in Professional Football Players. Theodore S. Schlegel, M.D.; and J.M. Godfrey, M.D.

AC Joint Reconstruction with CA Ligament Transfer Using the Docking Technique. I. H. Pacheco, R. Gobezie, B. Krastins, N. Tsaniklides, and Peter J. Millett, M.D.

American Academy of Orthopaedic Surgeons Multimedia Education Center

The academy also accepted three teaching multimedia (Video/DVD) presentations produced by the Foundation:

Arthroscopic Management of Femoroacetabular Impingement. Allston J. Stubbs, M.D.; and Marc J. Philippon, M.D.

Hip Arthroscopy Set-Up and Anatomically Guided Portal Placement. Allston J. Stubbs, M.D.; and Marc J. Philippon, M.D.

Triceps Tendon Ruptures in Professional Football Players. Laurence R. Laudicina, M.D.; Theodore F. Schlegel, M.D.; Scott D. Mair, M.D.; and Richard J. Hawkins, M.D.

2006 Arthroscopy Association of North America May 2006, Miami, Florida

Arthroscopy Association of North America (AANA) is an accreditation council for continuing medical education, which exists to promote through continuing medical education functions the development and dissemination of knowledge in the discipline of arthroscopic surgery.

AANA accepted the following two podium presentations and three poster presentations:

Podium

Second-look Arthroscopy of Chondral Lesions of the Acetabulum Treated with Arthroscopic Microfracture. Marc J. Philippon, M.D.; Mara Schenker; and Karen K. Briggs, M.B.A., M.P.H.

Factors Associated with Revision Hip Arthroscopy. Marc J. Philippon, M.D.; Allston J. Stubbs, M.D.; Mara Schenker; and Karen K. Briggs, M.B.A., M.P.H.

Poster

Validation of the IKDC Score for Meniscus Injuries of the Knee. Kevin Crawford, M.D.; Karen K. Briggs, M.B.A., M.P.H.; William G. Rodkey, D.V.M.; and J. Richard Steadman, M.D.

Four-to-six-year Follow-up of Hip Arthroscopies in Professional Athletes. Marc J. Philippon, M.D.; Mara Schenker; and Allston J. Stubbs, M.D.

Three-Year Outcome of Hip Arthroscopy. Marc J. Philippon, M.D.; R. R. Martin; and Mara Schenker.

2006 European Society of Sports Traumatology Knee Surgery and Arthroscopy Annual Meeting, May 2006, Innsbruck, Austria

The European Society of Sports Traumatology, Knee Surgery and Arthroscopy (ESSKA) promotes the exchange of data covering research into the scientific and practical aspects of knee ailments. ESSKA has accepted the following four podium and six poster presentations for the annual meeting.

Podium

Psychometric Properties of the Lysholm Knee Score and Tegner Activity Scale for Osteoarthritis of the Knee. Karen K. Briggs, M.B.A., M.P.H.

Four-to-Six-Year Follow-up of Hip Arthroscopies in Professional Athletes. Marc J. Philippon, M.D.; Mara Schenker; and Allston J. Stubbs, M.D.

The Log Roll Test for Hip Instability. Marc J. Philippon, M.D.; Mara Schenker; Karen K. Briggs, M.B.A., M.P.H.; and Allston J. Stubbs, M.D.

(continued on page 12)

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Demographics of Cam and Pincer Hip Impingement.

Marc J. Philippon, M.D.; Mara Schenker; Karen K. Briggs, M.B.A., M.P.H.; and Allston J. Stubbs, M.D.

Poster

Clinical Presentation of Hip Instability. Marc J. Philippon, M.D.; Mara Schenker; Karen K. Briggs, M.B.A., M.P.H.; and Allston J. Stubbs, M.D.

Clinical Presentation of Femoroacetabular Impingement.

Marc J. Philippon, M.D.; Mara Schenker; Karen K. Briggs, M.B.A., M.P.H.; and Allston J. Stubbs, M.D.

A Three-Year Outcome Study of Hip Arthroscopy.

Marc J. Philippon, M.D.; R. R. Martin, and Mara Schenker.

Factors Associated with Revision Hip Arthroscopy.

Marc J. Philippon, M.D., Allston J. Stubbs, M.D., Mara Schenker, and Karen K. Briggs, M.B.A., M.P.H.

Lysholm Score and Tegner Activity Level in Normal

Knees. Karen K. Briggs, M.B.A., M.P.H.; Sophie Hines; and J. Richard Steadman, M.D.

Patient Knee Function and Activity Level Five-Year Post-Arthroscopy Compared to Normal Values.

Karen K. Briggs, M.B.A., M.P.H.; Sophie Hines; and J. Richard Steadman, M.D.

2006 American Orthopaedic Society for Sports Medicine, Annual Meeting, June 2006, Hershey, Pennsylvania

The American Orthopaedic Society for Sports Medicine (AOSSM) is a national organization of orthopaedic surgeons specializing in sports medicine, including national and international sports medicine leaders. The AOSSM works closely with many other sports medicine specialists and clinicians, including family physicians, emergency physicians, pediatricians, athletic trainers, and physical therapists, to improve the identification, prevention, treatment, and rehabilitation of sports injuries.

AOSSM has accepted the following three poster presentations:

Podium

Clinical Presentation of Femoroacetabular Impingement.

Marc J. Philippon, M.D.; Mara Schenker; Karen K. Briggs, M.B.A., M.P.H.; and Allston J. Stubbs, M.D.

Interference Screw vs. Suture Anchor Fixation for Open Subpectoral Biceps Tenodesis: Does It Matter?

Peter J. Millett, M.D.; R. Gobezie; B. Krastins; N. Tsaniklides; and J. P. Warner, M.D.

AC Joint Reconstruction with CA Ligament Transfer

Using the Docking Technique. I. H. Pacheco, R. Gobezie, B. Krastins, N. Tsaniklides, and Peter J. Millett, M.D.

The International Symposium on Ligaments and Tendons, March 18, 2006, Chicago, Illinois

This symposium provides a forum to discuss state-of-the-art ligament and tendon research. By bringing together leaders as well as budding investigators in our field, we hope to address challenging problems in clinical management of ligament and tendon injuries, and set new directions in biomechanical and biological research that hold great potential for the future.

The symposium accepted the following abstract:

Muscle and Ligament Restraints to the Adductor

Moment during Normal Gait. Kevin B. Shelburne, Ph.D.;

Michael R. Torry, Ph.D.; William I. Sterett, M.D.;

J. Richard Steadman, M.D.; and Marcus G. Pandy, Ph.D.

American College of Sports Medicine Annual Meeting, June 1-4, 2006, Denver, Colorado

The American College of Sports Medicine (ACSM) promotes and integrates scientific research, education, and practical applications of sports medicine and exercise science to maintain and enhance physical performance, fitness, health, and quality of life.

ACSM has accepted the following seven abstracts for the annual meeting in Denver:

Non-Contact ACL Injury: An Interdisciplinary Approach to a Complex Problem. Kevin B. Shelburne, Ph.D.

The Structure and Function of Articular Cartilage and the Initiation, Progression, Treatment and Rehabilitation

of Knee Osteoarthritis. American College of Sports

Medicine - Special Featured Session. Michael R. Torry,

Ph.D.; Van C. Mow, Ph.D.; Thomas P. Andriacchi, Ph.D.;

J. Richard Steadman, M.D.; and C. Riegger-Krugh,

Sc.D., P.T.

Role of the Lower-Extremity Musculature in Maintaining

Knee Stability during Gait. American College of Sports

Medicine Special Featured Session, The Structure and

Function of Articular Cartilage and the Initiation,

Progression, Treatment and Rehabilitation of Knee

Osteoarthritis. Marcus G. Pandy, Ph.D.; Kevin B.

Shelburne, Ph.D.; and Michael R. Torry, Ph.D.

Biomechanics of a Failed Single Legged Landing due

to Fatigue. T. W. Kernozek; Michael R. Torry, Ph.D.;

B. J. Wallace; and E. J. Miller

Differences in Kinematics between Youth and

Professional Baseball Players. Tom R. Hackett, M.D.;

Michael R. Torry, Ph.D.; Michael J. Decker, M.S.;
M. Sabick, Ph.D.; Tom Noonan, M.D.; Richard J. Hawkins,
M.D.; and Peter Millett, M.D.

Forces at the Shoulder During the Baseball Pitch in Youth and Professional Baseball Throwers. Tom Noonan, M.D.; Michael R. Torry, Ph.D.; Michael J. Decker, M.S.; M. Sabick, Ph.D.; Tom R. Hackett, M.D.; Richard J. Hawkins, M.D.; and Peter Millett, M.D.

Musculo-Tendon Length during Pendulum Exercise. Takashi Yanagawa, M.A.; Kevin B. Shelburne, Ph.D.; Michael R. Torry, Ph.D.; and Marcus G. Pandy, Ph.D.

World Congress of Biomechanics, July 29 - August 4, 2006, Munich, Germany

Biomechanics covers a wide field, from solid to fluid mechanics, and from motion sports mechanics to automobile crash tests. It includes tissue engineering and biomaterials, artificial organs, and sports therapy.

At the 5th World Congress the newest experimental studies will be presented. Special emphasis will be placed on state-of-the-art technology and medical applications. Only new, unpublished papers will be accepted.

The congress has accepted the following six abstracts:

Shoulder Kinematic and Kinetic Pitching Profiles in Youth and Professional Baseball Players. Michael R. Torry, Ph.D.; M. Sabick, Ph.D.; Michael J. Decker, M.S.; Tom R. Hackett, M.D.; Richard J. Hawkins, M.D.; and Peter Millett, M.D.

Differences in Trunk Control between Youth and Professional American Baseball Pitchers. Michael R. Torry, Ph.D.; M. Sabick, Ph.D.; Michael J. Decker, M.S.; Tom R. Hackett, M.D.; Richard J. Hawkins, M.D.; and Peter Millett, M.D.

Effect of Tibial Plateau Angle on Knee Loads during Activity. Kevin B. Shelburne, Ph.D.; Michael R. Torry, Ph.D.; William I. Sterett, M.D.; and Marcus G. Pandy, Ph.D.

Dependence of Tibiofemoral Load on Body Position in Two-Legged Stance. Kevin B. Shelburne, Ph.D.; H-J Kim; J.W. Fernandez; J. Erik Giphart, Ph.D.; Michael R. Torry, Ph.D.; William I. Sterett, M.D.; and Marcus G. Pandy, Ph.D.

Contributions of the Rotator Cuff Muscles to Glenohumeral Joint Mechanics During the Belly Press. Taka Yanagawa, M.A.; Michael R. Torry, Ph.D.; Kevin B. Shelburne, Ph.D.; and Marcus G. Pandy, Ph.D.



photo: John Kelly

Moment Arms of the Upper and Lower Portions of the Subscapularis Muscle. Taka Yanagawa, M.A.; Michael R. Torry, Ph.D.; Kevin B. Shelburne, Ph.D.; and Marcus G. Pandy, Ph.D.



Vail Cartilage Symposium Website Now Live
Please visit www.vailcartilage.com to view the website. Physicians around the world can access the site, watch the webcast and earn continuing medical education credit.

In August 2005, the professionals and staff of the Steadman♦Hawkins Research Foundation hosted the Third Vail Cartilage Symposium in Vail, Colorado. The two-day meeting, funded by educational grants from Pfizer, Inc.; Genzyme Biosurgery; Innovation Sports, Inc.; and GlaxoSmithKline, featured a world-renowned, international faculty of orthopaedic surgeons, each of whom has pioneered innovative procedures for treating articular cartilage injuries.

With growing worldwide interest and concern over the increase in degenerative arthritis, this seminar was timely and relevant to both the orthopaedic world and lay community. A direct outcome of the symposium was the production of an accredited continuing medical education online webcast and DVD. The symposium is available free of charge to physicians worldwide to access upon request, thus broadening the audience and making this unique educational opportunity available to many who otherwise would not be able to participate. Co-chairs of the event were Dr. J. Richard Steadman, founder of the Steadman♦Hawkins Research Foundation and principal of the Vail-based Steadman-Hawkins Clinic, and Dr. Martin Boublik, principal of the Steadman-Hawkins Denver Clinic.





photo: John Kelly

FREQUENTLY ASKED QUESTIONS

IS THERE A TAX BENEFIT FOR CONTRIBUTING TO THE STEADMAN♦HAWKINS RESEARCH FOUNDATION?

Yes, the Foundation is a tax-exempt non-profit charitable organization under section 501(c)(3) of the IRS tax code. Contributions to the Foundation are deductible to the donor as allowed by law. For further information on tax-exempt organizations, please speak to a tax or financial advisor.

WHAT IS AN EXAMPLE OF A RESEARCH PROJECT THAT HAS MADE ITS WAY INTO CLINICAL PRACTICE?

Pioneered by Dr. Steadman, the development and validation of the microfracture technique by the Foundation has impacted multitudes of patients worldwide. Just 12 years ago, only a small percentage of the world's orthopaedic surgeons performed microfracture. Today, it is the treatment of choice among surgeons all over the world to relieve pain and slow the progression of arthritis in the knee. This procedure may also prevent or at least postpone the need for irreversible and highly invasive knee-replacement surgery.

WHAT'S THE DIFFERENCE BETWEEN THE FOUNDATION'S DEPARTMENTS OF BASIC SCIENCE RESEARCH, BIOMECHANICS RESEARCH LABORATORY, AND CLINICAL RESEARCH?

The purpose of our Basic Science Research is to gain a better understanding of factors that lead to degenerative joint disease and osteoarthritis. Our focus is to develop new surgical techniques, innovative adjunct therapies, rehabilitative treatments, and related programs that will help prevent the development of degenerative joint disease.

The Biomechanics Research Laboratory (BRL) is a multidisciplinary laboratory in which the principles of mathematics and engineering are applied to solving complex problems in orthopaedic medicine. A main objective of the BRL is to explain how and why treatments, surgeries, and various therapies work for some individuals and not for others.

In Clinical Research, we strive to improve the quality of patient-reported outcomes following surgical procedures. Our department focuses on results based on physician/patient assessment of improvement of the function and quality of life. Our goal is to learn from the experiences of patients to validate treatment protocols and assist patients in making decisions regarding their health care.

HOW WAS SUPPORT USED IN 2005?

Donor support was used in the following ways:

- Seven Fellows were trained.
- Twenty-two studies were published.
- One international symposium was hosted and a worldwide webcast on cartilage was produced, featuring the newest and best treatment options.
- Twenty-five research studies were continued.
- Research partners thrived in six states and Australia.
- Millions of people were helped.

Your gift today is essential to keep us moving forward!



Save the Dates:

STEADMAN-HAWKINS SANCTUARY GOLF TOURNAMENT SET FOR AUGUST 17

The Steadman♦Hawkins Research Foundation has been selected by RE/MAX International, a global real-estate firm, to hold the third *Pepsi 2006 Steadman-Hawkins Golf Classic, presented by REMAX International* at the Sanctuary, a premier golf resort located south of Denver near Sedalia. Proceeds from the 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 includes 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 38 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



Spectacular Sanctuary!



photo: John Kelly

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.

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

FOUNDATION CELEBRATES COLORADO EVENING, PRESENTED BY WESTSTAR BANK

A lifetime of excellence will be on display Saturday, August 19, in Vail, Colo., as the Steadman♦Hawkins Research Foundation hosts the "Colorado Classic," an evening culinary extravaganza. *The Colorado Evening, presented by WestStar Bank*, will feature superb cuisine, courtesy of some of the Vail Valley's finest restaurants, award-winning wines, and opportunities to bid on the dreams of a lifetime.



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.

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Mara Schenker
Research Intern

EDUCATION

Greta Campanale
Director

Ashley King
Educational/Development Program Assistant

TECHNICAL RESOURCES

VISUAL SERVICES

Joe Kania
Coordinator

Mark Your Calendar:

AUGUST 17

Pepsi 2006 Steadman-Hawkins Golf Classic, presented by RE/MAX International at the Sanctuary in Sedalia, Colorado.

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

AUGUST 19

Steadman-Hawkins Colorado Evening, Presented by WestStar Bank.

Celebrate an evening of Vail Valley cuisine and the opportunity to bid on the dreams of a lifetime. For more information, contact Rachele Palmer at (970) 479-5809, rachele.palmer@shsmf.org

DECEMBER 7-9

Thirteenth Annual Steadman♦Hawkins Research Foundation Fellows Meeting.

For more information, contact Greta Campanale at (970) 479-5782, greta.campanale@shsmf.org

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

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



Steadman♦Hawkins
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