

Steadman-Hawkins



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Volume 11

Research Foundation

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Patients in the News

AI Perkins: From Patient to Advocate

By Jim Brown, Ph.D.

Editor's Note: Jim Brown is the Executive Editor of the *Sports Performance Journal*, a publication of Athletes' Performance in Phoenix, and a contributing writer to *The Arthritis Advisor* and *Health News*.

He knew it was a serious injury the moment it happened. AI Perkins, a 215-pound defensive back at the University of New Hampshire, took a hit to the side of his left knee. It caused an anterior cruciate ligament tear and the loss of a piece of cartilage nearly the size of a quarter.

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Photo: John Kelly

Sports and Wellness

Playing With Arthritis: How to Manage and Avoid Pain

By Hershel Sarbin and Jim Brown, Ph.D., co-authors, *A Different Game: Golf After 50*

One-third of all Americans suffer (or will suffer) from some form of arthritis. The other two-thirds knows somebody who has the condition. So whether you're a player, a player's spouse, or a friend of a golfer who plays with arthritis, here are some suggestions from the Arthritis Foundation to make golf more enjoyable and less painful.

Instead of slowing you down, there is a case to be made for what golf can do for you and your arthritis. Walking the course is good for maintaining proper weight and improving your cholesterol count. Swinging a club enhances upper body

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Steadman-Hawkins Research Update

The Package: New Treatment Breakthroughs for the Arthritic Knee

By Bruce S. Miller, M.D.

Editor's Note: Dr. Miller is an Assistant Professor of Orthopaedic Surgery at the University of Michigan in Ann Arbor, Michigan. He specializes in sports medicine surgery and is a team physician for the University of Michigan Athletic Department and the U.S. Ski Team. Dr. Miller is a graduate of the Steadman-Hawkins Fellowship Program.

Osteoarthritis is one of the most common maladies in adults and is estimated to affect 70 million Americans (nearly one in three adults). The disease is caused by degeneration of joints, specifically, loss of the cartilage that caps the end of bones and enables smooth and painless motion of joints. Arthritis is characterized by

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Photo: John Kelly

An International Center for Research and Education—Keeping People Active

Foundation Ranks First in Production of Scientific Journal Publications

By Mininder S. Kocher, M.P.H., M.D.

Editor's Note: Dr. Kocher, a former Steadman-Hawkins Fellow, is a member of the Scientific Advisory Committee of the Steadman-Hawkins Research Foundation. He is an Assistant Professor of Orthopaedic Surgery at Harvard Medical School/Harvard School of Public Health, the Assistant Director of the Division of Sports Medicine at Children's Hospital Boston, and the Director of the Clinical Effectiveness Research Unit at Children's Hospital Boston.

Academic medicine has three primary focuses: patient care, research, and teaching. The benchmark for performance in medical research is publication in major medical journals. The number of publications in major medical journals is a primary consideration in assessing the strength of an academic department or organization and in the promotion of an academic physician. The three major medical journals in orthopaedic sports medicine are *The Journal of Bone and Joint Surgery*, *The American Journal of Sports Medicine*, and *Arthroscopy*.

The Steadman-Hawkins Research Foundation tracked its number of publications in these three journals from 2002 to 2004 and compared the results to four other top academic sports medicine programs: The Cleveland Clinic, The Hospital for Special Surgery in New York City, The University of Pittsburgh, and Methodist Sports Medicine in Indianapolis (see Table). The Steadman-Hawkins Research Foundation ranked first in number of publications in these three major medical journals.

Medical journals disseminate state-of-the-art research findings to physicians.

Physicians may change the way they treat patients based on articles in medical journals. The process of publication in major medical journals is very rigorous. After a research study has been completed and presented at major medical meetings, the study is written as a scientific manuscript. The manuscript conforms to a standardized style: introduction, methods, results, discussion, references, and figures. The manuscript is then submitted to a medical journal. The editors of the medical journal review the manuscript and send it to three or more experts for review. This peer review process is the key in ensuring quality research. The reviewers are "blinded" to the identity of the authors and the authors are "blinded" to the identity of the reviewers. The editors of the journal consider the reviewers' comments and either reject or accept the manuscript. Once accepted, the manuscript undergoes several revisions based on comments and suggestions from the editors and reviewers.

Such benchmarking in terms of number of publications in major medical journals is very important in assessing the quality and quantity of medical research produced by an academic department or organization. In addition to the superior educational strength of the Fellowship Program, the Steadman-Hawkins Research Foundation is the leader among academic sports medicine programs in terms of quality and quantity of research publications.

You Tell Us!

You want to make a difference. You want your gift to impact some of the most promising initiatives in the fields of research, education, and treatment. And what we want is for you to tell us how to use your gift to accomplish that.

Where Do You Want Your Gift To Go?

An unrestricted gift is the most flexible way to make a difference and allows you to have a share in everything we do. When an unrestricted gift is received, the Foundation can direct it to where the need is greatest as well as focus on where the opportunities are greatest.

To have a specific impact on an area of work in which you are particularly interested, consider creating a named fund. Your fund can support a program for one year or multiple years. To have an impact that outlasts your lifetime, you can fund a program in perpetuity. Areas that can be funded include, but are not limited to:

- ◆ A five-year named academic chair.
- ◆ A Fellowship sponsorship.
- ◆ A study on gene therapy in cartilage development.
- ◆ A study on improving treatments for the degenerative knee.
- ◆ A study on the effects of age and muscular weakness on the arthritic knee.

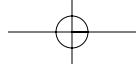
Worldwide Impact

Your gift will have practical and far-reaching effects because when we develop or refine a surgical or treatment procedure, we share it with surgeons all over the world to benefit the thousands of patients for which they care.

The Foundation wants to recognize your thoughtful generosity through these naming opportunities and show others that the care they receive in the future will be made better by the difference your gift is making today. We would be pleased to create a funding opportunity to meet your philanthropic and financial objectives. Please contact John McMurtry at 970-479-5781 or e-mail to: john.mcmurtry@shsmf.org

Knee and Shoulder Publications: 2002 - 2004

	Journal of Bone and Joint Surgery	American Journal of Sports Medicine	Arthroscopy	Total
<i>Steadman-Hawkins Research Foundation</i>	2	8	2	12
Cleveland Clinic	1	2		3
University of Pittsburgh	1	3	2	6
Hospital for Special Surgery, New York City	2	4	4	10
Methodist Sports Medicine, Indianapolis	1	6	1	8



We're Changing Our Name

For 16 years, we've helped people perform at their highest level possible, but the name Sports Medicine implies that we only treat athletes. Nothing could be further from the truth! Our research helps people from all walks of life. Thanks to many donors and supporters, our Foundation is the leading independent orthopaedic research foundation in the world. And so we're changing our name to the Steadman◆Hawkins Research Foundation.

We're giving credit where credit is due. This Foundation was founded by Dr. Steadman for the purpose of keeping people active for life—elite athletes, weekend warriors, high school heroes, mid-lifers, and even those of us who hung up our skis, cleats, and baseball gloves many years ago. We all benefit from the work of the Steadman◆Hawkins Research Foundation and the Foundation benefits tremendously from you.

Since 1990, the Foundation has spent \$25 million on research, education, and support programs. We couldn't have done this without the commitment, dollars, and concerns of many individuals.

The desire of each of us to lead a full, active life has been the driving force for the groundbreaking treatment protocols pioneered by the Foundation and its unique philosophy of treating and helping prevent degenerative arthritis. Because we believe that the body's own tissue is the optimum restorative medium, we're focused on how the body heals itself and we're developing leading-edge research and treatment techniques to harness and accelerate that ability.

We're also committed to sharing what we learn through our world-renowned Fellowship Program, thousands of scientific research papers and presentations, and a clinical database that now includes details of more than 12,000 knee surgeries and 2,300 shoulder surgeries. In addition, the Foundation collects information on patients' post-surgical symptoms, function, and satisfaction. One of many key applications of the patient database is its use by researchers to identify risk factors that lead to arthritis. This powerful database is already providing

Thanks to many donors and supporters, our Foundation is the leading independent orthopaedic research foundation in the world. And so we're changing our name to the Steadman◆Hawkins Research Foundation.

information about a new surgical treatment under development (see Research Update, pg.1) that shows great promise as a treatment for arthritis.

Of course, there's a great deal more to be done and we need continued support to do it. Here's a glance at what we're working on right now:

- ◆ Developing innovative procedures such as microfracture surgery and healing response, to provide less costly, less invasive, and ultimately more flexible alternatives to knee replacements and total ACL reconstruction.
- ◆ Pioneering the promising field of computer modeling by exploring technology that includes three-dimensional joint modeling and virtual-reality simulations to allow surgeons and therapists to select the optimum surgical and rehabilitative procedures.
- ◆ Investigating the potential of gene therapy to activate the body's own healing power, particularly as it relates to enhancing the growth and improving the quality of repaired cartilage tissue in the treatment of degenerative arthritis and cartilage disease.
- ◆ Training the next generation of orthopaedic specialists to live and work in your community.

Our core values haven't changed, and our dedication will never waiver. We've simply changed our name to reflect more accurately everything we do. It's an exciting time at the Steadman◆Hawkins Research Foundation—one we hope to share with you.

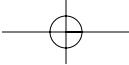
Save the Date

Foundation Celebrates "Colorado Evening"

A lifetime of excellence will be on display August 13 in Vail, Colorado, as the Steadman◆Hawkins Research Foundation hosts the "Colorado Evening," a culinary extravaganza presented by WestStar Bank. Proceeds will support the research and educational programs of the Foundation. The "Colorado Evening" will feature superb cuisine, courtesy of some of the Vail Valley's finest restaurants, award-winning wines from Duckhorn Vineyards and Silver Oak Cellars, and opportunities to bid on the dreams of a lifetime.

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



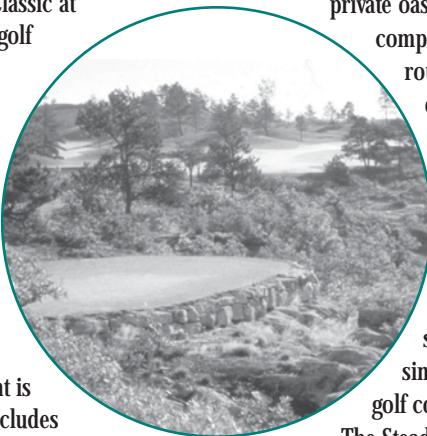


Steadman-Hawkins on the Links

Steadman-Hawkins Sanctuary Golf Tournament Set for August 31

The Steadman-Hawkins Research Foundation has been selected by RE/MAX International, a global real-estate firm, to hold the second Steadman-Hawkins Golf Classic at the Sanctuary, a premier golf resort located south of Denver. 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. More than 75 charities have raised more than ten 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, 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.

NFL Charities Awards \$89,000 Grant for Orthopaedic Shoulder Research

For the twelfth year, NFL Charities, the charitable foundation of the National Football League, has awarded a substantial research grant to the Steadman-Hawkins Research Foundation for new and continuing work on the causes, treatments, and prevention of sports-related injuries. The research project is titled "Three Dimensional Analysis of In Vivo Shoulder Motion."

One of the most significant problems plaguing shoulder biomechanics research lies in the difficulty in tracking the motions of the upper arm, collarbone, and scapula. These motions are complex, three dimensional, take place beneath the skin, and are difficult to quantify. The objective of this research is to measure the three-dimensional motion of the shoulder joint.

The study will provide valuable information that can later be utilized in a sophisticated

model of the upper extremity to quantify and explain the roles of the individual muscles of the shoulder and elbow in standard motions.

The immediate benefits of the study's findings will provide the scientific knowledge to cause a paradigm shift in the manner in which shoulder rehabilitation is approached. The new information provided by this study will offer change in the health care provided to the shoulder patient, allowing for better outcomes, as well as increasing quality of life in these patients.

The principal investigators are Michael R. Torry, Ph.D., director of the Foundation's Biomechanics Research Laboratory; Kevin Shelburne, Ph.D., assistant director; and staff scientists Takashi Yanagawa, M.S., and Erik Giphart, Ph.D.

Health Matters

Understanding Lumbar Degenerative Disc Disease

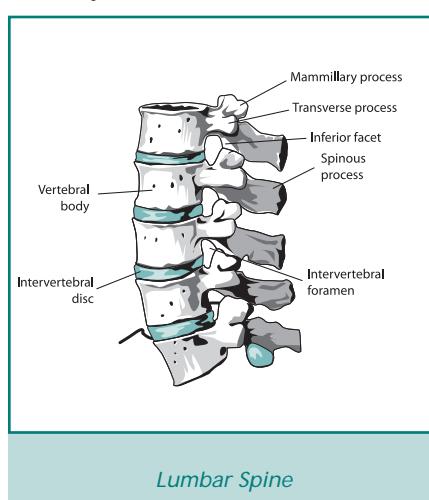
By Donald Corenman, M.D., D.C.

Editor's Note: Dr. Corenman practices at the Steadman-Hawkins Clinic in Vail, Colorado, and is currently a clinical assistant professor of orthopaedic surgery at the University of Colorado and an adjunct instructor of chiropractic medicine at Los Angeles College of Chiropractic.

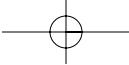
The purpose of the spine is to keep the body upright while allowing enough motion to position the head and arms in space for functional activities of daily living. The spine also protects the spinal cord from compression and injury. The spine has to have shock-absorbing capability so impact doesn't injure the vertebrae and also has to be resistant to too much motion to prevent excessive movements that could injure the cord and nerves. The disc plays a major role in all these functions.

Some people would argue that the ability to walk upright instead of on all fours causes degenerative problems. This is not a valid argument, as many four-legged species develop significant back disorders after only 6-10 years. Humans normally don't develop problems until their 30s or 40s. Upright posture, however, does create some unique problems that are not seen in quadrupeds. For example, our two-legged stance creates research dilemmas because we don't have an animal model that walks only on two legs to help us study the mechanics of the spine.

Anatomy

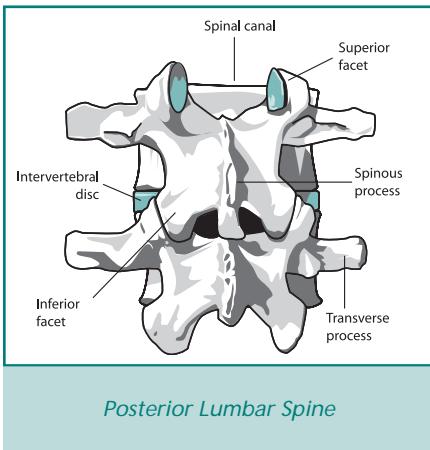


Lumbar Spine



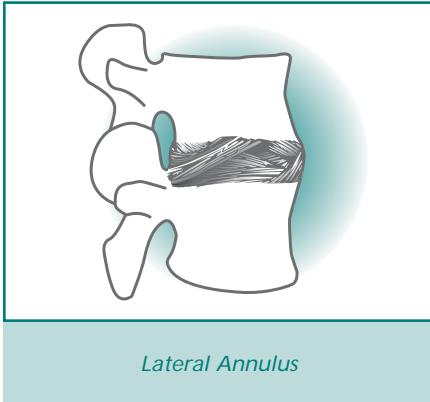
The spine is actually relatively easy to understand. In some respects, it acts like a tripod. It is made up of building blocks called vertebrae that stack up, one on top of another. In the front, the individual vertebra has a large "body" that bears most of the weight. Two vertebral bodies are separated by the disc. The disc is essentially a cushion that allows motion of one vertebra on another. It also absorbs shock—something the vertebrae don't do very well.

Facet Joints



In the back of the spine, the vertebrae are hooked together by paired joints called facet joints. They are true joints similar to a hip or shoulder joint. A joint is essentially two bony surfaces covered with cartilage, a teflon type material, to reduce friction and allow the surfaces to glide with minimum friction. These facet joints regulate directional motion as the discs by themselves don't have any directional stability. These facet joints allow you to bend forward and backwards (flexion and extension), as well as side to side (lateral bending). The lower facet joints restrict rotation (twisting) more than the upper facets.

The Disc



The disc is the main stabilizer in the spine. It functions like a restricting shock absorber. The disc has to absorb impact and still allow motion of the spine, but it has to restrict this motion to prevent damage to the spine. This is a great deal to ask of a tissue and here is where the problems lie.

The disc looks like a jelly-filled donut. This donut has an interesting design. The inside jelly (nucleus) is made of sugar attached to a protein and acts like a giant sponge. This material pulls in water from the body of the vertebra to create a high-pressure interior mass. The outside of this donut (annulus) is made up of about sixty rings of collagen. These rings are quite tough.

The endplates of the vertebra separate the bone from the disc. These endplates are made of hyaline cartilage — the same cartilage that lines the hip and knee joints. This material creates a barrier to nutrients and oxygen flowing into and out of the disc.

To make matters worse, after the age of 15 the blood flow to the disc disappears. This leaves the interior of the disc in the adult with no blood supply. The only fluids that can be exchanged are under pressure. This effect is evident in our height differences throughout a typical day. When we get up in the morning, we are actually one-half inch taller than we are in the evening. The pressure inside the disc with prolonged standing squeezes water out, making the disc less thick. Therefore, the spine has less height at the end of the day. Motion of the disc exchanges fluids similarly to squeezing a sponge under water. Fluid is forced out and then reabsorbs. This barrier significantly restricts nutrient and waste exchange.

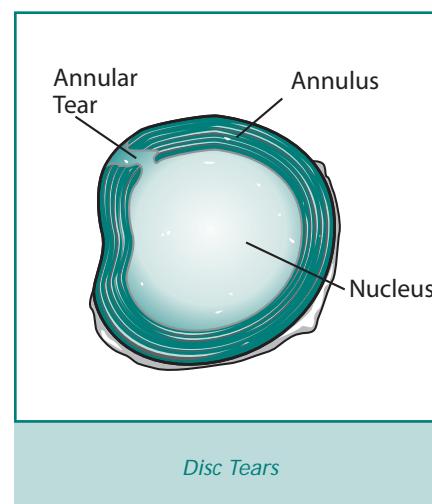
Without oxygen, the cells inside the disc that manufacture the shock-absorbing protein that make up the jelly become senile. Without the production of these proteins, the pressure in the disc drops. When the pressure drops, the walls of the disc (the annulus) take more of the strain and are at more risk to tear. Therefore, a degenerative disc is much less resistant to abnormal movements and these motions can create injury.

Another problem with the disc is the type of collagen that makes up the outside of the donut. Not all collagen is created equal. Some types are like thick bungee cords. They can be bent and stretched continuously and they will continue to function as though they

were new. Other types of collagen are somewhat brittle, like coat hangers. You can bend them only a limited amount of times before they fail. The genetics of the disc go a long way in predetermining the health of your back. This gives you a good reason to shift responsibility for your back pain to your parents.

You can see that the disc is mechanically and biologically at risk. The disc is the largest structure in the body that has no blood supply. Without a blood supply, the disc can't heal after an injury. All injuries to the disc therefore are cumulative. To say it another way, any injury to the disc is, essentially, a permanent injury. A tear of the collagen in the donut won't repair itself. If you were born with brittle or weak collagen, there is a greater risk of injury to the disk.

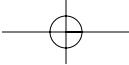
Annular Tears



What happens if you develop an annular tear? When there is a tear of the outer disc wall, a very weak supply of blood is available to assist in the healing process. Tears will attempt to heal, but the scar tissue laid down is not nearly as strong as the collagen fibers it attempts to replace. In addition, blood vessels that grow into the torn fibers of the disc carry new pain fibers in with them. This is another cause of pain for the disc.

Tears of the inside of the disc expose the internal disc fibers to the nucleus. There have been some fascinating discoveries regarding the nucleus of the disc. This nucleus has been

continued on page 6



(Disc Disease continued from page 5)

shown to contain many compounds that are direct causes of inflammation. These chemicals, if injected directly anywhere in the body will cause a significant inflammatory response. Arachidonic acid, metaloproteases, and Substance P are examples.

What causes the pain? The back portion of the disc is full of pain sensors called nociceptors. When these pain receptors come in contact with the inflammatory nucleus of the disc, they become sensitized and much more easily transmit pain signals. Normal day-to-day activities can then cause pain. Sometimes, pain signals can be transmitted without any movement at all.

Preventing Degenerative Disc Disease (DDD)

Unfortunately, there have been no great breakthroughs to prevent DDD. Diet and supplements are not effective because of the poor blood supply. This is why chondroitin and glucosamine are not effective in treating back pain.

There are few indications that occupation will change your chance of developing DDD. One study noted that truck and bus drivers had a higher incidence of disc problems. This theory reasons that the vibration of the vehicles have the same resonance as that of the lumbar spine discs.

Objects have a frequency at which they

will vibrate naturally. Put a guitar or violin in front of a speaker. If a C note is played over the speaker, the C string will vibrate as it absorbs this energy. The other strings won't vibrate because they don't have the same resonance. The lumbar spine seems to have the same resonance as the vibration of a truck or bus and absorbs this energy in the same manner. The disc can prematurely suffer. This problem was partially solved by creating "air ride" seats that isolate the driver from the vehicle.

There are recognized body positions that put the disc in jeopardy. The fibers of collagen that make up the outside of the annulus are layered. Each layer has its fibers lining up at 90 degrees to each other and at 30-degree angles to the long axis of the spine. This stabilizes the disc, but at a price. Upon rotation, 50 percent of the fibers of the disc relax and the other 50 percent tighten. This means that when you twist or rotate your back, you can lose up to 50 percent of the strength of your outer disc fibers. When you then bend forward, you load the disc and stretch the posterior fibers. These fibers are also the thinnest in the entire annulus. Under these conditions, the fibers can tear, leading to degenerative disc disease.

The moral of this story is that you should never twist when you lift. Most injuries result from ignoring these basic points. Remember, NO BLT—bending, twisting, and lifting.



Photo: John Kelly

Eat Less, Walk More: The Metabolic (Insulin) Resistance Syndrome

By Laurence W. Gaul, M.D., F.A.C.C.

Editor's Note: Dr. Gaul, an employee of the Denver Cardiology Group, began his career in medicine as a paramedic at the Vail Valley Medical Center. He has been a practicing cardiologist for ten years and is the cardiovascular consultant to the U.S. Ski Team and team physician for the U.S. Nordic Ski Team.

Here in Vail, as in many resort towns, people like to think of themselves as the "picture of health." Compared to other cities, it is harder to find obesity, and the average time on a standard Bruce Protocol Stress Test here is about double that of several major institutions to the east. But all is not well. And it's not likely to be all well in your town.

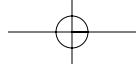
There is an epidemic brewing. It is sweeping the country and has nothing to do with bioterrorism or the avian flu. It is called the metabolic syndrome, or insulin resistance syndrome. The latter term describes much of the underlying physiology. It is a cousin of and, in fact, a precursor of adult onset diabetes. Diabetes is a major risk factor for the development of coronary artery disease, the most common killer of men and women in every developed nation.

The syndrome is characterized by abdominal obesity, abnormal cholesterol with low HDL, high triglycerides, and small, dangerous LDL particles. Another key component is resistance to insulin, causing elevated fasting glucose above 100 mg/dl. It is often accompanied by high blood pressure.

Why Is This Syndrome Important?

Insulin resistance is a harbinger of diabetes and just the presence of insulin resistance is associated with a doubling of the risk of dying from coronary artery disease. And the syndrome is common. Across the United States about 25 percent of adults meet the definition. Here in Vail it is a little lower, but despite the more fit appearance of our patients, about one in six have it. Luckily, my patients tend to exercise more than most, which helps mitigate the dangers.

Of great concern are our children. A pediatrician from a large East Coast city recently reported obesity in one-third of his patients under the age of 16. Obesity is



defined as a body mass index (wt in kg/height in square meters) of over 30. This is double the rate he saw 10 years ago. Reviewing charts from the Centers for Disease Control and Prevention, this matches the rest of the country. Obesity and diabetes have doubled in 10 years. Additionally, about 41 million people in the United States have glucose intolerance as determined by glucose tolerance tests or repeat elevated fasting glucoses.

What does this mean? It means that we all need to get up and do something. Do what? Almost anything. Action is needed in several areas. Politically, we need more time and availability of sports for children. Parents need to lead by example. Turn off the computer, the Internet, and the television set, and go for a walk. Behaviorally, lots of changes are needed, but the benefits are huge. A 2002 study in *The New England Journal of Medicine* noted a 58 percent reduction in diabetes with just a 6 percentage weight loss over six months.

How To Do It

Millions of dollars have been made writing diet books and each one has probably helped someone. In my office we jokingly sell the "Gaul Diet Book." It combines many of the most important interventions needed to prevent the insulin resistance syndrome. While it is the most expensive book known on a per-word basis (\$3.00 per word), it is only four words long: "Eat Less-Walk More." Weight loss and exercise are the easiest and most effective preventions for the insulin resistance syndrome. Everyone who has followed this advice has succeeded. Weight loss is a simple equation: spend (exercise) more than you put in (the bank or your stomach) and you will lose weight.

We have seen great results that include lower blood pressure, lower fasting glucoses, lower cholesterol (sometimes), and fewer medicines. One patient has lost over 100 pounds and is taking one-third the amount of blood pressure medicine. From now on you may see this sign in my office:

"If we are running late, please feel free to get up and walk laps in the hall. It is probably more useful than your visit with the doctor."

(*Playing With Arthritis: How to Manage and Avoid Pain, continued from page 1*)

strength and lower body flexibility. "Golf can help your range of motion," says the Arthritis Foundation, "as well as improve balance and coordination."

Learning to adapt is the key to playing the sport when you have arthritis. There are things you can do, or have done, to modify grips, shoes, balls, and clubs. Here are a few:

- ◆ Use clubs with lightweight graphite shafts.
- ◆ Use a low compression ball.
- ◆ Use a perimeter-weighted club head (to absorb shock).
- ◆ Use wrist braces or gloves on both hands (to stabilize joints).
- ◆ Wear spikeless golf shoes or comfortable walking shoes.

Warm Up

Warm up by walking for a few minutes (don't stretch first), then stretching for five minutes, and taking at least 10-15 swings on the practice range. An upper body/trunk stretch, such as a trunk twist (arms crossing your chest, rotate upper body to the right, hold for three ten-second periods, repeat to the left side), is a good start. Stretch your hamstrings (back of upper legs) by sitting on a bench or in a chair and extending one leg forward so your heel touches the ground or floor. Now point your toes toward the ceiling and lean forward until you feel pressure on the thigh. Don't push it past that point. It shouldn't hurt. Again, hold for three ten-second stretches.

Judy Alvarez, a PGA/LPGA teaching professional (www.judyalvarez.com) in Florida, says, "Move around on the practice tee. Don't just stand on the range and hit balls for long periods of time. Use tees on the range, wider-topped tees (for those who have arthritis in the hands and wrists, it's easier to place the ball on the tee), fatter grips, and two golf gloves. It will help absorb the shock of hitting the ground and the ball."

During a Round

Take only the five or six clubs you use most often onto the course. Pull your bag on



Photo: John Kelly

a cart; don't carry it; ride instead of walking, if walking diminishes your ability to play a full round. Use tees for every shot (except putts) to avoid striking the ground with your club-head. Keep your arms and trunk as relaxed as possible during your swing. Start play from the 150-yard markers when you feel tired. Don't feel obligated to play 18 holes. Look into the possibility of playing (and paying for) a nine-hole round. Finally, stay hydrated. It's good for your arthritis and for your overall health. After a round, take a warm bath or long shower to relax your muscles.

Everybody who has arthritis knows about the pain cycle. It hurts when you move, so there is a temptation not to exercise. But the longer you delay movement, the more it hurts when you do. Playing golf is one way to stay physically active and to manage your arthritis at the same time.

Steadman-Hawkins Update

Publications, Presentations, and Research

Annual Meeting of the American Academy of Orthopaedic Surgeons (AAOS)

The Foundation is once again on track to set a record for the number of presentations and publications accepted by prestigious medical and scientific research, education, and communications organizations (see *Foundation Ranks First in Production of Scientific Journal Publications*, pg 2).

Washington, D.C., was the location and February 23-27 the dates of the 72nd Annual Meeting of the American Academy of Orthopaedic Surgeons (AAOS). 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.

As in past years, the Foundation was well represented by the Clinical Research Department, which prepared four podium and poster exhibits that were made by Foundation principals for this annual meeting. Additionally, one podium presentation, *Posterior Tibial Slope after Medial Opening Wedge High Tibial Osteotomy of the Varus Degenerative Knee*, by Bruce Miller, M.D.; Thomas Joseph, M.D.; Valerie Rich, M.A.; Elizabeth Barry, B.A.; and William Sterett, M.D., was accepted for presentation by the American Orthopaedic Society for Sports Medicine. The Society meets concurrently with the annual Academy meeting in Washington.

AAOS Podium Presentations

Reliability, Validity, and Responsiveness of the ASES Shoulder Score, by Mininder S. Kocher, M.P.H., M.D.; Marilee P. Horan, B.S.;

Karen K. Briggs, M.P.H., M.B.A.; Tyler R. Richardson, B.S.; James O'Holleran, M.D.; and Richard J. Hawkins, M.D.

AAOS Poster Presentations

Determinants of Patient Satisfaction after Shoulder Arthroplasty, by Andrew Chen, M.D.; Marilee P. Horan, B.S.; Elizabeth Barry, B.S.; and Richard J. Hawkins, M.D.

Factors Associated With Meniscus Tears in the ACL Deficient Knee, by Michael A. Terry, M.D.; R. Brian Maxwell, B.S.; Arun J. Ramappa, M.D.; Karen K. Briggs, M.P.H., M.B.A.; and J. Richard Steadman, M.D.

Factors Associated with Severe Chondral Damage in Patients with ACL Deficiency, by Michelle Cameron, M.D.; Karen K. Briggs, M.P.H., M.B.A.; and J. Richard Steadman, M.D.

American Academy of Orthopaedic Surgeons Multimedia Education Center

The Academy also accepted 35 teaching multimedia presentations. Two of these presentations were produced by the Foundation: *Reverse Total Shoulder Arthroplasty*, by Andrew L. Chen, M.D.; Richard J. Hawkins, M.D.; Arun J. Ramappa, M.D.; and Mark A. Frankle, M.D.

The second presentation was *On-field Evaluation and Treatment of Cervical Spine Injuries*, by David P. Rudman, M.D.; Theodore E. Schlegel, M.D.; Martin Boublik, M.D.; Richard J. Hawkins, M.D.; James Keller, A.T.C.; and Steve Antonopoulos, A.T.C.

The Foundation will also be well represented at the International Society of Arthroscopy, Knee Surgery and Orthopaedic Sports Medicine (ISAKOS) Fifth Biennial Congress April 3-7, 2005, in Hollywood, Florida. ISAKOS advances the worldwide exchange and dissemination of education, research, and patient care in arthroscopy, knee surgery, and orthopaedic sports medicine. Nine presentations have been accepted by ISAKOS for presentation and display.

Podium

Factors Associated with Severe Chondral Damage in Patients with ACL Deficiency, by Michelle Cameron, M.D.; Karen K. Briggs, M.P.H., M.B.A.; and J. Richard Steadman, M.D.

Variability of Single Versus Double Leg Stance Radiographs for Preoperative Planning for High Tibial Osteotomy, by William I. Sterett, M.D.; Andrew Chen, M.D.; Valerie Rich, M.A.; and Elizabeth Barry, B.S.

The Prevalence of Chondral Damage in Patients with Rotator Cuff Pathology, by Richard J. Hawkins, M.D.; Karen K. Briggs, M.P.H., M.B.A.; Marilee P. Horan, B.S.; and R. Brian Maxwell, B.S.

Poster

Validity and Responsiveness of the Tegner Activity Scale for Meniscus Injuries of the Knee, by Karen K. Briggs, M.P.H., M.B.A.; Mininder Kocher, M.P.H., M.D.; J. Richard Steadman, M.D.; and William G. Rodkey, D.V.M.

Predictors of Decreased Function and Activity Level in Patients Seeking Treatment for Osteoarthritis of the Knee, by Karen K. Briggs, M.P.H., M.B.A.; and J. Richard Steadman, M.D.

Outcomes of an Arthroscopic Treatment Regimen for Severe Osteoarthritis of the Knee, by J. Richard Steadman, M.D.; Arun Ramappa, M.D.; Timothy S. Bollom, M.D.; Karen K. Briggs, M.P.H., M.B.A.; and William G. Rodkey, D.V.M.

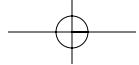
Kellgren-Lawrence (K-L) Scores and Arthroscopic Findings in the Degenerative Knee, by Arun Ramappa, M.D.; J. Richard Steadman, M.D.; Timothy S. Bollom, M.D.; Mindy Fein, B.A.; R. Brian Maxwell, B.S.; and Karen K. Briggs, M.P.H., M.B.A.

Determinants of Patients Satisfaction after SLAP Surgery, by Richard J. Hawkins, M.D.; Marilee P. Horan, B.S.; and Karen K. Briggs, M.P.H., M.B.A.

Posterior Tibial Slope after Medial Opening Wedge High Tibial Osteotomy of the Varus Degenerative Knee, by Bruce Miller, M.D.; Thomas Joseph, M.D.; Valerie Rich, M.A.; Elizabeth Barry, B.A.; and William Sterett, M.D.

The Arthroscopic Association of North America Annual (AANA) Meeting, May 12-14, Vancouver, British Columbia

AANA is the Accreditation Council for Continuing Medical Education, which exists to promote, encourage, support, and foster through continuing medical education func-



tions the development and dissemination of knowledge in the discipline of arthroscopic surgery.

The following poster presentations were accepted by AANA:

The Prevalence of and Factors Associated with Proximal Tears of the ACL, by Andrew L. Chen, M.D.; Catherine Bradford; Karen K. Briggs, M.P.H., M.B.A.; and J. Richard Steadman, M.D.

Factors Related to Increased Damage of the Meniscus in the ACL Deficient Knee, by Michael A. Terry, M.D.; R. Brian Maxwell, B.S.; Arun J. Ramappa, M.D.; Karen K. Briggs, M.P.H., M.B.A.; and J. Richard Steadman, M.D.

Reliability, Validity, and Responsiveness of the Lysholm Knee Score and Tegner Activity Scale for Meniscus Injuries of the Knee, by Karen K. Briggs, M.P.H., M.B.A.; Mininder Kocher, M.P.H., M.D.; J. Richard Steadman, M.D.; and William G. Rodkey, D.V.M.

Grants

In addition to the National Football League Charities Grant (see pg. 4), the Foundation has recently been awarded three grants to support the Foundation's education and research programs.

Wyeth Pharmaceuticals provided a grant to support two symposiums for the public entitled *Non-Surgical Management of the Arthritic Knee*. Dr. Jason Folk, on behalf of the Foundation, conducted the two symposiums on how people can take care of their arthritic knees without facing surgery. Arthritis and chronic joint problems will plague 50 percent of all Americans over the age of 65, making it one of the most prevalent diseases in the United States. The painful effects of arthritis limit physical activity more frequently than heart disease, cancer or diabetes.

Dr. Folk spoke at the Vail Valley Medical Center last August 23 and again on September 1 at Keystone Resort. "I discussed the many innovative techniques designed to manage pain associated with arthritis in the knee," says Dr. Folk. "Among these topics were bracing techniques, medications, injections, and visco-supplements."

The Steadman-Hawkins Research Foundation in Vail has established itself as a world leader in osteoarthritis research dedicated to preventing arthritis and to reducing its burden on people.

Center of Excellence



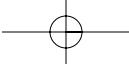
John Allard, Pfizer district manager, left, and Doug Webb, Pfizer specialty representative, right, present inSCOPE award certificate to Steadman-Hawkins Fellow Jason Dragoo, M.D., center.

The Foundation has been selected by Pfizer, Inc., through its inScope Awards Program, as a Center of Orthopaedic Excellence. This designation will allow the Foundation to apply for research and education grant support from Pfizer. In 2004, inSCOPE grants supported three projects.

The first project was an educational grant to support a preceptorship October 28 and 29 for 13 Pfizer sales representatives. The two-day preceptorship consisted of instructional sessions, surgery observations, and rehabilitation clinic rounds. Dr. J. Richard Steadman, Dr. William I. Sterett, and Dr. David C. Karli made presentations that addressed many of the current treatments in the changing field of orthopaedics.

Pfizer also supported a study directed by Dr. Mike Torry investigating the efficacy of selective COX-2 inhibitors in chronic treatment of golf-related osteoarthritic back pain. Preliminary results are encouraging.

The third project was funded through the inSCOPE Orthopaedic Fellowship Awards Program. The program is designed to support fellowship programs at leading centers of orthopaedic excellence. The grant is to be used to support the research project *Clinical and Biomechanical Analysis of Patellar Tendon Adhesions*. Steadman-Hawkins Fellow Dr. Jason Dragoo is the principal investigator. The purpose of this research is to describe and determine the treatment as well as the clinical outcomes of a well-recognized yet poorly understood condition that is often observed in chronic knee osteoarthritic patients. This data will provide the scientific foundation for a new clinical tool that could be utilized to diagnose and assess many forms of knee disorders. It could also be used to evaluate the surgical repair and/or the conservative drug treatment therapies often employed in orthopaedics to avert advanced stages of knee arthritis.



Media

Bode Miller: Healing Response and the Comeback Kid

By Richard Needham

Editor's Note: Richard Needham is editor of *Skiing Heritage* magazine and the health newsletter, *Arthritis Advisor*.



Bode Miller, of the United States, shows the gold medals he won in the Men's Downhill and the Men's Super-G, during the medal ceremony for the World Alpine Ski Championships, in Bormio, Italy, Saturday, Feb. 5, 2005. (AP Photo/Luca Bruno)

National and international media continue to focus on the success of American ski racer and Steadman-Hawkins patient, Bode Miller. In March, Miller became the first American man since Phil Mahre, also a former patient of Dr. Steadman's, to win the Alpine Ski World Cup Title. At the World Alpine Ski Championships in Bormio, Italy, this past February he won downhill and super G gold medals. In December, he celebrated a historic slalom win in Sestriere, Italy, to become only the second man — after Luxembourg's Marc Girardelli, another Steadman patient — to win races in all four individual disciplines in the same season.

Call it coincidence, but it seems every time world-class athletes — Bruce Smith, Dan Marino, Joe Montana, Phil Mahre, Steve Mahre, John Elway, Picabo Street, Greg Norman — in need of a body repair visit Steadman-Hawkins, they return to the playing field in better shape than when they were

competing at even their highest level. Miller is no exception. In February 2001 at the World Championships in St. Anton, Austria, Miller fell in the combined downhill event and tore his ACL. Dr. Steadman opted to use a revolutionary new procedure called the healing response, which he and the Foundation had developed.

Microfracture

This arthroscopic procedure involves making 3-10 small "microfracture" holes in the bone at the femoral origin of the injured ACL. The blood clot from the bleeding bone captures the injured end of the ACL and eventually reattaches the ligament back to the bone. The healing response has many advantages, including a much shorter recovery period and less cost, and because it is less invasive, the chances for osteoarthritis to set in later are greatly reduced.

Three weeks following his surgery, Bode was fully mobile and without the need of a brace. Encouraged, Dr. Steadman suggested waiting another three weeks to determine whether the healing response would take. When the three weeks were up, the news was even more encouraging. "My ACL," says Bode, "was re-growing entirely on its own."

By July, Bode was back on skis once again, training at Mt. Hood, Oregon, and "feeling 100 percent, going right after it, right away." In the season's first World Cup giant slalom in Soden, Austria, Bode finished a remarkable fifth, eight months after his surgery.

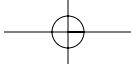
The Payoff

Bode's new knee and his determination to "go right after it" has paid off handsomely. Since the repair, he has become the best skier in the world, winning the overall 2004-2005 World Cup Title, four World Championship gold medals, two Olympic silver medals, and one World Championship bronze. The World Championship golds are in four of the five Alpine disciplines: downhill, super G, giant slalom, and combined.

The Steadman-Hawkins Research Foundation is key to the medical breakthroughs that are bringing active people like Bode Miller back to world-class form. The Foundation provides the research environment in which important new procedures, such as the healing response, are developed, nurtured, tracked, and refined to promote top-of-the-game performance for elite competitors and weekend warriors alike.



Bode Miller of the United States takes a curve on his way to winning the Men's Downhill at the World Alpine Ski Championships, in Bormio, Italy, Saturday, Feb. 5, 2005. (AP Photo/Claudio Scaccini)



Foundation Hosts New York City Fund-Raising Event

Leader in Orthopaedic Research and Education Benefits from Generous Contributions, Including NFL Charities Donation



Steadman-Hawkins Research Foundation New York City Reception, November 11.

Left to right: Earl Graves, Peter Dawkins, Jack Kemp, Dr. J. Richard Steadman, Ed Rutkowski, Jim Kelly and Ed Bradley

The Steadman-Hawkins Research Foundation held a fund-raising event in New York City on November 11, 2004, touting its mission to keep people of all ages physically active through cutting-edge orthopaedic research and education.

In addition to private donations from the event tallying upwards of \$45,000, NFL Charities announced an \$89,000 donation to the Foundation. NFL Charities was represented by Joe Browne, senior vice president of communications; NFL Hall of Famer Jim Kelly; and Edward Rutkowski. Kelly and Rutkowski both played for the Buffalo Bills. As the cornerstone of the National Football League's commitment to community service, NFL Charities is dedicated to supporting programs that further sports-related medical research for the benefit of professional and recreational athletes.

Dr. Richard Steadman and his wife, Gay, were joined by former patients, a star-studded crowd of athletes, and fellow Foundation board members, including Adam Aron, George N. Gillett, Jr., Earl and Barbara Graves, Howard and Judy Berkowitz, Al

Perkins, Damaris Skouras, Dr. William Rodkey, Edie Thys Morgan, Donna Weinbrecht, Jack Kemp, and "60 Minutes" broadcaster Ed Bradley.

"Dr. Steadman and the Foundation deserve your support to continue the leading-edge research that has allowed us to remain healthy and active today with a future that promises a continued active life for years to come," Bradley told the crowd gathered at the prestigious Union League Club.

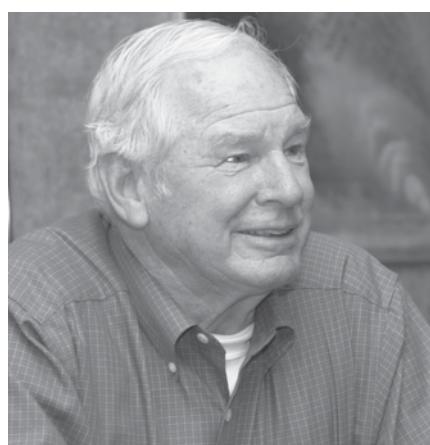
Because of the high-profile athletes who have passed through the Steadman-Hawkins Clinic's doors over the years—John Elway, Joe Montana, Bruce Smith, and Dan Marino, to name a few—the clinic's name has become synonymous with resurrecting and prolonging competitive greatness. But less known—and certainly far less celebrated—is the role the Foundation has played in studying, validating, perfecting, and disseminating to the larger orthopaedic community the revolutionary surgical techniques developed by Dr. Steadman and his partner, Dr. Richard Hawkins. These techniques are vital

to the healing process in the areas of arthritis, rehabilitation, and injury prevention.

"It's always an honor to treat an elite athlete, but there are only about a thousand of them in the world and there are millions of people who want to be athletic late into life, so that's really our Foundation's focus," Dr. Steadman said.

As one of the largest independent orthopaedic research institutes in the world, the Foundation spends two-three million dollars annually on research that has led to significant advances in the fields of orthopaedics and sports medicine. The Steadman-Hawkins Research Foundation depends on contributions to continue to pioneer the most innovative surgical and rehabilitative techniques. For more information, please log onto www.shsmf.org.

Congratulations, Distinguished Graduate



John A. Feagin, M.D.

Steadman-Hawkins Scientific Advisory Board member and Emeritus Professor of Orthopaedics at Duke University, John A. Feagin, M.D., was honored in May of 2004 by the Association of Graduates at West Point with the Distinguished Graduate Award. Dr. Feagin graduated from West Point in 1955. Nominated by the graduates in his class, Dr. Feagin has lived a lifetime of significant service to the nation. He is the first physician to

continued on page 12

**(Distinguished Graduate,
continued from page 11)**

receive the award and was joined on the dais by four, four-star generals. In October 2004, Dr. Feagin was again honored by West Point with the establishment of the John Feagin West Point Sports Medicine Fellowship Program. Dr. Feagin, often referred to as the father of modern sports medicine, helped establish the sports medicine program at West Point. The two-year fellowship program specializing in joint and soft-tissue trauma includes one year of basic science extremity trauma research at Brooke Army Medical Center in San Antonio, Texas, and one year of clinical practice at West Point.

Dr. Feagin authored and edited *The Crucial Ligaments*, a medical text now in its third printing. This book, termed "The Bible of the Knee," has been characterized by reviewers as "a must for orthopaedic surgeons" and "a major contribution to the subjects of cruciate anatomy, biomechanics, and principles of repair and reconstruction."

Meet Our Staff

Rachele Palmer, Development Coordinator



Rachele Palmer joined the staff of the Development Department at the Steadman-Hawkins Research Foundation in May 2001. The Development Department is instrumental in

raising the much-needed funds that ensure the research and educational programs will continue to prosper and grow.

She helps with five major mail solicitations produced throughout the year, maintains the donor database, manages all the donations that are received, and is instrumental in the planning of our fund-raising events.

Rachele, a native of Great Falls, Montana, comes from a military family and has four sisters. Being fourth in line, she learned early on the virtue of appreciation.

"I enjoy the very simple pleasures that life has to offer. It doesn't take much to make me happy."

In 1987, she and her family (husband Brad and sons Dustin and Nicklas) left Montana for Denver to seek a new future. After eight years in Denver, they felt the "big city" was too big for raising children. Having an opportunity to live in the mountains, they moved to the smaller community of Leadville, Colorado, about 45 miles south of Vail.

Dustin has since graduated from high school and is currently serving in the Navy aboard the USS Abraham Lincoln aircraft carrier. Nicklas is a senior in high school and a few months after graduation he will be heading off to the U.S. Marine Corps. "You just have to love them. I'm so proud of my boys!"

After working five years at a neighboring ski resort as a staff accountant, she found her way to the Steadman-Hawkins Research Foundation. "I love working at the Foundation. I learn something almost every day and that makes me happy that I work here. Everyone is 'first class' in my book!"

Why did he specialize in orthopaedic surgery?

"Everyone in medical school tries to figure out what kind of specialty would be a good fit. For me it became pretty clear that I was surgically oriented," he answers. "Orthopaedic surgery involves problems that you can get your hands on. Typically, after assessing the situation, you can define a problem, find a solution, implement the solution, and make a tangible difference in the lives of people who are in pain, disabled, or have a loss of function. That process was and still is attractive to me."

Why Steadman◆Hawkins?

"The first time I heard about the Steadman◆Hawkins Research Foundation was during medical school. Some of my mentors who had been Fellows there told me that its clinical and research programs were unparalleled. The research reputation, combined with the fact that people senior to me recommended it, helped push me in that direction. I had to apply two years ahead of time, was accepted, and was part of the 2003-2004 class."

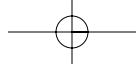
The Steadman◆Hawkins Research

Foundation Fellowship Program is considered one of the top post-residency sports medicine fellowship programs in the world. Each year, six young orthopaedic surgeons are selected from a pool of more than 100 candidates.

The Fellows participate in a 12-month training period to refine their skills in orthopaedic surgery and investigate the causes, prevention, and cure of degenerative arthritis and sports-related injuries. For four months, the Fellows work in clinics and surgery alongside Dr. Richard Steadman, whose specialty is the knee. They serve another four months working with shoulder specialist Dr. Richard Hawkins, and two months with Dr. William Sterett in the care of fractures. Two months are devoted to research, although some clinical and research projects are conducted simultaneously.

The work conducted in the Steadman-Hawkins Fellowship Program reaches the public in three ways:

- ◆ Results are disseminated through Fellows to orthopaedic centers throughout the world.



***"At Steadman-Hawkins,
Fellows learn how to preserve
joints. That will be the wave
of the future."***

- ◆ Thousands of patients benefit from Foundation research as each graduate joins the network of Steadman-Hawkins Fellows.
- ◆ Fellows learn new techniques that will improve health care and reduce medical costs worldwide.

Dr. Ramappa describes a typical clinical workday like this: Get to work between 7 and 8 a.m. Participate in an hour-and-a-half academic conference to discuss orthopaedic medicine literature and current practices. Begin seeing patients later in the morning and continue until 6 or 7 p.m. A typical day in the operating room starts around 7 a.m. and continues until all the cases are done. That could be as late as 11 p.m. "During the two months dedicated to research," says Dr. Ramappa, "Fellows design projects and carry out the necessary research to complete them. Steadman-Hawkins has assembled a star-studded scientific advisory board, and Fellows



Dr. Ramappa, left, with Dr. Steadman.

have access to them for advice and opinions about biomechanical, clinical, and basic science research."

In addition to responsibilities in Vail, Fellows work with athletes at the high school, college, and professional levels. Dr. Ramappa attended the National Football League combine in Indianapolis to examine players prior to the draft. He also spent time during Major League Baseball spring training examining and treating players in the Colorado Rockies system.

What sets Steadman-Hawkins apart?

"There are at least two things that set Steadman-Hawkins apart from other fellowship programs," explains Dr. Ramappa. "In most medical schools, students are being taught how to replace joints. At Steadman-Hawkins, Fellows learn how to preserve joints. That will be the wave of the future. The goal is to keep active people active. This emphasis has made an indelible mark on my approach to patient care. It is particularly timely because people are living longer and they want to remain youthful and vigorous. The work being done by Steadman-Hawkins physicians and Fellows—sponsored by the Foundation—is allowing people to perform at the highest level possible."

"The second distinguishing characteristic of Steadman-Hawkins," continues Dr. Ramappa, "is the atmosphere created by Drs. Steadman and Hawkins. "I came from a large program where everyone was a small part of

the big picture. I was looking for a situation where I could establish meaningful relationships with my mentors and co-workers. I can say unequivocally that the program surpassed all my expectations. The mentorship of Drs. Steadman, Hawkins, and Sterett has been invaluable. The staff is happy to be there, they are very talented, and they make you feel like you are part of a

family. That was something I had not experienced in my previous training."

What would Dr. Ramappa tell potential Foundation donors about Steadman-Hawkins?

"People who support the Foundation financially should know that the quality of work and research performed at the Foundation is allowing people to live active, productive lives. For that to continue, we have to develop better and better therapies. The Foundation is making that research possible."

Today, Arun Ramappa, M.D., is back in Boston, a member of the faculty at Harvard, an orthopaedic surgeon, and a sports medicine physician at Beth Israel Deaconess Medical Center. "I'll return to Colorado every year to attend the meeting of Steadman-Hawkins Fellows. It's a unique opportunity to participate in lively discussions with some of the best sports medicine doctors in the world. I'll also continue to work in research, perhaps doing something here in Boston in conjunction with the Foundation. Whatever the project, I look forward to being involved with Steadman-Hawkins Research Foundation for a long time."

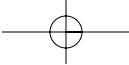
Welcome 2004-05 Fellows
Six New Physicians Introduced

Six new members of the incoming class of Steadman-Hawkins Fellows have a busy schedule of refining 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 100 applicants.

Steadman-Hawkins Fellows spend their year refining skills and learning new surgical techniques, as well as participating 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

continued on page 14



**(Welcome 2004-05 Fellows,
continued from page 13)**

orthopaedic programs, share knowledge they have gained from years of training with the physicians and scientists of the Foundation.

Kevin Crawford, M.D.

Dr. Crawford attended Baylor University as an undergraduate student of biology. He continued his studies at the University of Texas Southwestern Medical School to earn his medical degree and was named to the Alpha Omega Alpha Medical Honor Society. He completed his orthopaedic residency at the University of Texas Southwestern Medical Center. Dr. Crawford has been practicing with Lubbock Sports Medicine Associates in Texas. He is currently a member of several organizations, including the American Orthopedic Society for Sports Medicine and the American Academy of Orthopaedic Surgery. Dr. Crawford is taking time off from his private practice to come to Vail with his wife, Maura, and children, Kylie, Colin, and Caden.

Jason L. Dragoo, M.D.

Dr. Dragoo graduated summa cum laude from Cal Poly State University with a degree in biological sciences/sports medicine and then studied medicine at the University of Arizona Medical School, where he was named Top Medical Student at graduation by the University of Arizona Foundation. He completed his residency in orthopaedic surgery at the University of California, Los Angeles. Dr. Dragoo has received numerous awards for his work in basic science and clinical research. He has been published in the *Journal of Bone and Joint Surgery*, *American Journal of Sports Medicine*, *Arthroscopy*, and *Tissue Engineering*. Dr. Dragoo is joined in Vail by his wife, Kristin.

R. Matthew Dumigan, M.D.

Dr. Dumigan was a magna cum laude graduate at Louisiana State University, where he earned a degree in microbiology. He continued his studies at Louisiana State University School of Medicine and was named to the Alpha Omega Alpha National Honor Medical Society. He received the award for outstanding student in orthopaedic surgery and graduated fourth in his class. Dr. Dumigan completed his residency in orthopaedic surgery at the



Drs. J. Richard Steadman, William I. Sterett, and Richard J. Hawkins with 2004/2005 fellows. Front, left to right: Austin Yeargan, M.D.; Kevin Crawford, M.D.; Sanjitpal Gill, M.D.; Jason L. Dragoo, M.D.; R. Matthew Dumigan, M.D.; and Allston J. Stubbs, M.D.

University of Texas Southwestern Medical Center in Dallas. An accomplished college athlete, Dr. Dumigan's interests include golf, fishing, hunting, and skiing. He is joined by his wife, Shelly, and son, Will.

Sanjitpal (Sonny) Gill, M.D.

Dr. Gill graduated summa cum laude from Boston University with a degree in medical science. He attended Boston University School of Medicine and graduated cum laude. He completed his residency in orthopaedic surgery at the University of Virginia in Charlottesville. Dr. Gill has won numerous research awards, including the 2003 Albert Trillat Young Investigator's Award by the International Society of Arthroscopy, Knee Surgery, and Orthopaedic Sports Medicine Committee (ISAKOS). He has presented his research at numerous forums and has been published in journals such as *Arthroscopy* and *Journal of Bone and Joint Surgery*. After recently completing a prestigious spine fellowship at Emory University, Dr. Gill is enthusiastic about starting his fellowship in Vail. He is joined by his fiancée, Heather.

Allston J. Stubbs, M.D.

Dr. Stubbs earned an undergraduate degree in biology and a master of business administration in finance/biotechnology at the

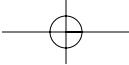
University of North Carolina, and he continued on to study medicine at Duke University School of Medicine. Dr. Stubbs performed his orthopaedic residency at Duke University Medical Center, where he was awarded the Herodius Society Award for Orthopaedic Research in 2002. Dr. Stubbs comes to Vail with his wife, Carlie.

S. Austin Yeargan, M.D.

Dr. Yeargan studied chemistry as an undergraduate at the University of North Carolina at Chapel Hill. He attended medical school at the East Carolina University School of Medicine, where he was named to the Alpha Omega Alpha National Honor Medical Society. Dr. Yeargan completed his orthopaedic residency at the John A. Burns School of Medicine at the University of Hawaii. A dedicated family man and surfer, Dr. Yeargan traded in his surfboard for a pair of skis. He is joined by his wife, Alison, and children, Fisher, Caroline, and Abby.

Thank you

A special thank you to our sponsors who make the Fellowship Program, one of the top orthopaedic sports medicine fellowship programs in the world, 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 2004/2005 Steadman-Hawkins Fellowship Class are **Mr. and Mrs. Harold Anderson, Mr. and Mrs. Lawrence Flinn, Mr. and Mrs. Jay Jordan, Mr. and Mrs. Peter Kellogg, and Mr. and Mrs. Steven Read.**

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. 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.**

Where Are They Now?

Steadman-Hawkins 2003-2004 Fellows Establish New Careers in Orthopaedics

Timothy Bollom, M.D., joined the Orthopedic and Neurosurgical Center of the Cascades in Bend, Oregon.

Andrew Chen, M.D., is practicing at the Littleton Orthopaedics in Littleton, New Hampshire.

Doug Lowery, M.D., moved to Evansville, Indiana, and is practicing with the Orthopaedic Associates.

Charles May, M.D., joined The Orthopaedic & Sports Medicine Center of Northwest Georgia in Rome, Georgia.

Arun Ramappa, M.D., is a member of the faculty at Harvard and a sports medicine physician at Beth Israel Deaconess Medical Center in Boston, Massachusetts.

Michael Terry, M.D., returned to the University of Chicago, Chicago, to practice medicine as Assistant Professor of Surgery and Sports Medicine.

(The Package: New Treatment Breakthroughs for the Arthritic Knee, continued from page 1)

pain, stiffness, and swelling of the joints. In addition, roughened joint surfaces or fragments of bone and cartilage can lead to "mechanical" symptoms of catching and locking of the joint.

Although there is presently no cure for arthritis of the knee, many treatment options provide relief of symptoms. Weight loss, well-cushioned shoes, and a general strengthening program may alleviate some symptoms of arthritis. Certain medications, including anti-inflammatory agents (ibuprofen, for example) and acetaminophen (Tylenol) are known to provide relief. Some of these medications may have harmful side effects or interactions with other medications and should be monitored by a physician. Nutritional supplements such as glucosamine and chondroitin sulfate may also be of benefit. Additional non-surgical options include the use of braces to help improve alignment of the knee and the injection of anti-inflammatory or lubricating medications.

While knee replacement surgery is considered the gold standard treatment for end-stage arthritis of the knee and provides predictable pain relief, it is not appropriate for everyone. Many individuals with arthritis of the knee are either too young or are unwilling to accept the physical restrictions that accompany replacement surgery. Other interventions exist for these individuals.

Arthroscopy is a minimally invasive procedure that can be a potent treatment option for the arthritic knee. Arthroscopy involves the use of video-guided instruments through small punctures in the skin. This procedure is safe, effective, and allows for rapid recovery. Dr. Steadman, a pioneer in arthroscopic surgery of the knee, has developed and popularized many techniques that are used around the world for the treatment of cartilage injuries and arthritis of the knee. When used together, these techniques offer an effective treatment package for the arthritic knee. The Foundation's continued research and the powerful database is providing information about this package, which shows great promise as a treatment for arthritis.

Arthroscopic Treatment

Arthritis of the knee does not simply result in thinning of cartilage. Rather, the dis-

ease affects the joint in many ways. The components of the arthritic knee may include stiffening or scarring of the joint capsule, inflammation of the joint lining, tears of the meniscus cartilage, thinning and roughening of the articular cartilage, the formation of bone spurs, and the presence of loose bodies floating in the joint. Each of these components contributes to the symptoms of the degenerative knee and each is addressed below.

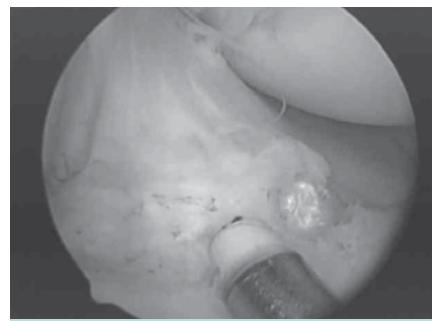
Insufflation:



Joint is injected with fluid.

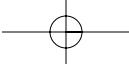
The joint lining and capsule of the arthritic knee can become stiff with time. This stiffness can limit motion of the joint and can also lead to increased pressure on the joint. Excessive pressure can contribute to further deterioration of cartilage. At the time of surgery, after an anesthetic has been administered, but before the arthroscope is introduced into the knee, the joint is injected with fluid under pressure. This injection helps stretch the contracted joint lining and improve motion of the knee.

Lysis of Adhesions:



Special device cuts scar tissue.

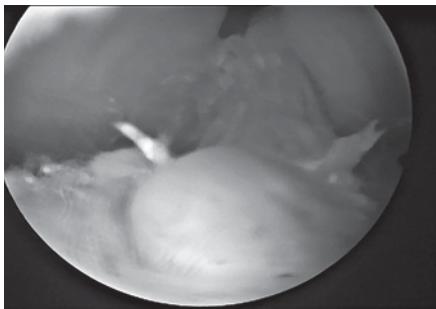
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(The Package: New Treatment Breakthroughs for the Arthritic Knee, continued from page 15)

Adhesions, or scarring of the joint lining, is another factor that can limit motion of the joint and contribute to unfavorable joint pressure. These adhesions are commonly encountered in a knee that has undergone previous surgery. At the time of arthroscopy, these adhesions are identified and released with the use of a special device that can simultaneously cut scar tissue and control unwanted bleeding. Adhesions behind the patellar tendon are frequently encountered after anterior cruciate ligament surgery and may contribute to anterior knee pain. Removing these adhesions with an "anterior interval release" has been demonstrated to improve pain under the patella.

Loose Body Removal:



Bone spur.

"Loose bodies" floating in the knee is like having a bothersome pebble in the shoe. These loose bodies consist of cartilage and/or bone and may grow with time as they derive nutrition from normal joint fluid. Loose bodies can contribute to the mechanical symptoms of catching and locking in the arthritic knee. At the time of arthroscopy, a thorough inspection of all areas of the knee allows for identification and removal of loose bodies.

Chondroplasty:

The common denominator in all arthritic knees is the presence of degenerated cartilage. There is a spectrum of cartilage damage, ranging from simple "softening" of the cartilage to complete loss of cartilage with exposed bone. Early to mid degeneration is often characterized by a shaggy appearance



Shaving device smooths irregular surfaces.

of the previously smooth joint surface. During arthroscopic surgery, a motorized shaving device is employed to help smooth irregular surfaces.

Synovectomy

The synovium is the thin lining of joints and is composed of cells that produce normal joint fluid. The synovium also possesses a rich nerve supply. In arthritis and other inflammatory conditions, the synovium becomes inflamed. Synovitis (inflamed joint lining tissue) is painful and contributes to recurrent swelling in the knee. During arthroscopy, areas of inflamed synovium can be removed, resulting in diminished pain and swelling.

Osteophyte Resection

Bone spurs are a common finding in the arthritic knee and can contribute to pain and loss of motion. Careful removal of bone spurs with a motorized shaving device may be of benefit if the spurs are contributing to a mechanical block to joint motion.

Meniscectomy

The meniscus is the shock absorber of the knee. With age, the meniscus cartilage can become stiff and predispose the tissue to tearing. A torn meniscus is a very common component of the arthritic knee and contributes to pain, catching, and locking. Although the healthy meniscus plays a critical role in normal joint function, the torn meniscus in the degenerative knee has lost its protective function. A limited resection, or removal, of the torn tissue can alleviate pain and mechanical symptoms while leaving behind the remainder of the meniscus that retains functional properties.

Microfracture

Although there is no true cure for arthritis, there are several surgical techniques aimed at cartilage repair or regeneration. Dr. Steadman and the Research Foundation have pioneered, validated, and popularized the microfracture technique of cartilage regeneration. In this technique, the body's own healing potential is tapped. In a recently published study by Dr. Steadman, the microfracture procedure was found to significantly improve all the characteristics evaluated in a carefully selected population of patients with degenerative arthritis of the knee. ("Patient Satisfaction and Outcome after Microfracture of the Degenerative Knee." *Journal of Knee Surgery*. 2004 Jan;17(1):13-7. Miller, Bruce S., M.D.; Steadman, J. Richard, M.D.; Briggs, Karen K., M.B.A., M.P.H.; Rodrigo, Juan J., M.D.; Rodkey, William G., D.V.M.)

Arthritis is a complex disease and affects the knee joint in many ways. Although there is presently no cure for this condition, many treatment options exist to help alleviate the symptoms. In certain patients with degenerative disease of the knee, a careful arthroscopic surgery that addresses all of the components of the arthritic knee can provide dramatic relief.

(AI Perkins: From Patient to Advocate, continued from page 1)

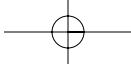


AI Perkins

What Perkins didn't know was that the injury would be the beginning of a 25-year journey that led him to be a Steadman-Hawkins patient, then a member of the Steadman-Hawkins Research Foundation

Board of Directors, and now co-chairman of the Foundation's Development Committee.

"After the injury, we just let it sit for a few months," remembers Perkins. "Back then, treatment was based as much on a gut feeling as anything else. I went through the usual physical therapy routines, but there was just too much pain and I eventually had reconstructive knee surgery. After the surgery,



"I eventually flew to Colorado and met with Dr. Steadman. He said simply, 'I think we can help you.' I got goose bumps over the possibilities. You can't imagine the relief I felt after being told so many times by doctors on the East Coast that there wasn't much that could be done about my condition."

I was looking at a life that would have been vastly diminished by severe arthritis. Within the next decade I was told to stop running and playing basketball, and to limit skiing. Bicycling and walking a golf course caused unbearable pain and swelling. The prognosis was bleak. After having been involved in sports all of my life, the thought of having a knee replacement at the age of 36 was depressing and unacceptable.

"By the 1990s, my activity was even more limited," says Perkins. "This was particularly disappointing because my son was becoming increasingly involved in skiing, soccer, and baseball. All I could do was hope that science would delay my need for a knee replacement and allow me to be active enough to share a few experiences with him."

While the condition of Perkins' knee was going downhill, the direction of his business career took off in a decidedly upward direction. In 1987, less than ten years out of college, he founded Darwin Partners, an information technology company based in Wakefield, Massachusetts. Darwin developed a national client base that included Nextel, Bank of America, Pfizer, Unisys, and AT&T Wireless, and his company surpassed the \$100,000,000 revenue mark. In 1992, Perkins founded Edgewater Technology, an IT outsourcing firm that generated \$20,000,000 in revenue within its first few years of operation. The company was sold in 1999, delivering significant value to its shareholders. Today, Perkins serves as chairman of Darwin Partners.

The Steadman-Hawkins Connection

Things begin to change for Perkins' bad knee in the early '90s. "I knew a member of the U.S. Ski Team who told me about a Dr. Richard Steadman in Colorado. Patients were being treated by Dr. Steadman for knee injuries similar to mine with a procedure called microfracture, an arthroscopic technique used to repair cartilage through small incisions." To Perkins, the results seemed almost too good to be true. Athletes with potentially career-ending knee injuries were returning to compete at the highest levels in their sports.

"I eventually flew to Colorado and met with Dr. Steadman. He said simply, 'I think we can help you.' I got goose bumps over the possibilities. You can't imagine the relief I felt after being told so many times by doctors on the East Coast that there wasn't much that could be done about my condition."

The microfracture surgery was performed in 1996. "I'm never going to have a young knee again, but I am relatively pain free and I can ski with my son, play doubles in tennis, ride a bike, and do lots of things that never would have been possible without Dr. Steadman's help. His emphasis was not on joint replacement, but on joint preservation. I was so grateful, I just wanted to sit down and write a check to support the work being done in Vail."

A Different Idea

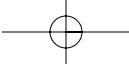
But the Steadman-Hawkins Research Foundation had a different role in mind for Perkins. Five years ago, he was asked to serve on its Board of Directors. "I think they asked me because I bring an unbridled enthusiasm for spreading the message of research, service, and education that is being provided by the Foundation. Great things are coming out of its work, but more people need to know about it. The doctors are too modest to talk about it and too busy to promote it. Their time needs to be spent treating patients and supervising research that continues to produce medical breakthroughs, not in trying to raise money."

As co-chairman of the Development Committee (with Earl Graves, founder of *Black Enterprise* magazine), raising money for the Foundation's projects is one of Perkins' responsibilities. "People who support the Foundation can specify that their contributions go to one or more of several programs. It just depends on their particular interests. Money is needed for the Steadman-Hawkins Fellowship Program, to continue the development of the microfracture technique and the 'healing response,' an alternative to full ACL reconstruction, to find ways to treat or prevent osteoarthritis, and to support the

continued on page 18



Photo: John Kelly



(Al Perkins: From Patient to Advocate, continued from page 17)

Foundation's Basic Science, Biomechanics, and Clinical Research departments. There is a laundry list of programs from which to choose."

Lessons Learned

Perkins' contributions of time, money, and energy have not been a one-way street. He is quick to tell you about the valuable lessons learned in the non-profit environment of the Steadman-Hawkins Research Foundation that he has taken back to his world of highly

competitive business. "The biggest thing I've learned is compassion. An experience like this makes you step back, realize how lucky you are, and understand that there are things in life other than being successful in business. My professional success wouldn't have happened without the healthy lifestyle that the Foundation's research provided me.

"There are many projects worthy of supporting," concludes Perkins, "but this is one you can put your hands on. The Foundation's programs are changing people's lives in a way that will affect generations to come. I've been fortunate enough to see it have a direct impact on my life, and I want others to be able to share the same experience."

Steadman-Hawkins Research Foundation Welcomes Three New Physicians to Orthopaedic Team

Dr. Marc J. Philippon, Dr. Neal ElAttrache, and Dr. Tom Hackett join the Staff at the Prestigious Steadman-Hawkins Clinic

The Steadman-Hawkins Clinic has treated enough professional athletes to understand the meaning of greatness. It also understands the need for expertise in each team position. Similar to the Super Bowl Champs' adding a star running back to their championship lineup, the Steadman-Hawkins Clinic has announced the addition of Dr. Marc J. Philippon, Dr. Neal ElAttrache, and Dr. Tom Hackett to its already world-renowned group of physicians.

Dr. Philippon

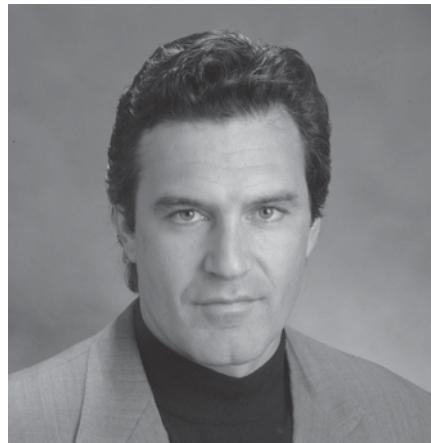
Dr. Philippon, a native of Canada, is widely recognized for his innovative surgical procedures in hip arthroscopy. He brings with him a well-deserved reputation in sports medicine and a list of celebrity patients who endorse him wholeheartedly. This list includes golfer Greg Norman, Olympic gold medalist figure skater Tara Lipinski, NFL quarterback Jay Fielder, NFL running back Priest Holmes, basketball player Marcus Camby, baseball player Luis Castillo, and hockey player Mario Lemieux, among others.

After graduation from McMaster University Medical School in Ontario, Canada, Dr. Philippon completed his postgraduate work at the University of Miami's Jackson Memorial Hospital.

Dr. Philippon joins the Steadman-Hawkins Clinic from the University of Pittsburgh Medical Center, where he pioneered a new form of arthroscopic surgery that has helped many people avoid hip joint replacement. His invention of new flexible surgical instruments allows access to areas of the joint which were previously impossible to treat arthroscopically. Dr. Philippon has prolonged numerous professional sports careers and has helped patients from all walks of life avoid the constant pain of severe hip joint disorders.



Photo: John Kelly

*Marc J. Philippon, M.D.**Neal ElAttrache, M.D.**Dr. Tom Hackett, M.D.*

While at the University of Pittsburgh Medical Center, Dr. Philippon was Director of Sports Medicine/Hip Disorders, Director of the Golf Medicine Program, Director of the Sports Medicine/Hip Disorders Fellowship Program, and Clinical Assistant Professor in the Department of Orthopaedic Surgery. His work has been published in numerous medical journals and he has given extensive presentations focusing on hip disorders and his revolutionary surgical techniques.

"I am very pleased to join Steadman-Hawkins," said Dr. Philippon. "I look forward to adding my expertise in hip disorders as a member of a team that is already made up of the world's top orthopaedic sports medicine specialists."

Dr. ElAttrache

Dr. ElAttrache specializes in treating shoulder and elbow disorders, and is an orthopaedic consultant for the Los Angeles Dodgers, Los Angeles Kings, Los Angeles Lakers, Anaheim Mighty Ducks, and the St. Louis Rams. He is also an associate clinical professor at the University of Southern California and has published numerous textbook chapters and research journal articles. In addition, his work has been presented at more than 150 national and international orthopaedic conferences. Dr. ElAttrache will be splitting his practice time between the Kerlan Jobe Clinic in Los Angeles and Steadman-Hawkins in Vail. A Pennsylvania native, Dr. ElAttrache graduated from the University of Notre Dame and

went on to attend medical school at the University of Pittsburgh. He graduated cum laude in 1985. Following medical school, Dr. ElAttrache completed an internship in general surgery at the Hospitals of the University Health Center of Pittsburgh and then completed his residency at the University of Pittsburgh. In 1991, Dr. ElAttrache completed a fellowship in sports medicine at the famed Kerlan Jobe Clinic in Los Angeles and went on to specialize in sports medicine as an orthopaedic surgeon.

"The Steadman-Hawkins Clinic has clearly set the benchmark in the orthopaedic field," said Dr. ElAttrache. "It is a great honor, as well as a great personal thrill for me to join such prestigious company."

Dr. Hackett

Dr. Hackett, a sports medicine orthopaedic surgeon, is a former collegiate athlete who received a degree in anthropology from Colorado College and followed his passion for the outdoors to work locally and internationally as an archeologist, mountaineer guide, and ski patrolman.

After developing extensive hands-on experience in wilderness medicine and rescue, he went on to formally study medicine. Following his residency in orthopedics, he completed a sports medicine fellowship at the Kerlan Jobe Clinic in Los Angeles, specializing in shoulder and elbow surgery. He has conducted research in surgery of the shoulder, hip and knee and has published articles in peer reviewed medical journals, has written

several book chapters, and has presented his research at national and international meetings.

While in Los Angeles, Dr. Hackett served as an Assistant Team Physician to the Los Angeles Lakers, Sparks, Dodgers, Kings, Galaxy, and the Anaheim Mighty Ducks professional sports teams.

"As an orthopaedic surgeon and an outdoor enthusiast, the Steadman-Hawkins Clinic offers me the unique opportunity to live in the mountains and to work for what is perhaps the best orthopaedic clinic in the world," said Dr. Hackett.

Dr. Philippon, Dr. ElAttrache, and Dr. Hackett join the clinic's founders, Dr. J. Richard Steadman, who treats only knees, and Dr. Richard Hawkins, a shoulder, knee and elbow specialist, who now spends the majority of his practice time at the Steadman-Hawkins Clinic of the Carolinas in Spartanburg, South Carolina.

Rounding out the Vail clinic's staff are Dr. William Sterett (shoulder, knee, and orthopaedic trauma), Dr. Randall Viola (hand and wrist), Dr. Donald Corenman (spine), and Dr. David Karli (physiatrist).

Research conducted by the physicians has led to significant advances in the fields of orthopaedics and sports medicine. The physicians at Steadman-Hawkins treat patients from all walks of life, including recreational and elite athletes from all over the world.

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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Mark Your Calendar**August 5-7, 2005**

Third International Vail Cartilage Symposium. For more information, contact Greta Campanale at (970) 479-5782 or by e-mail greta.campanale@shsmf.org.

August 13, 2005

Steadman-Hawkins Colorado Evening. Celebrate an evening of Vail Valley cuisine, the wines from Duckhorn Vineyards and Silver Oak Cellars, and the opportunity to bid on the dreams of a lifetime. For more information, contact Rachele Palmer at (970) 479-5809, or e-mail rachele.palmer@shsmf.org, or coloradolclassic.org.

August 31, 2005

Steadman-Hawkins 2005 Golf Classic presented by RE/MAX International at Sanctuary in Sedalia, Colorado. For more information, contact Rachele Palmer at (970) 479-5809, or e-mail rachele.palmer@shsmf.org, or coloradolclassic.org.

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