Steadman·Hawkins
SPORTS MEDICINE FOUNDATION VOLUME 8 FALL/WINTER 2002-2003
An International Center for Research and Education — Keeping People Active

Patients in the News:
Judy Collins: Shouldering On

Editor's Note: The following profile is based on an interview by Richard Needham. Mr. Needham is editor of *Skiing Heritage* magazine and the health newsletter *Arthritis Advisor*.

For a pianist/guitarist with 37 albums, a bevy of top 10-hits and a host of Grammy nominations, a broken shoulder is not only no fun, it can be downright ruinous to a performer's career.

At the top of her profession four years ago (though most fans will argue that her career hasn't peaked yet), Judy Collins took a tumble while skiing. It happened at Vail, on Swingsville, and the result was a broken shoulder.

For Judy, it was a bummer. She and 18 other members of the Collins clan had gathered for a March weekend family reunion. "We had come in from all over the map," she says. "Normally I don't like to ski the first day because I've just flown in from who knows where and I try to spend the time organizing things, making dinner reservations, that sort of thing. But that afternoon I went for a run with my brothers and sisters.

"We had just started down Swingsville when my brother started joking about how famous people run into trees. Well, that did it. I took a dive on the trail's first pitch and was down for the count. Even though I couldn't stand up or sit down or move and could barely breathe, we pretty much concluded it was just a displaced shoulder.

"But no such luck. The next step was a visit to Dr. Sterett at Steadman-Hawkins."

The diagnosis: a fracture and dislocation of the right proximal humerus. The fix: a hemiarthroplasty of the right humerus, or a total right shoulder replacement.

Though the surgery was a success, Dr. Sterett cautioned Judy that she might see her shoulder recover only 60 percent to 70 percent. "But," says Judy today, "my shoulder is 110 percent." How come? "Four years," says Judy, "of pretty disciplined rehab, and I was back on skis within a year."

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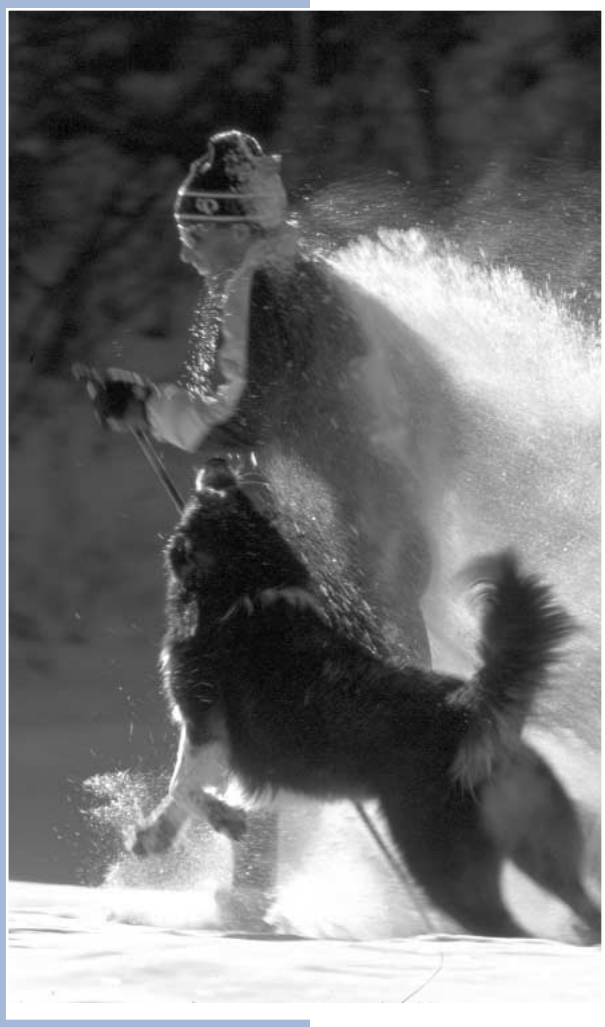

PHOTO COURTESY OF JOHN KELLY.

IN THIS ISSUE

Sports and Wellness:
Increase Power and Quickness on the Slopes with This Simple Resistance Program

By Jeff Carlson

Editor's Note: Mr. Carlson is a physical therapist for the Howard Head Sports Medicine Center in Vail, Colo.

So many snowy days, so little time to play. With all the activities of winter, and that little thing we call work, the average weekend athlete will have difficulty staying in good ski shape. One long ski run would send the most of us crawling for the oxygen tank and crying for a full body massage.

The lower body is where a person's power and speed come from. Without sufficient strength in your legs, not only will it be difficult to

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Steadman-Hawkins Research Update:
Knee Ligament Forces During Walking
An award-winning study examines knee ligament function

By Kevin Shelburne, Ph.D.

Editor's Note: The American Society of Biomechanics has selected this study as winner in the 2002 *Journal of Biomechanics* Award competition. Kevin Shelburne, Ph.D.; Marcus Pandy, Ph.D.; Frank C. Anderson, Ph.D.; and Michael Torry, Ph.D., jointly authored the abstract. In recognition of this research, the authors were presented the *Journal of Biomechanics* Award at the World Congress of Biomechanics in August.

When we walk, a mysterious and complex balance of forces in our muscles, bones and ligaments keeps us moving forward in an activity that many of us take for granted. For those with knee

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Low Interest Rates Mean Greater Wealth for Your Heirs

How would you transfer significant sums — potentially free of gift tax — to family members while making meaningful, multi-year contributions to the Steadman◆Hawkins Sports Medicine Foundation? In an environment of low interest rates, there's no better way than through a charitable lead trust (CLT).

The principle is simple: Create a CLT by placing assets in a trust. The trust pays out to the Foundation for the trust's term and, at the end of the term, the assets in the trust pass to the family members you designate.

"Freezing" Gift Tax

Why does this work so well in a low-interest-rate environment? Funding a CLT when the fixed rate the IRS uses in valuing your gift is low "freezes" your gift-tax exposure when you create the gift. However, if the trust earns a higher return over its term, that increased wealth passes to your children without using more of your gift-tax exemption. With current rates, this is an excellent time to take advantage of the opportunity.

Leveraging Earnings

Suppose you funded a CLT with $1,000,000 and designated a 5 percent payout to SHSMF over a term of 15 years. At today's current low rates, the taxable value of your gift would be slightly under $445,000, well under your $1,000,000 gift-tax exemption. The 5 percent payout to the Foundation would result in a generous $50,000 annual gift — a total gift of $750,000. And if, for example, the trust earned 6 percent over the next 15 years, the total value passing to your family would be just over $1,200,000.

Charitable lead trusts represent significant gifts requiring careful planning. Therefore, in addition to contacting our office, we encourage you to work with an estate-planning professional experienced in these gift plans. Should you have different objectives — immediate income benefits for you and your family, for example — we invite you to call about our life income gift plans as well. For information, contact John McMurtry, Vice President of Program Advancement, at (970) 479-5781.

Donate On-Line

The Steadman◆Hawkins Sports Medicine Foundation has announced a website enhancement that enables the Foundation to accept donations on-line. The Foundation's mission of "Keeping People Active Through Research and Education" assures the advancement of techniques, technologies and treatments for individuals suffering from arthritis, degenerative joint disease and injury. The Foundation relies on the generous support of its many donors to fulfill this mission.

To make it as easy as possible to donate, the Foundation recently added a new service at its website, www.shsmf.org. Merely click on the "Donate" button and the donation form will appear. All transactions are secure and the Foundation's privacy policy adheres to the strict standards established by the Foundation. Please feel free to contact John McMurtry at the Steadman◆Hawkins Sports Medicine Foundation with any questions. E-mail John at john.mcmurtry@shsmf.org or phone (970) 479-5781.

Major John Tokish, M.D.: On the Front — and on the Field

Editor's Note: The following profile is based on an interview by Richard Needham. Mr. Needham is editor of *Skiing Heritage* magazine and the health newsletter *Arthritis Advisor.*

Air Force Major John Tokish, M.D., a Steadman-Hawkins Fellow, has seen his share of action — on the war front and on the athletic field. An orthopaedic surgeon currently stationed at the Air Force Academy in Colorado Springs, Tokish is a team physician ministering to the scrapes, pulls and pains of academy athletes.

It's a job he enjoys — particularly during football season since, as this is written, Air Force is 6-0 for the season and ranks 13th among all college teams in the nation. Particularly, as well, because the Air Force Academy team is a young squad that is already showing signs of soon becoming one of the nation's top college gridiron teams.

These days at the academy are a lot different for Tokish than they were after the terrorist attack on Sept. 11. Shortly after that tragedy, three months after completing his Steadman-Hawkins Fellowship, Maj. Tokish was dispatched to Afghanistan. As one of the first orthopaedic surgeons in the war zone, he was assigned command of the first MFST(Mobile Forward Surgical Team) unit, where he served on the front repairing soldiers from U.S. Special Operations, the Army's elite combat group whose soldiers had found themselves on the receiving end of mine or mortar attacks.

"Fortunately," says Maj. Tokish today, "I had to perform only 25 surgeries during the six months I served on the front, which was certainly good news for our guys.

"Still," he continues, "it wasn't pretty. Most of the surgeries involved amputation from mine explosions and mangled extremities, which wasn't exactly sports medicine. But we did encounter a number of injuries from soldiers jumping out of planes or from combat maneuvers that weren't necessarily surgical in nature but needed an injection or properly directed rehab or bracing. All of this, of course, was extremely valuable to my training."

What Tokish did discover were close similarities between Special Operations soldiers and the athletes that he had been trained to repair.

"Managing the care of a Special Ops soldier is a lot like managing an elite athlete. What struck me at first was the fact that these soldiers were asked to perform at a very high level physically. They are capable of doing things that we don't ask regulars to often do. And their attitude is different. Like a professional athlete, they're not interested in anything other than how fast they can get back to their mission. So your first goal as a surgeon, as with a professional athlete, is education — convincing them that you have the same goal that they do, and that goal is getting them back to the job at hand.

"These soldiers are very dedicated professionals who are willing to sacrifice their lives to complete their mission. And they know they're not going to do that from the sidelines."

As a Fellow who had spent a year at the Steadman-Hawkins Clinic in 2000-2001, Tokish says he's taken away a lot from the experience.

"I learned how to listen to patient concerns. Both Dr. Steadman and Dr. Hawkins were careful to listen to each patient attentively and educate each patient as to the nature of his injury and all the options that were open to him. Almost always, the patient would make the decision that was best for himself and his family or his team. That, in my experience, was true for our soldiers as well."

Equally impressive, says Tokish, was the manner in which the Clinic's doctors treated not only their patients, but their staff. "Dr. Steadman's staff has been with him virtually forever—and there's a reason for that. It's because he treats everyone on his staff with the utmost respect. For all the accolades Dr. Steadman has received in his lifetime, he is still a person who is dedicated to helping others, and he does it with a humility that is very rare, especially among people who have experienced the level of success that he has."

Major John Tokish, M.D.

Tokish, who calls Seattle home, was selected as a Fellow in July 2000 from hundreds of others, largely because he had already established himself as one of the top practitioners in the orthopaedic field. Prior to his residency at the University of Arizona Health Sciences Center, Maj. Tokish attended the U.S. Air Force Academy for his undergraduate degree in biochemistry and the University of Washington School of Medicine. His honors include membership in the Alpha Omega Alpha Honor Society, the House Officer Educator of the Year at the University of Arizona, and the Leonard F. Peltier Award for Excellence in Research. He has also been published in the *Journal of Arthroplasty, Techniques in Orthopaedics* and the *Journal of Orthopaedic Trauma*.

Tokish has reason to be proud of his selection as a Steadman-Hawkins Fellow. Considered one of the top post-residency sports medicine fellowship programs in the world, the Fellowship program is at the core of the Foundation's educational effort.

Each year, six young orthopaedic surgeons are chosen from more than 200 candidates to become Steadman-Hawkins Fellows. They are with the Foundation for an intensive 12-month training program, during which their orthopaedic surgical skills are refined and they investigate the causes, prevention and cure of degenerative arthritis as well as the treatment and prevention of injuries.

The Fellowship program itself (there are now 120 Fellows and associates worldwide) provides benefits in three critical areas: (1) research, which is shared with other orthopaedic centers throughout the world; 2) benefits for thousands of patients as each graduate from the program joins the network of practicing Steadman-Hawkins Fellows; and 3) each Fellow learns new techniques that will improve health care and reduce medical costs worldwide.

"Our goal," says Dr. Hawkins, "is to prepare our Fellows to be at the cutting edge of their field for the remainder of their career.

"We're fortunate to work with the best and brightest young physicians in the world. Their insight and enthusiasm during this rewarding program has demonstrated to us many times over that we, too, learn as we teach." ■

Steadman◆Hawkins Sports Medicine Foundation Research Wins International Biomechanics Award

International Society Praises Foundation's Research

The American Society of Biomechanics has selected the abstract, "Anterior-Cruciate Ligament Forces in the Intact Knee During Normal Gait," as winner in the 2002 *Journal of Biomechanics* Award competition. Kevin Shelburne, Ph.D.; Marcus Pandy, Ph.D.; Frank C. Anderson, Ph.D.; and Michael Torry, Ph.D., jointly authored the abstract.

Dr. Shelburne is the senior staff scientist of the biomechanics laboratory at the Steadman◆Hawkins Sport Medicine Foundation. The award, one of the most prestigious in the biomechanics field, was presented to the winner at the Fourth World Congress on Biomechanics in August in Calgary.

"We (doctors in biomechanics) help (medical) doctors understand the mechanics of knee joints," says Dr. Torry. "With this information, doctors can make better choices of treatment plans." The awarded research shows what happens to a healthy knee while walking and one that has a torn ACL. "We discovered that without the ACL, all ligaments have to make up for what the ACL isn't doing," Dr. Torry says.

The World Congress of Biomechanics, a conference held every four years, hosts biomechanists from around the world and includes much of the best biomedical research conducted during the previous four-year period. The goal of the Congress is to facilitate the exchange of cutting-edge research in biomechanics. More than 1,100 communications and 500 symposia speakers were invited to participate in the meeting. Abstracts representing every continent and 47 countries were presented at the meeting.

The ASB *Journal of Biomechanics* Award, sponsored by Elsevier Science, Ltd., publishers of the *Journal of Biomechanics*, recognizes substantive and novel mechanics approaches that explain how biological systems function. Candidates for the award are selected from a pool of the top-rated 20 percent of abstracts submitted to the WCB meeting. The ASB Awards Committee selects two finalists for the award and each of these two authors presents his or her work in a special awards session at the meeting.

According to Dr. Kevin Shelburne, the award is the Super Bowl of biomechanical research. "Just being a finalist for this award," said Dr. Kevin Shelburne, "is a great honor. To have our work selected from among the work of such an elite group of researchers is most gratifying." Dr. Shelburne received his bachelor of science degree in mechanical engineering from Texas A&M University in 1985. He was awarded a master of science degree in mechanical engineering from Texas A&M in 1988 while specializing in robotics. Before returning to graduate study at the University of Texas at Austin, Dr. Shelburne spent three years working for McDonnell Douglas Space Systems on the International Space Station project.

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In 1997, Dr. Shelburne received his Ph.D. in mechanical engineering from the University of Texas, where he specialized in biomechanics under the direction of Dr. Marcus Pandy. The focus of much of his work with Dr. Pandy was in computer modeling and simulation of the mechanics of the normal and reconstructed knee joint.

Following graduation, Dr. Shelburne spent three years with Lockheed Martin Space Systems, working on the design of new launch vehicles. Dr. Shelburne joined the Steadman◆Hawkins Sports Medicine Foundation in March 2000. ■

Meet Our Staff:
William G. Rodkey, D.V.M.

William G. Rodkey, D.V.M., director of Basic Science Research.

Dr. Rodkey serves as Director of Basic Science Research and Educational Consultant at the Steadman◆Hawkins Sports Medicine Foundation in Vail. Involved with the Foundation since its beginning, he is our longest-serving staff member. He also serves as Vice President of Scientific Affairs for ReGen Biologics, a biomedical technology company involved with collagen matrix technology for tissue engineering in musculoskeletal tissue regeneration.

Prior to joining Dr. Steadman in 1990, Dr. (Colonel, U.S. Army) Rodkey was Chairman of the Military Trauma Research Division for the Letterman Army Institute of Research (LAIR) in San Francisco. Dr. Rodkey has conducted extensive orthopaedic sports medicine research at the Foundation as well as other research aimed at improving early surgical care of trauma victims. For example, at LAIR he conducted independent research and collaborated on projects that included peripheral nerve repairs, reconstruction of skeletal muscle, extensor tendon repairs, blood gas and acid-base determinations by simplified techniques, surgical treatment of penetrating renal trauma, treatment of acute spinal trauma, pulsatile and non-pulsatile cardiopulmonary bypass, effects of various anesthetic agents in traumatized patients, and anterior cruciate ligament repair.

Dr. Rodkey also was involved with research protocols and served as director of the extramural contract program in Combat Trauma Research, supervising 72 personnel, including 12 military officers (physicians, veterinarians and basic scientists), 39 military technicians, 12 senior civilian scientists (Ph.D. level), and nine civilian technical and clerical workers. Dr. Rodkey's accomplishments while in the service of our country earned him numerous awards and military decorations, including the U.S. Legion of Merit Medal, Meritorious Service Medal, Army Commendation Medal, Humanitarian Services Medal, Order of Military Medical Merit, and the U.S. Secretary of the Army Research and Development Achievement Award.

He has authored more than 125 articles and abstracts on research and clinical topics. He has also made more than 180 presentations at national and international meetings. Dr. Rodkey has received numerous national and international awards for his research efforts. Included are the Excellence in Research in Basic Science Award from the American Orthopaedic Society for Sports Medicine, the H. Edward Cabaud Memorial Award for Knee Research from the American Orthopaedic Society for Sports Medicine, the Albert Trillat Award for Excellence in Knee Research, the Distinguished Alumnus Award from Purdue University, and the GOTS-Beiersdorf Research Award 2000. He serves on the editorial review boards or as reviewer for several orthopaedic, sports medicine and veterinary journals, as well as grant review committees. Dr. Rodkey received his Doctor of Veterinary Medicine degree from Purdue University and completed his surgical and orthopaedic residency at the University of Florida. He is board-certified as a Diplomate of the American College of Veterinary Surgeons.

As the Foundation looks forward to celebrating its 15-year anniversary in 2003, Dr. Rodkey looks back on his experience. "The past 12-plus years," he says, "have been the highlight of my professional career. Helping to build the Foundation and see it flourish has been most gratifying. Having the opportunity to work closely with Dr. Steadman on many studies is an unparalleled opportunity." His favorite quote (and philosophy of work) is "The real voyage of discovery consists not in seeking new landscapes, but in having new eyes." ■

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enjoy a full day of skiing, but you also increase the risk of injury.

Skiing requires both power and endurance. On the days you can't get to the slopes, try doing a little cross training to beef up your strength and cardiovascular endurance: 15-30 minutes on a bike, a moderate two- to three-mile jog, or some interval training can work wonders for improving control and stamina. Anytime you can get your heart rate up and start sweating, progress is being made.

Quarter Squats

Skiing every day will give even the least competitive athlete improved strength in the legs. However, if you'd like to be able to hit the slopes with a little more speed and control, a simple weight program can increase your power and quickness.

Balance Squats

Hamstring Curls

Calf Raises

1. Quarter Squats: With a bar on your shoulders, or holding dumbbells, begin with a slight flex in the knees. Drop your butt down toward the ground about 8-10 inches, then back up. Be sure not to let your knees go over your toes (this tends to put too much stress on your joints). Try for three sets of no less than 10 repetitions.

2. Balance Squats: This is a single-leg squat with no weight, going a little deeper than the quarter squats. Begin with your left foot on a chair or stool, behind your body. Step a little farther forward with your right foot on the ground. For this exercise, start with about a 30-degree flex in your right knee. Again, drop your butt until you are just before parallel to the ground. This is a great exercise. You'll really feel it in your quads and gluts. Try for two sets on each leg.

3. Hamstring Curls: This can most easily be done on a machine in a gym. Look for one where you are either lying on your stomach or sitting. This exercise will resist you as you try to kick your feet behind your body. You should feel the "burn" on the back of your thighs. Three sets of 10 repetitions are recommended.

4. Calf Raises: Start on flat ground, feet about shoulder-width apart facing forward. Go up on your toes, and then back down to the ground. It's as simple as it sounds, but this exercise can increase your agility and quickness for the tough returns. More advanced techniques include doing the raise standing on one leg, or standing on the balls of your feet on a step, allowing yourself to get lower than you normally would on the floor.

Before starting any new exercise program, please consult your physician. ■

Health Matters:
The Good, The Bad and the Ugly of Cholesterol

By Jack Eck, M.D.

Editor's Note: Dr. Eck has practiced internal medicine at Vail Valley Medical Center since 1971. His area of interest and specialty has been sports medicine and wellness.

It seems like everyone is talking about cholesterol these days. No matter where you go, whether it's a health club, golf course, restaurant or cocktail party, it's something everyone wants to better understand. We talk about high and low cholesterol, as if that were the end-all for making decisions in controlling our weight and what we eat. Innately, we all want a healthy lifestyle.

Basically, cholesterol is a fat, and it needs some type of carrier to transport it through the blood, which is a water substance. Because fat is not able to dissolve in water, it attaches to fat-transporting substances called lipoprotein. Many of these lipoproteins are directly related to a person's risk of vascular disease. For purposes of this article, we'll focus on the vascular system of the heart (coronary arteries). The coronary arteries are the arteries that carry blood to the heart muscle. These arteries are vulnerable to plaque buildup from cholesterol. But arteries in the rest of the body also have the same vulnerabilities.

Basically, total cholesterol is not the whole story. In fact, the components of the total cholesterol give us more insight than the total cholesterol alone. Some people can get by with a high total cholesterol, if the components are favorable.

Total cholesterol measurement is made up of several different elements, the most important being HDL, LDL and triglycerides.The HDLs (high-density lipoproteins) help as a scavenger to remove the cholesterol from the arteries and, therefore, take it back to the liver for removal from the body. The higher the level of HDL, the less risk of heart disease.

LDLs (low-density lipoproteins) are transported from the liver (the body's manufacturing plant) to be used in all parts of the body. If they are not cleared from the blood (by HDL), they can build up in the arteries, creating plaque, one of the major culprits that cause heart attacks.

Therefore, we have "good" cholesterol, called HDL, which clears cholesterol from the blood, and "bad" cholesterol (LDL), which contributes to the building up of cholesterol (or plaque) in the arteries.

People often have difficulty remembering which cholesterol is which. One of my patients had a neat mnemonic, where H stands for "hero" and L stands for "lethal."

Medical research constantly strives to determine the "acceptable" level of HDL and LDL for reducing cardiac risk. Recent analysis of population demographics has revealed that the older standards allowed for the incidence of heart attack among a lot of people.

Optimally, your HDL level should be 60 or above. Most of the standards clearly do not recommend its being below 40, but that

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is difficult for everyone to achieve. Just last year, the LDL level was set at 130, but now we know that the average person having a heart attack has an LDL of 130. Therefore, one wants to reduce the LDL as much as possible. And clearly, people with diabetes, heart disease or high blood pressure need their LDL to be below 100.

The real challenge, however, is that both your HDL and LDL are genetically predetermined, so our ability to manipulate them through diet and lifestyle changes is at best difficult. But it is easier to manipulate LDL by lifestyle and diet changes than it is the HDL. In general, HDL is the most difficult to change. The things we can modify would be to quit smoking (if we are smokers), start exercising (if we are not), use niacin, and choosing our parents differently. The LDLs give us a better chance to change things by exercising, losing weight and being more careful about fat and simple sugar intake in our diet.

Even these modifications are not easy, because people tend to substitute carbohydrates for reduced fat intake, which can bring on its own set of problems.

In general, eating lots of fruits and vegetables (particularly the colorful types, which contain folic acid, antioxidants and different nutrients), as well as reducing our intake of dairy products, are general rules of thumb to improve eating patterns.

Triglycerides are another type of fat molecule that participate in the transport of dietary fats, and they can also raise heart disease risk. Although they were devalued as a significant risk in the past, in recent years we have discovered that they do pose a risk. The recent reduction in the risk guidelines for triglycerides from 200 to 150 has prompted us to take another look. Triglycerides are particularly dangerous for a person with diabetes, or with a tendency for diabetes.

The real challenge, however, is that both your HDL and LDL are genetically predetermined, so our ability to manipulate them through diet and lifestyle changes is at best difficult.

Two lifestyle changes that can improve triglycerides without medication are considerable reduction in alcohol and the reduction of simple sugars.

Despite all this information, one should also be aware that 30 percent of individuals who have heart attacks have excellent cholesterol levels. Therefore, cholesterol management is not the entire story on the prevention of heart disease. Some individuals are at elevated risk because of specific fractions of LDL, HDL, and related compounds (for example Lp(a)). Those who fail to control cholesterol levels by lifestyle changes alone are still at risk and, therefore, need various medications (which is a topic for another discussion).

It is well known that there are other entities, not touched upon here, that are responsible for heart disease. Consider new information that heart disease is really an inflammatory process, and in another cardiac discussion we could cover additional topics including cardiac CRP, homocysteine, CO Q 10, and alpha-lipoprotein. These make it more complex than this article intended.

Just a few personal anecdotes as a physician in a small community of wonderful, bright, healthy, and aware people: As I walk into a restaurant, everyone seems to hide his plate of favorite foods, saying, "Watch out, here comes Dr. Eck. He is going to see me violating my diet." The converse is, people have come to my table, saying "Oh, I wonder what the doctor is eating" and putting me through all kinds of scrutiny.

As a closing bit of fun, one of my friends at a luncheon club said to another, enjoying his ice cream dessert, "Be careful; here comes Jack Eck. He can hear the glug, glug, glug of cholesterol going down the arteries of your heart." So with this in mind, we still have to enjoy life and our food. The old axiom of everything in moderation, continual diet surveillance, exercise, weight loss, stress reduction, all are benefits we can do for ourselves. ■

The Search for a Safer Aspirin

By Kenneth Paul Glassman, M.D.

Editor's Note: Dr. Glassman is an associate clinical professor in the Department of Medicine at the University of Colorado Health Sciences Center and an assistant director of the Clinical Research Unit. He is in private practice at the Denver Arthritis Clinic in Denver. Dr. Glassman is a Fellow of the American College of Rheumatology and a rheumatologist at the Denver Arthritis Clinic, where he has been involved in the research and clinical trials of every arthritis drug that has been marketed in the last 18 years. He has published many articles on inflammatory arthritis and myopathies.

From time immemorial, the treatment of pain and inflammation has long been a paramount focus of medical providers. Ancient civilizations used multiple plant species, especially willow bark, to accomplish this objective. These herbal therapies were the forerunners of "modern" anti-inflammatory medicines. In 1899, in an attempt to help his father's rheumatism, a chemist at the Bayer Company synthesized salicylic acid, or aspirin, the active compound in willow bark. Aspirin thus became the first and only pharmaceutical agent for pain and inflammation into the middle of the 20th century.

Despite its effectiveness, aspirin has a significant gastrointestinal toxicity, which limited its utility in many people and necessitated the search for a safer aspirin. That search culminated in the discovery of cortisone and its dramatic anti-inflammatory effects in rheumatoid arthritis. For this important discovery, Dr. P. Hench won the Nobel Prize in medicine in 1950. It marked the first and only time this prestigious honor was awarded in the field of arthritis and rheumatic diseases. However, enthusiasm waned for this effective treatment because of the untenable side effects (diabetes, infection, osteoporosis) experienced with long-term usage. The need existed for not only a safer aspirin but also a safer cortisone.

The story progresses to 1963 when pharmaceutical drug research into inflammation in animal models gave rise to a new class of therapeutic agents, nonsteroidal anti-inflammatory drugs (NSAIDs). Phenylbutazone and indomethaicin were the first two on the market. Further research in the 1970s led to the discovery that NSAIDs inhibited cyclooxygenase, a key enzyme that promoted the development of substances (prostaglandins) which hastened inflammation. However, prostaglandins also were responsible for protecting the lining of the stomach and normal function of platelets, a blood-clotting cell. NSAIDs proliferated in the 1970s and 1980s. Unfortunately, so did the incidence of fatal bleeding and perforated ulcers.

More recently, two forms of cyclooxygenase have been discovered. COX-1 enzyme is responsible for maintaining the normal lining of the stomach and COX-2 is involved mainly in promoting the inflammatory process. The therapeutic implication was that if you could selectively inhibit COX-2, you could impair inflammation without damaging the integrity of the stomach. Two COX-2-specific inhibitors, celecoxib (Celebrex) and rofecoxib (Vioxx) were studied and available by 1999. Two long-term ulcer trials indicated that the incidence of bleeding or perforated ulcers for rofecoxib was reduced by 50 percent when compared to traditional NSAIDs, Naprosyn and ibuprofen.

Within the past year, a third COX-2 inhibitor has become available — valdecoxib (Bextra) — and there are others currently under clinical investigation. Have we truly found a safer NSAID? It would appear so, at least from an ulcer point of view. However, when these drugs are used, we must monitor for other possible side effects, including fluid retention and elevation of blood pressure. For patients at risk for stroke or heart attack, low-dose aspirin is still prescribed.

The American College of Rheumatology and the American Pain Society currently recommend the use of COX-2-specific inhibitors in all patients who have tried and failed a course of acetaminophen (Tylenol) for osteoarthritis.

Though NSAIDs are the mainstay for treating arthritis, adjunctive nonpharmacologic interventions, such as exercise, physical therapy, glucosamine and injectable cortisone or hylauronate (synvisc/Hyalgen), are often helpful. Our search for safer therapeutics has been the paramount focus when using medicines intended to enhance the quality of life. In treating chronic inflammatory diseases, we intend to adhere to the adage "Doctor, do no harm." ■

PHOTO COURTESY OF JOHN KELLY.

Education

WELCOME 2002-03 FELLOWS

Six New Physicians Introduced

Drs. William I. Sterett, J. Richard Steadman, and Richard J. Hawkins with 2002/2003 Fellows, rear, left to right: Dr. Sterett, Scott A. Hacker, M.D.; James Van den Bogaerde, M.D.; Dr. Steadman; Dr. Hawkins; Michael J.Milne, M.D.; front, left to right: Timothy D. Farley, M.D.; Timothy O'Brien, M.D., and Reed L. Bartz, M.D.

Winter has come early to the Vail Valley, signaling the beginning of a new and busy year for the incoming "class" of Steadman-Hawkins Fellows. Regarded as one of the most prominent academic Fellowship programs in orthopaedic sports medicine, six new orthopaedic surgeons are selected from a pool of more than 150 applicants.

Steadman-Hawkins Fellows spend their year refining skills and learning new techniques from Drs. Steadman, Hawkins and Sterett. The Fellowship program includes an opportunity to participate in research with Foundation scientists. Each Fellow will be actively involved in Clinical Research, Basic Science and Rehabilitation/Human Performance Research. The Fellows will also experience "hands-on" medical coverage of major-league baseball's Colorado Rockies, the NFL's Denver Broncos and Eagle County High School sports teams.

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

Reed Bartz, M.D.

Dr. Bartz graduated from Southern Methodist University with a degree in economics and then went to the University of Texas at Galveston to study medicine. He completed his residency in orthopaedic surgery at Baylor College of Medicine, where twice he was presented with the Paul Harrington Award for excellence in orthopaedic research. Dr. Bartz is also the recipient of the prestigious Herodicus Society Award for best resident paper by the American Orthopaedic Society for Sports Medicine for his study of the topographical matching of osteochondral transplant

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(EDUCATION cont. from pg. 7)

donor and recipient sites. He has been published in the *Journal of Bone and Joint Surgery*, the *American Journal of Sports Medicine*, and the *Journal of Orthopaedic Trauma.*

Dr. Bartz will be joined in Vail by his wife Kristie and children Claire and James.

Timothy Farley, M.D.
Dr. Farley graduated with honors in psychology from the University of Notre Dame. He attended Rush Medical College in Chicago, where he served as president of the college's chapter of the Alpha Omega Alpha Medical Honor Society. Dr. Farley completed his residency at the Hospital for Special Surgery in New York City, where his research included studying the prevention of ossification after hip surgery, following cell viability of cryopreserved meniscal allografts in the sheep model, and comparing different types of implants in total knee arthroplasty.

An accomplished hockey player, Dr. Farley will be joined by his wife Barbara and baby son Ryan.

Scott Hacker, M.D.
Dr. Hacker earned his undergraduate degree in bioengineering from the University of California at San Diego and also was awarded the Regent's Fellowship for a master's degree in bioengineering concentrating on orthopaedic biomechanics. He then studied medicine at the University of California at Irvine. As an orthopaedic surgery resident at the University of Washington, he pursued his strong interest in clinical and biomechanics research and has been published in the *Journal of Biomechanical Engineering, Journal of Orthopaedic Research*, and *Osteoarthritis and Cartilage.*

An outdoor enthusiast and talented musician, Dr. Hacker will be joined by his wife Mona.

Michael Milne, M.D.
Dr. Milne studied economics and finance as an undergraduate at Southern Methodist University and at the London School of Economics before deciding to pursue a career in medicine. He earned his medical degree and completed his residency in orthopaedic surgery at the University of Texas' Southwestern Medical Center. During residency, Dr. Milne received the Texas Orthopaedic Association Award for the Best Resident Paper on "Knee Bridging External Fixation of High Energy Bicondylar Tibial Plateau Fractures."

A recent member of the physicians' team for men's and women's Olympic trials in triathlon, Dr. Milne brings a well-rounded interest in athletics to his fellowship year in Vail.

Timothy O'Brien, M.D.
Dr. O'Brien graduated cum laude from Harvard University with a degree in government. After working two years with an international law firm, he decided to change direction and study medicine. He attended Brown School of Medicine and became interested in orthopaedics while working on several basic science research projects in the laboratory at Rhode Island Hospital. Dr. O'Brien completed his orthopaedic surgery residency at the University of California at San Francisco, where he was involved in researching functional outcome following chronic rupture of the patellar tendon.

A leader in many volunteer and community-based projects, Dr. O'Brien also looks forward to enjoying the mountain biking, hiking and golf in Vail.

James Van den Bogaerde, M.D.
Dr. Van den Bogaerde studied biology as an undergraduate at University of California and attended the University of Chicago's Pritzker School of Medicine. While in medical school, he received the Roche Laboratories Award for Excellence in Basic Science Research at the National Student Forum and the National Institutes of Health Summer Student Research Award. Dr. Van den Bogaerde completed his residency program at the University of California (Davis) Medical Center, where his research projects included comparing hamstring and patellar tendon grafts for MCL reconstruction, as well as studying approaches to the repair of intercondylar humerus fractures.

Captain of his championship collegiate alpine ski racing team, Dr. Van den Bogaerde will be joined in Vail by his wife Erica and children Sadie and Nicholas. ■

Steadman-Hawkins Update:

Publications, Presentations and Research

The Foundation was the center of attention at the **Fourth Academic Congress of the Asian Shoulder Association** in October, as Foundation shoulder research was presented by Dr. Richard J. Hawkins and visiting Korean physician Young-Kyu Kim, M.D. Dr. Hawkins presented three lectures, "Overview in Posterior Instability," "Shoulder Problems in the Overhead Athlete," and "Rotator Cuff and the Biceps Tendon Update." Dr. Kim presented four topics of Foundation research at the Congress: "Humeral Torque in Youth Baseball Pitchers: Implications for the Development of Little League Shoulder and Humeral Retroversion," "Humeral Torque in Professional Baseball Pitchers and its Relationship to Humeral Shaft Fracture and the Development of Humeral Retroversion," "Electrothermal Arthroscopic Shoulder Capsulorrhaphy for Chronic Shoulder Instability: A Minimum Two-Year Followup," and "Relationship Between Humeral Retroversion and Shoulder Rotation in Major League Baseball Pitchers."

After many years of hard work by numerous people, the landmark paper, "Outcomes of Microfracture for Traumatic Chondral Defects of the Knee: 11-year follow-up," by J. Richard Steadman, M.D.; Karen K. Briggs, M.B.A.; Juan J. Rodrigo, M.D.; Mininder S. Kocher, M.D.; Tom J. Gill, M.D.; and William G. Rodkey, D.V.M., has been accepted for publication with no further revisions by the *Journal of Arthroscopy*.

The American Academy of Orthopaedic Surgeons (AAOS) annual meeting will be held in New Orleans, February 5-9. The Foundation has produced several publications and presentations for this meeting. **Karen Briggs, M.B.A.**, director of Clinical Research, reports that the following three podium presentations have been accepted: "The Relative

Risk of Glenohumeral Arthritis in Patients with Shoulder Instability," by Michele Cameron, M.D.; Karen Briggs, M.B.A.; Marilee P. Horan; and Richard J. Hawkins. The second presentation is entitled "Lysis of Pretibial Patellar Tendon Adhesions (Anterior Interval Release) to Treat Anterior Knee Pain After ACL Reconstruction Anterior Interval Release," by Sumant G. Krishnan, M.D.; J.Richard Steadman, M.D.; and Peter J. Millett. "Patient Satisfaction and Functional Outcome After Microfracture of the Degenerative Knee" is the work of Bruce S. Miller, M.D.; J. Richard Steadman, M.D.; Karen K. Briggs, M.B.A.; Jason W. Folk, M.D.; and Juan J. Rodrigo, M.D.

Accepted poster presentations include: "Determinants of Patient Satisfaction with Outcome after Rotator Cuff Surgery," by James O'Holleran, M.D.; Mininder S. Kocher, M.D.; Marilee P. Horan, Karen K. Briggs, M.B.A.; and Richard J. Hawkins, M.D.; "Rupture of the Subscapularis Tendon After Shoulder Arthroplasty: Diagnosis, Treatment and Outcome," by Bruce S. Miller, M.D.; Marilee P. Horan; Tom Noonan, M.D.; and Richard J. Hawkins, M.D.; "Critical Review of the Recurrence of Glenohumeral Instability After Open Surgical Procedures: One Surgeon's Experience," by Sumant G. Krishnan, M.D.; Richard J. Hawkins, M.D.; and Marilee P. Horan; and "Posterior Tibial Slope Following Medial Opening Wedge Proximal Tibial Osteotomy for Varus Arthrosis of the Knee," by Bruce S. Miller, M.D.; Valeri Rich; and William I. Sterett, M.D. **The American Orthopaedic Society for Sports Medicine Specialty Day** accepted yet another podium presentation: "A Critical Review of the Recurrence of Glenohumeral Instability After Open Surgical Procedures: One Surgeon's Experience," by Sumant G. Krishnan, M.D.; Richard J. Hawkins, M.D.; and Marilee P. Horan.

Exhibit

The abstract "Electrothermal Arthroscopic Shoulder Capsulorrhaphy: A Minimum Two-Year Follow-Up," by Sumant G. Krishnan, M.D.; Spero Karas, M.D.; Marilee P. Horan; and Richard J. Hawkins, M.D., will be the subject of a week-long exhibit at the AAOS meeting. The abstract was chosen as the best submitted abstract for the 2002 Annual AOSSM Meeting.

Publications:

Clinical Research also reports the following papers have been accepted for publication:

Journal of Shoulder and Elbow Surgery: "Accuracy of Magnetic Resonance Imaging in Determining the Presence and Size of Recurrent Rotator Cuff Tears," by A.R. Motamedi, M.D.; Luis H. Urrea, M.D.; Robert E. Hancock, M.D.; Richard J. Hawkins, M.D.; and Charles Ho, M.D., Ph.D.

Journal of Pediatric Orthopaedics: "Management and Complications of Anterior Cruciate Ligament Injuries in Skeletally Immature Patients: A Survey of The Herodicus Society and The ACL Study Group," by Mininder S. Kocher, M.D.; Richard J. Hawkins, M.D.; Hilary S. Saxon; and David W. Hovis, M.D.

American Journal of Sports Medicine: "Reliability of the Heel-Height Measurement in Documenting Knee Extension Deficits," by Theodore F. Schlegel, M.D.; Martin Boublik, M,D.; Richard J. Hawkins, M.D.; and J. Richard Steadman, M.D.

Journal of Shoulder and Elbow Surgery: "The Relative Importance of Acromial Morphology and Age with Respect to Rotator Cuff Pathology," by Tom J. Gill, M.D.; Elizabeth McIrvin; Mininder S. Kocher, M.D.; Karen K. Homa; Scott D. Mair, M.D.; and Richard J. Hawkins, M.D.

Journal of Bone and Joint Surgery: "Determinants of Patient Satisfaction After Anterior Cruciate Ligament Reconstruction," by Mininder S. Kocher, M.D.; J. Richard Steadman, M.D.; D. Zurakowski, M.D.; Karen K. Briggs, M.B.A.; William I. Sterett, M.D.; and Richard J. Hawkins, M.D.

Physician and Sports Medicine: "Toradol Use in the National Football League: A Survey of Use, Policy and Experience and Review of the Literature," by John M. Tokish, M.D.; E.T. Powell, M.D.; Theodore F. Schlegel, M.D.; and Richard J. Hawkins, M.D.

American Journal of Sports Medicine, (December 2002): "Operative vs. Nonoperative Management of Acute Achilles Tendon Ruptures: Expected-Value Decision Analysis," by Mininder S. Kocher, M.D.; J. Bishop, M.D.; R. Marshall, M.D.; Karen K. Briggs, M.B.A.; and Richard J. Hawkins, M.D.

American Journal of Sports Medicine (December 2002): "Posterior Instability of the Shoulder with Secondary Impingement in Elite Golfers," by W. David Hovis, M.D., Mark T. Dean, M.D.; W.J. Mallon, M.D.; and Richard J. Hawkins, M.D.

Arthroscopy (In press): "Outcomes of Patients Treated Arthroscopically by Microfracture for Traumatic Chondral Defects of the Knee: Average 11-Year Follow-Up," by J. Richard Steadman, M.D.; Karen K. Briggs, M.B.A.; Juan J. Rodrigo, M.D.; Mininder S. Kocher, M.D.; Tom J. Gill, M.D.; and William G. Rodkey, D.V.M.

American Journal of Sports Medicine (In press): "The Prevalence of Glenohumeral Osteoarthrosis with Shoulder Instability," by Michele L.Cameron, M.D.; Mininder S. Kocher, M.D.; Karen K. Briggs, M.B.A.; Marilee P. Horan; and Richard J. Hawkins, M.D.

American Journal of Sports Medicine (In press, scheduled Jan. 2003): "Reproducibility and Reliability of the Outerbridge Classification for Grading Chondral Lesions of the Knee," by Michele L. Cameron, M.D.; Karen K. Briggs, M.B.A.; and J. Richard Steadman, M.D.

Journal of Shoulder and Elbow Surgeons (In press, scheduled Jan. 2003): "Clinical Evaluation and Treatment of Spinoglenoid Notch Ganglion Cyst," Bruce E. Piatt, M.D.; Richard J. Hawkins, M.D.; R.C. Fritz, M.D.; Charles P. Ho, M.D.; E. Wolf, M.D.; and M. Schickendantz, M.D.

Arthroscopy (In press): "Laser-Assisted Thermal Capsulorrhaphy," by Tom J. Noonan, M.D.; John M. Tokish, M.D.; Karen K. Briggs, M.B.A.; and Richard J. Hawkins, M.D.

Orthopedics (In press): "Decreased Range of Motion Following Acute vs. Chronic Anterior Cruciate Ligament Reconstruction," by William I. Sterett, M.D.; Kim S. Hutton, M.D.; Karen K. Briggs, M.B.A.; and J. Richard Steadman, M.D.

American Journal of Sports Medicine (Accepted with revisions): "Chondral Resurfacing and High Tibial Osteotomy in the

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Varus Knee," by William I. Sterett, M.D.; and J. Richard Steadman, M.D.

American Journal of Sports Medicine (Accepted with revisions): "Relationships between Objective Assessment of Ligament Stability and Subjective Assessment of Symptoms and Function after ACL Reconstruction," by Mininder S. Kocher, M.D.; J. Richard Steadman, M.D.; Karen K. Briggs, M.B.A.; William I. Sterett, M.D.; and Richard J. Hawkins, M.D.

American Journal of Knee Surgery (Accepted with revisions): "The Microfracture Technique in the Treatment of Full-Thickness Chondral Lesions of the Knee in National Football League Players," by J. Richard Steadman, M.D.; Spero Karas, M.D.; Bruce S. Miller, M.D.; Theodore M. Schlegel, M.D.; Karen K. Briggs, M.B.A.; and Richard J. Hawkins, M.D.

Michael Torry, Ph.D., director of the Biomechanics Research Laboratory, reports that the following abstracts and papers have been accepted for publication:

Fourth Academic Congress of the Asian Shoulder Association, Seoul, Korea, Oct. 30-Nov. 2, 2002: "Humeral Torque in Professional Baseball Pitchers and its Relationship to Humeral Shaft Fracture and the Development of Humeral Retroversion," by Y-K Kim, M.D.; Michele Sabick, Ph.D.; Michael R. Torry, Ph.D.; and Richard J. Hawkins, M.D.

Fourth Academic Congress of the Asian Shoulder Association, Seoul, Korea, Oct. 30-Nov. 2, 2002: "The Relationship Between Humeral Retroversion and Shoulder Rotation in Major League Baseball Pitchers," by Y-K Kim, M.D.; J.M. Tokish, M.D.; Michael R. Torry, Ph.D.; Michele B. Sabick, Ph.D.; and Richard J. Hawkins, M.D.

Fourth Academic Congress of the Asian Shoulder Association, Seoul, Korea, Oct 30-Nov 2, 2002: "Humeral Torque in Youth Baseball Pitchers: Implications for the Development of Little League Shoulder and Humeral Retroversion," by Y-K Kim, M.D.; Michele Sabick, Ph.D.; Michael R. Torry, Ph.D.; and Richard J. Hawkins, M.D.

Papers:

Journal of Biomechanics (In review): "Anterior Cruciate Ligament Force During Normal Walking," Kevin B. Shelburne, Ph.D.; Marcus G. Pandy, Ph.D.; F.C. Anderson, M.D.; and Michael R. Torry, Ph.D.

Journal of Shoulder and Elbow Surgery (In Press): "Clinical Evaluation of Upper and Lower Subscapularis Muscle Activity Lift-Off and Belly-Press Tests," by John M. Tokish, M.D.; Michael J. Decker, M.S.; Michael R. Torry, Ph.D.; Henry E. Ellis; and Richard J. Hawkins, M.D.

American Journal of Sports Medicine (In Press): "EMG Evaluation of Select Rehabilitation Exercises for the Subscapularis Muscles," by Michael J. Decker, M.S.; Michael R. Torry, Ph.D.; John M. Tokish, M.D.; Henry E. Ellis; and Richard J. Hawkins, M.D.

Medicine Science in Sports and Exercise, 34:9:1408-1413: "Landing Adaptations after ACL Reconstruction," by Michael J. Decker, M.S.; Tom J. Noonan, M.D.; Michael R. Torry, Ph.D.; A. Rivier; and William I. Sterett, M.D.

Awards

Steadman-Hawkins Website Wins Design Award

The website of the Steadman◆Hawkins Sports Medicine Foundation was recently awarded a "Standard of Excellence" WebAward from the Web Marketing Association. Designed by the Vail Valley-based firm of Hill & Company, the Foundation's website, www.shsmf.org, makes available to the general public and medical specialists the results of valuable orthopaedic research being performed at the Foundation. The site has been a great tool for communicating information to physicians and the general public and assisting with fund-raising efforts. Articles, studies, FAQs, papers and contact information are now available at the www.shsmf.org website.

Development of the Foundation's website was funded by a grant from the **Steven & Michele Kirsch Foundation**. The Kirsch Foundation invests in causes in which high-impact activities can result in a safer and healthier world.

This is the fourth award for the Steadman-Hawkins website. The International Association of Web Masters and Designers previously selected it for "Golden Web" awards in 2000/2001 and 2001/2002. It was also the recipient of the 2001 "Surfer's Choice" award.

The Web Marketing Association (WMA) was founded in 1997 to help establish a high standard for Internet marketing and corporate web development on the World Wide Web. The "Standard of Excellence" award recognizes the standard for which all corporate websites should strive. Judges include members of the media, advertising executives, site designers, content providers and webmasters. Other 2002 "Standard of Excellence" awards were made to websites for Lucent, Shell, BMW, the Cleveland Zoo, and FedEx, among others.

Richard O'Connor Award

The collaborative research effort between the Steadman◆Hawkins Sports Medicine Foundation and the University of Pittsburgh Musculoskeletal Research Center has borne fruit. John C. Loh, M.D., a resident in the Department of Orthopaedic Surgery in the School of Medicine, recently was awarded the 2002 Richard O'Connor Award presented by the Arthroscopy Association of North America (AANA) for his paper "Does Lateralization of Femoral Tunnel Placement Improve Anterior Cruciate Ligament Graft Function?" The award was presented during the 2002 AANA Annual Meeting, April 25-28, in Washington, D.C. Dr. Loh is primary author of the paper, which was sponsored by the Foundation. Co-authors from Pitt's Department of Orthopaedic Surgery include Freddie H. Fu, M.D., David Silver (Professor and Chair); Savio L-Y. Woo, A.B. Ferguson (Professor of Orthopaedic Surgery and director, Musculoskeletal Research Center); Yukihisa Fukuda, M.D., and Eiichi Tsuda, M.D. (both postdoctoral research fellows at the Musculoskeletal Research Center); and J. Richard Steadman, M.D. The manuscript has also been submitted to *Arthroscopy*.

Board of Directors in the News

Cindy Nelson
PHOTO COURTESY OF JOHN KELLY

Congratulations to Foundation Board member **Cindy Nelson**, who was inducted into the **Colorado Ski Hall of Fame** Oct. 19. Cindy started her 14-year tenure with the U.S. Ski Team when she was only 15 years old. During her ski-racing career, she was named to four Olympic teams, competing at three Olympics and four World Championships. In 1974, Nelson broke the great Annemarie Moser-Proell's winning streak to become the first U.S. racer to win a World Cup downhill. She won the Bronze medal at the 1976 Olympic Downhill at Innsbruck and the Silver Combined World Championship medal at the 1980 Lake Placid Olympics. Cindy earned several World Cup titles and was a national champion seven times. She was also the first skier to win a World Cup Super G. Cindy competed in all five alpine disciplines and retired as one of the finest athletes ever to compete for the U.S. in international competition.

Education

Where Are They Now?

The graduating class of 2001/2002 Steadman-Hawkins Fellows are busy establishing new careers in orthopaedics.

Jason W. Folk, M.D., remains in Vail and has joined the Steadman-Hawkins Clinic. **David C. Johnson, M.D.**, has started a private practice in Alexandria, Va. He plans to open a sports clinic in the D.C. metropolitan area with his brother, who is also an orthopaedic surgeon who practices at Johns Hopkins University in Baltimore. **Thomas A. Joseph, M.D.,** has moved to Youngstown, Ohio, to join an eight-person orthopaedic practice. Dr. Joseph will specialize in sports medicine (shoulder, elbow and knee) surgery. He has also accepted the position of Medical Director of Sports Medicine at St. Elizabeth's Hospital in Youngstown. **Richard L. Lawton, M.D.,** has moved to Colorado. He is developing a practice specializing in problems involving the knee, shoulder, elbow and hip. **Bruce S. Miller, M.D.,** holds a full-time academic position in orthopaedic sports medicine at the University of Michigan in Ann Arbor. After his fellowship, **Douglas J. Wyland, M.D.,** spent a month in California learning more about sports medicine of the foot and ankle, which he will utilize in his new practice at the Steadman-Hawkins Denver Clinic. Along with his clinical duties, Dr. Wyland serves as a team physician for the Colorado Rockies.

A special "thank you" to our sponsors who make our Fellowship program possible. We'd also like to recognize those individuals and foundations that support the entire Fellowship class through the sponsorship of Academic Chairs. Chair sponsors include **Mr. and Mrs. Harold Anderson, Mr. and Mrs. Lawrence Flinn, the Fred and Elli Iselin Foundation, Mr. and Mrs. John W. Jordan, Mr. and Mrs. Henry Kravis, Mr. and Mrs. Ron Miller,** 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 work. We extend our gratitude to the following individuals for their generous support: **Mr. Milledge Hart, Mr. and Mrs. John W. Jordan, Mr. and Mrs. Kent Logan, Mr. Tim McAdam, Mr. and Mrs. Jay Precourt, Mr. Tom Quinn**, and **Mr. and Mrs. Stewart Turley**.

Media

Lindsay Davenport
PHOTO: AP/WIDE WORLD PHOTOS

Tennis stars **Lindsay Davenport** and **Sandra Rubin** caught the media's attention when they both underwent surgery by Dr. Steadman in early 2002. Rubin and Davenport have met 10 times, with Davenport holding the winning edge 8-2. They have never played in a final, but they do have something in common: Both are back on the tour this year after having had knee surgery performed by Dr. Steadman. "He's the man," says Rubin. Adds Davenport, "He's an incredible doctor." Rubin underwent two surgeries on her left knee in 13 months. She had the first in early 2001 and another in January. "After the operation, it was a question of getting physically fit," says Rubin. "Lindsay has had a long road back as well."

Davenport was faced with a potentially career-ending injury. She had chondral defect on the right lateral tibial plateau when she arrived in Vail. "If we hadn't come up with a solution, it would have ended her ability to play tennis," says Dr. Steadman. He performed microfracture surgery, a less invasive procedure to regenerate cartilage that allowed her to go back to full activity. "She's had a very strong recovery," Steadman says. "She's already been in the finals of two tournaments." Davenport, a

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multiple Grand-Slam winner and Olympic champion, made it to the semi-finals at the U.S. Open this past August before losing to Serena Williams.

Add future Pro Football Hall of Fame athlete and Super Bowl MVP **Terrell Davis** to the list of people who also will benefit from microfracture. A headline in the September 19 **Denver Post** announced that the former Denver Broncos running back was to undergo microfracture surgery on his left knee by Broncos team physicians Dr. Richard J. Hawkins and Dr. J. Richard Steadman at the Steadman-Hawkins Clinic. If nothing else, the surgery is expected to improve Davis' quality of life years from now. But it also could provide the medical miracle Davis said he would need to return to the game. Davis is one of only three running backs in the history of the NFL to have rushed for more than 2,000 yards in a season. More than 50 NFL players have undergone microfracture, including Washington Redskins defensive end **Bruce Smith** and Oakland Raiders safety **Rod Woodson**.

Red Brick Knee and Shoulder Hospital

With more than 77 percent of orthopaedic surgeons worldwide now using microfracture as an alternative to knee replacement, it's no wonder that many of the world's top athletes travel to Vail for treatment of their injuries. News media from London, Berlin and Rome report on the health of their countries' soccer stars who trek to Vail. **Renaldo, Matthäus, Diesler, Del Piero** and **Redknapp** have all visited the exam rooms of the Steadman-Hawkins Clinic in Vail. In the Oct. 2, 2002, issue of the German magazine ***Stern,*** Dr. Steadman and the Foundation were featured in the article "Retter der Geknickten" (Rescuer of The Broken). "From all over the world," said the article, "famous people with knee injuries make the pilgrimage to (Dr.) Richard Steadman in Vail, Colorado. The orthopaedic surgeon healed Oliver Kahn, Marc Girardelli and Martina Navratilova with his innovative operating techniques. He is admired by pop stars, statesmen, football players, ski racers and tennis players. Eighteen specialists at the Sports Medicine Foundation conduct research in the basement of the "red brick knee and shoulder hospital."

With microfracture gaining acceptance, other medical disciplines are beginning to become aware of this procedure, which was pioneered by Dr. Steadman and developed by the Foundation. ***Family Practice News***, a magazine whose audience is primary-care physicians, published the article *Microfracture Knee Repair: Less Pain, More Gain,* in its Oct. 15, 2002, issue. "The microfracture technique for repair of articular damage in the knee," said the article, "shows impressive benefits in a series of athletes followed for 11-plus years." The article also mentions a Foundation paper Dr. Steadman presented at the symposium of the International Cartilage Repair Society. The study involved 14 National Football League players on whom he had performed microfracture. The players were followed for a mean of 6.5 and a maximum of 14 years afterward. "The most important outcome measure in this group of pro athletes was this: 13 of the 14 were able to return to the NFL, where they averaged another six seasons and 74 games of play."

"We felt this was a validation of the procedure," said Dr. Steadman. "These are supersized athletes—their average weight is about 275 pounds—and we felt this must be pretty durable tissue if it's holding up as well as it has for them."

(PATIENTS IN THE NEWS cont. from pg. 1)

Pretty remarkable for someone who claims she was never a jock. "I grew up playing the piano. In fact, that's all I did. I had absolutely no childhood... but I'm making up for it now."

Born and raised in Colorado, and now living with husband Louis Nelson in New York City, Judy still pines for the outdoors—hiking, for the most part, and skiing. She has performed as a musician, singer and songwriter her entire life, first as a classical pianist at age 10 (she studied under the famed conductor Antonia Brico, later producing a documentary on Brico's life that earned her an Academy Award nomination), and later, at 16, as a guitarist and singer as she discovered and embraced the traditional songs of the folk revival of the sixties.

Playing at the Village Gate in New York in 1961, she was discovered by Elektra Records. Thus began a 35-year involvement with the company. But Judy's eclectic nature soon blossomed into a broad mixture of songs, a characteristic that has stamped her albums ever since.

She now has her own record label, Wildflower, and a new song, "Kingdom Come," a tribute to the New York City firemen who perished on September 11, 2001.

What impressed Judy most during her experience at Steadman-Hawkins were the people. "They were the best — so kind and so

Judy Collins

professional." It's one reason for her frequent trips to Vail to perform in fund-raisers for the Foundation.

"I'm particularly interested in the Foundation's research program. I've learned so much, so many things about women in sports —- about the links to osteoporosis, about how to stay fit — that I never knew before."

As for her career, it continues to skyrocket. As one music critic recently put it, "Judy continues, with music of hope and healing, to light up a world that needs music that matters and speaks to the heart."

Nice words. But what matters as much to Judy is skiing with her family, and especially with her granddaughter. "She's 15," says Judy, "and she's one hot skier!" ■

(RESEARCH UPDATE cont. from pg. 1)

ligament injuries and injury to the anterior cruciate ligament (ACL), returning to normal walking can be a real challenge. The knee's ACL provides a strong elastic link between the femur and tibia. Injury of the ACL often leads to knee instability that requires the individual to adapt his walking style to remain mobile. Even though injury to the ACL is common and debilitating, little is known about how the ligament carries force during walking and other activities of daily living. This is because there exists no practical way to measure the force carried by the ACL. Nonetheless, knowledge of how the ACL works during walking may provide clinicians with valuable information in order to better design treatment and rehabilitation protocols. For this reason, many orthopaedic researchers have long sought to explain how the ACL carries force and stabilizes the knee.

Last spring, as part of an ongoing collaboration with the University of Texas Biomedical Engineering Department, the Steadman◆ Hawkins Sports Medicine Foundation's Biomechanics Research Laboratory (BRL) sought to predict and explain the role of the ACL during walking. One of the great challenges of predicting ligament force is that muscle force largely determines the resulting force in the ligaments. Muscle forces can be surprisingly large during activities of daily living. During walking, for example, the muscles of the thigh generate force that may be one and a half times as great as the total weight of the body. This problem has confounded previous efforts by other researchers since, as previously noted, there is no practical way to directly measure muscle force. To address the problem, the collaborators used detailed mathematical representations of the musculoskeletal system and computer simulation. Computer simulation enables the exploration of places that have no other way of being reached. For this reason, computer simulation has been used for years for the design and testing of spacecraft. Using some of the same basic concepts and computing tools, a sophisticated computer simulation of human walking was developed and applied at the University of Texas by Frank Anderson (now a research associate at Stanford University) and Marcus Pandy (Steadman◆ Hawkins Sports Medicine Foundation Scientific Advisory Board member and professor of Biomedical Engineering at the University of Texas).

The muscle forces predicted by the walking simulation were then input by Kevin Shelburne of the Foundation's Biomechanics

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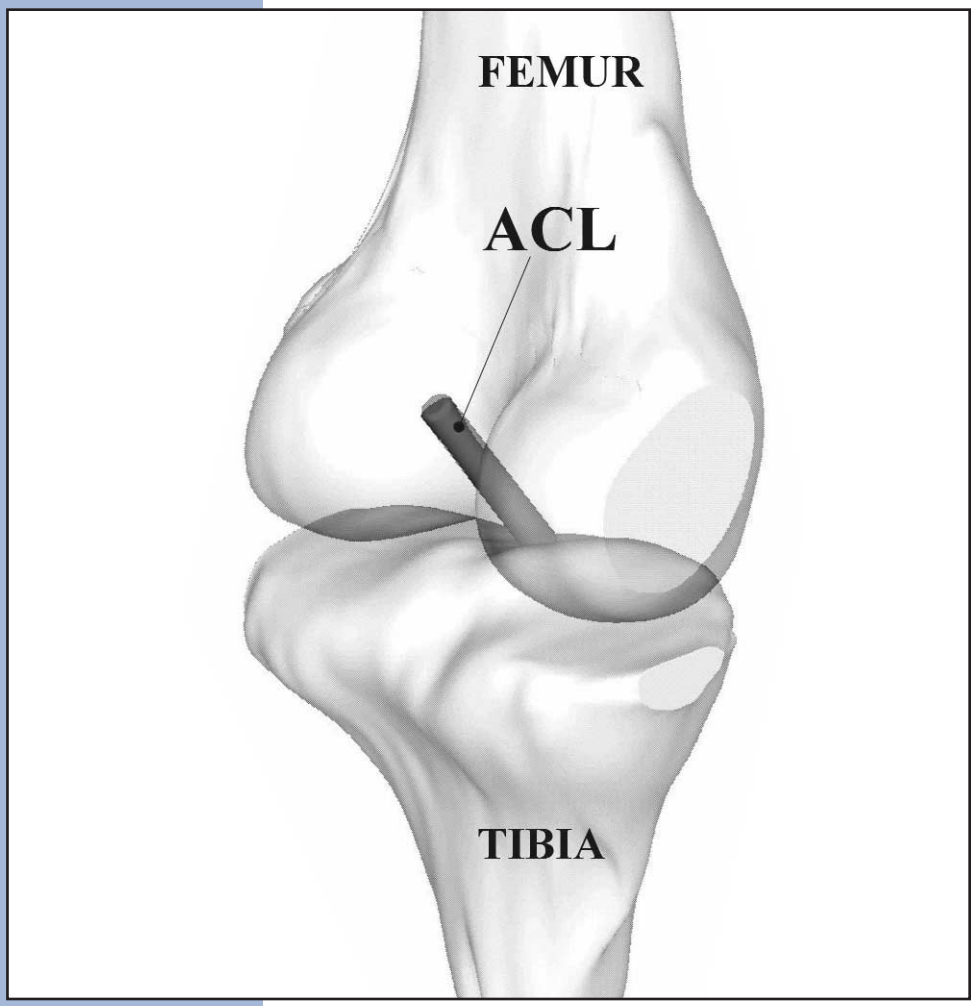

The knee's ACL provides a strong elastic link between the tibia and the femur. The computer model of the knee used to predict ACL force included all of the major ligaments and muscles spanning the knee and was originally developed by Marcus Pandy, Kotaro Sasaki and Seonpil Kim at the University of Texas.

(RESEARCH UPDATE cont. from pg. 13)

Research Laboratory into a second computer simulation composed of a highly detailed model of the bones, ligaments and muscles at the knee.

The results of the simulation demonstrated that the ACL carries substantial force (equivalent to about half the weight of the body) throughout the stance phase of walking (when the foot is on the floor and not swinging forward). Furthermore, the results demonstrated that the forces in the thigh muscles largely determine the force in the ACL. This knowledge may lead to a more precise definition of when and how walking is used in rehabilitation protocols following ACL injury and repair.

One of the unique advantages of computer simulation is that "what if" questions can be readily asked by making changes to the model. For walking, an additional computer simulation was performed after cutting the ACL in the computer model of the knee. In this way, the computer model performed walking with a simulated ACL injury. In order for the model to compensate for the absence of the ACL and the stability it provides, the computer simulation was changed to coordinate the thigh muscles in a way that was found to be similar to the way in which people with ACL injuries appear to move. The results of this simulation lend support to the effectiveness of many of the exercises and therapies that have been recommended for ACL-injured and-repaired individuals.

In the future, additional computer simulations will investigate the performance of the ACL during demanding activities such as jumping, landing and running. Unlocking the mysteries of how the ligament stabilizes the knee and interacts with the muscles and bones during activity requires patience and advanced technology, but the benefit is a better understanding of how best to repair and rehabilitate the injured knee. ■

PHOTO COURTESY OF JOHN KELLY

Factors That Influence Osteoarthritis Patients to Exercise the Role of Self-Efficacy

By Karen K. Briggs, B.S., M.B.A.

Editor's Note: Karen Briggs is Director of Clinical Research at the Steadman•Hawkins Sports Medicine Foundation. She is currently pursuing her master's in Public Health and, as part of her degree, she will be developing a community health education program: Inform, educate and empower our community in the fight against arthritis.

Introduction

Arthritis will affect more than 18 percent of all people in the U.S. in the year 2020. Various forms of arthritis currently affect more than 15 percent of the population (more than 43 million) and more than 20 percent of the adult population. Arthritis is the leading cause of disability and is the source for at least 44 million visits to health-care providers.

Osteoarthritis may slowly progress for many years, improve briefly, or on occasion progress rapidly to the point that the patient becomes disabled.

The estimated medical cost for people with arthritis was $15 billion in 1992. Osteoarthritis (OA) is among the most frequent and symptomatic medical problems for middle-aged and older people. The number of people suffering from the disease is increasing as the average age of the population increases. In 1994 it was estimated that 15.8 million U.S. adults are affected by OA, with the majority being over 65. Pain is the most common symptom of OA, which consists of a progressive loss of articular cartilage.

The diagnosis of OA includes joint pain, reduced range of motion, and swelling. Osteoarthritis may slowly progress for many years, improve briefly, or on occasion progress rapidly to the point that the patient becomes disabled.The role of exercise in the treatment of osteoarthritis has been well established. Some authorities propose that the low level of activity in patients with knee osteoarthritis is to avoid knee pain.

Exercise may be a treatment for pain and, if patients experience improved muscle strength and joint range of motion from exercise, symptoms and disability may decrease. In another study, it was found that participants in exercise programs had less disability and increased knee strength. In other words, exercise was found to be beneficial and did not worsen the disease.

Behavioral Change

The Transtheoretical Model of Change describes behavioral change as a process of passing through five stages. Stage One is pre-contemplation, in which the individual has no intention of changing. Stage Two is contemplation, in which the individual intends to change within the next six months. Stage Three is preparation, in which the individual intends to change in the immediate future. Stage Four is

action, in which the individual has made a change within the past six months. Stage Five is maintenance, in which the individual tries to avoid relapse. Individuals weigh the pros and cons of change.

Individuals progress through these stages based on several activities. These activities include awareness, emotional experiences, self-assessment, self-and social liberation, helpful relationships, and others. In a study by Keefe et al., it was determined that these stages change among arthritis patients. The study examined self-management programs in patients with osteoarthritis or rheumatoid arthritis. The results of the study showed that 39 percent of the patient sample were in the precontemplation stage. This stage reflected a lack of motivation to take action. Ten percent of the sample were in the contemplation stage and 24 percent were in the preparation stage. The action stage made up 8 percent, and 20 percent were in the maintenance stage.

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Precontemplation patients, it was found, were less obese, and patients in the contemplation stage were more educated. Patients in preparation and maintenance had the highest levels of pain and disability. The maintenance group also experienced the highest level of coping. The action group exhibited the highest level of self-efficacy—the conviction that one can successfully execute the behavior required to produce the intended outcome.

Confidence defines self-efficacy—an individual's belief that he can cope with the situation. Self-efficacy was the most important factor in changing individual behavior.

The possibility of delaying disability or surgical intervention may motivate people to move forward in the stages of change.

The self-efficacy of patients with osteoarthritis has been well studied. Rejeski examined exercise as a treatment for disability in patients with knee osteoarthritis. The purpose of the study was to determine the relationship between self-efficacy, knee pain and exercise. Exercise did increase self-efficacy for stair-climbing. The study concluded that exercise programs can result in changes in symptoms and self-efficacy in patients with knee osteoarthritis.

A study by Barlow et al., looked at the long-term outcomes of the arthritis self-management program. The purpose of the study was to determine whether improvements in arthritis self-efficacy and increased use of self-management behaviors could be maintained. The study concluded that patients involved in this community-based education intervention program derived substantial and prolonged benefits in terms of perceived ability to manage arthritis, reduce pain and improve psychological well-being.

Based on these studies, patients need to be encouraged to take advantage of self-management programs, such as exercise, in the early stages of OA. The possibility of delaying disability or surgical intervention may motivate people to move forward in the stages of change. The problem may be that in order for patients to begin an exercise program they need increased self-efficacy to drive them through the stages of change. Once they are exercising, they will develop improved self-efficacy and this will help in maintenance of their program.

Conclusions

Based on current research, it is important to begin patient education on the benefits of exercise. Educating caregivers on the importance of self-efficacy and the stages of change may help increase the number of patients with knee osteoarthritis who exercise and maintain their program. Finally, we must develop pathways to promote community-based programs that educate people on arthritis and the benefit of exercise and self-management programs. ■

The Steadman◆Hawkins Sports Medicine 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.

Mark Your Calendar

June 27-30, 2003 Steadman-Hawkins Colorado Classic Weekend, Fifteenth Anniversary Celebration. The Steadman◆Hawkins Sports Medicine Foundation presents an evening of Vail Valley cuisine and the opportunity to bid on dreams of a lifetime. For moreinformation, call Rachele Palmer at (970) 479-5809, or e-mail rachele.palmer@shsmf.org.

July 9-12, 2003 Twelfth annual Steadman◆Hawkins Sports Medicine Foundation Fellows meeting. Steadman◆Hawkins Sports Medicine Foundation, Vail, Colo. call Greta Campanale, (970) 479-5782, for more information.

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