



Gary Peterson, President and Chief Executive Officer

Photo: Barry Eckhaus

INSTITUTE INSIGHT

How The Steadman Clinic and Steadman Philippon Research Institute Work Together to Maintain Their Positions as World Leaders

By Gary Peterson, President and Chief Executive Officer, The Steadman Clinic and The Steadman Philippon Research Institute

Since assuming my position earlier this year, one of the most important tasks I've had is examining how The Steadman Clinic and Steadman Philippon Research Institute (SPRI) work together, how that relationship can become even more effective, and how to convey the importance of that relationship to those individuals and corporate sponsors who support SPRI.

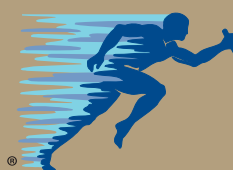
The two entities are not only complementary, they are almost symbiotic. The Clinic and the Research Institute need each other. The Steadman Clinic is known worldwide because of what The Clinic and the Research Institute have been doing together for the past 25 years.

Our advantage is SPRI's compilation of data and how it is used to advance outcomes-based orthopaedic practice. It is really the key to the success of The Clinic. That database gives us a 20-year lead on everyone else. Keeping that stream of information flowing to our doctors, scientists,

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Vail Valley Medical Center 2015 Steadman Philippon Research Institute Golf Classic at Sanctuary, presented by RE/MAX, LLC



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SPRI NEWS FALL 2014

Steadman Clinic and the Steadman Philippon Research Institute being mentioned side-by-side. The USOC makes it clear that these two entities—The Clinic and SPRI—are essentially important to each other.

We have submitted our application to the International Olympic Committee to become the first U.S.-based research center for the IOC. If chosen, that would be another great honor and is something about which we are very hopeful.

While the USOC is very focused on our USA teams, their health, and their success, the IOC is more supportive of basic research regarding all athletes' health, injury prevention, and improved performance.

At SPRI and The Steadman Clinic, we are going to protect and support the intellectual property produced by The Clinic and the Research Institute. Our innovations, both devices and techniques, can provide significant research funding in the form of royalties and other revenue streams.

In regenerative medicine, we plan to build significantly on our mission by creating advances in the areas of cartilage, tissues, tendons, bones, and muscles to accelerate the healing process, all the way down to the cellular level.

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patients, and people around the world will ensure that we maintain our advantage over other great orthopaedic centers. As I like to say, "The data always win."

This year, the United States Olympic Committee designated us as one of only two U.S. Olympic National Medical Centers in the country. That is quite an honor and one that we take very seriously. And the USOC would not have bestowed that honor, the Olympic Rings, and the National Medical Center emblem without The

IRA Charitable Rollover Legislation Still Uncertain

In 2006, Congress passed the first legislation for what has come to be called "the IRA charitable rollover," which allowed plan holders to make gifts from their individual retirement accounts (IRAs) directly to charities. From its original passage, Congress has retroactively extended (and the President has approved) the legislation in two-year increments, with the last ending December 31, 2013.

Beneficial for individuals and charities, this popular giving option allows an individual who is 70½ or older to transfer up to \$100,000 from his/her qualified plan directly to a charity. The ability to make a direct transfer removed some of the cumbersome steps and tax exposure of the more traditional method of using an IRA for charitable giving. However,

the legislation has never been made permanent nor has Congress extended the provision before its expiration. At press time, Congress still has not taken any action to renew this provision for 2014 and beyond. We will keep you posted on the progress of the legislation, but encourage you to consult your advisor, particularly as it relates to your 2014 charitable giving planning and your required minimum distribution. For more details, contact John McMurtry at mcmurtry@sprivail.org or (970) 479-5781.

The Benefits of Giving Stock This Year *Instead of Cash*

Since 2009, the Dow Jones has performed well, thus creating four benefits you can receive from your gift of stock to the Steadman Philippon

Everything we do in regenerative and translational medicine is directed toward clinical application and patient benefit.

We will maintain the high standards already in place in our renowned education and fellowship programs. In addition to our already established Vail Hip Symposium, we initiated the Vail International Complex Knee Symposium directed by SPRI's Dr. Robert LaPrade and Dr. Lars Engebretsen of Norway. They were joined by a faculty of 18 of the world's top physicians, surgeons, and scientists. The hands-on symposium attracted more than 100 attendees from every part of the world.

Teaching is a very important component of what we do here. SPRI will continue to build its Surgical Skills Laboratory to train surgeons, fellows, and visiting scholars. We have one of the few facilities in the world in which a physician can observe a specific technique used by our doctors in the operating room and then go directly to the laboratory to practice those skills.

The SPRI Fellowship Program is one of the most sought-after honors in the orthopaedic medical community. We are able to select elite candidates from a field of hundreds. They are excited about being accepted and we are excited about

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Research Institute. With your gift of long-term appreciated securities, you will keep more of your cash, receive an income tax deduction, avoid capital gains tax, and make a transformational gift in furthering our work keeping people of all ages physically active through education, treatment, and research. The most important detail for protecting your tax benefits is to communicate with your broker early enough to ensure the securities are in our account by December 31, 2014. When you are ready, you or your broker can contact John McMurtry at mcmurtry@sprivail.org or (970) 479-5781 for instructions on how to transfer your gift.

SPRI Presented with American Orthopaedic Society for Sports Medicine 2014 Excellence in Research Award



From the left: Coen Wijdicks, Ph.D. Lars Engebretsen, M.D., Ph.D., Nicholas Kennedy, Rob LaPrade, M.D., Ph.D. Scott Faucett, M.D.

The Steadman Philippon Research Institute received the **2014 Excellence in Research Award** from The American Orthopaedic Society for Sports Medicine (**AOSSM**) during the annual AOSSM meeting in Seattle this past July. This is the first time that the Institute has won this award since the award was established in 1988. AOSSM is a world leader in sports medicine education, research, communication, and fellowship.

This award is given to the best paper submitted in any category to the AOSSM Awards Committee. The award is a symbol of quality and research excellence. It is also a symbol of international collaboration.

TITLE OF SUBMISSION: Posterior Cruciate Ligament Graft Fixation Angles: Biomechanical Evaluation for Single- and Double-Bundle Reconstruction

AUTHORS: Nicholas I. Kennedy, B.S., Mary T. Goldsmith, M.Sc., Scott C. Faucett, M.D., Matthew T. Rasmussen, B.S., M.Sc., Garrett A. Coatney, Lars Engebretsen, M.D., Ph.D., Coen A. Wijdicks, Ph.D.

This study was partially funded by the Norwegian Health South-East (Helse Sør-Øst) Regional Health Authority Post-Doctoral Grant No. 39385. In addition, this study received in-kind donations of supplies from AlloSource, Arthrex, and Smith & Nephew. The findings will be presented at the upcoming AOSSM meeting and will be submitted for publication to the *American Journal of Sports Medicine*.

Founded in 1972, AOSSM is an international organization of orthopaedic surgeons and other allied health professionals dedicated to sports medicine.

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Your support is making a difference in the lives of people around the world by improving the diagnosis, treatment, and prevention of orthopaedic conditions and injuries, and by keeping people active throughout their lives.

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having them come to Vail, train, and conduct research with our physicians and scientists.

We will address coming advances in the area of medical imaging. The Clinic and the Research Institute benefit from the Siemens 3.0 Tesla imaging system. The Clinic uses the 3T MRI machine for all patients who require imaging, and the Institute adds data generated by the 3T to its database.

We are now working with the supplier to make significant upgrades that will produce even finer diagnoses, and the MRI process, unlike others, will operate silently. This is an example of how we are

constantly focused on the patient experience—not only getting the patient better, but making the experience before, during, and after a visit to The Clinic as pleasant as possible.

Finally, we have committed to a letter of intent that will revamp the Vail Valley Medical Center. The Clinic and SPRI will be getting their own floors, entrance, and presence, including the USOC flag.

All of these initiatives are part of a process to develop an improved business model for both The Clinic and SPRI. The goal is to provide better opportunities to grow, to do things better, and to continue to lead the world in orthopaedic sports medicine practice and research.

We depend on your support and we want to thank you for making our work possible. Your support is making a difference in the lives of people around the world by improving the diagnosis, treatment, and prevention of orthopaedic conditions and injuries, and by keeping people active throughout their lives.



United States Olympic Committee Flag flies above the Steadman Philippon Research Institute and The Steadman Clinic



The Brazilian Visiting Scholar Program Benefits Two Countries, a Growing Number of Orthopaedic Surgeons, and Millions of Patients

The Jorge Paulo Lemann Mentored Scientific Award turned an idea into an internationally recognized educational program

It started with a house call, but not your typical house call. When Damaris Skouras, a long-time SPRI Board member, learned that Dr. Richard Steadman would be speaking at a conference in Rio de Janeiro, Ms. Skouras asked Jorge Paulo Lemann if he would like to meet Dr. Steadman and ask him to check on a knee Mr. Lemann had injured in a skiing accident.

Dr. Steadman agreed and the three of them spent Easter weekend at Mr. Lemann's home in Angra dos Reis, where the seeds of Mr. Lemann's vision to recognize the Steadman Philippon Research Institute as an entity that could have an impact in Brazil were planted.

Mr. Lemann's friend and physician, Dr. Leonardo Metsavaht, had known of Dr. Steadman's work and was well aware that Steadman's thinking was clearly ahead of its time. From that first visit, friendships developed and expanded, an idea was born, and that idea resulted in an award and a program: The Jorge Paulo Lemann Mentored Scientific Award is given to an outstanding young Brazilian orthopaedic surgeon. The winner of that award participates in the Brazilian Visiting Scholar Program at the Steadman Philippon Research Institute.

In just six years, the award and program have provided advanced training for eight orthopaedic surgeons, pro-



L-R, Jorge Paulo Lemann and Leonardo Metsavaht, M.D.

duced more than 40 publications in scientific journals, benefitted two research institutes, and had a significant impact on medical practice in two countries.

Jorge Paulo Lemann is one of the world's most accomplished and successful businessmen, as well as one of the world's most active philanthropists. Leonardo Metsavaht, M.D., is an internationally respected orthopaedic surgeon and chief scientific officer of the Institute Brazil of Health Technologies, which is the official administrator of the Jorge Paulo Lemann Mentored Scientific Award.

A GREAT DAY

"A year after Dr. Steadman's house call, the four of us met in Vail, Colorado," recalls Ms. Skouras. "After Jorge had been checked out by a team of physicians at The Steadman Clinic, he attended a meeting we arranged in which Drs. Steadman, Philippon, Millett, Rodkey, and other SPRI staff members described the mission, work, and goals of the Research Institute. Dr. Philippon presented a five-year plan to advance knowledge of hip biomechanics and arthroscopy."

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Brazilian Orthopaedic Surgeon Dr. Bruno Nogueira Joins Steadman Philippon as Visiting Scholar.

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“By the end of that presentation,” says Dr. Metsavaht, “Jorge was impressed with The Clinic and the educational opportunities being provided by SPRI. He looked at me and said, ‘Leo, I am willing to help Dr. Steadman and Dr. Philippon through annual donations. Any idea of how we could make it better?’ ”

“I suggested that we could provide one Brazilian physician/scholar for the SPRI research team every year and that person would be able to return to Brazil and spread this knowledge in our country.”

“And that was it,” says Dr. Metsavaht. “It was a great day.”

SIX YEARS LATER

The Brazilian Visiting Scholar Program is now an ongoing, expanding, and productive initiative. It has brought eight outstanding orthopaedic surgeons to SPRI. They spend one year in Vail, observing and working with SPRI physicians and scientists, conducting research, making presentations, and writing articles for international medical and scientific journals.

The selection process is rigorous, according to Dr. Metsavaht. “Jorge Lemann and Dr. Steadman want to identify good people and competent physicians who

are deserving of advanced orthopaedic training. For the past 20 years, Jorge has participated in the selection process of a program that sponsors students who have been accepted to top universities in the U.S., but who can’t afford all of the expenses. My duty is to do the same with the Jorge Paulo Lemann Mentored Scientific Award.”

DEMANDING QUALIFICATIONS

- Candidates must meet seven standards before they can be considered as candidates for the award. They must:
- 1) be highly skilled orthopaedic surgeons
 - 2) be familiar with arthroscopic surgery and biomechanics
 - 3) be fluent in English
 - 4) have written peer-reviewed scientific papers
 - 5) be willing to spend a year away from their homes and jobs
 - 6) have the capability to apply what they learn at SPRI to their daily duties in Brazil
 - 7) be able to spread their knowledge throughout the Brazilian orthopaedic community

THE RESULTS

Former award winners have performed highly technical surgery in towns that previously had no access to advanced medical practices. They have also made presentations, described their research at national and international conferences, published studies, won scientific awards, and participated in Brazilian national scientific events.

“The return to the Brazilian medical and scientific communities has exceeded our expectations,” says Dr. Metsavaht.

MEDICINE, EDUCATION, AND PHILANTHROPY

“Jorge’s vision is on education, not science,” says Dr. Metsavaht. “He believes the most effective way to build a better world is through education, because you don’t merely help the person, you offer a network of opportunities. There are other medical exchange programs, but our goal is focused on

improving Brazilian orthopaedic education and scientific criticism. The best way to do that is through scientific research.”

DOUBLING THE PROGRAM

“The only change we have made to the program was to double our investment,” says Dr. Metsavaht. “In 2012, Jorge told me that he was happy with the program and asked me what I thought of sponsoring two scholars.”

“His suggestion coincided with the addition of Dr. Robert LaPrade to The Steadman Clinic and the Research Institute. I have the highest regard for Dr. LaPrade because I had been following his state-of-the-art work in researching knee instability. I suggested that we sponsor one scholar in hip and a second in knee biomechanics and arthroscopic surgery.”

After sending award winners and visiting scholars to Vail in 2009, 2010, 2011, and 2012, Mr. Lemann has funded and Dr. Metsavaht has administered the selection process for two scholars in 2013 and two more 2014.

A WIN-WIN PROGRAM

“We are proud to work with these young visiting scholars,” says Dr. LaPrade, director of the International Scholars Program

at SPRI. “They are already making an impact in Brazil and we expect them to become the leaders of a new generation of sports medicine scientists.”

Bruno Nogueira, M.D., was an award winner in 2011. About his experience he says, “Being named a visiting scholar at Steadman Philippon is the best award I’ve won in my life. I really wanted to go to Vail and SPRI, and couldn’t believe it when I was told I had been accepted into the program. I knew it would allow me to learn from the world’s best sports medicine surgeons and scientists.”

A 2012 visiting scholar, Dr. Lourenco Peixoto, says, “The Jorge Paul Lemann Mentored Scientific Award was a great and unexpected honor. I’m a much better physician now than I was before my experience at SPRI. Just one year changed my life, and I’m not the only one. I saw others who came to Vail as young doctors and left as experienced practitioners and researchers.”

Damaris Skouras says it best, “On behalf of the SPRI Board of Directors and SPRI community at large, we are deeply grateful to you, Jorge Paulo Lemann, for the results we have achieved for the U.S. and Brazil. Muito obrigado, Jorge Paulo!”



Jorge Paulo Lemann, Dr. Leonardo Metsavaht, and the Institute Brazil of Health Technologies

“I met Jorge Paulo Lemann in 2007,” says Leonardo Metsavaht, M.D., M.Sc., C.S.O, a renowned orthopaedic surgeon and researcher in Rio de Janeiro. “He had a skiing accident and had been unable to play tennis for five months. I suggested a conservative treatment protocol and he was able to return to tennis in six weeks. We started playing tennis once a week, which was enough time to see that we had similar core values, and we became friends.”

Mr. Lemann’s interest in tennis, sports medicine, and orthopaedics is not surprising. He was a five-time national tennis champion in Brazil and played on the Davis Cups teams of both Brazil and Switzerland.

“Jorge asked me how we could improve orthopaedics as a whole in Brazil, other than by building another hospital,” recalls Dr. Metsavaht. “We decided to create an institute to improve thinking on medical conditions. It is called the Brazil Institute of Health Technologies (IBTS), a not-for-profit research institution focused on the prevention of orthopaedic injuries and conditions.”

“Today, our main research efforts are 1) identifying predictive factors of injuries in sports and 2) measuring the risks, as well as identifying risk factors, of falls through biomechanics and motion analysis.”

“IBTS has produced meaningful results sooner than we expected. In four years, the Institute has produced high-impact research published in professional journals, and in 2013 it was awarded the top research award by the World Biomechanics Congress.”

PATIENTS IN THE NEWS

Olympic Skiers Andrew Weibrecht and Kikkan Randall Made Stops at The Steadman Clinic and SPRI en Route to the 2014 Games in Sochi

By Jim Brown, Ph.D., Editor, Steadman Philippon Research News

Athletes with nicknames like “The War Horse” and “Kikkanimal” are expected to be different, perhaps special. You get both with Andrew Weibrecht and Kikkan Randall.

Andrew “The War Horse” Weibrecht has overcome devastating injuries and

near-impossible odds to win medals in the 2010 and 2014 Olympic Super G competition—the Super Giant Slalom. He got his nickname because of the way he attacks the course. Nobody comes out of the gate like The War Horse.

A coach used to shout at him before the start of a race, “Let the wombat out of the cage!” One of his competitors said, “If there is one guy who risks everything, it’s Andrew.”

Cross-country skier Kikkan Randall is a four-time Olympian. She has won three consecutive World Cup Sprint titles and is the most decorated cross-country skier in American history. In her career, she has won 17 U.S. Championships and 21 World Cup podiums, and her 2013 and 2014 sprint titles placed her third overall in the World Cup standings—both records for the U.S. women.



United States' Andrew Weibrecht approaches a gate in the men's super G at the Sochi 2014 Winter Olympics, Sunday, February 16, 2014, in Krasnaya Polyana, Russia. (AP Photo/Charles Krupa)

How do you explain a first name like Kikkan and a nickname like “Kikkanimal?” You can’t. Only Kikkan (pronounced Keek’ an) can. “My parents came up with a combination of Kikki (inspired by Christine “Kiki” Cutter, the first American to win a World Cup title) and Megan, which was a popular name about the time I was born. We later learned that ‘kikkan’ is the Swedish expression for little girl, which gets me a few extra cheers when I race in Scandinavia.”

“Teammates over the years have used variations of Kikkan, not all of which I can mention here, but in high school they started calling me ‘Kikkanimal’ because I was always pushing to do more, work harder. They said I was like an animal they had never seen before, and ‘Kikkanimal’ stuck. I kind

of like the attitude that the nickname embodies.”

MULTIPLE SPORTS

Weibrecht and Randall have more in common than unusual nicknames. Both played multiple sports as kids and both had early success in their skiing careers.

“I played soccer, lacrosse, and a lot of tennis,” says Weibrecht, “but skiing was my best sport. By the time I was 12 or 13, I was beginning to stand out. At 15, I won the children’s world championship called the Trofeo Topolino Games in Italy, and I was third at the Junior World Championships in 2006. That sort of showed me that I could compete at the international level.”

Kikkan Alpine-raced seriously for a few years and thought it might be her

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Kikkan Randall from the U.S. competes during the qualification of the Women’s World Cup Cross Country Ski 1.5km Sprint Free event in Szklarska Poreba, Poland, Saturday, January 18, 2014. (AP Photo/Alik Keplicz).

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sport, but she also ran track and played soccer. It wasn't until she was 16 when that she went into cross-country skiing fulltime. She got a top ten in her first junior championship event and by the age of 19 was a member of the U.S. Ski Team.

FAMILY HISTORY, EDUCATION EMPHASIS

Both Randall and Weibrecht come from families with sports and education backgrounds. Kikkan has an aunt and uncle who were Olympic cross-country skiers. Andrew's dad was a football player and his mom was on the U.S. Luge Team. His two brothers were ski racers and competed in college.

Kikkan and Andrew are both students—Andrew at Dartmouth, Kikkan at Alaska Pacific University. Andrew's wife, Denja, has two degrees and teaches in the Lake Placid area. Kikkan's husband, Jeff Ellis, is a former Canadian athlete in two sports and now the marketing and media coordinator for the FIS Cross

Country World Cup.

"When I win a race, he gets to interview me," says Kikkan.

MEMORABLE OLYMPIC EXPERIENCES

"Every Olympic experience has been unique and memorable for me," says Kikkan. "The first one was in Salt Lake, where I was born. I felt very much at home. Four years later, Turino was exciting because I had my first top ten Olympic finish. By the time we went to Vancouver, I was consistently among the top finishers and it was cool to be back and racing in Canada. Sochi was my first real chance to get to the Games with medal potential."

2010 was a breakout year for Andrew. "I had been getting better every year and was getting great results. Then I went to the Olympics and won a bronze medal. Everything was going perfectly. Four years later, after so many injuries, I decided to give it one more shot. Winning another medal (silver) made everything worth it."



Dr. Clanton in surgery.

Photo: John Kelly

INJURIES

Athletes suffer injuries and skiers seem to get more than their fair share. Kikkan had a “massive” blood clot in her leg that threatened her career, but it happened at the end of the 2008 season and she had time to recover from the ordeal.

“My foot injury was worse,” she says. “Pain in my right foot started developing during the 2012 season. I managed to train through it and then tried to ignore it, but by August my coach told me we were going to have to do something about it before it got even more serious. He recommended that I see Dr. Thomas Clanton at The Steadman Clinic and the Steadman Philippon Research Institute.”

During the past four years, Andrew had more surgeries than top ten finishes. Right shoulder, left shoulder, right ankle, and left ankle—all since the Olympics in Vancouver in 2010.

“There were lots of internal struggles. I didn’t tell anyone, but if it had not gone well in 2014, I was going to be done with it. I loved the sport, but I don’t think I could have gone through that cycle of injuries again.”

THE CLANTON CONNECTION

Dr. Clanton has now treated both Kikkan and Andrew successfully. He is an internationally recognized orthopaedic surgeon who joined The Steadman Clinic and SPRI in August 2009 as the director for foot and ankle sports medicine. He specializes in injuries to the lower extremities and the foot and ankle, and has treated many professional and collegiate athletes, including former NBA player Yao Ming, NFL star and Heisman Trophy winner Eddie George, and World Champion hurdler Liu Xiang.

KIKKAN’S STRESS FRACTURE

“Dr. Clanton diagnosed my injury as a stress fracture and gave me the advice I really needed to hear,” says Kikkan. “First, I didn’t need surgery. I backed

off my training schedule, took time to recover, and he set me up with orthotics after discovering that my skis were not supporting my feet in the right way.”

“One of the great things about The Steadman Clinic is that I could go right downstairs to Howard Head Sports Medicine to get started on my rehab program. Working with Ana Robinson Jeronimus, my physical therapist, I was able to improve my balance, strength, and stability, and to take pressure off my foot. I still do the exercises Ana showed me.” (Ana also worked with Andrew when he was in Vail.)

ANDREW’S BROKEN ANKLE

Andrew had two surgical procedures for his broken ankle with Dr. Clanton. His Olympic silver medal and performance during the 2013-2014 season reflect the success of those operations. He says he feels better now than at any time since 2010.

“There are very few orthopaedic hospitals in the world that can match the reputation of The Steadman Clinic,” says Andrew. “It made sense for me to go somewhere that can provide the best care. I prefer to have a physician like Dr. Clanton, who does 300 foot and ankle operations a year.”

Kikkan adds that Steadman is really unique in that the physicians understand the athlete’s perspective. “It’s important to have a doctor who can appreciate the different components of elite training and racing, and design a treatment plan that gets you back to your sport as soon as possible.”

ON THE AGENDA

Andrew and Kikkan are training for the 2014-2015 season and hope to be teammates again in the 2018 Winter Games in South Korea. Watch “The War Horse” to see how he attacks courses and goes after his third medal. And follow “Kikkanimal” on her quest to become one of the rare athletes who will have participated in five Olympic Games.

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Dr. Thomas Clanton Keeps Olympians on Their Feet

Among the things Olympic skiers Andrew Weibrecht and Kikkan Randall have in common is that they both worked through serious injuries, both were treated successfully at The Steadman Clinic by Dr. Thomas Clanton, and both benefitted from ongoing research conducted by Dr. Clanton and his colleagues at the Steadman Philippon Research Institute.

“Regardless of the injury or the level of the athlete, it is never easy to deal with an injury,” says Dr. Clanton. “It represents a setback and a roadblock to one’s goals. That is why it is essential to have a physician, along with others on the healthcare team, who understand sports and can guide the athlete to successfully surmount such roadblocks.”

“In Kikkan’s case, this was primarily through recognizing the incredibly stressful training schedule through which she had put herself, analyzing the causes of her stress-related injury, and prescribing a course of calculated rest and resumption of training that still enabled her to heal and reach her goals,” explains Dr. Clanton.

“In Andrew’s situation, the problem was a structural issue that had reached the point of interfering with his ability to compete at the highest level. Surgery was necessary to correct the problem. Not only was it important to be able to explain to Andrew what the surgery would do, but he also needed to know the proper course of rehabilitation and the timeline for a return to high-level competition.”

Dr. Clanton adds that for these two great athletes, as well as others who face similar injuries, it is an indomitable attitude and a spirit of perseverance that leads to success.

THE MOST COMMON INJURIES

Foot and ankle injuries are among the most common seen in sports, according to Dr. Clanton. Ankle injuries alone are the most common in terms of time lost from training and competition. Other common injuries include tendon tears such as the Achilles, sprains such as those to the midfoot or big toe (turf toe), and various fractures such as traumatic breaks

in the ankle or foot bones, as well as fatigue fractures.

“Prevention is better than having to miss time treating one of these injuries,” advises Dr. Clanton. “This can include proper training programs, developing strength and flexibility, avoiding high-risk situations, using bracing and taping (plus orthoses), and complete rehabilitation of minor injuries to prevent more serious ones.”

THE MOST COMMON MISTAKES

The most common mistake Dr. Clanton sees is failure to fully engage and complete the rehab process. He says it is important to recognize that injuries or surgery take a certain amount of time in order for the healing process to be complete.

“In addition, the resumption of sports requires that the injured area (which could mean the entire leg or kinetic chain that has been affected) must be brought back gradually to accept the same loads that part of the body was accepting before the injury. This may require a pragmatic approach of walking first, running second, and more aggressive maneuvers later, before returning to competition.”

ONGOING FOOT AND ANKLE RESEARCH AT SPRI

Dr. Clanton and his colleagues recently completed a series of research projects and resulting publications on lateral ankle sprains and instability, looking at normal ligaments and their strength and stiffness compared to various methods of repair, reconstruction, and reinforcement surgically.

“We have compared our patients’ results with these methods and discovered important information that will guide the way we treat such injuries in the future,” he concludes.

Other projects have included research on turf toe injuries, high ankle sprains, and osteochondral injuries (tears or fractures in the cartilage covering a bone in the ankle joint). Future projects include testing various methods for Achilles repair and evaluating the motion involved after total ankle replacements.



Dr. Robert LaPrade and Össur Americas Develop an Improved Method of Bracing a Knee Ligament

Dr. Robert LaPrade, chief medical officer at SPRI, working with the support of Össur Americas, has developed an improved means to brace posterior cruciate ligament (PCL) tears.

The PCL is one of the four major ligaments of the knee and resists forces pushing the tibia—one of the two long bones in the leg—from the back.

Dr. LaPrade approached Össur Americas regarding the concept in 2010. At that time, the only available brace was one used after PCL reconstruction procedures. Dr. LaPrade proposed a study that would quantify the external forces applied to the tibia by both a static force brace and a dynamic force brace.

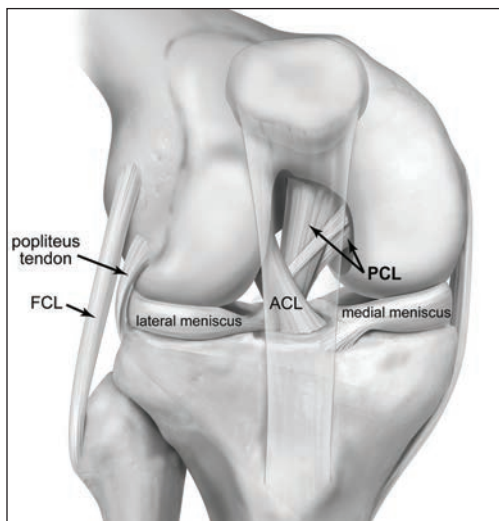
STATIC FORCE BRACE

A **static force brace** provides a constant force applied to the tibia for each level of the brace, and the force does not change throughout the range of motion that the brace allows. The effect is a force to counteract the posterior sag of the tibia. This “sag” can be identified by a physician or physical therapist when a patient is lying on his or her back with the affected knee joint raised and at a 90-degree angle. If the position of the joint is not properly controlled during rehabilitation, loads from the hamstring muscles cause the PCL to heal in an elongated position.

DYNAMIC FORCE BRACE

A **dynamic force brace** applies an anterior-directed force (a force on the back of the leg/joint) to the tibia that changes with the angle of the knee joint, but this type of brace has not been biomechanically or clinically validated.

Typical reasons for PCL bracing include the protection of a reconstructed



Subject descending stairs while wearing a dynamic force brace (left) and a static force brace (right). Maximum flexion occurred at toe off.

If knee joint positioning is not properly controlled during rehabilitation, the forces can cause the PCL to heal in an elongated position.

PCL and to prevent a graft from becoming elongated. The brace can also assist in PCL healing in cases where surgery has not been performed, and it can provide external stability to a knee that is PCL-deficient. In the PCL-deficient knee, bracing can diminish the development or progression of osteoarthritis.

HYPOTHESIS CONFIRMED

The most important finding was that the force applied by the dynamic force brace changed as the angle of the joint changed, while the force applied by the static force brace remained the same. Also, forces applied by the dynamic brace were significantly larger than forces applied by the static force brace at higher flexion angles, at which the PCL load is greatest.

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The results of this study confirmed Dr. LaPrade's hypothesis that forces applied by the dynamic brace would dynamically change as the leg's flexion angle changed, and forces applied by the static brace would remain constant. Dr. LaPrade concluded that:

- The dynamic force brace applied forces to the posterior proximal tibia that dynamically increased with increased flexion angle.
- The dynamic force brace applied significantly larger forces at higher flexion angles compared to the static force brace, where the PCL is known to experience larger forces.
- Clinical outcome studies are necessary to determine if the loading characteristics of the dynamic force brace result in long-term improved posterior (rear) knee laxity following PCL injury.

Dr. LaPrade also concluded that non-operative and post-operative management of PCL injuries should incorporate the use of a dynamic force brace that supplies a dynamic anterior (front) tibial force. This will protect the PCL by off-loading the forces that would have been applied to the healing PCL.

This study is an example of applied research conducted at SPRI and the partnership between Dr. LaPrade and Össur Americas that resulted in an improved means for bracing following a posterior cruciate ligament injury or PCL surgery.

Dr. LaPrade's study was published August 11, 2014, in *Knee Surgery, Sports Traumatology, Arthroscopy*.



Tears of the posterior cruciate ligament (PCL) can be disabling, especially during descent and deceleration activities, due to increased laxity in the rear area of the knee. Although favorable clinical outcomes have been reported for non-operative treatment of most isolated grade PCL injuries, increased rates of osteoarthritis have been associated with non-operative treatment of chronic injuries, and surgical intervention has been recommended for most combined ligament injuries.

EDUCATION

Gregory Sawyer, M.D.: First from the Brown University Residency Program to Serve as a Steadman Philippon Sports Medicine Fellow

By Jim Brown, Ph.D., Editor, Steadman Philippon
Research News

“The medical profession was the environment in which I was raised,” says Gregory Sawyer, M.D., who just completed his year as a sports medicine fellow at the Steadman Philippon Research Institute.

“We lived in Wilton, Maine, but my mom was an administrative assistant at the Franklin Memorial Hospital in Farmington, just a few miles away. Some of my earliest memories were functions at the hospital, and it was sort of understood that medicine was what I was going to do.”

“The two physicians I was most frequently exposed to (because of broken bones while playing sports) were my family physician and my orthopaedic surgeon. The experiences with my orthopaedic surgeon really put him on a pedestal in my mind and made me think about taking care of athletes someday.”

Sports have also been a big part of Dr. Sawyer's life. He played basketball and soccer in high school, and went on to play soccer at Colby College, where he graduated summa cum laude with a double major in chemistry and biology.

When growing up in the northeast playing and following sports, you are a Red Sox, Celtics, Patriots, and Bruins fan. It's not just a birthright—it's a solemn responsibility. “One of the greatest weeks of my life was when the Red Sox beat the Yankees in the 2004 American League playoffs,” he says. (Editor's note: He doesn't appear to be kidding.)

A GOOD MATCH

Dr. Sawyer's medicine and sports interests began to merge during medical school at Dartmouth, where he was inducted into the Alpha Omega Honor Society. "I waivered a bit between radiology and orthopaedics, but being an orthopaedic surgeon specializing in sports medicine would give me the opportunity to be in the office and the operating room, as well as to get out and take care of players and teams. The energy of orthopaedics plus the connection with sports was a good match for me."

After graduating from medical school at Dartmouth, he began his residency at Brown University's Alpert Medical School. He served as an assistant team physician for the university's hockey and lacrosse teams and for the Providence Bruins, a minor league affiliate of the Bruins.

Dr. Sawyer also completed a fellowship in orthopaedic trauma surgery at Rhode Island Hospital. There he met his wife, Annah, who was a social worker at the hospital with degrees from Union College and Columbia.

VAIL

The next big career move for Dr. and Mrs. Sawyer brought them to Vail, when Greg was accepted into the Steadman Philippon Sports Medicine Program. He was one of six chosen out of a highly competitive field of more than 150 applicants and the first graduate of Brown's residency program to be accepted into the program.

"I distinctly remember the interview process, and it was very intimidating," says Dr. Sawyer. "I was sitting around a table with these giants of orthopaedic medicine whose articles I had been reading for several years. Now they were asking about my research, my writing, and my experiences, and telling me that they would love to have me be a part of their program."

"When we learned that I had been accepted, Annah and I were overwhelmed," recalls Greg. "Steadman Philippon was our first choice, and we were thrilled with the opportunity to



Photo: Angelica Wedell

Gregory Sawyer, M.D.

work at SPRI and live in Vail. We both grew up Maine and Vermont, so we feel very much at home in the mountains, although the mountains there are not exactly the Rocky Mountains."

IMPRESSIONS

"I was incredibly impressed with how well things are organized here and how much attention is given to detail by the entire staff," says Greg. "You don't get that at other places. Everyone was welcoming and pleasant. It's more than a workplace relationship. They want to get to know you outside of the hospital. We were invited into the homes of Dr. Steadman and the other Steadman Clinic/SPRI physicians."

"One of the things that sets SPRI apart is the mentorship model," says Greg. "Whether in the office or the operating room, you are there with some of the best surgeons in the world. You get to see exactly how Dr. Millett or Dr. Clanton run their practices and you see them execute very specific skills in the OR. At times, I had to kind of pinch myself knowing that I was in the operating room at midnight finishing up a case with Marc Philippon."

Dr. Sawyer was one of the last fellows to complete a one-month rotation with Dr. Steadman before he retired from his surgical practice. "I think his lasting legacy will be how he cared for

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“Donations fund programs and research that are changing the way sports medicine is being practiced. SPRI is essentially setting the medical community’s guidelines for improving patient outcomes. It is impacting orthopaedics like no other institute.”

(continued from page 15)

the patient,” observes Greg. “I’ve never worked at a place where the doctors and staff members are more invested in making patients better. They take care of people as individuals, not just patients, and that is a reflection of Dr. Steadman’s influence.”

RESEARCH

During his fellowship at SPRI, Dr. Sawyer’s primary research was conducted with Dr. Philippon and focused on different ways to repair the hip’s labrum (the ring of cartilage around the socket of the hip joint). The results of the study were presented during Dr. Sawyer’s last week as a fellow and have now been submitted to a peer-reviewed professional journal for publication.

“There is never a month that goes by that there is not at least one article written by doctors and scientists at SPRI in high-impact orthopaedic or sports medicine journals,” says Dr. Sawyer. “Sometimes there are two or three in the same journal. The number of quality research publications that come out of this Institute is incredible.”

LOOKING BACK

Dr. Sawyer has observations on other aspects of the Research Institute. Here are a few of them.

On the Surgical Skills Laboratory: “It is unmatched. You can’t go anywhere in the country that provides this level of access to a facility where you can practice surgical techniques at almost any hour of the day. I could call Kelly Adair, the Surgical Skills Laboratory director, and tell him that I would like to have a shoulder (for example) available the next day

at 4:00. He always said yes. And when I got down there, there was a very good chance that Dr. LaPrade or one of the other SPRI physicians was already there working on a new surgical technique.”

On the challenges of a SPRI Fellowship: “It’s the unpredictable nature of the practice. It’s not just a nine-to-five job. The doctors there are taking calls all the time from college and professional coaches, trainers, athletes, and health care professionals. A high-profile athlete could be injured somewhere in the world on a Friday and we would be treating him or her the next day in Vail. That’s just the way it works in this field. You have to be flexible.”

Lessons learned: “Three things stand out. First, I learned procedures and techniques in the operating room and labs that are on the cutting edge of orthopaedics. Second, I learned how to conduct a successful practice that takes care of patients at the highest level. And finally, I had the opportunity to establish relationships with the best orthopaedic surgeons in the world. Not just being able to learn from them, but to call them friends. It’s something that will be with me for a long time.”

On supporting SPRI: “Donations fund programs and research that are changing the way sports medicine is being practiced. SPRI is essentially setting the medical community’s guidelines for improving patient outcomes. It is impacting orthopaedics like no other institute.”

LOOKING FORWARD

Greg and Annah Sawyer returned to New England in August. Their daughter, Lylah, will have a baby brother or sister later this year.

Dr. Sawyer has accepted a position at the Maine Medical Center in Portland, where he will serve as a sports medicine physician and trauma surgeon. His goal is to eventually establish the first orthopaedic residency in the state of Maine.

Based on what he’s accomplished as a medical student, resident, orthopaedic surgeon, SPRI fellow, husband, father, and Red Sox fan, we expect him to succeed.



Welcome 2014–2015 Fellows

Eight New Physicians Introduced

This year, eight young orthopaedic surgeons were selected from a field of more than 160 to participate in 12 months of vigorous training in the Steadman Philippon Sports Medicine Fellowship Program. Our goal is to prepare them to be leaders in the field of orthopaedic sports medicine for the remainder of their careers. Many go on to hold high-level faculty positions at top medical schools.

In 2010, we added two fellows to our program when we welcomed the Institute's first Foot and Ankle Fellow and the world's first Sports Medicine Imaging Research Fellow, which is sponsored by Kenneth Griffin. In addition, we

now have three visiting scholars, who are in essence research fellows from other countries. The 11 fellows and visiting scholars are being given a unique opportunity to perform research in their respective areas of interest, including biomechanics research, clinical research, imaging research, and basic science research.

Once every 18 months after that, they will return with other past fellows for further education and to exchange the knowledge they have gained since completion of fellowship training. The Institute currently maintains a network of more than 190 fellows in communities around the world who serve in academic positions at leading universities and in private practices.

2014–2015 STEADMAN PHILIPPON SPORTS MEDICINE FELLOWS

Sanjeev Bhatia, M.D.

Originally from Brookfield, Wisconsin, Dr. Bhatia graduated Phi Beta Kappa from the University of Wisconsin-

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*Front L-R:
John Feagin, M.D.,
Tom Clanton, M.D., J.
Richard Steadman, M.D.,
Sanjeev Bhatia, M.D.,
Peter Millett, M.D., M.Sc.,
Robert LaPrade, M.D., Ph.D.*

*Second Row:
Justin Newman, M.D.,
M. Brett Raynor, M.D.,
William Mook, M.D.,
Michael Walsh, M.D.*

*Back Row:
Tom Hackett, M.D.,
Brent Warner, M.D.,
Scott Whitlow, M.D.,
Randy Viola, M.D.,
Marc Philippon, M.D.*



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Madison, where he spent a summer studying human rights at the London School of Economics. After college, he attended medical school at Northwestern University, where his growing interest in orthopaedic surgery led him to pursue a one-year orthopaedic sports medicine research externship.

Dr. Bhatia completed his residency at Rush University Medical Center in Chicago, Illinois. He participated in sports team coverage for several local college and professional teams, including DePaul men's and women's soccer, Chicago Force women's football, and Chicago Steel men's hockey. As a resident, he published studies on glenoid bone loss, ACL reconstruction, and bone-tendon healing. His research has received awards at the national level and has been presented internationally. As a chief resident, Dr. Bhatia was nominated co-editor of the "Grand Rounds: What's Your Diagnosis" monthly column in *Orthopaedics Today*. He is currently a scientific reviewer for the *American Journal of Sports Medicine*.

Outside of medicine, Dr. Bhatia enjoys downhill skiing, mountain biking, photography, and travelling. He will be

moving to Vail with his wife, Avanti, a speech-language pathologist who will be working with the Listen Foundation and Eagle County Schools.

William R. Mook, M.D.

Born and raised in Virginia, Dr. Mook completed his undergraduate education at Virginia Tech, where he graduated summa cum laude with a B.S. in human nutrition, foods, and exercise and minors in biology and chemistry. As an undergraduate he also completed an intramural research-training award fellowship in lipid biochemistry at the National Institutes of Health, in addition to completing additional course work in human anatomy at the Johns Hopkins School of Medicine.

Dr. Mook went on to receive his medical training at the University of Virginia, where he confirmed his interest in orthopaedics. He was elected a member of Alpha Omega Alpha and graduated with honors. Upon completing medical school, Will traveled to Duke University for his orthopaedic surgery training. During his time at Duke, he provided physician coverage for most of Duke's varsity athletic teams, including the men's football, basketball, and lacrosse teams. His research interests at Duke included multi-ligament knee injuries, athletic foot and ankle injuries, and periprosthetic shoulder infections. Prior to completing his training, he was chosen by his fellow residents for the John M. Harrelson Chief Resident Teaching Award in recognition of the chief resident who contributed the most to their education and training.

Will and his wife Emily are very excited to be moving to Vail with their 15-month-old daughter, Reese. His interests outside of medicine include golfing, skiing, hiking, and staying active outdoors.

Thank you

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

Chair sponsors of the 2014–2015 Steadman Philippon fellowship class are **Mr. and Mrs. Lawrence Flinn, Mr. and Mrs. Peter Kellogg, Mr. and Mrs. Al Perkins, 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 and foundations for their generous support: **Mr. and Mrs. Milledge Hart, The Fred and Elli Iselin Foundation, Mrs. Mary Noyes, Mr. and Mrs. Jay Precourt, and Mr. and Mrs. Stewart Turley.**

Justin T. Newman, M.D.

Justin grew up farming and ranching in Holyoke, Colorado. He then went to the University of Denver on a Boettcher Foundation Scholarship. While there, he spent a year abroad with one semester at the University of London and another at the Universidad Católica de Valparaíso, Chile. He then returned to managing his farming business for a year before starting medical school at the University of Chicago, Pritzker School of Medicine. During medical school, he spent three months doing research in Peru, and he did a one-year orthopaedic and orthopaedic trauma research fellowship through Denver Health and the University of Colorado School of Medicine. He completed his orthopaedic residency at the University of Colorado.

Justin will be joined in Vail part time by his family. His wife, Mandi Beman, M.D., will continue her minimally-invasive gynecological surgery practice in Denver. She will bring their two boys to Vail for part of the week.

M. Brett Raynor, M.D.

Dr. Raynor grew up in Dallas, Texas. He attended Duke University, where he majored in economics. He returned to Texas to attend the University of Texas Southwestern Medical School and was inducted into the Alpha Omega Alpha Honor Medical Society. Following medical school, Dr. Raynor completed his residency in orthopaedic surgery at Vanderbilt University Medical Center in Nashville. During his time at Vanderbilt, he served as team physician for high schools in the area and frequently lectured at the medical school as part of the physical diagnosis curriculum. During residency, his research focused on the use of the patient history in diagnosing shoulder disorders and on the epidemiology of shoulder instability.

Dr. Raynor will be moving to Vail with his wife, Liza, their two daughters, Hadleigh and Julia, and dog, Henry. Outside of work, Brett enjoys running, skiing, and fly-fishing. He and his family are looking forward to their year in the mountains.

Michael P. Walsh, M.D.

Dr. Walsh graduated Phi Beta Kappa and summa cum laude with a biology and business management double major from Hamline University in St. Paul, Minnesota. While at Hamline, Dr. Walsh received eight athletic letters, playing both football and baseball. He also earned the Jerry Smith Award as the top senior athlete at Hamline. Dr. Walsh then moved down the street for medical school at the University of Minnesota in Minneapolis, where he found interest in orthopaedic surgery. Following medical school, Dr. Walsh traveled to Ann Arbor for orthopaedic surgery residency at the University of Michigan. While at the U of M, Dr. Walsh had the pleasure of covering the University of Michigan football and hockey teams, in addition to Eastern Michigan football and basketball in Ypsilanti, Michigan. He also served as team physician for two local high school football teams.

Dr. Walsh will be moving to Vail with his wife, Angela, a middle school teacher, who will be spending the year substituting. Dr. Walsh's interests outside of medicine include fishing, hunting, golfing, and skiing.

Brent T. Warner, M.D.

Born and raised in Ohio, Dr. Warner attended Duke University where he was a NCAA All-American pole vaulter and graduated summa cum laude with a degree in biomedical engineering. He then returned to Ohio to obtain his medical degree from The Ohio State University, graduating magna cum laude and as a member of the Alpha Omega Alpha

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Where Are They Now? . ?

The graduating class of 2013–2014 Steadman Philippon fellows is busy establishing new careers in orthopaedics.

Anthony Cerminara, M.D.

Dr. Cerminara has joined the practice at South Florida Orthopedics and Sports Medicine in Stuart, Florida.

Michael B. Ellman, M.D.

Dr. Ellman has established his practice at Panorama Orthopedics and Spine Center in Golden, Colorado.

Jeffrey R. Jaglowski, M.D.

Dr. Jaglowski has moved to Houston, Texas, and joined the All American Orthopedic and Sports Medicine Institute.

Jared Johnson, M.D.

Dr. Johnson is practicing at the Intermountain Orthopedic Clinic in Boise, Idaho.

Coley Gatlin, M.D.

Dr. Gatlin has moved back to Texas and has established his practice at the College Station Hospital in College Station.

Mark Hamming, M.D.

Dr. Hamming is establishing his practice at the Illinois Bone and Joint, Lake Forest, Illinois.

C. Thomas Haytmanek, Jr., M.D.

Dr. Haytmanek is practicing at the Coughlin Foot and Ankle Center in Boise, Idaho.

Gregory A. Sawyer, M.D.

Dr. Sawyer has moved to the East Coast and is practicing with Maine Medical Partners in Falmouth, Massachusetts.

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Honor Medical Society.

Following medical school, Dr. Warner completed residency training at the University of North Carolina at Chapel Hill. As a resident, he was selected for the American Orthopaedic Association Emerging Leaders Forum, participated in several research projects, and was published in *Arthroscopy*. He also provided physician coverage for the University of North Carolina football and women's soccer teams, the Carolina Railhawks, and North Carolina high school football teams.

In his free time, Dr. Warner enjoys outdoor activities, including long-distance running, cycling, skiing, and snowboarding. His wife, Kristie, daughter, Kate, and furry companion, Magill, will be joining him for the yearlong adventure in the Vail Valley.

FOOT AND ANKLE FELLOW

Scott R. Whitlow, M.D.

Dr. Whitlow was born and raised in Seattle, where he grew up on skis and rooting for Seattle sports. Seeking a change of scenery before returning to the West Coast, he attended Colby College in Waterville, Maine. He was interested in sciences and research, and after graduating with a B.A. in biochemistry, he moved to Boston to work in basic science research. He has multiple publications in the field of immunology resulting from his research at Harvard Medical School.

Deciding he desired the interpersonal relationships medicine had to offer, Dr. Whitlow attended Boston University School of Medicine, spending one summer working in clinics and operating rooms in Quito, Ecuador. After an initial interest in general surgery trauma, a week in orthopaedic surgery the summer before his fourth year changed his mind. He completed residency at UC Davis in

Sacramento, where he particularly enjoyed trauma, sports, and foot and ankle surgery.

Outside of work, Scott spends time skiing, mountain and road biking, hiking, paddling, and playing golf. He moved here with his dog Jack, who enjoys swimming, chasing tennis balls, and being pet by anyone and everyone. We are looking forward to a wonderful year here with you in Vail.

GRIFFIN VISITING SCHOLAR FOR CLINICAL SPORTS MEDICINE MRI

Elizabeth L. Carpenter, M.D.

Dr. Carpenter grew up in New York along the shores of Long Island and Fire Island, where she learned to sail, fish, and enjoy everything that the outdoors has to offer. She attended college in North Carolina at Wake Forest University, where she graduated cum laude with special honors in biology. During this time, she also studied abroad in Europe, where she focused on marine biology and the arts. She subsequently pursued medical school at Stony Brook University in Stony Brook, NY.

Following medical school, Dr. Carpenter completed a surgically based internship in Cooperstown, N.Y., followed by diagnostic radiology residency at New York University, where she also served as chief resident. Upon completion of her residency, Dr. Carpenter completed a one-year fellowship specializing in musculoskeletal radiology and interventional procedures, also at New York University. Her primary interests include sports medicine and image-guided procedures.

Outside of medicine, Dr. Carpenter enjoys running, cycling, and tennis, and has recently started competing in triathlons. She is thrilled to return to the slopes of Vail, where she originally learned to ski.



Steadman Philippon's Education and Public Outreach Program—EPOC—Develops the Next Generation of Home-Grown Scientists

For more than 25 years, the Steadman Philippon Research Institute has attracted physicians and scientists from all over the world. Now, SPRI is growing them in its own back yard.

SPRI staff members have been involved in the Vail Valley community since the Institute moved to Vail in 1990. That involvement reached a new level when the Institute's Education and Public Outreach Committee—EPOC—began a program to inspire elementary, middle, and high school students to become more involved in the fields of science, technology, engineering, and mathematics.

SPRI Board member Senenne Philippon chairs the committee, which also includes Coen Wijdicks, Mary

Goldsmith, Lynda Sampson, John McMurtry, and Megan Bryant, in addition to eight Vail Valley educators.

EPOC's three-tiered program has been developed in partnership with the Eagle County School District, Vail Mountain School, and Vail Christian Academy. During 2013-2014, four high schools, three middle schools, and four elementary schools participated in various EPOC programs.

SPRI's team of scientists offers tours, presentations, projects, science fairs, and internships. Here is how EPOC's program has involved more than 500 students, beginning with those in the fifth grade:

Grade Level	Activities
5th	<ul style="list-style-type: none"> • Tours of SPRI laboratories
6th, 7th, 8th	<ul style="list-style-type: none"> • School visits and presentations by SPRI staff scientists • Mentored school science fairs • Classroom and assembly lectures • Support for science-related projects (such as robotics competition)
High School	<ul style="list-style-type: none"> • SPRI Science Club • Mentored scientific research

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Mary Goldsmith, M.Sc., senior robotics engineer with fifth graders from the Eagle County School District.

Photo: Angelica Wedell



Photo: Angelica Wedell

Kelly Adair, director of the Surgical Skills Laboratory.

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SPRI LABORATORY TOURS

Three SPRI laboratory tour days are set aside each year, and as many as 80 fifth graders participate in the tours in a single day, according to Megan Bryant, Marketing Coordinator for The Steadman Clinic.

“The children are shown the full laboratory experience by Mary Goldsmith, senior robotics engineer, and Kelly Adair, director of the Surgical Skills Laboratory, with the help of other SPRI staff members,” says Ms. Bryant.

“The tours are very interactive for the students, who get to handle some of the surgical tools and artificial bones as the scientists and physicians direct open discussions about topics such as surgical processes and how research relates to those processes.”

SPRI SCIENCE CLUB

“The SPRI Science Club is an excellent gateway to research and orthopaedic education, as well as a professional ex-

perience for the students who are interested in these fields,” says Bryant.

Two 9th-12th grade student representatives from each participating Eagle County school are selected by their respective science teachers. A theme is chosen each year to guide the club’s research, and each student team defines its own question within the scope of the club’s theme.

“Having world-class research scientists as a sounding board really gives the students a sense of validation and pride,” says Gabe Scherzer, a Vail Mountain School science teacher.

Students agree to commit to a minimum of two hours per week to their science projects, and SPRI research scientists are available throughout the year to mentor the students. The student teams are required to develop research timelines, submit progress reports, and make a final report or presentation. Throughout the year, Science Club members are given the opportunity to attend research lectures at SPRI in order to expand their understanding of the research process.

“Our young scientists hold the key to the future,” says Coen A. Wijdicks, Ph.D., former director of the Department of BioMedical Engineering at SPRI. “These experiences allow students to use the resources they are taught in their science classes and to apply scientific methods and techniques to various topics and experiences. It is very rewarding to mentor the students and work with them on ways to better understand the dynamics behind producing an authentic experiment.”

Rachel Ledon, a student at Battle Mountain High School, has this to say about her SPRI Science Club experiences: “The EPOC Science Club allowed me to further explore my passion for science and research. With the help of SPRI’s doctors and researchers, I was challenged to explore questions and potential problems of skier safety. I practiced the scientific method, incorporating experimental procedures to find answers and possible solutions to the problem.”

Through her involvement, Rachel has become inspired to create a similar program at her school that allows students to conduct research projects on their own.

“The Science Club has taught me things I couldn’t learn in a classroom,” she adds.

WHO WINS?

Through EPOC’s variety of activities, Steadman Philippon physicians and scientists broaden their perspective by interacting with elementary, middle, and high school students.

Students get the opportunity to meet, question, and work with world leaders in science, research, and orthopaedic sports medicine.

“We are grateful and appreciative for all The Steadman Clinic and the Steadman Philippon Research Institute do for our students and community,” says Jason Glass, Ed.D., superintendent of Eagle County Schools.

“We are grateful and appreciative for all The Steadman Clinic and the Steadman Philippon Research Institute do for our students and community,” says Jason Glass, Ed.D., superintendent of Eagle County Schools.



Photo: Angelica Wedell

Dr. Glass, other educational administrators, and teachers throughout the Vail Valley area display the vision that makes interaction between the Steadman Philippon Research Institute and future scientists, engineers, mathematicians, and physicians possible. Everyone wins.



Ski Uphill

Tyler R. Cram, M.A., ATC
Sam G. Moulton, B.A.
Robert F. LaPrade, M.D., Ph.D.

As the leaves slowly fade to yellow and red, it marks a time when we put our two-wheeled machines away for winter hibernation and wax our skis to get them ready to carve the snow once again. Are you excited for ski season but maybe want to try something a little bit different? How about skiing uphill?

Ski touring has gained much popularity in the United States over the last few years and has afforded all levels of skiers a new skiing experience. Whether you are looking to find untouched powder stashes in the backcountry or just looking to gain a little fitness inbounds, we will explain everything you need to know to get ready for a ski season full of fitness and fun.

PRESEASON TRAINING AND INJURY PREVENTION

Whether you are looking to ski uphill or downhill, it is most important to initiate a preseason fitness and injury prevention program to stave off injuries and keep you skiing your best all season long. Skiing requires flexibility, leg strength, and endurance, but most importantly, a strong core, all of which should be included in your training. In addition, a good training program should also include functional lateral agility training mimicking the side-to-side demands of downhill skiing.

If you wish to embark on a ski touring trip or head up the mountain for a few turns before the lifts open, it is very important to increase your cardiovascular fitness to ensure your engine is as strong as possible. If you have been cycling all summer, the seated position can cause

your gluteal muscles to shut off and hip flexors can become very tight. As the largest muscle in the body, it is very important to make sure that your gluteus maximus (main muscle in your buttocks) is firing on all cylinders to get you uphill most efficiently. For these reasons, you should also include hip flexor stretching as well as hip extension strengthening exercises into your program, including moves such as hip bridges and kettle-bell swings.

SKI TOURING EQUIPMENT

In order to head up the mountain, you will need to modify your current downhill setup slightly. First, you will need an alpine touring binding which allows your heel to become free while heading up the hill and then to lock back to the ski before heading downhill. If you are a telemark skier, telemark bindings work in a similar way. Next, to keep you from sliding backwards as you ski up, you will need skins for the bottom of your skis. Touring skis have skins cut to fit the shape of the ski or you can get aftermarket skins and cut them to fit just about any ski.

Using a touring boot will also make your setup more comfortable. Touring boots or telemark boots work best because they provide flexibility in the ankle while going uphill, but can lock and become rigid when you want to charge down the hill. Every year more touring skis become available that vary in weight, width, and performance. It is best to choose the ski that will fit the type of terrain in which you will be skiing.

Finally, due to the high-energy demand of skiing uphill, it is important to layer and have the right type of clothing. If you are putting in a big effort, the temperature can feel up to 20 degrees warmer than the reading of the thermometer.

WHERE TO GO AND HOW TO STAY SAFE

While many might think ski touring is only for adrenaline junkies seeking fresh tracks on a remote mountain top, local ski resorts in Colorado are a perfect place to work up a sweat with your touring gear. One place to check out is Copper Mountain, where they support ski touring during normal ski hours. Stop by their lodge and fill out an uphill access pass and you are ready to make your ascent.

Another great ski touring option is heading out on a hut trip. There are a variety of huts and cabins nestled in the Rockies, including the 10th Mountain Division Hut System, that are accessible

for any level skier. More information on these huts can be found at www.huts.org. If you wish to get away from the resorts and head into the side country or back country, it is very important to take an avalanche safety course. There are some great resources here in the Vail Valley on avalanche safety to get you started.

Whether you are a long-time skier or just picking up skis for the first time this year, winter is just around the corner. With a little preseason conditioning, you will be ready to earn your turns and head up the mountain for some beautiful views and well-deserved, man-powered fresh tracks.



Photo: John Kelly

(Steadman Philippon Update, continued from page 3)

World's Top Knee Surgeons Gathered for First Vail International Complex Knee Symposium

Nearly 100 medical professionals from around the world came to the Vail Valley on July 16th through 18th to attend one of the world's first conferences based solely on complex knee surgeries. The first annual Vail International Complex Knee Symposium, sponsored by Smith and Nephew and hosted by The Steadman Clinic, Steadman Philippon Research Institute (SPRI), and Oslo Sports Trauma Research Center was held at the Vail Cascade Resort & Spa and SPRI.

The symposium was unique in that, in addition to lectures regarding complex knee issues, expert surgeons performed several live surgical demonstrations to aid in the learning process. The faculty included 25 of the top complex knee surgeons from every continent.

International Olympic Committee Medical Director Lars Engebretsen, M.D., Ph.D. and SPRI Chief Medical Officer Robert F. LaPrade, M.D., Ph.D, were co-directors of the symposium.

"Our clinic and institute consistently provide leading edge research, education and instruction, yielding tremendous evidence-based outcomes for our patients," said Gary Peterson, CEO and president



Photo: Angelica Wedell

International Olympic Committee Medical Director, Lars Engebretsen, M.D., Ph.D.

of the Steadman Clinic and Steadman Philippon Research Institute. "Our goal is to always advance the standard and continually collaborate with other leaders in the orthopaedic world."

Topics included complex meniscus issues, medial knee, posterolateral knee, PCL injuries and how arthroscopy brought about major change for knee ligament surgery. Steadman Philippon Research Institute physicians invented many of the surgeries covered during the symposium.

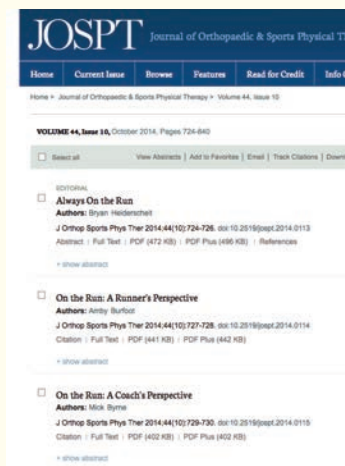
"The course was a complete success," said Dr. Robert LaPrade. "We partnered a live surgical demonstration after every two to three lectures to further reinforce the topic. We had excellent feedback from both faculty and attendees and look forward to the second course next June."

"This conference was a testament to the excellent surgeons at The Steadman Clinic who are leaders in the management of complex knees," said Doris Kirchner, CEO of Vail Valley Medical Center. "Their research once again demonstrates to the world that SPRI is a leader in the development of successful outcomes for its patients. I am proud to have these gifted surgeons and researchers in our local community and equally pleased that the world is coming to Vail for the conference."

"International, Interactive, Instructive and Awesome. I hope we can look forward to the return of this course annually - one of the best Knee courses ever." - Dr. John Feagin

Robert F. LaPrade, M.D., Ph.D., co-authored two lead articles in *Journal of Sports and Orthopaedic Sports Therapy*

The findings of studies initiated by Dr. LaPrade at the University of Minnesota were published in two lead articles in the September 2014 *Journal of Sports and Orthopaedic Sports Therapy*, the principal physical therapy journal. "Lead" articles are considered most significant.



“Comparison of 3-Dimensional Shoulder Complex Kinematics in Individuals With and Without Shoulder Pain, Part 1: Sternoclavicular, Acromioclavicular, and Scapulothoracic Joints” and “Comparison of 3-Dimensional Shoulder Complex Kinematics in Individuals With and Without Shoulder Pain, Part 2: Glenohumeral Joint” were published in the September 2014 issue.

Shoulder pain is the second most common musculoskeletal complaint. The objective of the research was to compare shoulder joint motion and linear translations between symptomatic and asymptomatic individuals during shoulder motion. The purpose of these studies is to improve manual therapy- and exercise-based physical therapy protocols.

Royal College of Physicians and Surgeons of Glasgow Selects Dr. Clanton as an Honorary Fellow



Dr. Thomas Clanton (left) with the president of the Royal College of Physicians and Surgeons of Glasgow, Dr. Francis G. Dunn (center), and Dr. Gordon MacKay (right).

Glasgow, Scotland, June 18. - The Royal College of Physicians and Surgeons of Glasgow selected Thomas Clanton, M.D., as an honorary fellow. Established by charter more than 400 years ago by King James VI, the Royal College is an institute of physicians and surgeons in Glasgow and was intended to be a regulatory authority to ensure that physicians and surgeons were properly trained. Today, the Royal College offers postgraduate medical education, membership, and diplomas to medical practitioners.

On June 19th, Dr. Clanton was also a plenary speaker at the third international triennial conference of the Royal College of Physicians and Surgeons of Glasgow, *Advancing Excellence in Healthcare 2014*.

Thomas Clanton, M.D., is the director of foot and ankle sports medicine at The Steadman Clinic in Vail, Colorado. One of his specialties is the treatment of ankle arthritis and osteoarthritis.

Orthopedics Today Features Dr. Millett’s Bony Bankart Bridge Technique



Photo: John Kelly

Dr. Peter Millett has been selected to the International Scientific Advisory Board for Obere Extremität.

The May 25 *Orthopedics Today* features Dr. Peter Millett’s bony Bankart bridge technique, introduced back in 2009. This technique is used to treat acute shoulder instability, and is recognized as having several advantages over the other surgical treatments for shoulder instability. One such advantage is that by securing two-point fixation, fragment compression can be achieved arthroscopically without sacrificing the bony fragment.

Peter Millett, M.D., has also been selected to be a member of the International Scientific Advisory Board for the German scientific journal *Obere Extremität* (Upper Extremity), published by Springer. This journal is dedicated to the care and treatment of injuries related to the shoulder, elbow, and hand. In addition, the journal serves as an educational forum between orthopaedic and trauma surgery for a variety of injuries.

As an internationally recognized shoulder specialist, Dr. Millett will contribute his expertise on injuries and treatments related to the shoulder to the advisory board. “Honored to be invited by my international colleagues to serve on the advisory editorial board of such a prestigious scientific journal. It is great to know that the work we do here in Vail is recognized internationally!” said Dr. Millett.

(continued on page 28)

(Steadman Philippon Update, continued from page 27)

Dr. Philippon Offered Tips to Dancers and Active People Traveling to Higher Altitude in *Dance Magazine*

Touring always comes with challenges, but traveling to a higher elevation is particularly difficult. When there is less oxygen available, it can affect your endurance and make your muscles tire faster. Some performers even suffer from dizziness, headaches, nausea, shortness of breath, and fatigue. What can you do? Dr. Marc Philippon, who works with dancers at the Vail International Dance Festival, offers these tips.

- Before you leave, increase your cardio cross-training to boost your endurance.
- Arrive early, if possible. Spend at least one day avoiding exercise and getting as much sleep as possible.
- Drink lots of fluids. Coconut water or sports drinks are particularly helpful to replace lost electrolytes.
- Avoid alcohol—it slows down the acclimatization process.
- Don't smoke.
- Eat a high-carb, low-salt diet to keep your fluids at optimal levels.
- If you've experienced mountain sickness before or have anemia, ask your doctor for medication.
- Use the oxygen tanks whenever you're backstage.
- If you feel dizzy, have a hard time catching your breath, or experience headaches that won't go away, see a doctor.

yourbody

Dancing on Air—Safely
 Dancing always comes with challenges, but traveling to a higher elevation is particularly difficult. When there is less oxygen available, it can affect your endurance and make your muscles tire faster. Some performers even suffer from dizziness, headaches, nausea, shortness of breath, and fatigue. What can you do? Dr. Marc Philippon, an orthopaedic surgeon who works with dancers at the Vail International Dance Festival, offers these tips.

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- Use the oxygen tanks whenever you're backstage.
- If you feel dizzy, have a hard time catching your breath, or experience headaches that won't go away, see a doctor.

Weird But True
 You want to know how you can improve your performance? Well, it's really quite simple: the current all-American President Barack Obama always keeps his mouth full of gum. Why? They think it can help you hold a pose tightly. They think it can help you hold a pose tightly. They think it can help you hold a pose tightly. Psychologists believe this helps because having your mouth full is a great way to focus on your job.

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Photo: John Kelly

Scientific Advisory Board Member Dr. John Feagin Inducted into Army Sports Hall of Fame

Dr. John Feagin, a West Point graduate who served as team physician, was inducted into the Army Hall of Fame, October 10, 2014. Dr. Feagin has been a close advisor and mentor to the Institute for more than 25 years.

"This Hall of Fame is a testament to the great tradition of athletics, Army, and West Point," said Army Director of Intercollegiate Athletics Boo Corrigan. "National champions, All-Americans, and incredible athletes are being honored."

Dr. Feagin is a 1955 West Point graduate and earned two varsity letters as a member of the swimming and diving team.

He was commissioned into the Artillery Branch of the U.S. Army, and graduated from Duke medical school in 1961. Feagin served as an orthopaedic surgical resident at Walter Reed Army Medical Center for four years and then as chief of orthopaedic services at the 85th Evac Hospital in Vietnam.

He returned to West Point as team physician in 1967 and worked closely with assistant football coach Bill Parcells and head basketball coach Bob Knight. Feagin is a founding member of the American Orthopaedic Society of Sports Medicine, the International Society of Knee Surgery and Arthroscopy, the Society of Military Orthopaedic Surgeons, and the American Orthopaedic Society for Sports Medicine.

An extensive author and lecturer, Feagin wrote "The Crucial Ligaments," which helped revise the treatment of anterior cruciate ligament injuries. His book and papers are still used today in treating the common sports knee injury, as well as in educating young orthopaedic surgeons.

Feagin served as the team physician for the U.S. Ski Team during the 1992 Winter Olympics after moving to Durham, NC, to become an associate professor at the Duke University School of Medicine and chief of orthopaedic services in the Durham Veterans Administration Medical Center.

He worked as team physician under West Point graduate Mike Krzyzewski and the Duke Basketball team, and helped found the Coach Krzyzewski-Nike Human Performance Laboratory.

Feagin was presented the Mueller International Knee Prize for a Lifetime of Contributions to the Sciences and Practices of Knee Surgery and was inducted into the American Orthopaedic Society of Sports Medicine Hall of Fame. He is an honorary member of the Army Football Letterman's Club and as a U.S. Military Academy Graduate, he established the John A. Feagin West Point Sports Medicine Fellowship.

NFL Legend Bruce Smith Special Guest at SPRI's "Rock the Research 2014"

Bruce Smith, a National Football League Hall of Fame member, was a special guest to honor Dr. Richard Steadman at "Rock the Research 2014" on Monday, July 14, at the Gerald R. Ford Amphitheater. Smith, one of the most dominant defensive players in NFL history, first met Dr. Steadman as a patient in 1992.

"I learned very quickly that there was something about Dr. Steadman that exceeds the normal doctor-patient relationship," he says. "He has a concern for each patient that is simply special. For me, he was like a ray of sunshine that brightens the moment. He's an accomplished and remarkable man—unique and humble—and that's why I wanted to attend this event."

"He also added at least five years to my career," adds Smith, who had three microfracture procedures



Bruce Smith, left, with Dr. Philippon.

performed by Dr. Steadman. "He protected me. He did not let them rush me back onto to the field prematurely. I couldn't have been more blessed to have a doctor who took care of me the way he did."

After graduating from Virginia Tech and being drafted No. 1 in 1985, Smith played in the NFL 19 years—15 for Buffalo and four for Washington. During his career, he earned "Defensive Player of the Year" honors in 1990 and 1996, was AFC Defensive Player of the Year four times, and was chosen to play in 11 Pro Bowls. With the Bills, his team went to four consecutive Super Bowls. His number, 78, has been retired at Virginia Tech.

When he was enshrined into the NFL Pro Football Hall of Fame in 2009, he credited Dr. Steadman for preserving his career.

"Dr. Steadman and his colleagues at the Steadman Philippon Research Institute are pioneers and innovators," says Smith. "They are constantly exploring new techniques that extend the playing careers of athletes and add to the quality of life of all their patients. For what they have done for me and thousands of others, I will be forever thankful."

Smith and his wife, Carmen, live in Virginia Beach, Virginia. Bruce is passionate about his alma mater, Virginia Tech, and attends every football game. He is a commercial real estate developer and has built a 300-unit apartment complex/hotel near the campus. Their son, Alston, is a sophomore offensive lineman for the Hokies.

FREQUENTLY ASKED QUESTIONS

ONCE A RESEARCH PROJECT IS COMPLETED, HOW ARE THE RESULTS DISSEMINATED?

The Institute publishes research results on knees, hips, shoulders, feet, ankles, and spine in the top-tier, peer-reviewed orthopaedic journals. In 2013, principal investigators and fellows published 116 papers in scientific and medical journals and delivered 259 presentations to a variety of professional audiences worldwide.

One journal in particular, the **American Journal of Sports Medicine (AJSM)**, is considered 'The New York Times' of orthopaedic journals. *AJSM* is ranked number one out of 65 orthopaedic journals. In 2013, the Institute published 12 articles in *AJSM*—four percent of all articles published. Hospital for Special Surgery in New York City had 13 articles accepted in *AJSM*.

HOW DO YOU MEASURE SUCCESS OF YOUR RESEARCH AND EDUCATION PROGRAMS?

Besides our acceptance rate of research results in top-tier journals, recognition through awards is another validation of quality and excellence.



Nick Kennedy receiving the Excellence in Research award from Robert F. LaPrade M.D., Ph.D., Research Committee Chair of the American Orthopaedic Society for Sports Medicine.

Because of the commitment from our many donors, SPRI has been recognized internationally at the highest levels for distinction in research. In July 2014, the Steadman Philippon Research Institute received the **2014 Excellence in Research Award** from the **American Orthopaedic Society for Sports Medicine**, a world leader in sports medicine education and research, during the annual meeting in Seattle. This is the first time that the Institute has won this award since it was established. The award is presented for the best paper submitted in any category.

Since the opening of the new BioMedical Engineering Laboratories in 2011, two fellowship classes have had the opportunity to perform quality research benefitting patients worldwide. Each of these two fellowship classes has won major international awards.

Earlier in 2013, Dr. Jeff Padalecki, one of our 2011-2012 SPRI fellows, was presented with the **Albert Trillat Young Investigator's Award** by the **International Society of Arthroscopy, Knee Surgery, and Orthopaedic Sports Medicine** at its biennial congress. This award recognizes his research team's contributions to the understanding, care, and prevention of injuries to the knee.

Dr. Jeff Nepple, a 2012-2013 fellow, was honored in October of 2013 in Munich, Germany, with an important international award presented by the **International Society for Hip Arthroscopy** at its annual scientific meeting. **The Richard N. Villar Trainee Excellence in Clinical Research Award** was presented to Dr. Nepple for his research titled, "The Effect of an Acetabular Labral Tear, Repair, Resection, and Reconstruction on the Hip Fluid Seal." This award was created to recognize young researchers who contribute high-quality research and information.



Steadman Philippon Golf Tournament

The Vail Valley Medical Center 2015 Steadman Philippon Research Institute Golf Classic Presented by RE/MAX International Set for August 13, 2015

The team event held at Sanctuary Golf Course, in Sedalia, Colorado, just south of Denver, will include a shotgun start with a modified scramble. The tournament is open to the public. Sanctuary organizes and hosts charitable events to support organizations devoted to the arts, children, health care, and crisis management.

Proceeds will support the orthopaedic research and educational programs of the Steadman Philippon Research Institute.

Since 2004, the Institute has raised more than \$1.5 million from this golf

tournament to support its research programs. Renowned course architect Jim Engh, Golf Digest's first-ever "Architect of the Year," designed the course that protects a private oasis of 220 acres, effectively complementing the 40,000 surrounding acres of dedicated open space.

The Steadman Philippon Research Institute is grateful to Dave and Gail Liniger, owners and co-founders of RE/MAX, LLC, who built this course and created this unique fundraising opportunity for the Institute to develop and enhance relationships with those who support our mission.

Sponsorship opportunities and team slots are available now. More information can be obtained by visiting our website (www.sprivail.org) under "Upcoming Events," or by calling the Development office at (970) 479-5781. To request an invitation or for more information on other upcoming events, please contact John McMurtry at the Steadman Philippon Research Institute, (970) 479-5781 or mcmurtry@sprivail.org.



Photo: Angelica Wedell

2014 winning foursome: L-R Joe Fogel, M.D., Cindy Nelson, Richard Steadman, M.D., and Henry Ellis.



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

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The Steadman Philippon Research Institute 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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Steadman Philippon Research Institute

Jen Rogus
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Steadman Philippon Research Institute

Greg Paschke
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Ashley Wilson
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Grant Dornan
Statistician

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Administrative Assistant

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Sam Moulton
Research Assistant

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Research Assistant

Nick Johnson, M.D.
Research Assistant

BIOMEDICAL ENGINEERING

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Senior Robotics Engineer

Travis Turnbull, Ph.D.
Research Engineer

Matt Rasmussen
Research Engineer

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Research Assistant

Adriana Saroki
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Research Assistant

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Griffin Visiting Scholar

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*Deputy Director, Sports Medicine
Fellowship Program
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Kelly Stoycheff
Education and Fellowship Coordinator

Max Petri, M.D.
Visiting Research Scholar

Fernando Fuso, M.D.
Visiting Research Scholar

Christiano Trindade, M.D.
Visiting Research Scholar

DEPARTMENT OF TECHNOLOGY AND MULTIMEDIA COMMUNICATION

Barry Eckhaus
AudioVisual/Multimedia Manager

Angelica Wedell
AudioVisual/Multimedia Technician

Mark Your Calendar:

AUGUST 13, 2015

Vail Valley Medical Center 2015 Steadman Philippon Research Institute Golf Classic, presented by RE/MAX, LLC at Sanctuary, Sedalia, Colo.

For more information, contact

John McMurtry at

(970) 479-5781 or mcmurtry@sprivail.org

Executive Editor:

Jim Brown, Ph.D.

Your Legacy, Our Future. Please remember Steadman Philippon Research Institute in your will, trust, or other estate plan.



SPRI has a Facebook page! Search for "Steadman Philippon" on Facebook and click "like" on our page. Watch our wall for updates on our research as well as lecture series, orthopaedics in the news and more!