



STEADMAN PHILIPPON RESEARCH INSTITUTE

2013 ANNUAL REPORT



An International Center For Research and Education — Keeping People ActiveSM

MISSION

The 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.

HISTORY

Founded in 1988 by orthopaedic surgeon Dr. J. Richard Steadman, the Steadman Philippon Research Institute is an independent, tax-exempt (IRS code 501(c)(3)) charitable organization employing scientists, researchers, fellows, visiting scholars, and interns. Dr. Steadman moved to Vail in 1990 with one researcher. Today, there are almost 30 employees (scientists, researchers, medical fellows, visiting scholars, administration, and interns). In 2010, Dr. Marc Philippon's name was added to mark the succession of the Institute and recognize his research efforts and contributions to the field of hip arthroscopy.

Funding for research and education programs comes primarily from public donations and fundraising events (grateful patients and the physicians of The Steadman Clinic), corporations, and competitive grants.

CONTENTS

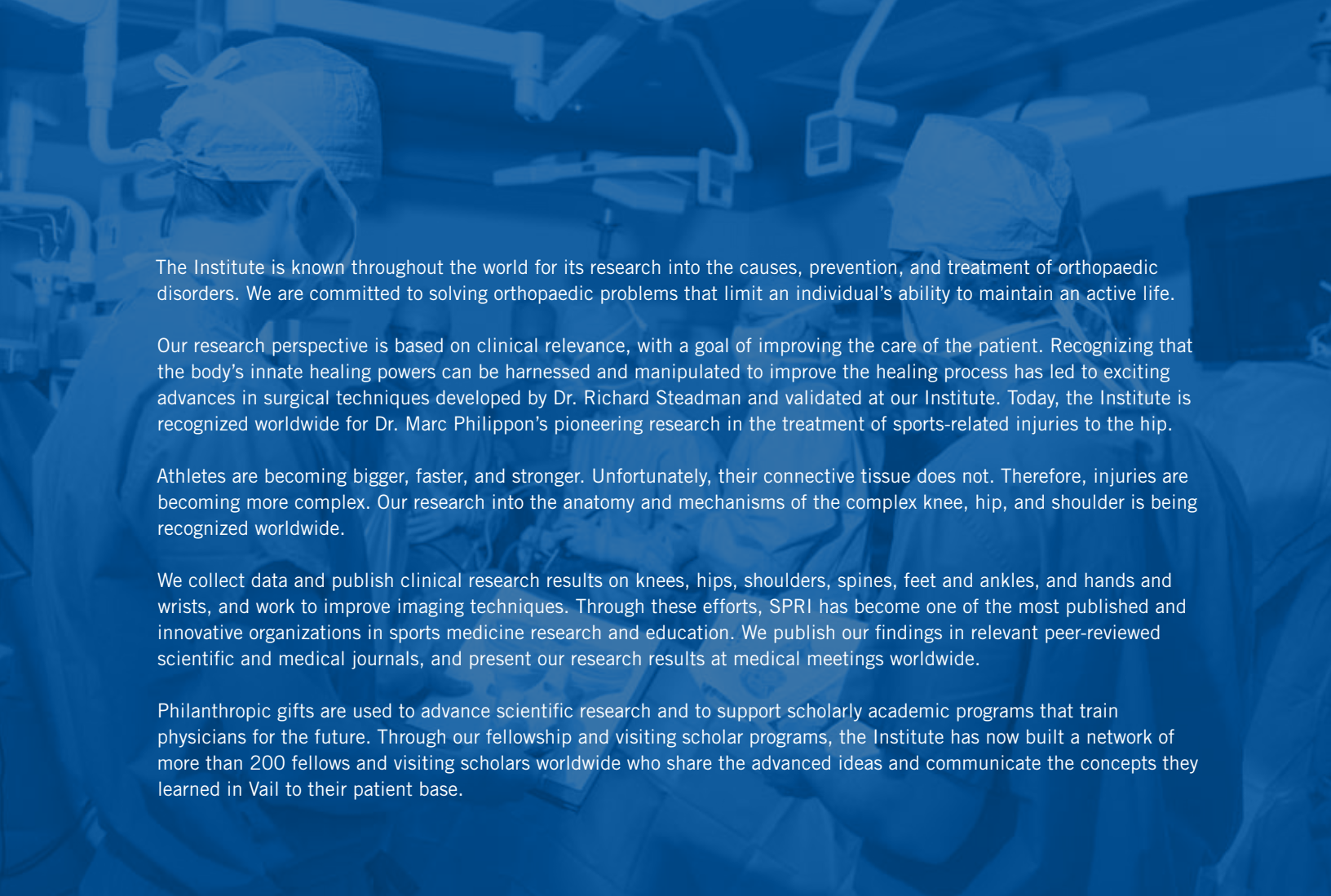
2	The Year in Review
4	Governing Boards
12	Awards and Recognition
18	Scientific Advisory Committee
20	Friends of the Institute
32	Corporate and Institutional Friends
33	Research and Education
35	Center for Translational and Regenerative Medicine Research
38	Center for Outcomes-Based Orthopaedic Research
50	BioMedical Engineering
52	Surgical Skills Laboratory
53	Imaging Research
56	Education and Fellowship
64	Presentations and Publications
81	Events
84	Associates
86	Audited 2013 Financial Statements

The Institute wishes to express again deep appreciation to John P. Kelly, who donated many of the stock photos in this year's Annual Report and contributed his time to photograph the many Institute and operating room subjects.

John Kelly first picked up a camera while serving as an infantry lieutenant in the Air Cavalry in Vietnam. He quickly developed a love for photography that he took home with him to Colorado. By combining his new craft with his passion for sports and adventure, Kelly created a successful career.

His diverse photo assignments have taken him from Wimbledon to trekking the Himalayas, the Winter Olympics to sailing the Caribbean. He was the official photographer for the U.S. Open Golf Championships for 10 years, and the only American among the official photographers at the Lillehammer Winter Olympic Games. When Robert Redford needed the defining shot to promote his film "A River Runs Through It," he called on Kelly. Subsequently, Kelly also provided the still photography for Redford's "The Horse Whisperer."

Although he has traveled all over the world, many of his favorite photo shoots have taken place at his beloved End of the Road Ranch in western Colorado, where clients such as Polo/Ralph Lauren have come to work and play with Kelly and his friends and animals.



The Institute is known throughout the world for its research into the causes, prevention, and treatment of orthopaedic disorders. We are committed to solving orthopaedic problems that limit an individual's ability to maintain an active life.

Our research perspective is based on clinical relevance, with a goal of improving the care of the patient. Recognizing that the body's innate healing powers can be harnessed and manipulated to improve the healing process has led to exciting advances in surgical techniques developed by Dr. Richard Steadman and validated at our Institute. Today, the Institute is recognized worldwide for Dr. Marc Philippon's pioneering research in the treatment of sports-related injuries to the hip.

Athletes are becoming bigger, faster, and stronger. Unfortunately, their connective tissue does not. Therefore, injuries are becoming more complex. Our research into the anatomy and mechanisms of the complex knee, hip, and shoulder is being recognized worldwide.

We collect data and publish clinical research results on knees, hips, shoulders, spines, feet and ankles, and hands and wrists, and work to improve imaging techniques. Through these efforts, SPRI has become one of the most published and innovative organizations in sports medicine research and education. We publish our findings in relevant peer-reviewed scientific and medical journals, and present our research results at medical meetings worldwide.

Philanthropic gifts are used to advance scientific research and to support scholarly academic programs that train physicians for the future. Through our fellowship and visiting scholar programs, the Institute has now built a network of more than 200 fellows and visiting scholars worldwide who share the advanced ideas and communicate the concepts they learned in Vail to their patient base.

OUR PRIMARY AREAS OF RESEARCH AND EDUCATION ARE:

- **Department of BioMedical Engineering** – advances patient care by focusing on injury mechanisms and prevention, develops and validates novel surgical treatments and rehabilitation techniques, and teaches advanced research protocols using state-of-the-art biomedical research techniques and technologies.
- **Center for Outcomes-Based Orthopaedic Research** – conducts evidence- or outcomes-based research using actual clinical data that aids both physicians and patients in making better and more informed treatment decisions.
- **Center for Translational and Regenerative Medicine Research** – undertakes biological studies at the cellular level to investigate the causes and effects of degenerative arthritis, techniques of cartilage regeneration, and basic biological healing processes.
- **Imaging Research** – develops and evaluates noninvasive imaging techniques of the joints for the purpose of directing and monitoring clinical treatment and outcomes, and to enhance the clinical relevance of biomechanics research.
- **Surgical Skills Laboratory** – implements new surgical technologies and trains surgeons in new techniques using state-of-the-art equipment.
- **Education and Fellowship Program** – administers and coordinates the physicians-in-residence fellowships and visiting scholars programs, hosts conferences and international medical meetings, produces and distributes publications and educational media, and organizes educational outreach programs in partnership with the local school district.

THE YEAR IN REVIEW

DEAR FRIENDS,

On behalf of all of us at the Steadman Philippon Research Institute, we wish to thank you for your continued support, which helped to make 2013 a year of accomplishment and significant international recognition. Your commitment makes it possible for us to carry out our mission of “Keeping People Active” and educating the worldwide orthopaedic community.

Philanthropy from patients, grateful families, and others who have benefitted from our work has been the basis for all our advances since SPRI’s founding in 1988. SPRI’s regenerative medicine and biomedical engineering research on the anatomy and mechanisms of knees, hips, spines, shoulders, and ankles—and the outcomes-based orthopaedic therapies they have yielded—are now recognized worldwide.

Because of the commitment from our many donors, your team at SPRI has been recognized internationally at the highest levels for the quality and excellence 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 (pg. 12),

a world leader in sports medicine education and research, during their annual meeting in Seattle. This is the first time that this award has been won by the Institute since the award 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.

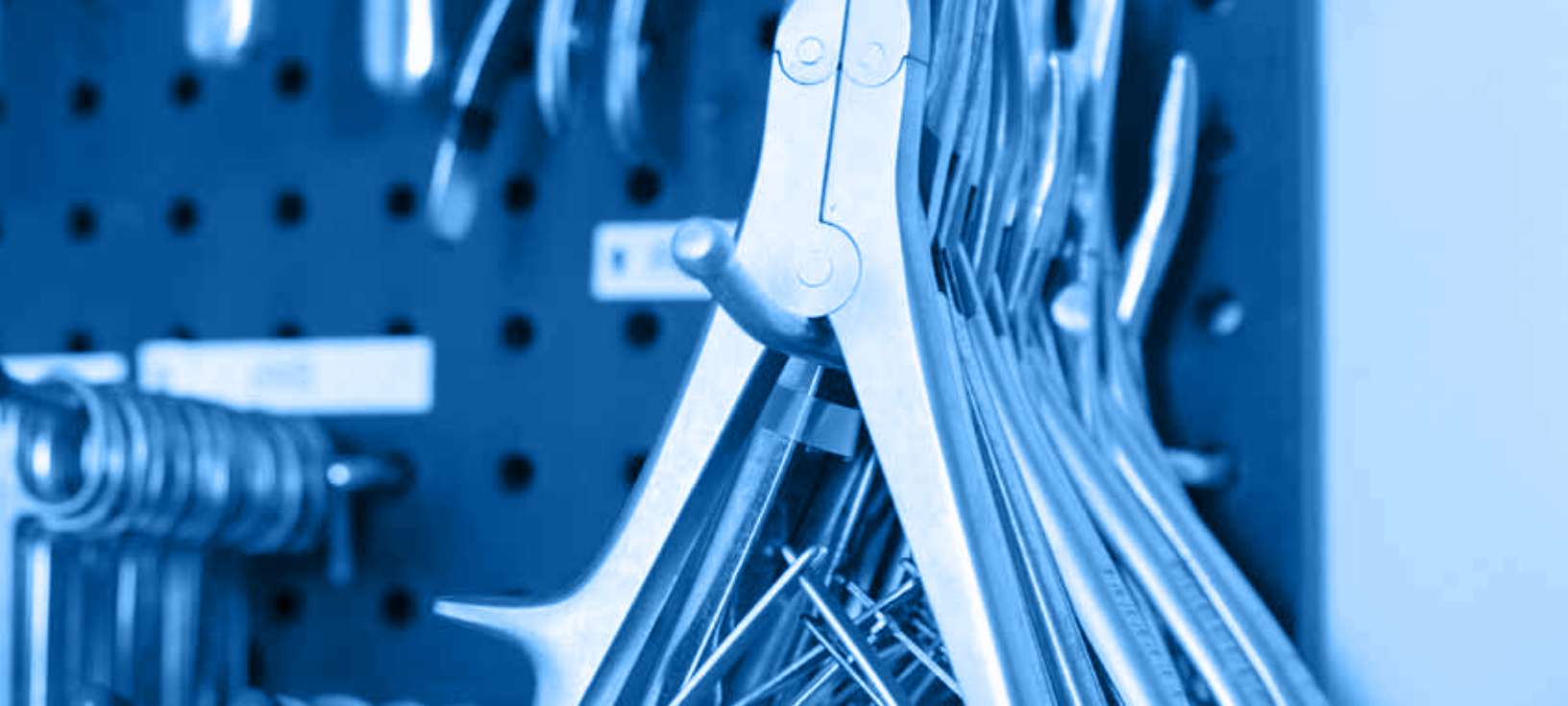
Earlier in 2013, Dr. Jeff Padalecki, one of our 2011-2012 SPRI fellows, was presented with the Albert Trillat Young Investigator’s Award by the International Society of Arthroscopy, Knee Surgery, and Orthopaedic Sports Medicine at its biennial congress. This award recognizes his research team’s contributions 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 (pg. 13) 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.

In July 2014, 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. The USOC would not have bestowed that honor, the Olympic Rings, and the National Medical Center emblem without The Steadman Clinic and the Steadman Philippon Research Institute being mentioned side-by-side. The U.S. Olympic Committee makes it clear that these two entities—The Clinic and SPRI—are essentially important as a team.

Looking forward, we have submitted our application to the International Olympic Committee to become the first U.S.-based research center for the IOC. That designation would be another significant honor and is



something about which we are very hopeful. The IOC is very interested in basic research regarding all athletes' health, injury prevention, and improved performance.

For more than 25 years, the Steadman Philippon Research Institute has devoted time and resources to the training and education of physicians and scientists from all over the world. SPRI staff members have been involved in the Vail Valley community since the Institute moved to Vail in 1990. On page 62, you will read about a new level of commitment achieved when the Institute's Education and Public Outreach Committee—EPOC—began a program to inspire elementary, middle, and high school students in Eagle County to become more involved in the fields of science, technology, engineering, and mathematics. During the 2013–2014 school year, EPOC's program involved more than 500 students from local schools, beginning with those in the fifth grade.

Our life-changing research would not exist without the visionary support of individuals like you. On behalf of our dedicated trustees and researchers, we wish to thank you,

our donors, corporate sponsors, and foundations, for your commitment. We look forward to your continued support and to updating you on exciting advances from the Steadman Philippon Research Institute.

With your help, we are able to make a difference.

Respectfully yours,

J. Richard Steadman, M.D.
Co-Chairman
Co-Chief Scientific Officer

Marc J. Philippon, M.D.
Co-Chairman
Co-Chief Scientific Officer

Gary A. Peterson
President and Chief Executive Officer



J. Richard Steadman, M.D.



Marc J. Philippon, M.D.



Gary A. Peterson

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Chief Executive Officer (retired)
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Bellaire, Fla.

Norm Waite

Vail, Colo.

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President and Chief Executive Officer
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Vail, Colo.

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AIS American Bell
Scottsdale, Ariz.

Betsy Nagelsen-McCormack
Professional Tennis Player (retired)
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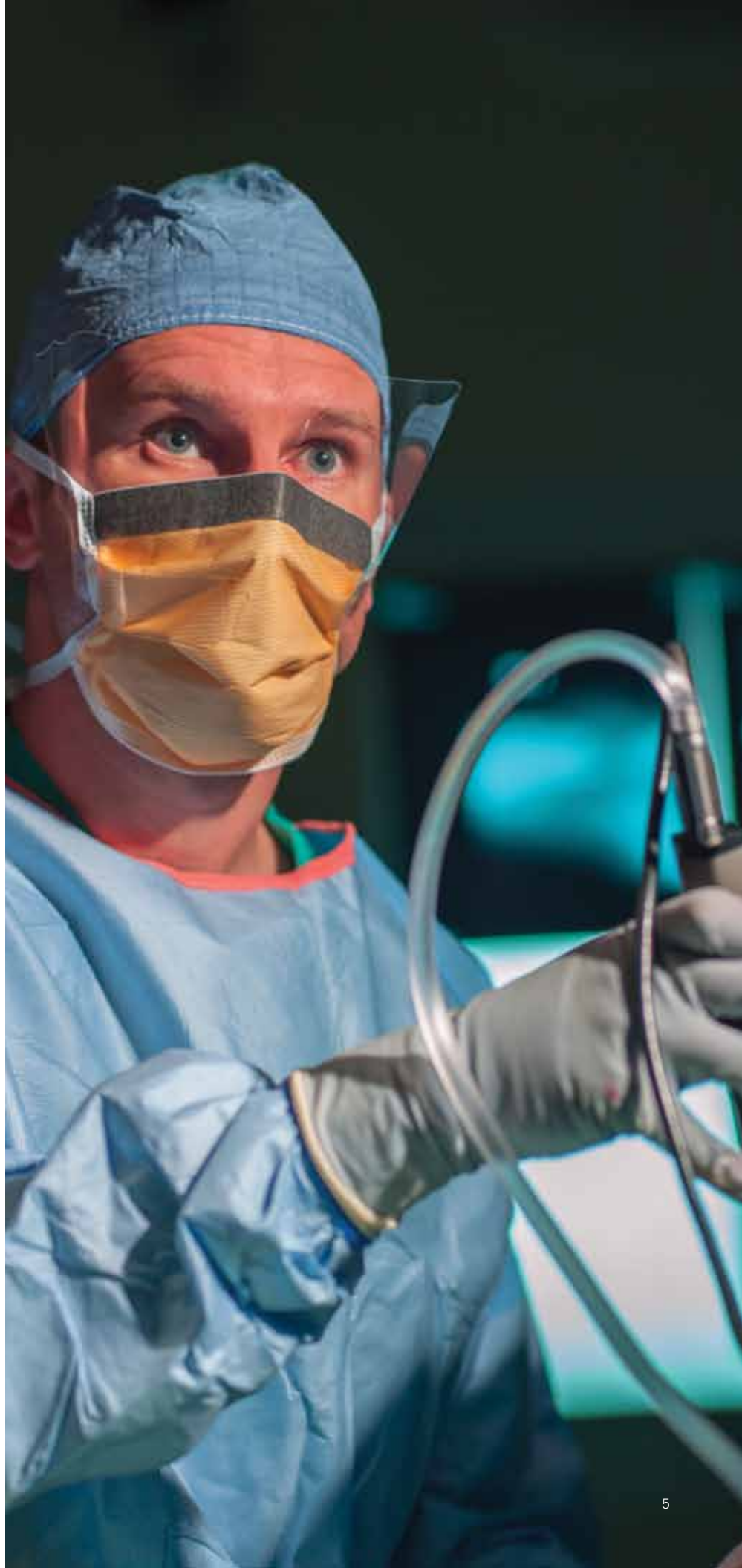
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Co-Chairman

Gary Peterson
President and Chief Executive Officer

Greg Paschke
Chief Financial Officer

Monica White, CPA, CGMA
Controller/Treasurer





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

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, which 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, produced 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, and 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."

"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 inquiry. 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 in 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 Cup 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."



2013 A RECORD YEAR FOR STEADMAN PHILIPPON RESEARCH INSTITUTE PRODUCTION

How your contributions enable SPRI to maintain its position as one of the world leaders in orthopaedic sports medicine research

The Steadman Philippon Research Institute has nine physicians, 20 research scientists, and six administrative professionals. Yet this relatively small group continues to position SPRI as one of the most productive institutions in the world as measured by publications, presentations, and awards.

In 2013, SPRI's doctors and researchers had 58 articles published in scientific and medical journals such as *The American Journal of Sports Medicine*, the *Journal of Orthopaedic Research*, and the *Journal of Bone and Joint Surgery*. Each publication was cited in the National Library of Medicine (PubMed).

More than 40 presentations describing the outcomes of studies

conducted at SPRI were made at conferences in the U.S., Europe, Canada, South America, and Africa.

Physicians and scientists at Steadman Philippon were honored by the American Academy of Orthopaedic Surgeons, the International Society for Hip Arthroscopy, and the International Society of Arthroscopy, Knee Surgery and Orthopaedic Sports Medicine.

HOW DO THEY DO IT?

The answer begins with you.

"All of our achievements are made possible through the support of generous individual donors and our corporate and institutional friends," says John McMurtry, M.A., M.B.A.,

director of Development. "We appreciate that support, which has helped SPRI's vision become a reality."

INTANGIBLES

Dr. William Rodkey, D.V.M., director of SPRI's Center for Translational and Regenerative Medicine Research, adds that two intangible factors have allowed things to come together that provide the impetus for so much productivity in 2013.

"The first is Dr. Steadman's overall leadership. He has always seen this Institute as an important means to validate and self-enforce a grade card as to how we are doing. The way he communicates and thinks with people serves as a stimulus for the physicians and scientists. It

really gives us some guidance and food for thought in our everyday approach to these research problems. That kind of thinking yields studies, publications, and presentations.”

“The second intangible,” says Dr. Rodkey, “is that the attending surgeons at SPRI are truly interested in and dedicated to research. They share Dr. Steadman’s philosophy and as a result, they really want to know how they are doing and what’s coming next. They are willing to support the research financially, philosophically, and intellectually.”

A third underlying factor contributing to productivity is not intangible, according to Dr. Rodkey, “It’s technology,” he says, emphatically. “Clearly, the technological advances we’ve made at Steadman Philippon represent a gigantic step toward efficiency, reliability, and accuracy.”

Coen Wijdicks, Ph.D., senior staff scientist and director of BioMedical Engineering, and Karen Briggs, M.B.A, M.P.H., director of the Center for Outcomes-Based Orthopaedic Research (COOR), provide a closer look at how SPRI’s advanced technology translates into high-impact productivity.

FOCUS

“We have clearly defined goals and outcomes,” explains Dr. Wijdicks. “Once you know where you are going, you can have the greatest impact. We know how to optimize our processes. Our focus is sports medicine and we concentrate on our strengths. That makes the Steadman Philippon Research Institute one of the best in the world at what it does.”

Dr. Wijdicks adds that now that SPRI’s expertise has been established, corporations, institutions, and the medical/scientific communities look to SPRI to develop and validate new products, techniques, and procedures.

EFFICIENCY

“One of the reasons we are more efficient than ever is because of our data software system,” says Ms. Briggs. “Our software incorporates a system that allows the data to check itself. Ninety percent of patient-based verifications (related to procedures that have been performed) are done by email. Instead of sending 900+ messages a month by regular mail and hoping for a response, patients now receive email questionnaires. They are very responsive and the new system has made our communication with patients much easier.”

Ms. Briggs also credits the staff’s experience as a factor in improving efficiency. “Knowing and working with this database for 21 years allows us to be thorough and faster,” she explains. “When doctors and fellows come to us with a question, we can do a better job of answering that question, responding more quickly, and helping them get their findings published sooner.”

Individuals and institutions can often see the results of their contributions in a matter of months, not years. The average time required for a research initiative at Steadman Philippon is six to eight months. When a project takes longer, those who make the effort possible are given periodic updates by the principal researchers.

IMPACT

Focus and efficiency are impressive, but the impact of SPRI research is even more important.

“We are not trying to break records or beat the number of the previous year’s publications or presentations,” says Dr. Wijdicks. “Our goal is to maintain the quality of production regardless of external factors that are out of our control.”

“Our production is having an impact on the scientific and medical communities,” he continues. “*The American Journal of Sports Medicine (AJSM)*, for example, is the number one orthopaedic journal (out of 65) in terms of impact factor. This metric, according to the editors, shows that authors around the world pay attention. If a person looked at any 2013 edition of the *AJSM*, the Steadman Philippon Research Institute name was probably in it.”

Dr. Philippon’s landmark article on labrum reconstruction of the hip was the lead article in the August 2013 issue of the *AJSM*. In the December issue of the same publication, four of the articles were written by SPRI’s staff members.

“Peer-reviewed publications that incorporate relevant research provide a significant, credible resource among peers,” says Dr. Wijdicks. “Because it is published in such a large forum, the result is high impact and captures a large audience.”

ACCOUNTABILITY

Whether a person contributes \$100, \$1,000, or \$100,000, that money is carefully managed so that 77 percent goes directly to research programs, while only 23 percent is spent on overhead. The percentage of contributions dedicated solely to research is one of the highest, if not the highest, in the world.

Some of the money is spent on items, supplies, and equipment that might be scientific-but-less-than-glamorous.

“We would not be able to collect data as we do if we did not keep our software updated and moving forward as medicine advances,” says Ms. Briggs. “We have to know what is in the professional literature, and it costs money to have access to that literature. We’ve hired some of the best minds in the country to

manage high-level statistical programs. Then we have to buy programs that will help our doctors make their presentations and present our research at meetings around the world.”

“We know the benefit of every surgical screw that gets donated,” adds Dr. Wijdicks, “and we appreciate the gift and the giver that make it possible. We want donors to know that their donations go to something necessary and good.”

CARE

Contributions also result in life-changing, patient-centered care. People are able to go about their normal daily activities, postpone or avoid joint replacement, participate in sports at every level, prevent injuries, and remain physically active throughout their lives because of procedures developed or refined at SPRI. Here are three examples:

“The research for Dr. Philippon’s labral reconstruction procedure began in 2005 when he came to SPRI,” says Ms. Briggs. “We’ve been keeping track of patients for seven years and have now validated that the procedure will last for an extended period of time. His research

has directly affected patient care by changing the method of treating hip conditions and injuries.”

Dr. Steadman developed an arthroscopic procedure for injured knees called “The Package.” Patients who underwent the procedure were understandably worried about if and when they might have to return for another procedure—or possibly even need knee replacement.

Dr. Steadman’s team conducted long-term monitoring of the repaired knees’ “survivorship.” They found that many patients were able to delay total knee replacement for up to 10 years, allowing them to make informed choices about their future health care.

For his landmark study, Dr. Steadman was honored with the Richard O’Connor Research Award given by the Arthroscopy Association of North America. The study was published in the February 2013 issue of *Arthroscopy*.

Robert F. LaPrade M.D., Ph.D., received the 2013 Orthopaedic Research and Education Foundation (OREF) Clinical Research Award for his paper on “Improving Outcomes for Posterolateral Knee Injuries.” The award is unofficially

recognized as the “Orthopaedic Nobel Prize” in the medical and scientific communities. Dr. LaPrade presented his paper at the combined annual meetings of the Orthopaedic Research Society and the American Academy of Orthopaedic Surgeons.

ONGOING INITIATIVES

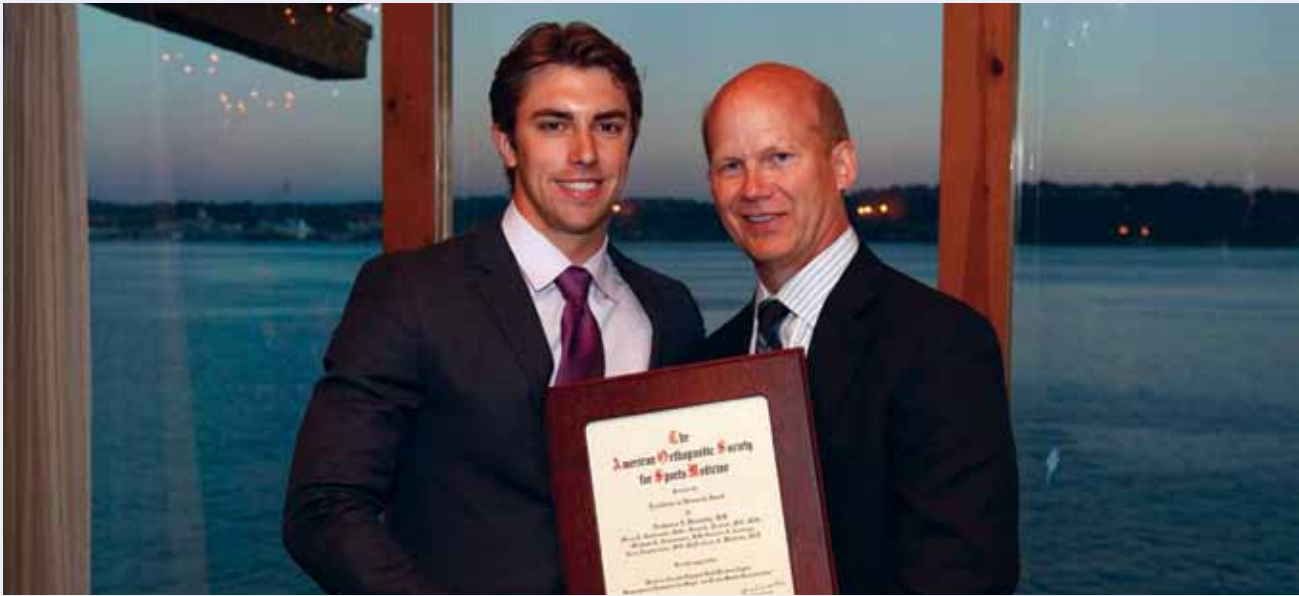
“Your contributions are already at work and supporting new research initiatives,” concludes Dr. Wijdicks. “Investigations involving the hips, shoulders, knees, feet, and ankles are growing exponentially. The metrics used to define successful outcomes are becoming more demanding and more precisely defined.”

“In the coming years, the Steadman Philippon Research Institute will continue to solidify its role as a leader in sports medicine research. That research will impact the lives of those who contribute to SPRI, as well as those of patients throughout the U.S. and abroad.”

Why was 2013 an especially productive year for SPRI? ***Because your support made it possible.***



AWARDS AND RECOGNITION



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.

AMERICAN ORTHOPAEDIC SOCIETY FOR SPORTS MEDICINE PRESENTS THE 2014 EXCELLENCE IN RESEARCH AWARD TO SPRI

The Steadman Philippon Research Institute was awarded 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 this award has been won by the Institute since the award was established in 1988.

This recognition is given to the best paper submitted in any category to the AOSSM Awards Committee, a world leader in sports medicine education, research, communication, and fellowship. The award is a symbol of quality and research excellence. It is also a symbol of international collaboration.

The award-winning research was conducted in partnership with Lars Engebretsen, Ph.D., from the Oslo Sports Trauma Research Center in Norway and Robert LaPrade, M.D., Ph.D., of the Steadman Philippon Research Institute in Vail.

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 Founded in 1972, AOSSM is an international organization of orthopaedic surgeons and other allied health professionals dedicated to sports medicine. This award is a symbol of quality and research excellence.



INTERNATIONAL SOCIETY FOR HIP ARTHROSCOPY (ISHA) RECOGNIZES DR. JEFF NEPPLE FOR EXCELLENCE IN CLINICAL RESEARCH

Dr. Jeff Nepple, a Sports Medicine Fellow (class of 2012–2013) at the Steadman Philippon Research Institute, was honored October 12–13, 2013 in Munich, Germany, with a major international award presented by ISHA at its annual scientific meeting. He was one of eight finalists.

The Richard N. Villar Trainee Excellence in Clinical Research Award was presented to Dr. Nepple for his presentation of research conducted during his fellowship year at SPRI titled “The Effect of an Acetabular Labral Tear, Repair, Resection, and Reconstruction on the Hip Fluid Seal.” The award was created to recognize young researchers who contribute high-quality research and information. Residents and fellows with a study related to hip arthroscopy were encouraged to apply.

SPRI Sports Medicine Fellowship Deputy Director and Chief Medical Officer Robert F. LaPrade, M.D., Ph.D., commented, “It is my pleasure to announce that an SPRI Sports Medicine Fellow was recognized with an international research award this past Saturday in Munich, Germany.”

“Since the opening of the new SPRI Laboratories in 2011, there have been two fellowship classes that have had the opportunity to perform quality research within BioMedical Engineering, and Jeff’s year represents the second fellowship class with a member to win an international award.”

Earlier this year, Dr. Jeff Padalecki won the Albert Trillat Young Investigator’s Award presented by the International Society of Arthroscopy, Knee Surgery, and Orthopaedic Sports Medicine at its biennial congress. The award was based on his research on the effects of radial root tears and repairs on medial compartment joint loads and contact areas.

The ISHA Awards Program is committed to recognizing and honoring young researchers whose work has contributed to better understanding and communication within the field of hip arthroscopy.

ISHA was established in 2008 to further the development, through education and research, of arthroscopic hip surgery. Dr. Marc Philippon is a founding member.



L-R, Drs. Marc J. Philippon and J. Richard Steadman, and Dr. Bill Moreau, Managing Director Sports Medicine, United States Olympic Committee.

STEADMAN PHILIPPON RESEARCH INSTITUTE AND THE STEADMAN CLINIC DESIGNATED A NATIONAL MEDICAL CENTER WITHIN THE U.S. OLYMPIC COMMITTEE'S NATIONAL MEDICAL NETWORK

The Steadman Philippon Research Institute and The Steadman Clinic announced their official designation as a National Medical Center within the United States Olympic Committee's National Medical Network, one of only two such centers since the network was first announced in August 2013.

"The Institute has one of the largest orthopaedic patient databases in existence, and its research is published worldwide in peer-reviewed professional journals. The patient treatment protocols developed and used by the physicians at The Steadman Clinic are validated through this research. The quality of SPRI's research and the outcomes of patients at The Clinic have led to several of the physicians becoming thought leaders in the field of sports medicine orthopaedics," says Karen Briggs, SPRI director for Outcomes-Based Orthopaedic Research.

"Our goal is to contribute to Team USA by delivering the highest standard of evidence-based orthopaedic care and personal attention to Team USA athletes," says Dr. Marc J. Philippon, co-chairman of the Steadman Philippon Research Institute and managing partner of The Steadman Clinic.

The Institute's commitment to research and the Clinic's philosophy of providing evidence-based care to elite athletes as well as people who just want to live an active lifestyle have produced countless success stories both on and off the awards podium.

"We are pleased to have the chance to give back to the athletes who have worked so hard to become Olympians and Paralympians, and we look forward to working with Team USA for many years to come," says Dr. Richard Steadman, who founded the nonprofit entity now known as the Steadman Philippon Research Institute.

Through its fellowship program, the Institute has graduated 196 orthopaedic surgeons now practicing in multiple locations in the United States and abroad.

"The Steadman Philippon Research Institute and The Steadman Clinic are highly honored to be designated a USOC National Medical Center, serving the athletes of the western United States," says Dr. Philippon.

"We are pleased to have the Steadman Philippon Research Institute and The Steadman Clinic join the USOC's National Medical Network as a national partner," says Alan Ashley, USOC chief of sport performance. "The variety and value of services that this collaborative project will provide is a great resource for Team USA, and we are excited to see the expansion of the National Medical Network, which now includes two national and five regional medical centers."



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

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).

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, Jan. 18, 2014. (AP Photo/Alik Keplicz).

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.

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 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 sport, but she also ran track and played soccer. It wasn't until she was 16 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 a sports and education background. 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."

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.



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 those of 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 with 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.

SCIENTIFIC ADVISORY COMMITTEE

DR. JOHN FEAGIN INDUCTED INTO ARMY SPORTS HALL OF FAME



Dr. John Feagin, a West Point graduate and former West Point 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 graduated in 1955 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 University School of Medicine 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 this common sports knee injury as well as in educating young orthopaedic surgeons.

Dr. Feagin served as the team physician for the U.S. Ski Team during the 1992 Winter Olympics after moving to Durham, N.C., 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 of the Duke basketball team under West Point graduate Mike Krzyzewski and helped found the Coach Krzyzewski -Nike Human Performance Laboratory.

Dr. 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.

The scientific advisory committee consists of distinguished research scientists who represent the institute and serve as advisors in our research and educational efforts, in our fellowship program, and to our professional staff.

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STEVEN ARNOCZKY, D.V.M., INDUCTED INTO THE AMERICAN ORTHOPAEDIC SOCIETY FOR SPORTS MEDICINE'S HALL OF FAME

Scientific Advisory Committee Member Steven Arnoczky, D.V.M., was inducted into the American Orthopaedic Society for Sports Medicine's (AOSSM) Hall of Fame at its annual meeting in Seattle July 11, 2014.


Only the second non-physician to receive this honor, Arnoczky is being recognized for basic science contributions to the advancement of ligament reconstruction of the knee and meniscal repair and replacement.

Dr. Arnoczky is a sports medicine researcher from the Michigan State University College of Veterinary Medicine. He has conducted basic science orthopaedic research for 40 years and has served on the SPRI Board for 24 years.

The AOSSM established the Hall of Fame in 2001 to honor members of the orthopaedic sports medicine community who have made original and significant contributions to the specialty. Induction is the highest honor given to a society member. There are currently 58 members from 11 countries in the Hall of Fame.

KENNEDY LECTURESHIP HONORS SPRI ADVISOR LARS ENGBRETSEN, M.D., PH.D.

Lars Engbretsen MD, PhD
2014 Distinguished Lecturer



Dr. Lars Engbretsen has served on the faculties of the University of Trondheim and the University of Minnesota as Associate Professor in Orthopaedic Surgery. He was the Professor and Chairman for the Department of Orthopaedic Surgery at Ullevaal Hospital from 1996-2000 and from 2002-04 and the Orthopaedic University Clinic in Oslo from 2000-2002. From 2003-2007, he served as the Divisional Director for Orthopaedics, Neurosurgery, Reintensive Physical Medicine and Rehabilitation in the Division of Musculoskeletal and Neurosciences at the University of Oslo. He is currently Professor and Chair of the Department of Orthopaedic Surgery at Oslo University Hospital and Faculty of Medicine University of Oslo, along with Co-Chair of the Oslo Sports Trauma Research Center. Since 2007, he has also served as the Chair of Medical Research for the International Olympic Committee.

Dr. Engbretsen completed his undergraduate degree at Hønefoss Katedralskole in Norway and then received his medical degree from the University of Oslo in 1978. He then went on to complete his orthopaedic residency at Trondheim University Hospital and his fellowship at the University of Minnesota. He received a PhD in orthopaedic surgery in 1980 from Trondheim University.

He has published more than 300 articles and book chapters and continues to be very active in clinical, epidemiological and basic science research in the areas of general sports medicine, knee ligaments, cartilage and prevention of sports injuries and illnesses. He has received research grants and awards from many agencies and associations, including the National Institutes of Health, the Norwegian Council for Research in Science and Humanities, the Norwegian Ministry of Health, ACSM and the International Olympic Committee. He and his research group have also won several research awards from around the world.

Dr. Engbretsen is currently involved with three research groups:

- Knee ligaments research—with May Arns Røiseng in Oslo and Robert LaPrade in Minnesota and Vail, Colorado
- Oslo Sports Trauma Research Center—co-chaired with professor Rolf Rahr and emphasizing prevention of injuries and diseases in sports
- Oslo Cartilage Group—studying the path to rehabilitation after surgery, and involving molecular biologists, pathologists, radiologists, physiotherapists and orthopaedic surgeons. In 1997, Dr. Engbretsen's group did the first knee joint stemcell transplantation in Norway. Since then, the group has had major emphasis on translational research.

Dr. Engbretsen is also the current Past President of The European Society of Sports Traumatology and Arthroscopy (ESSAT) and has been the President of the Norwegian Sports Medicine Society and the Scandinavian Federation of Sports Medicine. Dr. Engbretsen is or has been a board member of many other societies including, but not limited to the Norwegian Society of Sports Medicine, the Scandinavian Foundation of Medicine & Science in Sports, SCARIS, the Orthopaedic Research Society and International Knee Society. He is an editor of the British Journal Sports Medicine, Knee Surgery, Arthroscopy and Sports Traumatology, and The Knee and is a reviewer for multiple other orthopaedic and sports traumatology journals.

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

One of the highlights of each year's Sports Medicine Specialty Day, held on March 15 in 2014, is the John C. Kennedy Memorial Lectureship. Dr. Lars Engbretsen, a member of the Institute's Scientific Advisory Committee, was honored as the Distinguished Lecturer for 2014. An internationally recognized authority in orthopaedic sports medicine, Dr. Engbretsen serves in many capacities, including professor and chair, University of Oslo; professor in Sports Medicine, Norwegian School of Sports Science; professor in Sports Medicine, Oslo

Sports Trauma Research Center; and head of Medical Sciences, International Olympic Committee.

In 2001, **Dr. John Feagin**, also a member of the Scientific Advisory Committee and professor emeritus of orthopaedic surgery at Duke University, was honored as the Distinguished Lecturer.

This lectureship is named in honor of John C. Kennedy, M.D., F.R.C.S., a past president of the American Orthopaedic Society for Sports Medicine.

FRIENDS OF THE INSTITUTE

In 2013, SPRI received 1,196 separate gifts and support from individuals, foundations, and corporations. This combined support, including special events, amounted to \$4,385,518.

The Institute is grateful to the following individuals, corporations, and foundations for their support of the Institute in 2013. Their vision ensures the advancement of evidence-based medical research and joint preservation research, science, and care, as well as the education of physicians for the future. We extend our gratitude to these supporters for their generous contributions.



1988 SOCIETY | Lifetime Giving

On November 9, 1988, the Institute was incorporated as a not-for-profit educational and research organization dedicated to advancing modern medical science and the education of young physicians. The Institute is deeply grateful to the following members of the distinguished 1988 Society, whose cumulative giving totals more than \$1 million.

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Over the years, the Institute has been privileged to receive generous and thoughtful gifts from friends and supporters who remembered the Institute in their estate plans. In fact, many of our friends—strong believers and supporters of our work today—want to continue their support after their lifetimes. Through the creation of bequests, charitable trusts, and other creative gifts that benefit both our donors and the Institute, our supporters have become visible partners with us in our mission to keep people physically active through orthopaedic research and education in arthritis, healing, rehabilitation, and injury prevention.

To honor and thank these friends, the Founders' Legacy Society was created, recognizing those individuals who have invested not only in our tomorrow, but also in the health and vitality of tomorrow's generations.

Our future in accomplishing great strides, from understanding degenerative joint disease, joint biomechanics, and osteoarthritis to providing education and training programs, is ensured by the vision and forethought of friends and supporters who include us in their estate plans. The Institute's planned giving program was established to help donors explore a variety of ways to remember the Institute. We are most grateful to these individuals for their support in becoming founding members of the Founders' Legacy Society:

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Patient and Researcher in the News

PERSEVERANCE PLUS PERSPECTIVE EQUALS SUCCESS FOR DAWN OMMEN, M.D.

By Jim Brown, Ph.D.

Dr. Dawn Ommen, a Nebraska native and current SPRI research assistant, has brought a perspective to her work with Dr. Marc Philippon that may be unmatched. Who else can say she has been an NCAA Division I athlete, a college coach, a certified physical therapist, a hip surgery patient, a physician, and a medical researcher?

Dr. Ommen will tell you that none of her achievements have been easy. In fact, that's exactly what she recently told a group of young student-athletes in Colorado. Her never-ever-give-up attitude has put her in a position to make major contributions as a sports medicine physician and to inspire others to strive for ambitious goals.

FIRST BIG GOAL

"My first big goal coming out of high school was to play Division I college basketball," she recalls. "I didn't have a lot of scholarship offers, perhaps because I was short and slow. But I walked on at Kansas State and played for two years before transferring to the University of Nebraska to graduate."

Her experience as a college athlete opened the door to be a college

coach. She coached for one year at the University of Nebraska-Kearney and two years at the University of North Florida.

Her interest in sports and medicine led to graduate school and earning a Master of Physical Therapy degree at St. Ambrose University in Davenport, Iowa. "At the time, I thought about med school, but physical therapy seemed to be a natural way to go."

Dr. Ommen worked as a certified physical therapist for five years, part of that time as a wellness director of a program that won a national wellness award. She also helped the company decrease the bottom line on health insurance.

FIRST BIG OBSTACLE

Being a physical therapist added to her growing body of expertise and experience, but it led to what she describes as her first big obstacle. She suffered a hip injury while teaching a physical therapy student. The injury was misdiagnosed and mistreated for almost five years and included a procedure in which four screws were placed in her lower back. They didn't work.

That's when she heard about Dr. Philippon, who was then at the University of Pittsburgh—not exactly down the street from her home in Nebraska. "As the pain became more and more debilitating, I talked to a friend who had similar symptoms and who had been successfully treated by Dr. Philippon, and I was able to get an appointment with him."

Dr. Philippon eventually performed surgery on both of Dr. Ommen's hips, including the world's first ever ligamentum teres reconstruction via an iliotibial band. Since then, she has been able to return to a high level of competition and is an avid triathlete, snow skier, water skier, and weight lifter.

FIRST BIG FAILURE

Dr. Ommen continued to be a patient of Dr. Philippon after he moved to The Steadman Clinic and the Steadman Philippon Research Institute. She was inspired by the cutting-edge medicine she received.

"As a patient, it amazed me that every time I had an appointment or a procedure, there was always something new—whether it was

a surgical technique, an anti-coagulation regimen, or a change in rehabilitation exercises,” she says. “It’s obvious that Dr. Philippon is continually seeking to improve his world-leading surgical outcomes.”

Her experience with The Clinic and her awareness of the Research Institute motivated her to go to medical school, with the goal of becoming a sports medicine physician. “Not so fast,” she tells her audience. “I had to take the MCAT to get into school and I didn’t score well enough.”

“Should I try again?” she asked herself and her husband, Kevin, a high school math teacher and robotics coach in Nebraska.

“Yes,” they both answered.

So she did take the MCAT again, scored well, was accepted, and graduated from the University of Nebraska College of Medicine in May of 2013.

BECOMING PART OF THE SPRI TEAM

During one visit to see Dr. Philippon, Dr. Ommen asked about the possibility of a research assistantship at SPRI. He liked the idea and arrangements were made for Dr. Ommen to spend a year working with Dr. Philippon on a variety of research projects, including what she thinks could become a landmark study on the effects of prehabilitation on hip arthroscopy.

“There is a phenomenal relationship between The Clinic and the Research Institute,” says Dr. Ommen. “There is no wasted data here. Dr. Philippon and his colleagues are using that data to change what is going on in hip arthroscopy.”

Dr. Ommen’s medical records are part of SPRI’s famous database. As a research assistant and former patient, she may be analyzing information

taken from her own hip surgery procedures. Yet another perspective.

“I feel like I live and work at Disneyland out here in Vail,” says Dr. Ommen.

THE DRIVING FORCE

A person cannot achieve what Dr. Dawn Ommen is achieving without tremendous support. That support, she says, has come from Kevin, her husband of 11 years.

“He has been the driving force. He’s been with me through injuries, numerous surgeries, travel to get treatment, and getting me through school. He was the one who said you have to go back to medical school.”

ON THE AGENDA

Dr. Ommen’s medical training is not complete. She will soon learn where she will spend the next three years as a resident, and then there will be an additional year as a sports medicine fellow. Her long-term goal is to establish a sports medicine center that will address the surgical, rehabilitational, nutritional, and psychological needs of women athletes.

It sounds like a monumental task, but don’t tell Dr. Ommen she can’t do it. She has a well-documented record in the field of perseverance.

And now she can look at things from yet another perspective: that of a parent. Kevin and Dawn Ommen delivered their first child in April.



CHAIRS SUPPORT INSTITUTE WORK

The education of orthopaedic surgeons is a critically important mission of the Institute. Academic Chairs provide the continuity of funding necessary to train physicians for the future, thus ensuring the continued advancement of medical research.

Currently, more than 190 SPRI fellows practice around the world. We wish to express our gratitude and appreciation to the following individuals and foundations that have made a five-year, \$125,000 commitment to the fellowship program to support medical research and education. In 2013, four chairs provided important funding for the Institute’s research and educational mission. We are most grateful for the support from the following individuals:

- Mr. and Mrs. Lawrence Flinn**
- Mr. and Mrs. Peter Kellogg**
- Mr. and Mrs. Al Perkins**
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Medical research and education programs are supported by gifts to the Institute's annual fund. Visionaries are those patients and their families, trustees, staff, corporations, and foundations whose lifetime cumulative giving totals \$10,000 or more.

Donors at this level support many programs, including the Institute's research to validate the success of new treatments for degenerative arthritis and identify factors that influence treatment success. For example, as youth sports injuries rise to epidemic proportions due to early specialization and extensive practicing, the Institute is researching conditions and injuries commonly associated with specific sports, such as hip impingement in young hockey players, to determine how to prevent and treat them. Injuries in growing children may cause unforeseen complications during adulthood, such as an early onset of osteoarthritis.

Visionaries' gifts ensure the advancement of evidence-based medical research, joint preservation research, science, and care, as well as the education of physicians for the future. We extend our gratitude to these individuals for their lifetime of support:

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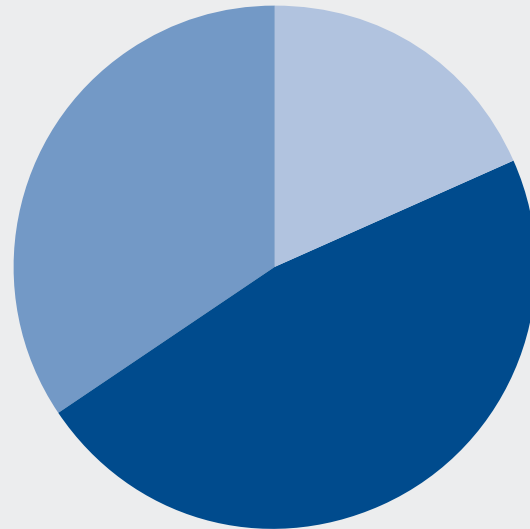
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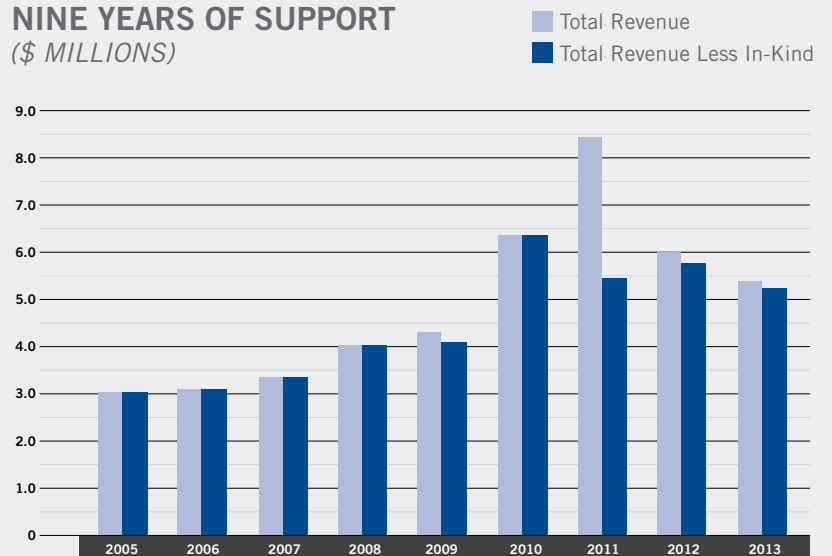


- MRI and Other Revenue: \$964,647
- Family and Friends: \$2,483,692
- Corporate Support: \$1,901,826

SUPPORTING ORTHOPAEDIC RESEARCH AND EDUCATION

In 2013, individuals, corporations and foundations contributed \$5,350,165 to support the Institute's research and education programs.

NINE YEARS OF SUPPORT (\$ MILLIONS)





FELLOWSHIP BENEFACTORS

Fellowship Benefactors fund the research of one fellow for one year at a level of \$10,000. As are other contributions to the Institute, this is a fully tax-deductible contribution that provides an opportunity for the benefactor to participate in a philanthropic endeavor by not only making a financial contribution to the educational and research year, but also by getting to know the designated fellow. 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 foundation for their generous support:

- Mr. and Mrs. Mitch Hart**
- The Fred and Elli Iselin Foundation**
- Ms. Mary Noyes**
- Mr. and Mrs. Jay Precourt**
- Mr. and Mrs. Stewart Turley**

CORPORATE AND INSTITUTIONAL FRIENDS

Corporate support helps fund our Institute's research and education programs in Vail, Colorado, and at six university sites. As we continue to deliver efficiencies, corporate funding has allowed us to direct more dollars into research. This year, 77 cents of every dollar raised went into research. The Institute is grateful for the generous support of our corporate partners. In 2013, we received \$1,790,755 in corporate support. This work will benefit patients and physicians for generations to come.

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THE YEAR IN RESEARCH AND EDUCATION



SPRI STUDY LOOKS AT PLATELET-RICH PLASMA FOR LIGAMENT HEALING

A team of physicians and scientists in the Department of BioMedical Engineering at SPRI led by Dr. Marc Philippon, Dr. Robert LaPrade, and Coen Wijdicks, Ph.D., is conducting preliminary studies to determine if injections of platelet-rich plasma (PRP) can hasten the healing process in injured knee ligaments.

PRP is derived by taking blood from a patient, subjecting it to a process that separates the blood into various components, then harvesting the PRP component and re-injecting it into the same patient. The concentration of platelets is thought to supply important growth factors that promote healing. The process is relatively easy to perform and surprisingly inexpensive.

INCREASED ATTENTION

PRP is drawing increased attention, but most of it comes as a result of anecdotal reports involving high-profile elite athletes. Among the injuries that have been treated using PRP are those involving the collateral ligament (MCL) and anterior cruciate ligament (ACL), as well as conditions such as patellar tendinitis and elbow tendinosis. The results have been mixed.

Despite the lack of scientific studies proving a beneficial effect, the number of injections of PRP

worldwide in elite and recreational athletes adds up to thousands of injections performed in the United States and Europe. This could translate into millions of dollars spent per year on an unproven treatment.

According to SPRI's Dr. Robert LaPrade, "Science has progressed greatly in the past decade, offering significant promise in the area of PRP, stem cells, and growth factors. However, future studies and additional research are needed so that we can take what we are learning at the scientific level and turn these into realistic, credible treatment recommendations for patients who are under the care of their orthopaedic physician."

With all of the publicity, it is not unusual for patients to demand PRP treatment from their orthopaedists. If they don't get the treatment, many of them will seek other clinicians who will administer PRP, whether its indications are evidence-based or not. These demands put tremendous pressure on physicians to use a treatment for which very few good basic research studies and randomized clinical trials exist.

No randomized clinical trials have been performed to confirm that PRP specifically accelerates MCL healing.

Based on the mixed results for ACL and other ligaments, it is difficult to project whether PRP would have a beneficial effect on injured MCLs.

MOST COMMONLY INJURED LIGAMENT

The MCL is the most commonly injured ligament of those supporting the knee, and the incidence of the injury is twice as high in males as in females. MCL tears or ruptures may not heal without intervention. One of those interventions is surgery, which has been shown to accelerate healing and hasten the return to performance. However, surgery is expensive, does not always allow the athlete to return to full performance, and may be associated with painful complications.

The surgeons and scientists at SPRI, working with the Colorado State University Orthopaedic Research Center, are proposing tests using biological models to determine if the effects of PRP can accelerate MCL healing. The BioMedical Engineering team has extensive experience in studying growth factor effects on musculoskeletal healing.

The specific aims of the study will be 1) to determine if a single dose of PRP at different platelet concentrations can accelerate healing when compared with a saline placebo, and 2) to determine if the highest PRP concentration can accelerate healing when injected at multiple time intervals.

The study, funded by The Kenneth and Anne Griffin Foundation, has been submitted to the American Orthopaedic Society of Sports Medicine and has received excellent reviews. A pilot study has been completed and the SPRI/Colorado State research teams expect to have preliminary results in 2014.

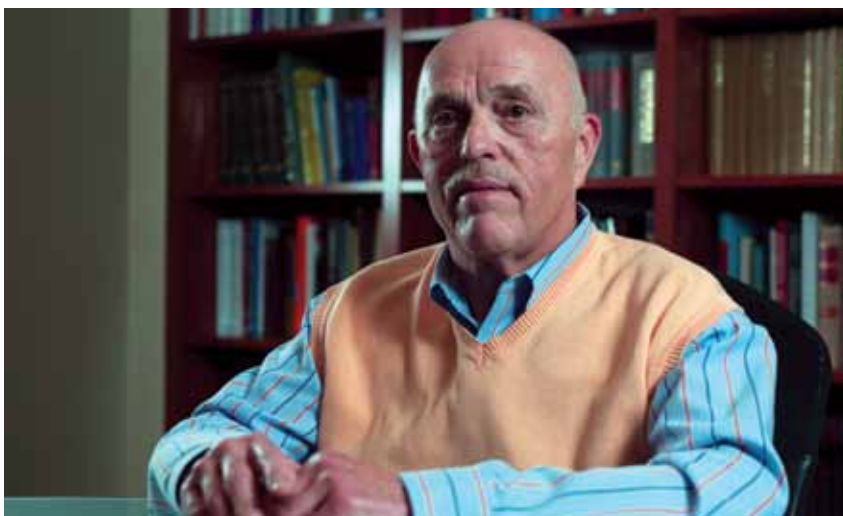
CENTER FOR TRANSLATIONAL AND REGENERATIVE MEDICINE RESEARCH

WILLIAM G. RODKEY, D.V.M., DIPLOMATE, AVCS, DIRECTOR, CENTER FOR TRANSLATIONAL AND REGENERATIVE MEDICINE RESEARCH

The purpose of the Center for Translational and Regenerative Medicine Research (CTRMR), formerly Basic Science Research, is to gain a better comprehension of factors that lead to 1) degenerative joint disease, 2) osteoarthritis, 3) improved healing of soft tissues such as ligaments, tendons, articular cartilage, and meniscus cartilage, and 4) new and untried approaches of treatment modalities.

Our emphasis is on understanding the effects of injuries and then enhancing therapies at the joint, tissue, and even cellular levels. We perform in vitro (laboratory) and translational (animal) studies before human use. Our ultimate goal is to regenerate, not just repair, injured tissues. That is, we focus our efforts on regenerative medicine.

The relatively new area of regenerative medicine coupled with biological enhancement of tissue healing is an exciting one that has gained global attention, especially in the areas of orthopaedic sports medicine and in the care of combat casualties from our military services. Many of the applications lend themselves to treatment of posttraumatic osteoarthritis. There are many new and innovative techniques under investigation by scientists around the world, including stem cells, blood products, and synthetic materials that exploit new sciences such as nanotechnology and electrospinning. One of the broad goals of this work can be stated simply as joint preservation.



William G. Rodkey, D.V.M.

ACCOMPLISHMENTS

- Three publications in quality peer-reviewed books.
- Twenty-five presentations in eight different countries.
- Served on two major international research committees.
- Served on the editorial board of directors of a major knee journal.
- Served as a peer reviewer for four major orthopaedic sports medicine journals.
- Completed important studies and/or published articles on adult autologous stem cells, meniscus regeneration, and the microfracture technique and rehabilitation.

PUBLICATIONS

In 2013, the department had three publications in high-quality and leading textbooks, including:

- The ACL-Deficient Knee. A Problem Solving Approach
- Surgical Techniques of the Shoulder, Elbow, and Knee in Sports Medicine

GRANTS

No outside grants or patents were obtained in 2013. Philanthropic donations were solicited for and used specifically for some of the CTRMR research studies.

COLLABORATIVE EFFORTS

CTRMR continued its very strong and extremely well-established collaboration with Colorado State University (CSU). Specifically, we worked closely on many projects with the CSU Orthopaedic Research Center (ORC) under the direction of Dr. Wayne McIlwraith and his deputy, Dr. David Frisbie.

Our collaborations have been ongoing for nearly 20 years, and our joint efforts have led to many publications and presentations on the subject of cartilage repair and resurfacing. Several of these studies have influenced the way that microfracture is performed, and other studies have validated the postoperative

rehabilitation protocols that have been developed by Dr. Steadman. This collaboration with the CSU ORC is truly invaluable to CTRMR and to SPRI as an institute.

One such collaborative study in particular is worthy of note. An in vitro (“test tube”) laboratory study was conducted to assess the effect of the timing of administration of stem cells to pieces of articular cartilage that were subjected to a mechanical injury. This mechanical injury model has been validated previously by Dr. Frisbie and co-workers at the CSU ORC. In this present study, we also added interleukin-1 (a naturally occurring inflammatory protein that is increased in living joints following traumatic injury and promotes the degenerative osteoarthritic process) to emulate the inflammation that accompanies direct injury in traumatic joint disease. If this laboratory model is proven successful, its use would save a great deal of money and laboratory

animal resources over traditional live animal studies. A successful model would also permit more studies to be done much more quickly, and the number of test products and testing protocols could be significantly increased. While this study is ongoing, the early findings suggest that this traumatic impact model with the addition of interleukin-1 provides a model that may closely mimic the joint environment in human patients following, for example, a ski injury. This finding will help guide our future studies. The second important interim finding is that the timing of when stem cells are administered seems to have no effect on results. We will continue to use this model and to analyze the specimens from the initial study.

We, of course, also collaborate with The Steadman Clinic attending staff and fellows. This collaboration is always fruitful and helps us assure that our work is clinically focused.

PROJECTIONS

The future looks very bright for regenerative medicine, and we believe that the Center for Translational and Regenerative Medicine Research can truly make a difference in this area of biomedical and orthopaedic sports medicine research. Some of the areas we will continue to pursue include:

- Functional tissue engineering
- Synthetic matrices
- Gene therapy
- Cellular therapy
- Stem cells, circulating progenitor cells, others
- Platelet-rich plasma (PRP)
- Mechanisms of action, dose optimization, etc.

All of these future projects focus on improved tissue healing and regeneration. In other words, we believe that the discipline of regenerative medicine is not only the future, but it is also right now.



DEVELOPING PROGRAMS TO PREVENT HIP INJURIES IN YOUNG ATHLETES

By Dawn Ommen, M.D.

Editor's note: Dr. Ommen is currently completing a research internship in the Center for Outcomes-Based Orthopaedic Research department of the Steadman Philippon Research Institute.

Dr. Philippon and his staff just completed the fourth consecutive year of physical hip screening for pre-adolescent/adolescent athletes. The purpose of the screening is to look for any indication of femoroacetabular impingement (FAI), an abnormal bone growth in the hip joint that can lead to hip pain and labral tears.

FAI is a common diagnosis in Dr. Philippon's patient population and is seen at a higher rate in the athletic community as compared with the general public. Indications of FAI are being found in young athletes, sometimes even before the onset of symptoms. The goal of the screening is to identify factors related to developing FAI and, ultimately, to develop an exercise prevention program that would allow these athletes to continue with their sports and be active throughout their lifetimes.

The number of athletes participating in the study has increased every year. This year we were able to more than double our prior participant numbers, as 77 athletes completed the study. This included 28 hockey players, 42 skiers, and seven figure skaters between the ages of nine and 17.

Figure skaters were a new addition to the study this year. The study consists of two parts: an abbreviated hip MRI and a clinical hip exam.

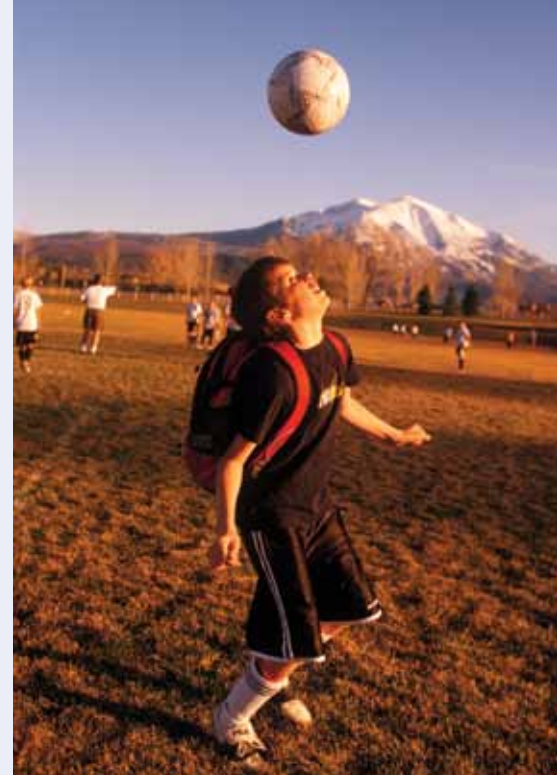
The clinical exam is similar to the exam that professional and Olympic athletes experience as one of Dr. Philippon's patients. The exam consists of range of motion, strength testing, and specific hip motion tests. These clinical results are correlated with a musculoskeletal radiologist's reading of the patient's MRI.

Erin, a mother of one of the study participants, knew right away that she wanted her child to participate in the study. "Being involved in healthcare myself and also being a lifelong athlete, I realize the importance of these types of studies. In addition, my child may benefit from the knowledge gained through this study in the future."

Erin indicated that the experience that her child had during the study was a great learning opportunity into the world of medicine, experienced in a non-threatening atmosphere.

The data from the last three years of screening have resulted in two manuscripts that have been published in the *American Journal of Sports Medicine*, the premiere sports medicine journal in the world. One of the manuscripts reported that even at young ages, ice hockey players have a greater bone growth associated with FAI than skiers of similar ages.

The other publication identified and analyzed at-risk positions for the hip during specific hockey movements. With a significant increase in female athlete participation in this year's screening, we are looking to analyze



the differences seen in male and female athletes for the first time this year. In addition, in the fourth year of the study, we are gaining valuable longitudinal data as many of the study's participants have completed the study each of the past four years.

This study was accepted to be presented as a poster at the International Olympic Committee Injury Prevention meeting in April. SPRI and Dr. Philippon would like to expand this screening in cooperation with the United States Olympic Committee medical team and United States Ski and Snowboard Association Sports Medicine.

This unique study is providing groundbreaking information in the young athlete population. Through this study, Dr. Philippon and his team are leading the way in identifying causes of an often debilitating hip condition in the competitive athlete, providing these and future competitors a better chance at an injury-free career and continued active lifestyle.

This study was partially funded by Mr. and Mrs. Paul Schmidt.

CENTER FOR OUTCOMES-BASED ORTHOPAEDIC RESEARCH (COOR)

KAREN K. BRIGGS, M.B.A., M.P.H., DIRECTOR; MARILEE P. HORAN, M.P.H., UPPER EXTREMITY COORDINATOR; LAUREN M. MATHENY, B.A., LOWER EXTREMITY COORDINATOR; GRANT J. DORNAN, M.S., BIostatistician; ASHLEY DARROUGH, DATA COLLECTION COORDINATOR; DAWN ROSSI, ADMINISTRATIVE ASSISTANT

Patient-centered outcomes following surgery are those outcomes that are important to patients. More than 20 years ago, Dr. Steadman started developing a sophisticated system to document how patients felt about their surgery in order to improve the quality of orthopaedic care.

In 2013, the Center for Outcomes-Based Orthopaedic Research continued to document outcomes on every knee, hip, shoulder, and ankle patient who visited The Steadman Clinic. In addition, annual follow-up forms are emailed to more than 15,000 patients.

As healthcare evolves, COOR will continue to provide physicians and patients the information on outcomes of orthopaedic surgery to assist with decision-making. Outcomes provide the tool to help address concerns over how the healthcare dollar is spent and the results of that expenditure. This type of information will be important to policy-makers, payers, and patients as they increasingly seek information about treatments and innovations.

These outcomes are available for many procedures, including microfracture, which was developed by Dr. Steadman in the 1980s, and labral reconstruction in the hip, which was developed by Dr. Philippon over the past 10 years and validated by data from our registry.

As data continues to be collected and new procedures are developed, the value of the COOR data registry continues to grow. SPRI and



COOR look forward to continuing to help patients and physicians with improved healthcare.

KNEE STUDIES

Anterior Cruciate Ligament Reconstruction in Patients 40 Years or Older: 20- to 25-Year Follow-up

Anterior cruciate ligament (ACL) injuries are most commonly seen in young active patients. The goal of ACL reconstruction is to return patients to high-intensity activities that may include twisting and cutting maneuvers. In the past, older patients who suffered an ACL injury were encouraged to change their activity level and avoid an ACL reconstruction. However, with the baby boomers staying active later in life, more ACL injuries are being seen in older patients, and these patients have a desire to return to activities and some to high-intensity activities. The goal as we

age is to keep active to maintain health and decrease risk of diseases associated with sedentary lifestyles. Bucking the trend of avoiding ACL reconstruction, in the late 1980s Dr. Steadman was performing ACL reconstruction on patients more than 40 years of age. With the number of knee replacements in adults ages 45 to 65 tripling over the last 10 years, we were interested in whether this group of patients had more knee replacements or continued with their active lifestyle.

From 1988 to 1993, 81 ACL reconstructions were performed in patients 40 years or older. The average age was 45, with a range from 40 to 60. Twenty years later, the average age was 68, with a range from 62 to 82. One patient had a reinjury 10 years following their reconstruction, and 24 percent of patients required a knee replacement at an average of 19 years following their ACL

reconstruction. Patients who did not have a total knee replacement had good-to-excellent outcomes scores and are still active. (See comments from patients in boxes.) The median patient satisfaction with outcome at minimum 20 years follow-up was 10 on a scale of 1 to 10, with 10 being very satisfied. This study showed that patients 40 years or older can have an ACL reconstruction without increased risk of knee replacement, and if they don't have knee replacement they have good function, are active, and are satisfied with the results.

Meniscus Suture Repair: 10-Year Outcomes in Patients over 40 Compared with Patients 40 and under

Meniscus tears are one of the most commonly seen orthopaedic injuries. Most tears are treated with debridement. However, with new research information showing the importance of preserving meniscus tissue, the number of repairs has increased. Removal of tissue surrounding the torn meniscus can often result in reduced protection of the surrounding articular cartilage surfaces. Previous studies have also shown that when large amounts of the menisci are excised, patients are more likely to develop knee osteoarthritis (OA) at a more rapid rate.

In the last 10 years, meniscus repair surgeries have drastically increased (Figure 1). Although multiple studies have documented outcomes following meniscus

suture repair, only limited studies have compared outcomes following meniscus repair in patients less than 40 years old versus patients over 40 years old. Failure rates in patients over 40 have been documented to range from 9 percent to 27 percent. However, it is unclear if there is a significant difference in subsequent surgery rate and outcomes following meniscus suture repair. To better understand the long-term outcomes following meniscus suture repair, COOR gathered outcomes data at 10 to 21 years follow-up in patients under 40 and 40 years and over.

All patients 18 years or older who underwent meniscus suture repair by Dr. Steadman were included in this study. Patients were asked to complete a questionnaire at a minimum of 10 years following knee surgery and each year thereafter. Outcome measures collected include the Lysholm score to document function, WOMAC score to document pain and function, and the SF-12 score to document general health and patient satisfaction with outcome.

There were 191 knees in 187 patients (125 males, 69 females) with an average age of 33 who underwent meniscus suture repair and were included in this study. There were 142 patients 40 years or younger, with an average age of 27.5 years, and 49 patients over 40 years of age, with an average age of 50 years. Older age did not associate with a greater number of second surgeries.

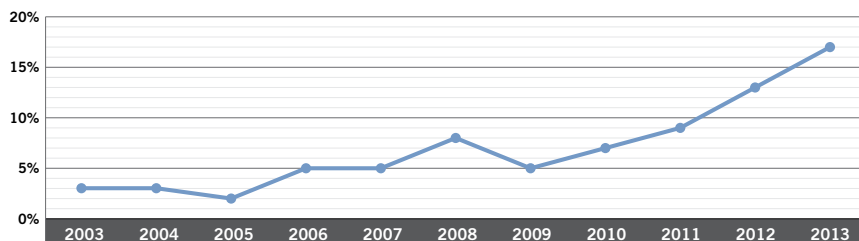


The WOMAC Index is divided into three categories: pain, stiffness, and function. It is validated to measure outcomes following treatment for osteoarthritis.

The SF-12 survey measures perceptions about health. This information helps keep track of feelings of wellbeing and performance of daily activities.

The Lysholm score (0-100, 100=highest) and Tegner activity level (0-10, 10 = highest satisfaction) are common scoring systems utilized to evaluate outcomes of arthroscopic knee surgery. The Lysholm score measures symptoms and function. The Tegner activity level categorizes individuals based on the activities in which they participate.

FIG. 1: Trends over 10 Years - all meniscus repair surgery





QUOTES FROM PATIENTS WHO HAD ACL RECONSTRUCTION 20 YEARS AGO BY DR. STEADMAN

“Dr. Steadman, Can’t believe you still follow-up with me.”

“I run, ski, play racquetball, volleyball, help with soccer, hunt, fish, backpack, all with abandon.”

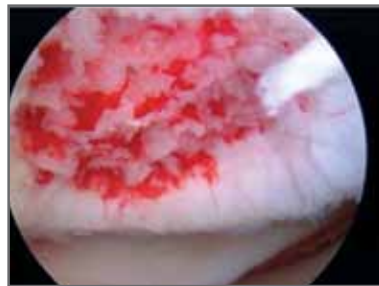
“Two weeks ago I finished a 184-mile relay race around the mountains.”

“None of what I like to do would be possible without Dr. Steadman fixing my knee in 1987. That is 26 years of fun.”

Patients who were older than 40 had similar function and satisfaction with outcome compared with patients 40 years or younger. Patients who underwent meniscus suture repair had high function and high patient satisfaction at an average 16 years following meniscus suture repair. This study shows that patients 40 years and older can do just as well following surgery as patients who are younger than 40.

Microfracture: 30 Years Later

In the early 1980s, Dr. Steadman began developing the microfracture technique—a relatively quick and minimally invasive surgical technique to stimulate articular cartilage repair. The goal was to create a combination of surgery and rehabilitation that would allow for



cartilage repair tissue to form. Most prior cartilage procedures had little to no emphasis on the postoperative period. The surgical goal was to create fractures in the subchondral bone perpendicular to the surface and to be able to reach all areas of the joint. The creation of these fractures would release blood and bone marrow, which would form a large clot and produce the cells that can create new cartilage. Creating

these fractures required various angled picks. Previous work had been done with drills, but drills could not reach all areas of the joint and when used, they produced heat that could limit the development of new tissue. A secondary goal was to provide a situation in which the marrow clot would stay in place. When a microfracture was created, the rough surface attracted and held the clot.

Now 30 years later, microfracture is performed in the knee, hip, shoulder, elbow, ankle, and hand joints. When done properly with the correct postoperative protocol, microfracture has been shown to be very successful in returning patients to their desired activities. Today, microfracture has its own surgical procedure code (CPT), and over 300 publications on microfracture in the knee are referenced in PubMed.

In 2012, the paper “Outcomes of microfracture for traumatic chondral defects of the knee: Average 11-year follow-up,” by Dr. Steadman and others, was named one of the top 25 most cited articles in all of the arthroscopic orthopaedic literature. Today, microfracture is the most common cartilage repair technique being used in the U.S., and the incidence continues to grow. The following table is a summary of the number of cartilage procedures performed over several years from analysis of a large payer database.

Microfracture is performed 60 to over 100 times more often than other procedures. This trend continued even as new techniques

PROCEDURE	2005	2006	2007	2008	2009	2010	2011
MICROFRACTURE	72,887	74,433	79,629	75,436	76,777	84,780	78,456
ARTHROSCOPIC AUTOGRAFT	1,181	1,376	1,137	1,074	999	1,155	1,044
ARTHROSCOPIC ALLOGRAFT	930	1,202	971	832	719	631	662
ACI	885	630	742	728	767	1,446	1,343
OPEN OSTEOCHONDRAL ALLOGRAFT	660	808	848	663	863	1,351	1,619
OPEN OSTEOCHONDRAL AUTOGRAFT				496	509	653	798

developed. Microfracture was developed and proven effective and continues to be the treatment of choice for cartilage defects.

HIP STUDIES

From Development to Validation: Hip Labral Reconstruction

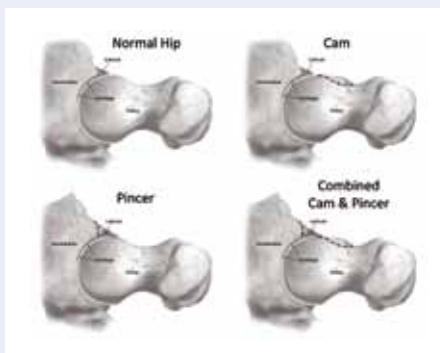
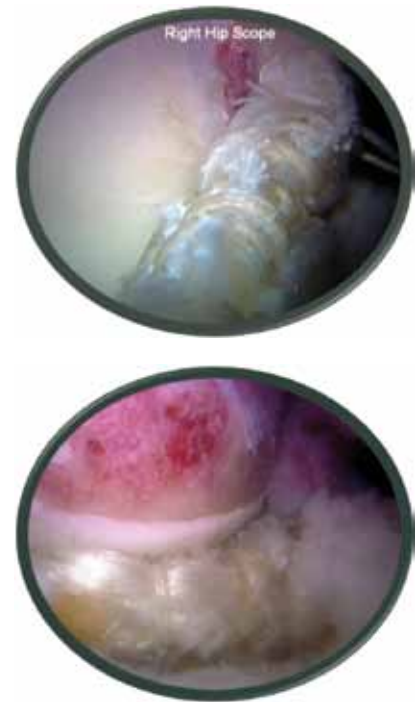
In 2005, Dr. Philippon developed a new technique for hip labral reconstruction. This procedure was for patients who had labral damage that could not be repaired and if removed, would not leave enough labrum to do its job. The technique uses a graft from the patient's own thigh. The graft is made into the shape of a tube and then placed around the acetabulum to replace the missing labrum. Early results of this technique were published in 2010; however, it was not clear yet if the graft would last.

COOR then gathered midterm follow-up on the patients. Eighty-seven percent of patients who did not have signs of osteoarthritis did not require

another surgery three years following surgery. At an average of four years after surgery, patients had excellent improvement in their outcome scores and reported high satisfaction with outcome. This study showed that acetabular labral reconstruction is a good option to manage patients with labral deficiency who continue to be symptomatic, rather than having to resort to a joint replacement at a significantly young age.

Following this study, we published a study on labral reconstruction in the professional athlete. Only athletes who were on an Olympic team or played sports as their primary job were included in the study. There were professional soccer, hockey, football, baseball, and basketball players. In addition, two Olympic skiers were included. Two athletes required total hip replacement. However, they were older and at the end of their playing careers. Of the rest of the athletes, 86 percent returned to professional sports and 81 percent returned to their previous level of play or better. This

was determined by comparing the players' sport statistics two years prior to surgery with those two years following surgery. These statistics included games played, minutes played, goals or points scored, etc.



WHAT IS FAI?

Femoroacetabular impingement (FAI) occurs when abnormally shaped bones of the hip repetitively hit each other during movement. As a result, soft tissue structures of the hip, including the acetabular labrum and the articular cartilage, are often entrapped and injured. Impingement

is particularly common in hip flexion and internal rotation, a position frequently encountered during activities of daily living. Difficulty with putting on shoes and socks and getting into and out of a car are common complaints in patients with extensive impingement.

There are two distinct types of FAI, cam and pincer. Most commonly, patients have a combination of the two types of impingement. Cam impingement results from excess bone located on the femoral neck. Pincer impingement results from excess bone located on the acetabulum. The precise cause of the impingement is unknown, but it likely has both developmental- and activity-related (such as in contact in sports) components.

In both types of impingement, the abnormal contact between the femoral head and acetabulum during movement causes injury to the labrum and articular cartilage. Injuries to the acetabular labrum lead to increased movement of the femoral head within the acetabulum, resulting in an unstable joint. Also, tears of the acetabular labrum result in increased contact forces between the femoral head and the acetabulum. With these increased forces, damage to the articular cartilage may result. Injuries to the articular cartilage over time may increase in size and depth, and ultimately result in bone-on-bone contact. At this point, the only current solution is a total hip replacement.

These two studies provided clinical validation for the use of the labral reconstruction in both elite athletes and the recreational population. The procedure provided an option for patients who previously had no options for missing labrums. We will continue to track these patients to determine the long-term success of the treatment.

Midterm Outcomes after Arthroscopic Hip Surgery for Femoroacetabular Impingement

Few studies have documented patient-centered outcomes of modern hip arthroscopy. Most studies are two-year outcome studies. In a study that was the largest of its kind, we published midterm outcomes on patients following arthroscopy for femoroacetabular impingement (FAI). We gathered follow-up data on 466 out of 559 patients who had surgery between 2005 and 2008. Before surgery, all patients had persistent pain and disability due to symptomatic FAI. In addition, all patients completed a trial of non-operative treatment including physical therapy and medication of their pain to allow activity, which was ineffective. Patients were between the ages of 18 and 77. Only 16 percent of the patients with no or limited arthritis required total hip replacement, at an average age of 73 years. Patient-centered outcomes were collected at a mean of 73 months following arthroscopy. Postoperatively, excellent outcomes were seen in patients with preserved joint space after hip arthroscopy for symptomatic FAI at a minimum of five years.

This study showed that durable and successful long-term results are achievable after hip arthroscopy to treat symptomatic FAI. Hip arthroscopy for FAI resulted in significantly better outcomes and activity level at a minimum of five years follow-up in patients with

limited osteoarthritis. “These results highlight the importance of Dr. Philippon’s preoperative patient selection criteria, the goal of which is to perform arthroscopy when symptoms are mild in order to prevent early conversion to arthroplasty and thus ensure excellent clinical results for patients.”

Performance Outcomes in Professional Hockey Players Following Arthroscopic Microfracture of the Hip



Several studies have reported that professional athletes can return to play following hip arthroscopy. There are many different causes of hip pain that may lead an athlete to arthroscopic surgery. Damage to the articular cartilage of the hip is common in the high-demand athlete, especially those who are contact athletes. The number of professional hockey players requiring hip arthroscopy has increased over the last several years. This has led to the question, “Can professional hockey players return to hockey following microfracture to treat articular cartilage defects?” Microfracture is the most commonly accepted treatment method for



cartilage lesions, and it has been shown to be relatively inexpensive and to produce reliable results.

We studied 17 male professional hockey players who had microfracture. There were four centers, five wings, five defensemen, and four goalies. They played between two and 17 seasons prior to microfracture. Eighty-two percent of the players returned to competition at their previous level of play. Return to play was dependent on when players had surgery. Players who had surgery in the off-season or the end of the current season returned to professional play the upcoming season, and players who had surgery at the beginning of the season returned to play the same season. The number of games played in the preoperative season was on average 68, compared with 56 in the postoperative season. Shooting percentage in non-goalies was 11



percent before surgery and 10 percent after surgery. The average number of goals against for goalies was 3.6 before surgery and 3.6 after surgery. When these players were compared to age-matched players who did not have surgery, their statistics were similar. Following surgery, the players averaged 25 minutes on ice and the non-surgical controls averaged 26 minutes on ice. The average number of goals in the treatment group was 11.8 and in the control group was 12.6. For goalies in the treatment group, save percentage was 89 percent, while the control group save percentage was 90 percent.

This study showed that professional hockey players with cartilage defects treated with microfracture can return to hockey and return to the same elite performance level following an arthroscopic microfracture procedure when compared with pre-injury outcomes and controls.

Outcomes Following Microfracture in Grade 3 and 4 Articular Cartilage Lesions of the Ankle

Articular cartilage lesions of the ankle joint are common cause of ankle pain and disability. These cartilage defects are usually the result of trauma, such as ankle sprains or fractures. Up to 50 percent of acute ankle sprains and 73 to 80 percent of ankle fractures will result in some type of cartilage damage. An untreated articular cartilage defect is a significant risk factor for the development of ankle osteoarthritis (OA).

Various treatment methods have been described for articular cartilage lesions of the ankle, which have



also been commonly referred to as osteochondral lesions of the talus (OLTs) when occurring on the talus. Non-operative treatment options include immobilization with casting; walking boots or braces; non-steroidal anti-inflammatory drug (NSAID) therapy; activity modification; corticosteroid injections; and more recently, hyaluronate and platelet-rich plasma (PRP) injections. Due to poor results with these non-operative treatments, surgical treatment is recommended.

Microfracture has been shown to be a relatively low-cost, low-risk procedure with good to excellent results in both the knee and the ankle. The microfracture technique for cartilage defects of the knee was developed by Dr. J. Richard Steadman in the 1980s. Microfracture surgery of the knee has been well documented, reporting functional and symptomatic improvement in approximately 67 to 95 percent of patients. However, the microfracture technique in the ankle has been less thoroughly studied. We conducted a study to document outcomes following microfracture of the ankle.

All patients 18 years or older who underwent ankle microfracture surgery at The Steadman Clinic for the treatment of an articular cartilage lesion were included in this study. Forty patients underwent microfracture for the treatment of an articular cartilage lesion of the ankle. Detailed surgical data were documented at the time of surgery. Patients were asked to complete a subjective questionnaire at a minimum of one year following ankle surgery and each year thereafter. Outcome measures included the Foot and Ankle Disability Index (FADI) to document function, the Lysholm score to document function, and the Tegner activity scale to document activity level and patient satisfaction with outcome.



The Lysholm score (0-100, 100=highest) and Tegner activity level (0-10, 10 = highest satisfaction) are common scoring systems utilized to evaluate outcomes of arthroscopic knee surgery. The Lysholm score measures symptoms and function. The Tegner activity level categorizes individuals based on the activities in which they participate.

The Foot and Ankle Disability Index (FADI) is a region-specific self-report of function. This index was designed to assess functional limitations related to foot and ankle conditions.



FIG. 1



FIG. 2



FIG. 3



FIG. 4

Four patients (10.5 percent) required another surgery after the initial microfracture surgery. Ninety-four percent of patients completed a questionnaire. The average Lysholm score was 74 out of 100. The average FADI score was 77 out of 100. Average Tegner activity scale was four out of 10, which demonstrates a recreational athlete. Median patient satisfaction with outcome was eight out of 10.

In our study, 30 percent of patients had previous ankle surgery and more than half of patients who were treated with ankle microfracture had chronic ankle injuries. Patients who had previous ankle surgery had lower outcome scores, as did patients who had a longer amount of time from ankle injury to surgery. The most important finding in this study is that patients were highly satisfied with their operative outcome. This study supports the use of microfracture for treatment of articular cartilage lesions of the ankle.

Return to Play in Athletes Following Ankle Injuries

The decision to allow an athlete to return-to-play (RTP) following an ankle injury is a multifactorial process—involving both physical and psychological parameters. There is limited research that provides guidelines to assist in the decision to allow an athlete to safely RTP. The ankle team at COOR reviewed the current literature and the functional tests that we use in our institution. The functional tests used include: The Dorsiflexion-Lunge Test (Figure 1), Star Excursion Balance Test (SEBT) (Figure 2), Agility T-Test (Figure 3), and Sargent/Vertical Jump Test (Figure 4).

Dorsiflexion (Figure 5) of the ankle is necessary for a normal gait, climbing stairs, and rising from a squatting position. Patients who can't move their ankle in this motion are at



FIG. 5

increased risk for injury and have limitations in normal functional activities. The Dorsiflexion-Lunge Test is a test of range of motion at the ankle while the patient has their weight on the ankle. If a patient has restriction in testing, then this implies stiffness in dorsiflexion. This makes squatting and leg press exercises challenging. To compensate for this loss of motion, athletes may have exaggerated hip flexion and inhibition of knee flexion, and the foot will be observed to rise from the floor. In assessing treatment changes, weight-bearing measures are more likely to detect treatment effects than non-weight-bearing measures

Balance can be defined as the ability to maintain the body's center of gravity within the base of support. Balance is a crucial element of most sports, and loss of proprioception is a risk factor for reinjury. The SEBT examines an athlete's ability for unilateral balance and dynamic neuromuscular control, and requires strength, flexibility, and proprioception. The patient is required to maintain a base of support with one leg while reaching maximally in defined directions with the contralateral leg. They must reach as far as they can while maintaining

the balance on the injured leg. The directions in which they reach form the shape of an eight-point star.

The classical description of agility is the ability to change direction rapidly. It is an essential component of team and field sports for a variety of reasons—neuromuscular control, injury reduction, and overall performance capabilities. Patients who have sustained an ankle injury have been shown to demonstrate impairment in agility when compared with uninjured ankles. The Agility T-test measures an athlete's agility by assessing movement in multiple directions. The athlete must navigate a course shaped like the letter T, where both the horizontal and longitudinal arms are each 10 yards.

Adequate strength is important not only for competitive performance, but also for injury prevention. Athletes who have decreased strength and flexibility are more prone to lower extremity injuries, and neuromuscular training programs can prevent injuries. In terms of ankle strength, athletes with muscle strength imbalance are at an increased risk of ankle injuries. The Sargent Jump Test was developed in 1921 by Dr. Dudley Sargent in order to test an athlete's "strength, speed, energy, and dexterity." The test allows us to derive an estimate of the power involved in the jump.

Functional testing provides objective measures to gauge an athlete's progression through the rehabilitation process. Testing balance and proprioception, strength, range of motion, and agility give the team physician effective measures for assessing RTP readiness. This, coupled with psychological assessment, can assist in the RTP decision-making process. If any doubt exists, then the physician should lean toward safety rather than expose the athlete to undue risk.

SHOULDER STUDIES

Clinical and Structural Outcomes after Arthroscopic Single- Versus Double-Row Rotator Cuff Repair: A Systematic Review

Rotator cuff tears are a significant source of shoulder pain and disability, and account for more than one million physician visits per year in the United States. As our population ages, the frequency of rotator cuff tears has steadily increased, which in turn has increased the demand for arthroscopic rotator cuff repairs, which have been proven to relieve pain and improve function. Furthermore, this increased demand has led to the rapid evolution of repair techniques that often outpace the development of solid clinical data, which are often used to make informed clinical decisions. As a result, many studies that evaluate rotator cuff repair techniques suffer from low patient numbers and conflicting results.

One controversy in the treatment of rotator cuff tears is over the best way to repair the rotator cuff tear. Some surgeons use just one row of repair sutures and some use two rows (Figure 1). Biomechanical evidence suggests that two-row repairs are stronger. However, only few clinical studies have shown that the patients have better outcomes when they have a two-row repair compared with a one-row repair.

To evaluate the research that has already been done on one-row versus two-row repairs, researchers at the Steadman Philippon Research Institute recently performed a systematic literature review. High-level studies that compared the patient outcomes and imaging results following arthroscopic rotator cuff repair using either a one- or two-row technique were chosen for review. Seven studies were identified and included in the review. All reported

SYSTEMATIC REVIEW

Systematic review is a method of research in which the results from multiple similar studies are considered together to arrive at an overall conclusion regarding a particular question. This approach is typically used when the results from numerous existing studies conflict with one another, with the goal of condensing all of the available information down to a single study with a more decisive conclusion. In some cases, it may be appropriate to combine all of the actual data points from each study in order to calculate the overall results (this is called a meta-analysis). While a standard systematic review is appropriate for some research questions, a meta-analysis may be appropriate for others.

To perform a systematic review, online medical research databases (such as PubMed.gov) and specific journal websites are searched using a predefined set of keywords related to the research question. Each record that is retrieved from this search is thoroughly evaluated to determine whether it should be included in the study according to certain previously-named inclusion criteria. The research methods, results, and conclusions are obtained from each included study, and this data is managed and presented in an appropriate manner so that the reader can quickly review all of the available literature regarding the original research question. This type of research must be performed using a set of published rules and guidelines that ensure that the study was performed 'systematically' (i.e. using a standard method) to avoid potential sources of bias that may alter the overall results.

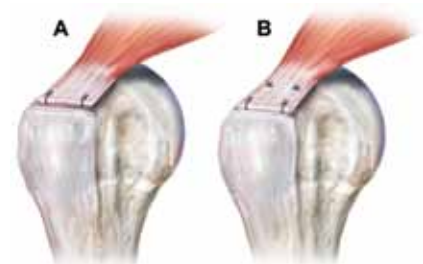


Figure 1: (A) One-row repair.
(B) Two-row repair.

outcomes scores and imaging-diagnosed re-tears for both the one- and two-row groups were documented. Using the data from each study, researchers identified several important clinical characteristics for both one- and two-row repairs.

Although there were no differences in patient outcomes scores between the two techniques, the one-row group demonstrated a significantly increased rate of imaging-diagnosed re-tears after two years. This information may suggest that one-row repairs do not hold up as long. In addition, these results indicate that the presence of a re-tear may not always result in increased symptoms or outcomes scores reported by the patient. Other studies have shown that rotator cuff tears may only become symptomatic more than two years after their initial appearance. Taken together, researchers believe that a follow-up period of two years may not be adequate to detect changes in patient symptoms for those who have sustained an imaging-diagnosed re-tear. At the Steadman Philippon Research Institute, we continue to track clinical outcomes in patients who have had rotator cuff tears for many years after their surgery. The data from our registry will help answer these questions in the future as we continue to collect long-term follow-up information.

Patient Expectations prior to Arthroscopic Shoulder Surgery: Correlation with Patients' Reasons for Seeking Treatment

What a patient expects from his or her treatment has been shown to influence the results of treatment. In other words, worse outcomes and low patient satisfaction can result if patients have expectations that are either too high or too low. Studies have demonstrated increased satisfaction after surgery in patients who had expectations similar to those of their surgeon as a result of

improved preoperative education. We performed a study to evaluate patient expectations prior to arthroscopic shoulder surgery and to correlate them with preoperative symptoms, function, and the reasons the patient decided to seek treatment. From our data registry, we identified 313 patients with completed expectation questionnaires who went on to arthroscopic shoulder surgery.

The three most important expectations among all patients were the ability to participate in sports, to achieve their pre-injury level of function, and to improve range of motion. Patients with more expectations were more likely to have more symptoms and worse function preoperatively when compared with those with fewer expectations. The study also showed that patients who had shoulder dislocations had a different expectation profile than the rest of the patients. In addition, more

than 50 percent of the patients in this study were over 50 years of age, indicating that a return to sporting activities and living an active lifestyle have become increasingly important in the 'baby boomer' population.

Complications Following Anatomic Fixation and Reconstruction of the Coracoclavicular Ligaments

The coracoclavicular ligaments connect part of the clavicle (collar bone) to part of the scapula (shoulder blade). These ligaments can become torn when the shoulder is injured, resulting in significant pain and deformity. These types of tears have been fixed surgically for many years. However, most of the older techniques resulted in a wide array of complications following surgery. Newer techniques have been developed to fix these tears and to improve patient outcomes by minimizing the risks for complications that were seen in the past.



On the other hand, new techniques can also introduce new, unique complications. We performed a study to determine which complications were associated with these newer techniques and to evaluate the effect that these complications may have had on patient outcomes. A query of our data registry resulted in a study group of 59 patients. All but three were males and most were injured during snow sports or cycling. About 23 percent of these patients had a complication that required a second surgery. There were no differences in outcomes between those patients who had a complication and those who did not, but patients who had a complication were less satisfied.

This study emphasizes the importance of both patient-centered outcomes and patient satisfaction on the overall treatment results. Although newer techniques have been developed to more closely mimic normal anatomy, it is most important to document how patients respond to these treatments.



RAISING MATTHEW: MARY ANTOINE'S PERSPECTIVE ON AN OLYMPIAN'S SUCCESS

Mary Elise Antoine is an author, cultural historian, and storyteller in Prairie du Chien, Wisconsin. She has three children. The oldest is Elise, who lives with her husband on a family farm in Iowa and is a high school social studies teacher. Nicholas is a government relations assistant with a consulting group in St. Paul. Matthew is the youngest—now an Olympic medalist and a national champion in men's skeleton. Here are Mary Antoine's reflections about raising Matthew.

EARLY SIGNS

"At an early age, Matthew wanted to go down a sliding hill standing up on his sled. Of course, all I could envision was Matt falling off and hurting himself, so I tried to get him to stop. It didn't work."

DETERMINATION

"What was noticeable in Matthew as a child was his determination. He would decide to do or make something. He would plan it out in his mind how to construct it and how it would work. He made a three-dimensional model of the solar system. He tried to invent an automatic dog-washing machine. He

would become frustrated, but he would never quit. He later made recommendations to the USA Bobsled and Skeleton Federation regarding a new sled being developed."

BEHAVIOR

"From an early age, my children knew what was expected of them regarding behavior in the family and in public. They had responsibilities at home and they knew they were expected to help my parents and elderly neighbors. The first job all three of my children had was bussing tables at a local restaurant. It taught them responsibility, how to take orders from others, and how to work with a variety of people."

THE IMPORTANCE OF EDUCATION

"When Matthew came to me as a senior in high school and told me he wanted to compete in skeleton, I never had a second thought. But I made one stipulation. He had to attend college while he learned and mastered skeleton. (Matt's brother and sister both have master's degrees, as does Mary.) It took Matthew six years of classes, assignments, and tests while competing at the national level, but he has a degree in sports management."



PATIENTS IN THE NEWS

Matt Antoine Wins Bronze Medal in Sochi Olympics

WISCONSIN NATIVE FOLLOWS HIS WIN IN SOCHI BY TAKING THE MEN'S U.S. NATIONAL SKELETON CHAMPIONSHIP AT LAKE PLACID

By Jim Brown, Ph.D.

Who would want to slide on an ice track, headfirst more than 1,500 yards downhill on a 70-pound steel sled at speeds near 80 miles per hour?

Matthew Antoine of Prairie du Chien, Wisconsin, would, and he has been doing it for the past 12 years. He capped his best season ever by becoming the first U.S. athlete to earn a medal at the Olympics since 2002 and by setting a track record in his win at the Nationals.

A few hours after his victory in Lake Placid, he spoke with SPRI News about his life and his career.

SPRI News: Is your life back to normal yet?

"I doubt that it will ever be as normal as it was before winning the bronze medal at the Olympics and the National Championships, but things will start to settle down sooner or later."

SPRI News: Why did you choose this sport?

"People often ask us if we are crazy. We're not crazy, but anyone who does this sport has to have a passion for speed. Growing up, I liked watching auto racing with my dad and my brother. I had a go-cart when I was a kid. I was convinced I was going

to be a race car driver, but that didn't work out. I liked anything that went fast and always enjoyed winter sports. Skeleton brought all of those things together. After my first run down the track, I knew it was something I wanted to do."

SPRI News: When did you start?

"I started competing when I was in high school and continued while I was in college, but there are only two tracks in the United States. In college, I tried to stay close to the one in Lake Placid."

SPRI News: What is a typical year of training and competition?

“The season lasts from October until March. We train most of the year. I’m taking about a two-month break after this past 2013-2014 season and will begin ramping it up again in mid-May. We train like track and field athletes.”

“The Skeleton National Team trains at the U.S. Olympic Training Center in Colorado Springs, where we have living quarters and access to the facilities, coaches, sports medicine services, and sports nutritionists. It’s a six-day week from 9:00 in the morning to approximately 4:00 in the afternoon.”

“During our summertime training, we really focus on the push-start. At this level, everyone is experienced. They all have the equipment, driving ability, and aerodynamics, but the push-start can make the difference.”

(The push-start is when the competitor pushes his or her sled from a standing start as fast as possible over 30-35 meters—think of sprinting from the goal line to the 30-yard line on a football field—before getting onto the sled.)

SPRI News: What kinds of injuries typically affect skeleton athletes?

“Our injuries get compared to those in contact sports. Bumps, bruises, contusions, ice burns, and concussions, but I’ve never had a concussion.”

SPRI News: What was your most serious injury?

“During the 2011-2012 season, my knee started hurting. It got to the point where I was having trouble walking, going up and down stairs, and even sitting. I knew something was wrong, but I continued competing. There really wasn’t much I could do about it at the time. It wasn’t an injury that happened during a skeleton event or training, but it was a knee overuse injury.”

SPRI News: How did you come into contact with Dr. Peter Millett at The Steadman Clinic?

“He was recommended by our team physician and by a teammate who had been treated by Dr. Millett.”

[Dr. Millett continues to use techniques developed and refined at the Steadman Philippon Research Institute.]

SPRI News: What was his diagnosis?

“My knee was beyond a point where it would heal on its own. The patellar tendon had begun to break down and a third of it was torn off. I had scar tissue, damaged cartilage, and a hematoma that had formed under the tendon.”

SPRI News: Why did you choose to have the surgery in Vail?

“I was looking for a positive prognosis following surgery. It was July and the season was going to start in October. Eighteen months after that, I wanted to be ready for the Olympics. Dr. Millett was positive about me being able to compete not only in the upcoming season, but for the rest of my career.”

SPRI News: What procedures did he perform?

“He removed the middle third of my patellar tendon, cleaned out scar tissue, repaired the damaged cartilage area, removed the hematoma, and drilled two holes through the patella to increase blood flow.”

SPRI News: How would you describe your overall experience?

“Absolutely amazing. Start to finish, I was really impressed with how they approach things. They were thorough in what they did. They were realistic about what needed to be done after the surgery, but at the same time very aggressive about getting me back to sports performance.”

“I would absolutely, hands-down, recommend Dr. Millett, The Clinic, and

the Research Institute to other people and other athletes. It is the most professional and thorough medical provider I’ve ever experienced.”

SPRI News: How is your knee now?

“It feels amazing—better than it did two years before surgery. I have no restrictions, and my outcomes in skeleton have been great since the operation.”

SPRI News: You’ve overcome some pretty serious obstacles to become an Olympic athlete and national champion. What message do you have for young athletes who might have Olympic aspirations?

“Stay positive and focused. Everyone who has ever been successful at this level has hit rock bottom at some point. Keep your eye on the goal and be persistent. Don’t let the down times keep you down. Figure out a way to battle back.”

DEPARTMENT OF BIOMEDICAL ENGINEERING

COEN WIJDICKS, PH.D., DEPARTMENTAL DIRECTOR, SENIOR STAFF SCIENTIST; TRAVIS TURNBULL, PH.D., RESEARCH ENGINEER; MARY GOLDSMITH, M.SC., SENIOR ROBOTICS ENGINEER; MATTHEW RASMUSSEN, B.S., RESEARCH ENGINEER; BRADY WILLIAMS, B.S., RESEARCH ASSISTANT; ADRIANA SAROKI, B.S., RESEARCH ASSISTANT; DAVID CIVITARESE, B.A., RESEARCH ASSISTANT

The Department of BioMedical Engineering aims to help physicians improve their practice of orthopaedic sports medicine by conducting research that can be directly implemented to improve patient care. Our multidisciplinary laboratory utilizes quantitative, analytical, and innovative methods to answer questions that arise from collaboration with clinical care, world-renowned medical doctors, and educational programs.

By promoting and sustaining a highly collaborative environment, we conduct research with direct and immediate applications to orthopaedic care in order to ensure patients receive evidence-based treatment proven to result in superior outcomes. By emphasizing bench-to-bedside research, we help active people from all walks of life and all athletes—from elite competitors to weekend warriors—maintain and enhance their athletic performance, health, and quality of life.

GOALS AND METRICS

In 2014, the Department of BioMedical Engineering expanded its collaboration with physicians, academic institutions, and corporate entities around the world. Along with expansion and collaboration, the success of research and education within the Department is measured by: 1) number of publications in high-impact, peer-reviewed journals, 2) presentations given at both national and international conferences that attract diverse audiences of physicians and scientists, 3) awards that validate research excellence,



impact, and overall contribution to the fields of orthopaedic and sports medicine, and 4) community outreach programs that support advances in medicine through innovative teaching and mentorship.

ACCOMPLISHMENTS

Since 2009, the yearly number of publications produced has continued to increase. In 2014, the Department has already set a new record for the number of articles accepted for publication and submitted for review. In 2013 alone, 22 articles originating from research conducted in the Department of BioMedical Engineering at SPRI were published in high-impact factor journals. Each publication was cited in the prestigious National Library of Medicine (PubMed). Notably, three of those articles were published in a single issue (December 2013) of *American Journal of Sports Medicine*—the journal ranked number one in all of orthopaedic surgery.

These three *AJSM* articles, now informally referred to at SPRI as the 'hat trick' issue, illustrate that top-ranked journals pay attention to the research generated by the Department, allowing our findings to reach surgeons around the world.

Additionally during 2013, two articles were published in the *British Journal of Sports Medicine*, while others appeared in publications such as the *Journal of Orthopaedic Research and the Journal of Bone and Joint Surgery and Knee Surgery, Sports Traumatology, Arthroscopy*.

During the past year, 12 podium and 17 poster presentations were given at high-impact conferences, including those of the American Academy of Orthopaedic Surgeons, the International Society for Hip Arthroscopy, the American Orthopaedic Foot & Ankle Society, the American Orthopaedic Society for Sports Medicine, and the International Society of Arthroscopy,

Knee Surgery & Orthopaedic Sports Medicine. Presentations were given by BioMedical Engineering researchers to audiences around the world at conferences in the United States of America, Canada, Europe, Africa, and South America.

Through a partnership with the Department of BioMedical Engineering, sports medicine fellows conducted research and received distinguished awards including the Albert Trillat Young Investigator's Award (Dr. Jeff Padalecki), presented by the International Society of Arthroscopy, Knee Surgery & Orthopaedic Sports Medicine, and the Richard N. Villar Trainee Excellence in Clinical Research Award (Dr. Jeff Nepple), presented by the International Society for Hip Arthroscopy.

Additionally, a research assistant in the Department received the prestigious Excellence in Research Award (Nicholas Kennedy), presented by the American Orthopaedic Society for Sports Medicine.

Moreover, our efforts have expanded beyond the research and medical realms and resonated throughout our local community. In January, Department Director Coen Wijdicks, Ph.D., was named a finalist for Young Professional of the Year, sponsored by the Vail Valley Partnership.

COLLABORATIVE EFFORTS

The Department collaborates with local, national, and international institutions, both academic and corporate, including:

- The United States Olympic Committee
- American Orthopaedic Foot & Ankle Society
- Arthroscopy Association of North America
- Ceterix Orthopaedics, Inc.
- University of Oslo, Norway
- Aarhus University in Denmark
- University of Queensland, Australia

- DePuy Synthes Trauma Division of DePuy Orthopaedics, Inc.
- Instituto Brasil De Tecnologias Da Sade in Brazil
- Colorado State University
- Vail Valley Medical Center
- Vail Mountain School
- Eagle County School District
- Arthrex, Inc.
- Össur, hf
- Smith & Nephew, Inc.

OUTREACH

The Department of BioMedical Engineering, in collaboration with all SPRI departments, participates with the Education and Public Outreach Committee (EPOC) (pg. 62) in coordinating SPRI laboratory visits for students, speaking at Eagle County schools, mentoring student projects, participating in school science fairs, and providing internships to young members of the Vail Valley community. In addition, through the EPOC Science Club initiative, the Department provides Eagle County high school students an opportunity to conduct innovative scientific research under the mentorship of science teachers and professional scientists. Combined, the SPRI outreach programs reach an estimated 500 students annually.

PROJECTIONS

The Department will continue to be goal focused and pursue our passion for bench-to-bedside research through embodying the SMART model for goal achievement. Research initiatives will be Specific, Measurable, Achievable, Relevant, and Time-bound. Expanding collaboration with local, national, and international institutions, continuing education that benefits students, surgeons, and the Institute, and consistently aiming to align their work with their core values will allow the Department to continue to achieve our goals while pursuing and applying our passion for advancing patient care through translational research.



SPRI Research Featured in Sochi Winter Games Issue of the *British Journal of Sports Medicine and International Olympic Committee Injury Prevention & Health Protection*.

The two articles are prominently displayed in the table of contents: “Epidemiology, identification, treatment and return to play of musculoskeletal-based ice hockey injuries,” Robert F. LaPrade, Rachel K. Surowiec, Ada N. Sochanska, Brandon S. Hentkowski, Brandie M. Martin, Lars Engebretsen, and Coen A. Wijdicks;

“Injuries in elite and recreational snowboarders,” Coen A. Wijdicks, Brandon S. Rosenbach, Troy R. Flanagan, Gillian E. Bower, Kelly E. Newman, Thomas O. Clanton, Lars Engebretsen, Robert F. LaPrade, and Tom R. Hackett.

AWARD-WINNING PAPER LEAD ARTICLE IN THE JOURNAL OF ORTHOPAEDIC RESEARCH



“Improving Outcomes for Posterolateral Knee Injuries” by Robert F. LaPrade, M.D., Ph.D., is the lead article in the January 4, 2014, online and April print issue of the highly regarded *Journal of Orthopaedic Research*.

The research and subsequent publication resulted in the competitive and prestigious 2013 Orthopaedic Research and Education Foundation Clinical Research Award, referred to as the “Orthopaedic Nobel Prize.”

“This award solidly validates our research strategy of defining the anatomy, developing improved means of diagnosing a problem, redefining the clinically relevant biomechanics, developing improved radiographic diagnostic measures, developing biomechanically validated ligament reconstructions, and then validating these reconstructions in patient outcomes studies,” said Dr. LaPrade.

The posterolateral corner of the knee stabilizes the joint. Posterior cruciate ligament injuries from external trauma or hyperextension are difficult to diagnose and treat and can be debilitating and career-ending for gymnasts and other athletes who play soccer, basketball, or football. However, patient outcomes following treatment have significantly improved as a result of Dr. LaPrade’s research.

Dr. LaPrade’s collaborators on this paper included Lars Engebretsen, M.D., Ph.D. (University of Oslo, Norway), Steinar Johansen, M.D. (University of Oslo), Chad Griffith, M.D. (University of Minnesota), Benjamin Coobs, M.D. (University of Minnesota), and Andrew Geeslin, M.D. (Western Michigan University).

SURGICAL SKILLS LABORATORY

KELLY R. ADAIR, DIRECTOR



Kelly R. Adair

An integral part of sports medicine surgery is mastery of operating abilities. Have you ever wondered how an orthopaedic surgeon becomes proficient in his or her expertise of surgery? Just as pilots may use a flight simulator, imagine the surgical skills lab as a surgery simulator for orthopaedic surgeons that precisely mimics the operating room, with the same equipment and instrumentation. The Surgical Skills Lab allows surgeons and other sports medicine professionals to practice in an environment that closely replicates the operating room. Our reputable surgeons and facilities have attracted medical specialists from all over the world to train and advance their techniques through hands-on cadaveric specimen training. We’re applying what we have learned through our inventive research projects by educating surgeons in these new techniques.

Year-to-date, we’ve hosted over 170 labs, which include 28 for various medical device companies and the remaining 142 for our MD fellows, ATC fellows, and other internal staff. We can expect hundreds of surgeons to come through our lab annually, and as many as 100 surgeons in a weekend. We are confident that increased surgeon training, particularly as it relates to our current research concepts and techniques, correlates with improved outcomes for the patients in the operating room.

IMAGING RESEARCH

CHARLES P. HO, PH.D., M.D., DIRECTOR; COLEY GATLIN, M.D., GRIFFIN VISITING SCHOLAR FOR CLINICAL SPORTS MEDICINE; RACHEL SUROWIEC, M.SC., RESEARCH SCIENTIST; NICHOLAS JOHNSON, B.A., RESEARCH ASSISTANT; KATHERINE WILSON, M.SC., CONSULTANT

Imaging Research develops and evaluates noninvasive imaging techniques of the joints for the purpose of directing and monitoring clinical treatment and outcomes, and to enhance the clinical relevance of research conducted in the Center for Outcomes-Based Orthopaedic Research (COOR), the Department of BioMedical Research, and the Center for Translational and Regenerative Medicine Research.

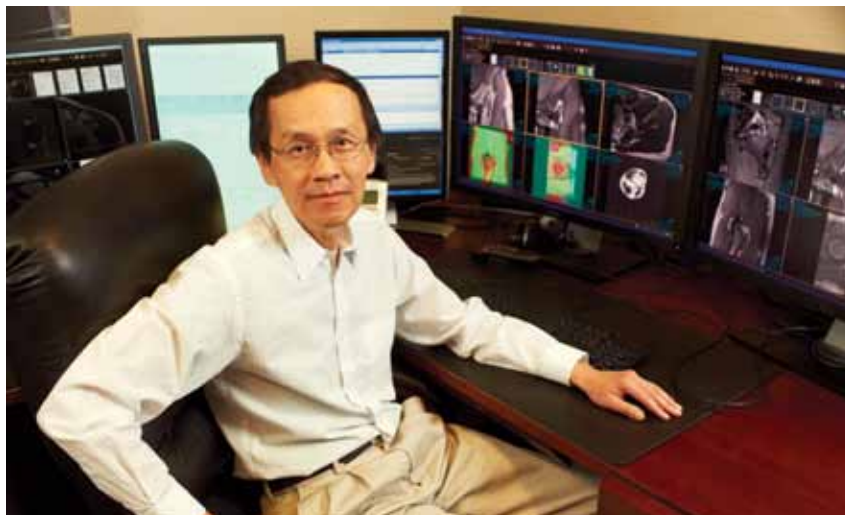
In 2013, collaboration with national, international, public, and private research and academic entities continued to emerge as a focus of Imaging Research efforts. Colorado State University, Siemens Medical Solutions USA, the University of Queensland (Australia), and the Commonwealth Scientific and Industrial Organization in Brisbane, Australia, are among the institutions currently coordinating their efforts with the work of Imaging Research.

STAFF

Imaging Research personnel and initiatives are supervised and directed by Dr. Ho.

Imaging Research continues to include and appreciate the contributions of the Griffin Visiting Scholar for Clinical Sports Medicine MRI. This fellowship is sponsored by the Kenneth and Anne Griffin Foundation. Coley Gatlin, M.D., began his service in this capacity in August of 2013 and completed his fellowship in July 2014.

Katherine Wilson, M.Sc., completed her work as a research engineer and now serves as an SPRI research consultant, focusing on Imaging Research.



Charles P. Ho, Ph.D., M.D.

TECHNOLOGY

The Imaging Research data registry continued to expand in 2013 to include approximately 300 new cases per month. A tablet-based data collection system developed by the Center for Outcomes-Based Orthopaedic Research made the process less time consuming and more efficient. Collection of MRI data now includes all knee, shoulder, hip, and foot/ankle patients.

RESEARCH AND COLLABORATIVE EFFORTS

Imaging Research is in its third year of screening young hockey players with hip injuries, and the initiative now includes skiers. The department is monitoring players and compares the data collected from both groups. The information could help identify movements in both sports that increase the risk of injuries or allow detection of players' predispositions to certain abnormalities.

Imaging Research continued its work to quantify imaging diagnoses of articular and soft tissues. That investigation has now been extended to include ligaments and tendons, including the mapping of tendon properties in the rotator cuff and peroneal tendons in the ankle. Imaging personnel have also begun the process of mapping posterior the cruciate ligament (PCL) properties in patients with and without symptoms of PCL injuries.

Siemens has continued to collaborate with SPRI on quantitative magnetic resonance imaging (MRI) of articular cartilage, focusing on the knee and hip. Siemens was scheduled to meet with SPRI and Imaging Research personnel in 2014 to discuss the development of new clinical quantitative imaging initiatives.

Efforts continued with Colorado State University to obtain histologic data (of microscopic structure tissue) obtained through studies of the hip.

CSU has conducted its research by analyzing specimens of cartilage waste products obtained from hip arthroscopies conducted by Dr. Marc Philippon at The Steadman Clinic. The histologic data obtained in specimens from surgical procedures can be compared with preoperative imaging biomarker values to further the understanding of and validate the noninvasive quantitative MRI of articular cartilage health. One phase of that research has been completed and the findings were to be submitted for publication in 2014. CSU has also collaborated with SPRI on other imaging and mapping initiatives.

2013 saw an extension of the collaboration with the University of Queensland and the Commonwealth Scientific and Industrial Research Organization (CSIRO) in Australia. Working with the institutions, Imaging Research is examining the role of MRI for modeling bone and soft tissues. Bone modeling has traditionally used computer tomography (CT), but it cannot model soft tissue and it involves the risk of exposure to radiation. The goal of the new research is to find ways to conduct bone modeling based on MRI data that will be comparable and consistent with CT data, but safer.

PROJECTIONS

Imaging Research will continue its efforts to expand the SPRI imaging data registry. It will also expand its work with other departments at SPRI, as well as with institutions around the world, to make its findings regarding biomarker and other quantitative imaging research more consistent, more reproducible, and more applicable for clinical use.



VISITING SCHOLARS PROGRAM BRINGS GERMAN PHYSICIAN TO THE INSTITUTE

Dr. Ulrich Spiegl: Destined for a Career in Sports Medicine from the Start

By Jim Brown, Ph.D.

The series of events that resulted in Ulrich Spiegl becoming a European Visiting Scholar at SPRI began two generations before he was born.

“My father and my grandfather were physicians,” says Dr. Spiegl. “I probably began thinking about being a doctor when I was nine or 10, so that was pretty much my goal all of the time. It always seemed to be part of the conversation in our family.”

There were many other factors that eventually led him to Vail and SPRI, where he began his one-year fellowship in January of 2013. He had played soccer and tennis. He was a mountain biker and skier. Although his work now begins before daylight and often ends after dark, he still works out four or five days a week.

He learned to speak English in Germany and improved his language skills during a two-year exchange student program at Raytown High South, near Kansas City. He traveled to California, New York, and many states in-between, including Colorado. He loves America.

MULTIPLE SPECIALTIES

But there’s more. After earning his Doctor of Medicine degree from Technical University in Munich, he also received specialty certification in orthopaedics and traumatology, emergency medicine, special trauma surgery, and sports medicine.

Dr. Spiegl has always had a strong interest in research, as evidenced by more than 20 articles already in-press or published in the world’s leading orthopaedic journals, including the *American Journal of Sports Medicine*, *Spine*, and the *Journal of Elbow Surgery*.

ARTHREX SPONSORSHIP

While participating in a fellowship program at the University of Leipzig, he read about SPRI’s European Visiting Scholar Program. The program was developed and sponsored by Arthrex, Inc., an orthopaedic medical device company. Arthrex’s founder and president, Reinhold Schmieding, has had a long-time interest in education.

“We are proud to work with these young visiting scholars,” says Robert F. LaPrade, M.D., Ph.D., director of the International Scholar Program. “These doctors are already making an impact on their respective home countries, and we expect them to become the leaders of a new generation of sports medicine scientists.”

BUMP IN THE ROAD

Then came a bump in Dr. Spiegl's career path. By the time he got the information, another physician had already been selected as the 2013 European Visiting Scholar.

No problem. The person selected had to cancel. Dr. Spiegl, with the approval of his supervisor at the University of Leipzig, recommendations from prestigious physicians in Germany, and support from the Society for Arthroscopy and Joint Surgery, applied for the position. Two weeks later, back on the fast track, he was notified that he had been accepted, and four months later he began his work in Vail.

Dr. Spiegl's host family during his exchange student days in Missouri had moved to Denver—close enough for regular visits. Another sign.

“Once accepted, I did more homework,” recalls Dr. Spiegl. “I knew about Dr. Steadman because of the work he had done with famous soccer players and other athletes. He is very well known in Europe. But I was equally impressed when I learned about the other physicians and scientists at Steadman Philippon and the amount of information provided by their research.”

PRODUCTIVE YEAR

At SPRI, Dr. Spiegl spent approximately 70 percent of his time on research projects and rotated among the various departments, but he worked very closely with Dr. Millett on investigations related to the shoulder.

“I was able to be involved with four case studies, in addition to five or six additional research projects. The year 2013 was very productive for the Research Institute and I was fortunate to be a part of that effort.”

“One of the most important things I observed is the time physicians give their patients and the teamwork that exists in the Research Institute,” says Dr. Spiegl. “If people have questions, they answer them. You don't get the feeling of being rushed. If one of the fellows or visiting scholars has an idea, it is easier to move forward with that initiative than at a bigger university or research facility. Those are just a couple of the many reasons that make Steadman Philippon such a different place.”

Dr. Spiegl completed his visiting scholar term earlier this year and has returned to the University of Leipzig. His goal is to complete the requirements for a Ph.D., continue to improve his surgical skills, and eventually return to his hometown of Murnau, a city near the southern border of Germany, to practice sports medicine.

Something he was destined to do.



VISITING SCHOLAR

The European Visiting Scholar, developed and sponsored by Arthrex, Inc., has become the model for our Visiting Scholars programs.

The SPRI Visiting Scholars programs are sponsored by corporate and individual donors. Our program was developed in conjunction with Arthrex, Inc., an orthopaedic medical device company. Arthrex's founder and president, Reinhold Schmieding, has had a long-time interest in education. Mr. Schmieding approached SPRI with an idea for educating a European orthopaedic surgeon with interest in research, committed to funding it, and the Visiting Scholars program was created. Mr. Schmieding commented, “Arthrex is pleased to contribute annually to the Institute. The sponsoring of a European research fellow exemplifies Arthrex's commitment to orthopaedic research to advance knowledge of the global medical community and to helping surgeons treat their patients better.” Arthrex, Inc., is annually sponsoring the European Visiting Scholars program, and due to its success, Mr. Jorge Paulo Lemann is supporting our Brazilian Visiting Scholar. These scholars learn new surgical techniques and conduct research, which is submitted for publication in leading orthopaedic journals.

“Dr. Spiegl says the research conducted at the Steadman Philippon Research Institute has had a profound effect on the practice of sports medicine in Germany and other European countries.”

EDUCATION

WELCOME 2013–2014 FELLOWS



FRONT ROW FROM LEFT TO RIGHT: Gregory Sawyer, M.D., Mark Hamming, M.D., Jared Johnson, M.D., Michael Ellman, M.D., Anthony Cerminara, M.D., Jeffrey Jaglowski, M.D., Tommy Haytmanek, M.D., Coley Gattlin, M.D., **SECOND ROW:** Tom Hackett, M.D., J. Richard Steadman, M.D., Robert LaPrade, M.D., PhD, Peter Millett, M.D., MSc, **BACK ROW:** Marc Philippon, M.D., Tom Clanton, M.D.

EIGHT NEW PHYSICIANS INTRODUCED

Each year, a select group of orthopaedic surgeons is chosen from a field of more than 160 to participate in 12 months of vigorous training in the Steadman Philippon Sports Medicine Fellowship Program. SPRI's 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.

Fellows and visiting scholars are given a unique opportunity to perform research in their respective areas of interest, including BioMedical Engineering, Outcomes-Based Orthopaedic Research, Imaging Research, and Translational and Regenerative Medicine Research. The Institute currently maintains a network of approximately 200 fellows and visiting scholars in communities around the world who serve in academic positions at leading universities and in private practices.

The following are brief summaries of the accomplishments of this year's class of eight SPRI fellows.

Anthony Cerminara, M.D.

Dr. Cerminara graduated summa cum laude from Gannon University in Erie, Pennsylvania. He attended Gannon on a football scholarship and was awarded with NCAA Division II All-Academic honors. He attended medical school at the State University of New York at Buffalo, where he graduated first in his class. Dr. Cerminara then traveled to Miami to pursue his residency in orthopaedic surgery at the University of Miami/Jackson Memorial Hospital. While in Miami, Dr. Cerminara covered the University of Miami football, baseball, and basketball teams and the Marlins baseball team, and was team physician for a local high school. He also obtained advanced training in musculoskeletal trauma at Miami's Ryder Trauma Center. Dr. Cerminara has moved to Vail with his wife, Sarah, a dermatologist who will be working at Vail Dermatology.

Michael B. Ellman, M.D.

Raised in Bloomfield Hills, Michigan, Dr. Ellman matriculated at the University of Michigan for his undergraduate studies and medical school training, where he graduated with honors at both levels. As an undergraduate, he spent six months studying Spanish language and culture in Seville, Spain. During medical school, Dr. Ellman earned the Dean's Commendation for Excellence in Clinical Skills and the Art of Medicine, and further developed his medical Spanish skills through work at a clinic in Guadalajara. Dr. Ellman completed his residency training at Rush University Medical Center in Chicago, Illinois. He published several research studies focused on articular cartilage biology and biochemical pathways involved in osteoarthritis, and was awarded the American Academy of Orthopaedics Baxter Healthcare Scholarship for his work and interest in hip cartilage preservation. Dr. Ellman also participated in sports

team coverage for the Bulls, White Sox, DePaul men's and women's soccer teams, and area high school football teams. His wife, Julie, works as a pediatric nurse practitioner.

Jeffrey R. Jaglowski, M.D.

Born and raised in Erie, Pennsylvania, Dr. Jaglowski attended Mercyhurst College in his hometown, where he majored in sports medicine. Clinical experience with collegiate athletics over those years led him to certification as an athletic trainer. He pursued graduate studies at Pennsylvania State University in Hershey, where he received his Master of Science degree in anatomy and performed basic science and clinical cancer research for which he received numerous grants. He began medical school at Penn State, where he continued to foster interests in orthopaedic surgery and sports medicine. He was elected a member of Alpha Omega Alpha and graduated with honors. Dr. Jaglowski completed residency training at the Harvard Combined Orthopaedic Surgery Residency Program and served as chief resident at the Massachusetts General Hospital. He looks forward to a great year in Vail with his wife, Heather.

Jared Johnson, M.D.

Jared grew up in the mountains and skiing in Salt Lake City. He attended the University of Utah, where he studied business administration and finance. He then moved to New York City and medical school at Weill Cornell Medical College, where he was awarded the T. Campbell Thompson Award for excellence in orthopaedic surgery from the faculty of The Hospital for Special Surgery. Following medical school, he moved to Los Angeles and completed his residency training at UCLA. During residency, he was involved in several research projects and was published in journals such as *The Journal of Bone and Joint Surgery*, *Journal of Biomechanics*, and the *Journal of Cellular Biochemistry*. He

and his wife, Nancy, are excited to head back to the mountains.

Mark Hamming, M.D.

Dr. Hamming graduated from Northwestern University in his home city of Chicago, with a B.S. in biology and a minor in Spanish. While at Northwestern, he was named MVP and captain of the swim team, received All-American honors, and competed at the U.S. Olympic Trials. Dr. Hamming obtained his medical degree at Rush Medical College, where he discovered his interest in orthopaedics. Upon completing medical school, Mark traveled to Duke University for an orthopaedics residency. Throughout his residency, he provided physician coverage for Duke's many varsity athletic teams including football, basketball, and lacrosse. During residency, Dr. Hamming's research focused on ACL grafts. Dr. Hamming has been joined in Vail by his wife, Lesley, and their eight-month-old son, George. Lesley Hamming, Ph.D., J.D., will start her career in Chicago as a patent attorney.

Gregory A. Sawyer, M.D.

Dr. Sawyer grew up in the foothills of western Maine and attended Colby College, where he double-majored in chemistry and biology and graduated summa cum laude. He attended Dartmouth Medical School, where he was inducted into the Alpha Omega Alpha honor society. Following medical school, Dr. Sawyer completed his orthopaedic residency at Brown in Providence, Rhode Island. During his time at Brown he served as an assistant team physician for the men's ice hockey and lacrosse teams, as well as for the Providence Bruins. While at Brown, he was involved in multiple areas of research, including biomechanical analysis of different ACL and tibial spine reconstruction techniques, patient outcomes following elbow arthroscopy, and an epidemiologic evaluation of Toradol use in athletes. Following

WHERE ARE THEY NOW?

The graduating class of 2012–2013 Steadman Philippon fellows is busy establishing new careers in orthopaedics.

Tyler C. Collins, M.D.

Dr. Collins has joined the practice at the CORE Institute in Mesa, Colorado.

Christopher Espinoza-Ervin, M.D.

Dr. Espinoza-Ervin is practicing at the McBride Orthopedic Hospital and Clinic in Oklahoma City, Oklahoma.

Scott C. Faucett, M.D., M.Sc.

Dr. Faucett is establishing his practice at Medical Faculty Associates at George Washington University, Washington, D.C.

Edmund “Edton” A. Ganai, M.D.

Dr. Ganai has moved to Newport, Rhode Island, and is practicing at the Naval Health Clinic New England.

Jared T. Lee, M.D.

Dr. Lee is establishing his practice with the Big Horn Basin Bone and Joint clinic in Cody, Wyoming.

Jeffrey J. Nepple, M.D.

Dr. Nepple is establishing his sports medicine practice at Washington University Orthopaedics in St. Louis, Missouri.

Jack Skendzel, M.D.

Dr. Skendzel has moved to Woodbury, Minnesota, and joined Summit Orthopedics.

Nicholas A. Viens, M.D.

Dr. Viens has joined the Lexington Clinic Orthopedics—Sports Medicine Center in Lexington, Kentucky.

W. Sean Smith, M.D.

Dr. Smith is practicing at MedQuest in Greenville, South Carolina.

his residency, Dr. Sawyer completed a fellowship in orthopaedic trauma surgery at Rhode Island Hospital. Dr. Sawyer and his wife, Annah, have a three-month-old daughter, Lylah.

FOOT AND ANKLE FELLOW

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

Dr. Haytmanek graduated cum laude from Wake Forest University with a major in chemistry and a minor in physics. He then attended Jefferson Medical College in Philadelphia, closer to his hometown of Bethlehem, Pennsylvania. After graduating cum laude at Jefferson, he completed his orthopaedic surgery residency at Duke University. During his training he completed research projects published in *The Journal of Bone and Joint Surgery, Clinical Orthopaedics and Related Research*, and *Foot and Ankle International*. Dr. Haytmanek and his wife, Larisa, have a young daughter, Abigail.

GRIFFIN VISITING SCHOLAR FOR CLINICAL SPORTS MEDICINE MRI

Coley Gatlin, M.D.

Dr. Coley Gatlin graduated cum laude from the University of Texas at Austin with a B.A. in biochemistry and attended the University of Texas Health Science Center at San Antonio

(UTHSCSA), where he obtained his medical degree. Next, he completed a UNC-affiliated family medicine residency and primary care sports medicine fellowship in Greensboro, North Carolina. During his residency and fellowship, Dr. Gatlin provided sports coverage for several local high schools, Elon University, and the Burlington Indians (a farm team of the Cleveland Indians).

Thinking the medical training was over, he moved to Kerrville, Texas, and joined a family medicine private practice. He transitioned to full-time emergency room work after realizing he enjoyed acute care medicine and sports medicine more than the geriatric and hospital-based internal medicine required of private practice. Dr. Gatlin provided sideline sports coverage for several local high schools and Schreiner University. Also, he worked with one of the local orthopaedic surgeons to establish a Saturday morning sports clinic. Dr. Gatlin enjoyed his work as medical director for a rural health clinic in Utopia, Texas, for four years. He served one-year terms as vice president and then president of the Kerr-Bandera Medical Society in 2005 and 2006. He returned to UTHSCSA for additional residency training in diagnostic radiology and completed the training in June 2013.

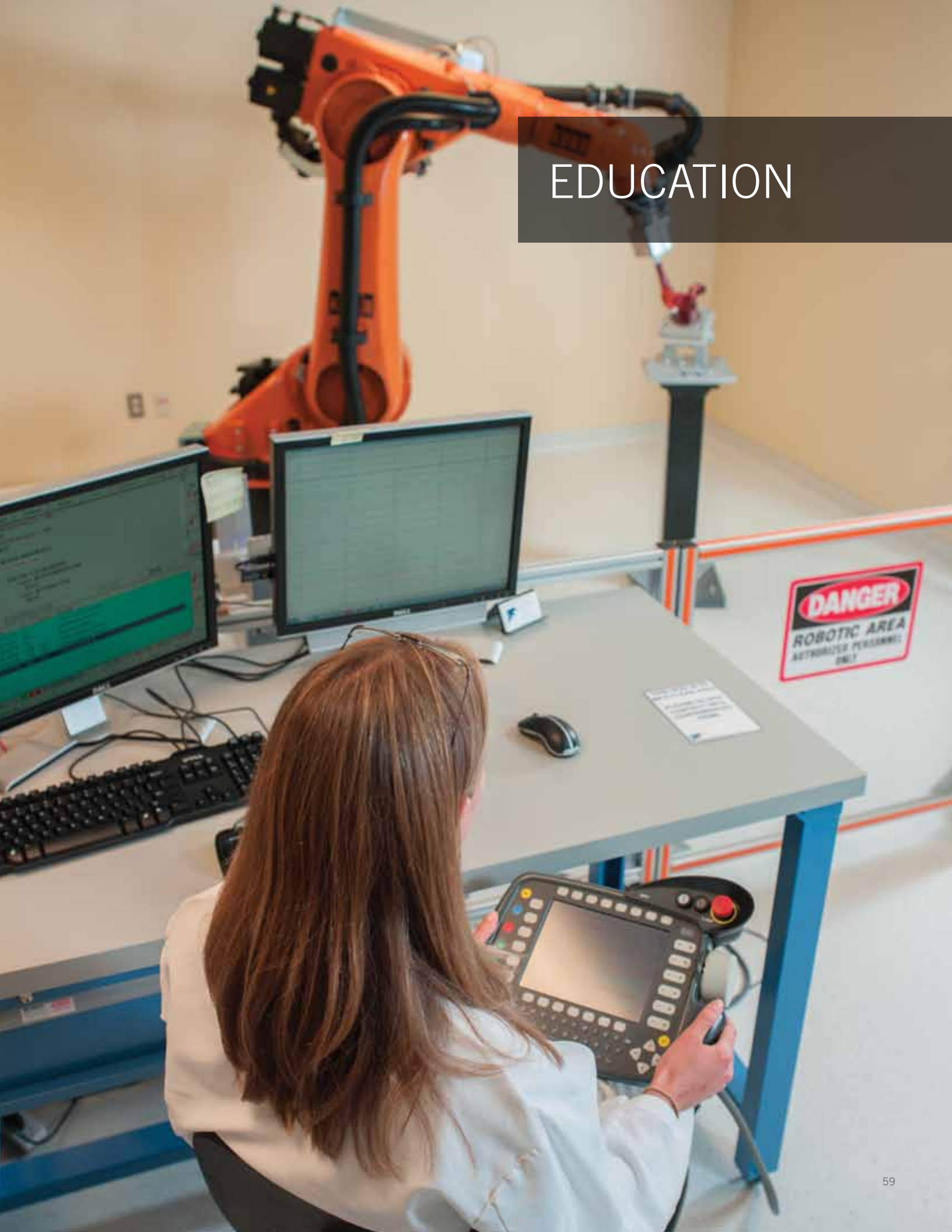
THANK YOU

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 2013–2014 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 for their generous support: **Mr. and Mrs. Milledge Hart, the Fred and Elli Iselin Foundation, Mr. and Mrs. Jay Precourt, and Mr. and Mrs. Stewart Turley.**

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.

“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 interest began to merge during medical school at Dartmouth, where he was inducted into the Alpha Omega Honor Society. “I wavered 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 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 operating room. 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 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 an 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.



STEADMAN PHILIPPON'S EDUCATION AND PUBLIC OUTREACH PROGRAM—EPOC—DEVELOPS THE NEXT GENERATION OF HOME-GROWN SCIENTISTS

By Jim Brown, Ph.D.

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:

5TH GRADE

- Tours of SPRI laboratories

6TH, 7TH, 8TH GRADE

- 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

- SPRI Science Club
- Mentored scientific research

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 Coen Wijdicks, Ph.D., director of

BioMedical Engineering and senior staff scientist, 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 experience 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 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., 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.

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.



PRESENTATIONS AND PUBLICATIONS



PUBLICATIONS AND PRESENTATIONS

In 2013, principal investigators and fellows published papers in scientific and medical journals and delivered presentations to a variety of professional and lay audiences worldwide.

2013 PUBLICATIONS

Aga C, Rasmussen MT, Smith SD, Jansson KS, LaPrade RF, Engebretsen L, Wijdicks CA. Biomechanical Comparison of Interference Screws and Combination Screw and Sheath Devices for Soft Tissue Anterior Cruciate Ligament Reconstruction on the Tibial Side. *Am J Sports Med.* 2013;41(4):841-848.

Ames JB, Horan MP, Van der Meijden OA, Leake MJ, Millett PJ. Association Between Acromial Index and Outcomes Following Arthroscopic Repair of Full-Thickness Rotator Cuff Tears. *J Bone Joint Surg Am.* 2012;94(20):1862-1869.

Anderson C, Kennedy N, LaPrade RF. Posterolateral Knee. In: Doral MN, Karlson J, eds. *Sports Injuries: Prevention, Diagnosis, Treatment and Rehabilitation.* 2nd Ed. New York, NY: Springer-Verlag; Epub ahead of print 2013.

Boykin RE, Patterson D, Briggs KK, Dee A, Philippon MJ. Results of Arthroscopic Labral Reconstruction of the Hip in Elite Athletes. *Am J Sports Med.* 2013;41(10):2296-2301.

Boykin RE, Rodkey WG, Steadman JR. Acute Anterior Cruciate Ligament Tear Surgery: Repair Versus Reconstruction – When? In: Sanchis-Alfonso V, Monllau JC, eds. *The ACL-Deficient Knee. A Problem Solving Approach.* London: Springer-Verlag; 2013:203-210.

Boykin RE, Stull JD, Giphart JE, Wijdicks CA, Philippon MJ. Femoroacetabular Impingement in a Professional Soccer Player. *Knee Surg Sports Traumatol Arthrosc.* 2013;21(5):1203-1211.

Buchholz A, Martetschläger F, Siebenlist S, Sandmann G, Hafelmeier A, Lenich A, Millett PJ, Stöckle U, Elser F. Biomechanical Comparison of Intramedullary Cortical Button Fixation and Interference Screw Technique for Subpectoral Biceps Tenodesis. *Arthroscopy.* 2013;29(5):845-853.

Brunkhorst JP, Giphart JE, LaPrade RF, Millett PJ. Coracohumeral Distances and Correlation to Arm Rotation: An In Vivo Three Dimensional Biplane Fluoroscopy Study. *Orthopaedic Journal of Sports Medicine.* 2013;1(2):2325967113496059.

Campbell KJ, Michalski MP, Wilson KJ, Goldsmith MT, Wijdicks CA, LaPrade RF, Clanton TO. The Ligament Anatomy of the Deltoid Complex of the Ankle: A Qualitative and Quantitative Anatomical Study. *J Bone Joint Surg Am.* 2014;96(8):e62.

Campbell KJ, Boykin RE, Wijdicks CA, Giphart JE, LaPrade RF, Philippon MJ. Treatment of a Hip Capsular Injury in a Professional Soccer Player with Platelet-Rich Plasma and Bone Marrow Aspirate Concentrate Therapy. *Knee Surg Sports Traumatol Arthrosc.* 2013;21(7):1684-1688.

Clanton TO, Betech AA, Bott AM, Matheny LM, Hartline B, Hanson TW, McGarvey WC. Complications After Tendon Transfers in the Foot and Ankle Using Bioabsorbable Screws. *Foot Ankle Int.* 2013;34(4):486-490.

Clanton TO, Jarvis HC, Matheny LM, Hirose C, Defee J, McGarvey W. Evaluation of Incongruity of the Talonavicular Joint After Lateral Column Lengthening. *Foot Ankle Int.* 2013. In Press.

Clanton TO, Johnson NS, Matheny LM. Outcomes Following Microfracture in Grade 3 and 4 Articular Cartilage Lesions of the Ankle. *Foot Ankle Int.* 2014;35(8):764-770.

Clanton TO, Matheny LM, Jarvis HC, Lewis EV, Ambrose CG. Quantitative Analysis of Torsional Stiffness in Supplemental One-Third Tubular Plate Fixation in the Management of Isolated Syndesmosis Injuries: A Biomechanical Study. *Foot Ankle Int.* 2013;34(2):267-272.

Clanton TO, Campbell KJ, Wilson KJ, Michalski MP, Goldsmith MT, Wijdicks CA, LaPrade RF. Qualitative and Quantitative Anatomic Investigation of the Lateral Ankle Ligaments for Surgical Reconstruction Procedures. *J Bone Joint Surg Am.* 2014;96(12):e98.

Clanton TO, Chacko AK, Matheny LM, Hartline BE, Ho CP. Magnetic Resonance Imaging Findings of Snowboarding Osteochondral Injuries to the Middle Talocalcaneal Articulation. *Sports Health.* 2013;5(5):470-475.

de Meijer PP, Karlsson J, LaPrade RF, Verhaar JA, Wijdicks CA. A Guideline to Medical Photography: A Perspective on Digital Photography in an Orthopaedic Setting. *Knee Surg Sports Traumatol Arthrosc.* 2012;20(12):2606-2611.

Domb BG, Philippon MJ, Giordano BD. Arthroscopic Capsulotomy, Capsular Repair, and Capsular Plication of the Hip: Relation to Atraumatic Instability. *Arthroscopy.* 2013;29(1):162-173.

Ejnisman L, Philippon MJ, Lertwanich, Pennock AT, Herzog MM, Briggs KK, Ho CP. Relationship Between Femoral Anteversion and Findings in Hips with Femoroacetabular Impingement. *Orthopedics*. 2013;36(3):e293-300.

Ellman M, LaPrade RF. Posterior Cruciate Ligament. In: Doral MN, Karlson J, eds. *Sports Injuries: Prevention, Diagnosis, Treatment and Rehabilitation*. 2nd Ed. New York, NY: Springer-Verlag; Epub ahead of print 2013.

Engebretsen L, Kennedy N, LaPrade RF. Ankle Injuries in Soccer. In: D'Hooghe P, Kerkhoffs G, eds. Springer; 2013.

Engebretsen L, LaPrade RF, Surowiec RK, Williams BT. Early Osteoarthritis. In: Kon E, Berruto M, Condello V, Peretti G, Ronga M, eds. *Cartilagine Istruzioni Per L'Uso*. eBook; 2013.

Engebretsen L, Surowiec R, LaPrade RF. Surgical Techniques in Cartilage Repair Surgery. In: Shetty AA, Kim SJ, Nakamura N, Brittberg M, eds. Springer; 2013.

Gaskill T, Millett PJ. Snapping Scapula Syndrome: Diagnosis and Management. *J Am Acad Orthop Surg*. 2013;21(4):214-224.

Gauger EM, Ludewig PM, Wijdicks CA, Cole PA. Pre- and Postoperative Function after Scapula Malunion Reconstruction: A Novel Kinematic Technique. *J Orthop Trauma*. 2013;27(8):e186-191.

Geeslin A, Huleatt J, LaPrade RF. Multiligament Injuries. In: Doral MN, Karlson J, eds. *Sports Injuries: Prevention, Diagnosis, Treatment and Rehabilitation*. 2nd Ed. New York, NY: Springer-Verlag; Epub ahead of print 2013.

Geeslin AG, LaPrade RF. Anatomy and Biomechanics of the Lateral and Medial Sides of the Knee and the Surgical Implications. In: Fanelli G, ed. *The Multiple Ligament Injured Knee: A Practical Guide to Management*. New York, NY: Springer Science+Business Media; 2013:29-50.

Geeslin A, LaPrade RF. Multiligament Knee Injuries. In: DeLee JC, Drez D, Miller MD, eds. *DeLee & Drez's Orthopaedic Sports Medicine*. 4th Ed. Elsevier; 2013.

Geyer MR, Philippon MJ, Fagrelus TS, Briggs KK. Acetabular Labral Reconstruction with an Iliotibial Band Autograft: Outcome and Survivorship Analysis at Minimum 3-Year Follow-up. *Am J Sports Med*. 2013;41(8):1750-1756.

Geyer MR, Rodkey WG, Steadman JR. Clinical Relevance of Chondral Lesions in the Treatment of the ACL-Deficient Knee: Microfracture Technique. In: Sanchis-Alfonso V, Monllau JC, eds. *The ACL-Deficient Knee. A Problem Solving Approach*. London, UK: Springer-Verlag; 2013:271-280.

Giphart JE, Brunkhorst JP, Horn NH, Shelburne KB, Torry MR, Millett PJ. Effect of Plane of Arm Elevation on Glenohumeral Kinematics: A Normative Biplane Fluoroscopy Study. *J Bone Joint Surg*. 2013;95(3):238-245.

Goldsmith MT, Jansson KS, Smith SD, Engebretsen L, LaPrade RF, Wijdicks CA. Biomechanical Comparison of Anatomic Single- and Double-Bundle Anterior Cruciate Ligament Reconstructions: An In Vitro Study. *Am J Sports Med*. 2013;41(7):1595-1604.

Griffith CJ, Wijdicks CA, LaPrade RF. The Lateral Collateral Ligament and Posterolateral Corner. In: Bonnin M, Amendola NA, Bellemans J, MacDonald SJ, and Menetre J, eds. *The Knee Joint – Surgical Techniques and Strategies*. Paris, France: Springer-Verlag; 2012:31-42.

Hapa O, Akşahin E, Erduran M, Davul S, Havitçioğlu H, LaPrade RF, Bozdağ E, Sünbuloğlu E. The Influence of Suture Material on the Strength of Horizontal Mattress Suture Configuration for Meniscus Repair. *Knee*. 2013;20(6):577-580.

Hauer HJ, Boykin RE, Petit CJ, Hardt J, Millett PJ. Decision-Making in Treating Diaphyseal Clavicle Fractures: Is There Agreement Among Surgeons? Results of a Survey on Surgeons' Treatment Preferences. *J Shoulder Elbow Surg*. 2014;23(2):e23-33. Epub Jul 6, 2013.

Horan MP, Warth RJ, Briggs KK, Millett PJ. Functional Limitations as Measured by the ASES Score for Patients That Present with Rotator Cuff Pathology (SS-25). *Arthroscopy*. 2013;29(6) :e12-e13.

Huleatt JB, Geeslin AG, LaPrade RF. Special Considerations for Multiple Ligament Knee Injuries. In: Doral MN, Karlsson J, eds. *Sports Injuries: Prevention, Diagnosis, Treatment and Rehabilitation*. 2nd Ed. New York, NY: Springer-Verlag; Epub ahead of print 2013.

Huleatt JB, LaPrade RF. The Role of Osteotomy for Knee Cartilage, Meniscus, and Ligament Injuries. In: Doral MN and Karlsson J, eds. *Sports Injuries: Prevention, Diagnosis, Treatment and Rehabilitation*. 2nd Ed. New York, NY: Springer-Verlag. Epub ahead of print 2013.

James EW, Williams BT, LaPrade RF. Stress Radiography for the Diagnosis of Knee Ligament Injuries: A Systematic Review. *Clin Orthop Relat Res*. 2014;472(9):2644-2657. Epub 2013.

Jansson KS, Michalski MP, Smith SD, LaPrade RF, Wijdicks CA. Tekscan Pressure Sensor Output Changes in the Presence of Liquid Exposure. *J Biomech*. 2013;46(3):612-614.

Jansson KS, Costello KE, O'Brien L, Wijdicks CA, LaPrade RF. A Historical Perspective of PCL Bracing. *Knee Surg Sports Traumatol Arthrosc.* 2013;21(5):1064-1070.

Johannsen AM, Anderson CJ, Wijdicks CA, Engebretsen L, LaPrade RF. Radiographic Landmarks for Tunnel Positioning in Posterior Cruciate Ligament Reconstructions. *Am J Sports Med.* 2013;41(1):35-42.

Kennedy N, Miller M, LaPrade RF. Surgical Approaches to the Knee. In: *Orthopaedic Surgical Approaches.* Elsevier. 2013.

Kennedy NI, Wijdicks CA, Goldsmith MT, Michalski MP, Devitt BM, Årøen A, Engebretsen L, LaPrade RF. Kinematic Analysis of the Posterior Cruciate Ligament, Part 1: The Individual and Collective Function of the Anterolateral and Posteromedial Bundles. *Am J Sports Med.* 2013;41(12):2828-2838.

Khan M, Adamich J, Simunovic N, Philippon MJ, Bhandari M, Ayeni OR. Surgical Management of Internal Snapping Hip Syndrome: A Systematic Review Evaluating Open and Arthroscopic Approaches. *Arthroscopy.* 2013;29(5):942-948.

LaPrade RF, Surowiec RK, Sochanska AN, Hentkowski BS, Martin BM, Engebretsen L, Wijdicks CA. Epidemiology, Identification, Treatment, and Return to Play of Musculoskeletal-Based Ice Hockey Injuries. *Br J Sports Med.* 2013;48(1):4-10.

Wijdicks CA, Philippon MJ, Civitarese DM, LaPrade RF. A Mandated Change in Goalie Pad Width Has no Effect on Ice Hockey Goaltender Hip Kinematics. *Clin J Sport Med.* 2014;24(5):403-408. Epub Dec 16, 2013.

LaPrade RF, Pierce CM, Bahr R, Engebretsen L, Cook J, Arendt E, Mohtadi N. Acute Knee Injuries. In: Bahr R, ed. *The International Olympic Committee Manual of Sports Injuries.* Hoboken, NJ: Wiley-Blackwell. 2012;357-400.

LaPrade RF, Devitt BM, Huleatt JB, Nepple JJ. A Novel Posterior Arthrotomy Approach for the Treatment of a Large Osteochondral Defect of the Posterior Aspect of the Lateral Femoral Condyle of the Knee. A Case Report and Technical Note. *J Bone Joint Surg Case Connect.* 2013;3(4):e113.

Martetschläger F, Rios D, Boykin RE, Millett PJ. Arthroscopic Assessment of Anterior Glenoid Bone Loss and Treatment Options. In: Safran, Mazzocca and Nicholson, eds. Rosemont, IL: American Academy of Orthopaedic Surgeons. 2013. ISBN 9780892039555.

Martetschläger F, Horan MP, Warth RJ, Millett PJ. Complications After Anatomic Fixation and Reconstruction of the Coracoclavicular Ligaments. *Am J Sports Med.* 2013;41(12):2896-2903.

Martetschläger F, Warth RJ, Millett PJ. Instability and Degenerative Arthritis of the Sternoclavicular Joint: A Current Concepts Review. *Am J Sports Med.* 2014;42(4):999-1007. Epub Aug 16, 2013.

Martetschläger F, Gaskill TR, Millett PJ. Management of Clavicle Nonunion and Malunion. *J Shoulder Elbow Surg.* 2013;22(6):862-868.

Martetschläger F, Buchholz A, Sandmann G, Siebenlist S, Döbele S, Hapfelmeier A, Stöckle U, Millett PJ, Elser F, Lenich A. Acromioclavicular and Coracoclavicular PDS Augmentation for Complete AC Joint Dislocation Showed Insufficient Properties in a Cadaver Model. *Knee Surg Sports Traumatol Arthrosc.* 2013;21(12):438-444.

Martetschläger F, Kraus TM, Hardy P, Millett PJ. Arthroscopic Management of Anterior Shoulder Instability with Glenoid Bone Defects. *Knee Surg Sports Traumatol Arthrosc.* 2013;21(12):2867-2876.

Martetschläger F, Michalski MP, Jansson KS, Wijdicks CA, Millett PJ. Biomechanical Evaluation of Knotless Anterior and Posterior Bankart Repairs. *Knee Surg Sports Traumatol Arthrosc.* 2014;22(9):2228-2236. Epub Jul 5, 2013.

Martetschläger F, Padalecki JR, Millett PJ. Modified Arthroscopic McLaughlin Procedure for Treatment of Posterior Instability of the Shoulder with an Associated Reverse Hill-Sachs Lesion. *Knee Surg Sports Traumatol Arthrosc.* 2013;21(7):1642-1646.

Matheny LM, Ockuly A, Steadman JR, LaPrade RF. Posterior Meniscus Root Tears: Associated Pathologies to Assist as Diagnostic Tools. *Knee Surg Sports Traumatol Arthrosc.* Epub May 28, 2014.

McCarthy M, Camarda L, Monson J, LaPrade RF. Combined Ligament Injuries of the Knee: Anterior Cruciate Ligament / Posterolateral Corner and Medial Collateral Ligament/Posterior Cruciate Ligament- Diagnosis, Treatment, and Rehabilitation. In: Johnson DH, Amendoloa NA, Barber F, Field L, Richmond J, Sgaglione N, eds. *Operative Arthroscopy.* 4th Ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2013:856-867.

McDonald JE, LaPrade RF. Medial Collateral Ligament and Posteromedial Corner Repair and Reconstruction. In: Cole BJ, Sekiya JK, eds. *Surgical Techniques of the Shoulder, Elbow, and Knee in Sports Medicine.* 2nd Ed. Philadelphia, PA: Elsevier; 2013.

McDonald JE, Herzog MM, Philippon MJ. Return to Play Following Hip Arthroscopy with Microfracture in Elite Athletes. *Arthroscopy*. 2013;29(2):330-335.

Millett PJ, Horan MP, Martetschläger F. The “Bony Bankart Bridge” Technique for Restoration of Anterior Shoulder Stability. *Am J Sports Med*. 2013;41(3):608-614.

Millett PJ, Horan MP, Pennock A, Rios D. Comprehensive Arthroscopic Management (CAM) Procedure: Clinical Results of a Joint-Preserving Arthroscopic Treatment for Young, Active Patients with Advanced Shoulder Osteoarthritis. *Arthroscopy*. 2013;29(3):440-448.

Millett PJ, Gaskill TR, Horan MP, van der Meijden OA. Technique and Outcomes of Arthroscopic Scapulothoracic Bursectomy and Partial Scapulectomy. *Arthroscopy*. 2013;28(12):1776-1783.

Millett PJ, Heurer H, Vaishnav S, Gaskill TR, van der Meijden OA. ORIF Mid-Shaft Clavicle: Plate. In: McCann PD, ed. *Video Atlas of Shoulder Surgery*. Philadelphia, PA: Jaypee Medical Brothers; 2013:186-187.

Millett PJ, Gaskill TR, Wierks C, Van der Meijden OA. Repair Pectoralis Major Tendon. In: McCann PD, ed. *Video Atlas of Shoulder Surgery*. Philadelphia, PA: Jaypee Medical Brothers; 2013:212-213.

Millett PJ, Mandell DB, O'Dell JM. *Wealth Protection Planning for Orthopedic Surgeons & Sports Medicine Specialists*. Guardian Publishing, LLC; 2013. ISBN-13: 978-0989216302.

Millett PJ, Schoenahl JY, Allen MJ, Motta T, Gaskill TR. An Association Between the Inferior Humeral Head Osteophyte and Teres Minor Fatty Infiltration: Evidence for Axillary Nerve Entrapment in Glenohumeral Osteoarthritis. *J Bone Joint Surg*. 2013;22(2):215-221.

Millett PJ, Schoenahl JY, Register B, Gaskill TR, van Deurzen DF, Martetschläger F. Reconstruction of Posterior Glenoid Deficiency Using Distal Tibial Osteoarticular Allograft. *Knee Surg Sports Traumatol Arthrosc*. 2013;21(2):445-449.

O'Brien L, Kennedy N, LaPrade RF. Beyond Basic Rehabilitation: Return to Football After ACL and MCL Surgery. In: Reider B, Davies G, Provencher M, eds. *Orthopaedic Rehabilitation of the Athlete: Getting back in the Game*. Elsevier; 2013.

Ockuly A, O'Brien L, LaPrade RF. Rehabilitation for Multiligament Injuries. In: Doral MN, Karlson J, eds. *Sports Injuries: Prevention, Diagnosis, Treatment and Rehabilitation*. 2nd Ed. New York, NY: Springer-Verlag. Epub ahead of print 2013.

Padalecki JR, Jansson KS, Smith SD, Dornan GJ, Pierce CM, Wijdicks CA, LaPrade RF. Biomechanical Consequences of a Complete Radial Tear Adjacent to the Medial Meniscus Posterior Root Attachment Site: In Situ Pull-Out Repair Restores Derangement of Joint Mechanics. *Am J Sports Med*. 2014;42(3):699-707.

Petre BM, Smith SD, Jansson KS, de Meijer PP, Hackett TR, LaPrade RF, Wijdicks CA. Femoral Cortical Suspension Devices for Soft Tissue Anterior Cruciate Ligament Reconstruction: A Comparative Biomechanical Study. *Am J Sports Med*. 2013;41(2):416-422.

Philippon MJ, Ho CP, Briggs KK, Stull J, LaPrade RF. Prevalence of Increased Alpha Angles as a Measure of Cam-Type Femoroacetabular Impingement in Youth Ice Hockey Players. *Am J Sports Med*. 2013;41(6):1357-1362.

Philippon MJ, Faucet SC, Briggs KK. Arthroscopic Hip Labral Repair. *Arthrosc Tech*. 2013;2(2):e73-76.

Philippon MJ. Rethinking Contraindications to Hip Arthroscopy. *Audio-Digest Orthopaedics*. 2013;36(21). ISSN 0271-132X.

Philippon MJ, Briggs KK, Carlisle JC, Patterson DC. Joint Space Predicts THA After Hip Arthroscopy in Patients 50 Years and Older. *Clin Orthop Relat Res*. 2013;471(8):2492-2496.

Philippon MJ. Labral Repair and Rim Trimming. In: Sekiya J, ed. *Hip Arthroscopy and Open Surgery*. Elsevier; 2013. In Press.

Philippon MJ, Field MH, Briggs KK. Arthroscopy Rim Trimming and Labral Repair. *Hip International*. 2013. In Press.

Philippon MJ, Souza BGS, Briggs KK. Hip Arthroscopy for Structural Hip Problems. In: Berry DF, Lieberman HR, eds. *Surgery of the Hip*. Elsevier; 2013.

Philippon MJ, Patterson D, Fagrelus T, Briggs KK. Hip Arthroscopy: Recent Progress and Future Directions. In: Haddad FS, ed. *The Young Adult Hip in Sport*. Springer; 2014. In Press.

Philippon MJ, Souza BGS. Capsule Pathology in the Hip. *International Society of Arthroscopy, Knee Surgery and Orthopaedic Sports Medicine (ISAKOS) – European Society of Sports Traumatology, Knee Surgery, and Arthroscopy (ESSKA) Standard Terminology*. 2013. In Press.

Philippon MJ, Patterson DC, Briggs KK. Hip Arthroscopy and Femoroacetabular Impingement in the Pediatric Patient. *J Pediatr Orthop*. 2013;July-Aug; 33 Suppl 1:S126-30.

Philippon MJ, Briggs KK, Sawyer G, Ommen D. Sports Medicine: Hip Labral Tears. *Online Educational Training Resource*. Chinese Educational Project Orthopaedic Website. Sept 2013.

Philippon MJ, Garvey S, Patterson D, Briggs KK. Rehabilitation After Joint Preservation Surgery. In: Clohisy JC, Della Valle CJ, Parvizi J, eds. *The Adult Hip, Volume 3: Hip Preservation Surgery*. Philadelphia, PA: Wolters Kluwer Health; 2015.

Pierce C, LaPrade RF. Standard Terminology: Acute Muscle Injuries – Quadriceps Muscles. In: Kerkhoff G, Servien E, eds. *Muscle Injuries, Standard Terminology*. 2013.

Pierce CM, LaPrade RF. ACL Injuries Combined with Lateral and Medial Knee Injuries. Acute Versus Chronic Injury: What to Do. In: Sanchis-Alfonso V, Monllau JC, eds. *The ACL-Deficient Knee: A Problem Solving Approach*. London, UK: Springer-Verlag; 2013:293-310.

Pierce CM, LaPrade RF, Wahoff M, O'Brien L, Philippon MJ. Ice Hockey Goaltender Rehabilitation, Including On-Ice Progression, After Arthroscopic Hip Surgery for Femoroacetabular Impingement. *J Orthop Sports Phys Ther*. 2013;43(3):129-141.

Pierce CM, O'Brien L, Griffin LW, LaPrade RF. Posterior Cruciate Ligament Tears: Functional and Postoperative Rehabilitation. *Knee Surg Sports Traumatol Arthrosc*. 2013;21(5):1071-1084.

Rasmussen M, LaPrade C, LaPrade RF. Posteromedial Knee. In: Doral MN, Karlson J, eds. *Sports Injuries: Prevention, Diagnosis, Treatment and Rehabilitation*. 2nd Ed. New York, NY: Springer-Verlag; Epub ahead of print 2013.

Rios D, Jansson KS, Martetschläger F, Boykin RE, Millett PJ, Wijdicks CA. Normal Curvature of Glenoid Surface Can Be Restored When Performing an Inlay Osteochondral Allograft: An Anatomic Computed Tomographic Comparison. *Knee Surg Sports Traumatol Arthrosc*. 2014;22(2):442-447. Epub Jan 24, 2013.

Rodkey WG. Meniscus Regeneration with Biologic or Synthetic Scaffolds. In: Cole BJ, Sekiya JK, eds. *Surgical Techniques of the Shoulder, Elbow, and Knee in Sports Medicine*. Philadelphia, PA: Elsevier; 2013:625-632.

Sethi PM, Rajaram A, Beitzel K, Hackett TR, Chowaniec DM, Mazzocca AD. Biomechanical Performance of Subpectoral Biceps Tenodesis: A Comparison of Interference Screw Fixation, Cortical Button Fixation, and Interference Screw Diameter. *J Shoulder Elbow Surg*. 2013;22(4):451-457.

Skendzel JG, Philippon MJ. Management of Labral Tears of the Hip in Young Patients. *Orthop Clin North Am*. 2013;44(4):477-487.

Skendzel JG, Goljan P, Philippon MJ. Update on Hip Instability. *Ortopedica e Traumatologica*. 2013;64:1-13.

Smith SD, Jansson KS, Philippon MJ, LaPrade RF, Wijdicks CA. Fracture Mechanics of the Femoral Neck in a Composite Bone Model: Effects of Platen Geometry. *J Biomech*. 2014;47(2):602-606. Epub Nov 26, 2013.

Smith SD, Wijdicks CA, Jansson KS, Boykin RE, Martetschlaeger F, de Meijer PP, Millett PJ, Hackett TR. Stability of Mid-Shaft Clavicle Fractures After Plate Fixation Versus Intramedullary Repair and After Hardware Removal. *Knee Surg Sports Traumatol Arthrosc*. 2014;22(2):448-455. Epub Jan 31, 2013.

Smith SD, LaPrade RF, Jansson KS, Argen A, Wijdicks CA. Functional Bracing of ACL Injuries: Current State and Future Directions. *Knee Surg Sports Traumatol Arthrosc*. 2014;22(5):1131-1141. Epub April 27, 2013.

Steadman JR, Briggs KK, Matheny LM, Ellis HB. Ten-Year Survivorship After Knee Arthroscopy in Patients with Kellgren-Lawrence Grade 3 and Grade 4 Osteoarthritis of the Knee. *Arthroscopy*. 2013;29(2):220-225.

Surowiec RK, Lucas EP, Ho CP. Quantitative MRI in the Evaluation of Articular Cartilage Health: Reproducibility and Variability with a Focus on T2 Mapping. *Knee Surg Sports Traumatol Arthrosc*. 2014;22(6):1385-1395. Epub Oct 30, 2013.

Surowiec RK, Lucas EP, Fitzcharles EK, Petre BM, Dornan GJ, Giphart JE, LaPrade RF, Ho CP. T2 Values of Articular Cartilage in Clinically Relevant Subregions of the Asymptomatic Knee. *Knee Surg Sports Traumatol Arthrosc*. 2014;22(6):1404-1414. Epub Nov 24, 2013.

Torry MR, Shelburne KB, Myers C, Giphart JE, Pennington WW, Krong JP, Peterson DS, Steadman JR, Woo SL. High Knee Valgus in Female Subjects Does Not Yield Higher Knee Translations During Drop Landings: A Biplane Fluoroscopic Study. *J Orthop Res*. 2013;31(2):257-267.

van der Meijden OA, Wijdicks CA, Gaskill TR, Jansson KS, Millett PJ. Biomechanical Analysis of Two-Tendon Posterosuperior Rotator Cuff Tear Repairs: Extended Linked Repairs and Augmented Repairs. *Arthroscopy*. 2013;29(1):37-45.

Viens NA, Wijdicks CA, Campbell KJ, LaPrade RF, Clanton TO. Anterior Talofibular Ligament Ruptures, Part 1: Biomechanical Comparison of Augmented Broström Repair Techniques with the Intact Anterior Talofibular Ligament. *Am J Sports Med.* 2014;42(2):405-411. Epub Nov 25, 2013.

Clanton TO, Viens NA, Campbell KJ, LaPrade RF, Wijdicks CA. Anterior Talofibular Ligament Rupture Part 2: Biomechanical Comparison of Anterior Talofibular Ligament Semitendinosus Allograft Reconstruction to the Intact Ligament. *Am J Sports Med.* 2014; 42(2):412-416. Epub Nov 26, 2013.

Waldrop NE 3rd, Zirker CA, Wijdicks CA, LaPrade RF, Clanton TO. Radiographic Evaluation of Plantar Plate Injury: An In Vitro Biomechanical Study. *Foot Ankle Int.* 2013;34(3):403-408.

Warth RJ, Martetschläger F, Gaskill TR, Millett PJ. Acromioclavicular Joint Separations. *Curr Rev Musculoskelet Med.* 2013;6(1):71-78.

Warth RJ, Briggs KK, Dornan GJ, Horan MP, Millett PJ. Patient Expectations Before Arthroscopic Shoulder Surgery: Correlation with Patients' Reasons for Seeking Treatment. *J Shoulder Elbow Surg.* 2013;22(12):1676-1681.

Werpy NM, Ho CP, Garcia EB, Kawcak CE. The Effect of Varying Echo Time Using T2-Weighted FSE Sequences on the Magic Angle Effect in the Collateral Ligaments of the Distal Interphalangeal Joint in Horses. *Vet Radiol Ultrasound.* 2013;54(1):31-35.

Wijdicks CA, Kennedy NI, Goldsmith MT, Devitt BM, Michalski MP, Årøen A, Engebretsen L, LaPrade RF. Kinematic Analysis of the Posterior Cruciate Ligament, Part 2: A Comparison of Anatomic Single- Versus Double-Bundle Reconstruction. *Am J Sports Med.* 2013;41(12):2839-2848.

Wijdicks CA, Michalski MP, Rasmussen MT, Goldsmith MT, Kennedy NI, Lind M, Engebretsen L, LaPrade RF. Superficial Medial Collateral Ligament Anatomic Augmented Repair Versus Anatomic Reconstruction: An In Vitro Biomechanical Analysis. *Am J Sports Med.* 2013;41(12):2858-2866.

Wijdicks CA, Balldin BC, Jansson KS, Stull JD, LaPrade RF, Philippon MJ. Cam Lesion Femoral Osteoplasty: In Vitro Biomechanical Evaluation of Iatrogenic Femoral Cortical Notching and Risk of Neck Fracture. *Arthroscopy.* 2013;29(10):1608-1614.

Wijdicks CA, Anavian J, Hill BW, Armitage BM, Vang S, Cole PA. The Assessment of Scapular Radiographs: Analysis of Anteroposterior Radiographs of the Shoulder and the Effect of Rotational Offset on the Glenopolar Angle. *Bone Joint J.* 2013;95-B(8):1114-1120.

Wijdicks CA, Rosenbach BS, Flanagan TR, Bower GE, Newman KE, Clanton TO, Engebretsen L, LaPrade RF, Hackett TR. Injuries in Elite and Recreational Snowboarders. *Br J Sports Med.* 2014;48(1):11-17. Epub Nov. 26, 2013.

Wijdicks CA, Philippon MJ, Civitarese DM, LaPrade RF. A Mandated Change in Goalie Pad Width Has No Effect on Ice Hockey Goaltender Hip Kinematics. *Clin J Sports Med.* 2014;24(5):403-408. Epub Dec 16, 2013.

Wijdicks FJ, Houwert RM, Millett PJ, Verleisdonk EJ, Van der Meijden OA. Systematic Review of Complications After Intramedullary Fixation for Displaced Midshaft Clavicle Fractures. *Can J Surg.* 2013;56(1):58-64.

2013 PRESENTATIONS

Aga C, Rasmussen M, Smith S, Jansson K, Petre B, LaPrade R, Engebretsen L, Wijdicks C. Biomechanical Comparison of Eight Soft Tissue Devices for Tibial Fixation of Anterior Cruciate Ligament Reconstruction Grafts. Poster. *Orthopaedic Research Society (ORS) Annual Meeting, San Antonio, TX, January 2013.*

Aga CA, Rasmussen M, Smith S, Jansson KS, LaPrade RF, Engebretsen L, Wijdicks CA. Biomechanical Comparison of 8 Soft Tissues Devices for Tibial Fixation of Anterior Cruciate Ligament Reconstruction Grafts. Podium. *9th Biennial International Society of Arthroscopy, Knee Surgery and Orthopaedic Sports Medicine (ISAKOS) Congress, Toronto, Canada, May 2013.*

Balldin BC, Wijdicks CA, Stull J, Jansson K, Philippon MJ. Effect of Arthroscopic Notching During Osteoplasty of CAM Lesions for the Treatment of Femoroacetabular Impingement: A Biomechanical Analysis. Podium. *ORS Annual Meeting, San Antonio, TX, January 2013.*

Balldin BC, Wijdicks CA, Stull J, Jansson K, Philippon MJ. Effect of Arthroscopic Notching During Osteoplasty of CAM Lesions for the Treatment of Femoroacetabular Impingement: A Biomechanical Analysis. Podium. *9th Biennial ISAKOS Congress, Toronto, Canada, May 2013.*

Briggs KK, Matheny LM, Rodkey WG, Steadman JR. Factors Associated with Repeat Meniscus Surgery in Patients Undergoing Suture Meniscus Repair. Podium. *9th Biennial ISAKOS Congress*, Toronto, Canada, May 2013.

Briggs KK, Doran G. Measuring General Health: Conversion of Data Forms SF-12 to VR12 Scoring. ePoster. *9th Biennial ISAKOS Congress*, Toronto, Canada, May 2013.

Briggs KK, Philippon MJ, Herzog M, Goljan P. Quality of Life Assessment for Non-Operative Treatment Versus Arthroscopy for Femoroacetabular Impingement. Podium. *9th Biennial ISAKOS Congress*, Toronto, Canada, May 2013.

Ho CP, Briggs KK. Sensitivity and Specificity of 3T MRI in Detecting Tears of the Ligamentum Teres. ePoster. *9th Biennial ISAKOS Congress*, Toronto, Canada, May 2013.

Briggs KK, Philippon MJ, Goljan P, Devitt BM, Peixoto LP. Comparison of Radiographic Hip Joint Space in Weight-Bearing and Supine Radiographs in Patients with Hip Pathology. Poster. *Osteoarthritis Research Society International (OARSI) World Congress*, Philadelphia, PA, April 2013.

Briggs KK, Steadman JR, Rodkey WG. Patello-Femoral Cartilage: Patients with Grade IV Chondral Defects of the Patella Have Increased Disability. *OARSI World Congress*, Philadelphia, PA, April 2013.

Briggs KK, Steadman JR, Rodkey WG. The Effect of Lesion Size on Clinical Outcomes After Microfracture: 2- to 8-Year Follow-Up Study. *OARSI World Congress*, Philadelphia, PA, April 2013.

Clanton TO. Ankle Arthroscopy. *2nd Annual Desert Mountain Medical Foot and Ankle Symposium*, Vail, CO, January 2013.

Clanton TO. Internal Brace. *2nd Annual Desert Mountain Medical Foot and Ankle Symposium*, Vail, CO, January 2013.

Clanton TO. Lateral Ankle Reconstruction. *2nd Annual Desert Mountain Medical Foot and Ankle Symposium*, Vail, CO, January 2013.

Clanton TO, Matheny LM, Briggs KK. Foot Pathologies Associated with Decreased Activity Levels. ePoster. *9th Biennial ISAKOS Congress*, Toronto, Canada, May 2013.

Clanton TO, Briggs KK, Matheny LM. Psychometric Properties of Commonly Used Outcomes Scores in Patients with Foot and Ankle Injuries. ePoster. *9th Biennial ISAKOS Congress*, Toronto, Canada, May 2013.

Clanton TO. ICL: Management of Complex Foot and Ankle Injuries in the Athlete. *American Academy of Orthopaedic Surgeons (AAOS) Annual Meeting*, Chicago, IL, March 2013.

Clanton TO. ICL: The Land of Ligaments: Navigating Sprains, Strains, and Ruptures About the Foot and Ankle. *AAOS Annual Meeting*, Chicago, IL, March 2013.

Clanton TO. Symposium: Inside Job: The Nuts and Bolts of Sports Injury Management. *AAOS Annual Meeting*, Chicago, IL, March 2013.

Clanton TO. Arthroscopic Ankle Fusions. *Arthrex Advanced Orthopedic Surgeon Foot and Ankle Arthroscopy Course*, Vail, CO, April 2013.

Clanton TO. Cutting Edge Use of Arthroscopy in Foot and Ankle Surgery. *Arthrex Advanced Orthopedic Surgeon Foot and Ankle Arthroscopy Course*, Vail, CO, April 2013.

Clanton TO. Posterior Endoscopy/ Arthroscopy. *Arthrex Advanced Orthopedic Surgeon Foot and Ankle Arthroscopy Course*, Vail, CO, April 2013.

Clanton TO, Waldrop N, Wijdicks CA, Jansson KS, LaPrade R. Biomechanical Strength of Fixation of the Anterior Talofibular Ligament with Suture Versus Suture Anchor. *AAOS Annual Meeting*, Chicago, IL, March 2013.

Clanton TO, Matheny LM. Outcomes Following Lateral Ankle Ligament Repair vs. Reconstruction. *AAOS Annual Meeting*, Chicago, IL, March 2013.

Clanton TO, Waldrop N, Zirker C, Wijdicks CA, LaPrade RF. Radiographic Evaluation of Plantar Plate Injury: An In Vitro Biomechanical Study. *AAOS Annual Meeting*, Chicago, IL, March 2013.

Clanton TO, Viens NA, Wijdicks CA, Campbell KJ, LaPrade RF. Biomechanical Comparison of Augmented Broström Repair Techniques to the Intact Anterior Talofibular Ligament. Poster. *American Orthopaedic Foot & Ankle Society (AOFAS) Annual Meeting*, Hollywood, FL, July 2013.

Clanton TO, Matheny LM, Briggs KK. Do Outcome Measures Differ by Ankle Pathology? ePoster. *Arthroscopy Association of North America (AANA) Annual Meeting*, San Antonio, TX, April 2013.

Clanton TO, Matheny LM, Briggs KK. Foot Pathologies Associated with Decreased Activity Levels. ePoster. *AANA Annual Meeting*, San Antonio, TX, April 2013.

Clanton TO, Matheny LM, Hartline BE. Outcomes Following Lateral Ankle Ligament Repair vs. Reconstruction. ePoster. *AANA Annual Meeting*, San Antonio, TX, April 2013.

Clanton TO. Ligamentous Injuries of the Ankle – Lateral: Anatomic Reconstruction with Tendon Graft. *AOFAS Fall Course: Sports Injuries of the Foot and Ankle*, Houston, TX, October 2013.

Clanton TO. Miscellaneous Topics in Sports Medicine: Ankle Fractures in Athletes – Is There a Difference? *AOFAS Fall Course: Sports Injuries of the Foot and Ankle*, Houston, TX, October 2013.

Clanton TO. Arthroscopic Ankle Fusions: New PowerRasp Technology, Hand Instruments, and Precision Screw Placement with GPS. *Arthrex Advanced Foot and Ankle Surgeon Arthroscopy Course*, Vail, CO, December 2013.

Clanton TO. Cutting Edge Use of Arthroscopy in Foot and Ankle Surgery: New Concepts and Challenges. *Arthrex Advanced Foot and Ankle Surgeon Arthroscopy Course*, Vail, CO, December 2013.

Clanton TO. ICL Course: Problems of the Foot and Ankle and How to Tackle Them Using the Scope. *AANA Annual Meeting*, San Antonio, TX, April 2013.

Clanton TO. Osteochondral Lesions of the Talus. *AANA Annual Meeting*, San Antonio, TX, April 2013.

Clanton TO. Anterior Ankle Soft Tissue and Bony Impingement. *Smith and Nephew Master's Course: Foot and Ankle Arthroscopy*, Vail, CO, February 2013.

Clanton TO. Arthroscopic Treatment in Conjunction with Fracture Care of the Ankle. *Smith and Nephew Master's Course: Foot and Ankle Arthroscopy*, Vail, CO, February 2013.

Clanton TO. New Strategies for Foot and Ankle Injuries. *Society of Military Orthopaedic Surgeons (SOMOS) Annual Meeting*, Vail, CO, December 2013.

Clanton TO. The History & Current State of Lateral Ligament Reconstruction of the Ankle. *Steadman Clinic Grand Rounds*, Vail, CO, January 2013.

Espinoza-Ervin C, Horan MP, Warth RJ, Millett PJ. Prospective Comparison of the Effectiveness of an All Knotless Versus Knotted Transosseous Equivalent Double-Row Repair Technique in the Treatment of Rotator Cuff Tears: A Comparative Cohort Study. *30th Annual Congress of AGA - Society for Arthroscopy and Joint Surgery*, Wiesbaden, Germany, September 2013.

Faruqi S, Wijdicks CA, Foad A. The Accuracy of the Physical Exam Versus Arthroscopy in the Detection of Subscapularis Tendon Injury. Poster. *American Orthopaedic Society for Sports Medicine (AOSSM) Annual Meeting*, Chicago, IL, July 2013.

Fripp J, Surowiec RK, Lucas EP, Engstrom C, Shakes C, Schwarz R, Ho CP, Crozier S. Automated Cartilage Morphometric and T2 Mapping using 3D-FSE MRI at 3T. *The International Society for Magnetic Resonance in Medicine (ISMRM)*, Salt Lake City, UT, April 2013.

Giphart JE, Wilson K, Kagnes K, Millett PJ. Alterations in Glenohumeral Kinematics in Patients with Rotator Cuff Tears Using Biplane Fluoroscopy. Podium. *ORS Annual Meeting*, San Antonio, TX, January 2013.

Giphart JE, Wilson K, Kagnes K, Millett PJ. Hip and Pelvic Kinematics in Cam and Pincer FAI Patients During Constrained and Unconstrained Squatting. Podium. *9th Biennial ISAKOS Congress*, Toronto, Canada, May 2013.

Giphart JE, Costello K, Decker M, Souza B, Philippon MJ. Alterations in Glenohumeral Kinematics in Patients with Rotator Cuff Tears Using Biplane Fluoroscopy. Podium. *9th Biennial ISAKOS Congress*, Toronto, Canada, May 2013.

Goldsmith M, Jansson K, Smith S, Engebretsen L, LaPrade R, Wijdicks C. Functional Equivalence of Anatomic Single- and Double-Bundle ACL Reconstructions: An In Vitro Study. Poster. *ORS Annual Meeting*, San Antonio, TX, January 2013.

Goldsmith M, Jansson K, Smith S, Engebretsen L, LaPrade R, Wijdicks CA. Functional Equivalence of Anatomic Single- and Double-Bundle ACL Reconstructions: An In Vitro Study. Podium. *9th Biennial ISAKOS Congress*, Toronto, Canada, May 2013.

Horan MP, Warth RJ, Briggs KK, Millett PJ. Association Between Rotator Cuff Pathology and the Disabilities of the Arm, Shoulder and Hand (Quick-DASH) Score: Preoperative Factors That Influence Subjective Disability. Poster. *30th Annual Congress of AGA - Society for Arthroscopy and Joint Surgery*, Wiesbaden, Germany, September 2013.

Horan MP, Warth RJ, Briggs KK, Millett PJ. Association Between Rotator Cuff Pathology and the Disabilities of the Arm, Shoulder and Hand (Quick-Dash) Score: Preoperative Factors that Influence Subjective Disability. ePoster. *9th Biennial ISAKOS Congress*, Toronto, Canada, May 2013.

Horan MP, Warth RJ, Briggs KK, Millett PJ. Association Between Rotator Cuff Pathology and QuickDASH Score: Preoperative Factors That Influence Disability. ePoster. *AANA Annual Meeting*, San Antonio, TX, April 2013.

Horan MP, Warth RJ, Briggs KK, Millett PJ. Functional Limitations as Measured by the ASES Score for Patients That Present with Rotator Cuff Pathology. Podium. *AANA Annual Meeting*, San Antonio, TX, April 2013.

Johannsen A, Anderson C, Wijdicks CA, Engebretsen L, LaPrade RF. Radiographic Landmarks for Tunnel Positioning in PCL Reconstructions. Podium. *AAOS Annual Meeting*, Chicago, IL, March 2013.

LaPrade C, Jansson K, Dornan G, Smith S, Wijdicks CA, LaPrade RF. Biomechanical Comparison of Lateral Meniscus Posterior Horn Root Avulsions and Radial Tears and In Situ Pull-Out Repairs of Root Avulsions and Radial Tears. Poster. *ORS Annual Meeting*, San Antonio, TX, January 2013.

LaPrade C, Jansson K, Dornan G, Smith S, Wijdicks CA, LaPrade RF. Altered Tibiofemoral Contact Mechanics Due to Lateral Meniscus Posterior Horn Root Avulsions and Radial Tears Can Be Restored with In Situ Pull-Out Repairs. Poster. *9th Biennial ISAKOS Congress*, Toronto, Canada, May 2013.

LaPrade RF, Padalecki JR, Jansson KS, Dornan GJ, Smith SD, Wijdicks CA. Biomechanical Consequences of a Complete Radial Tear Adjacent to the Medial Meniscus Posterior Root Attachment Site. *AAOS Annual Meeting*, Chicago, IL, March 2013.

LaPrade RF, Johannsen AM, Anderson CJ, Wijdicks CA, Engebretsen L. Radiographic Landmarks for Tunnel Positioning in PCL Reconstructions. *AAOS Annual Meeting*, Chicago, IL, March 2013.

LaPrade RF. Biologic Arthroplasty (Meniscal and Osteochondral Transplants). *Arthrex Surgical Skills Master's Knee Course*, Vail, CO, March 2013.

LaPrade RF. Posterolateral Corner and MCL Reconstruction/Repair. *Arthrex Surgical Skills Master's Knee Course*, Vail, CO, March 2013.

LaPrade RF. An Approach to Lateral and Posterolateral Injuries. *Arthrex Symposium*, Bergen, Norway, September 2013.

LaPrade RF. Knee Dislocations and Multiligament Injuries. *Arthrex Symposium*, Bergen, Norway, September 2013.

LaPrade RF. Meniscal Allograft: Who Should Have Graft, Suture, or Resection? *Arthrex Symposium*, Bergen, Norway, September 2013.

LaPrade RF. Meniscal Root Tears. *Arthrex Symposium*, Bergen, Norway, September 2013.

LaPrade RF. Outcomes of Acute Repairs vs. Reconstructions for PLC Injuries. *9th Biennial ISAKOS Congress: Evidence-Based Treatment of Collateral Ligaments Symposium*, Toronto, Canada, May 2013.

LaPrade RF. Altered Tibiofemoral Contact Mechanics Due to Lateral Meniscus Posterior Horn Root Avulsions and Radial Tears Can Be Restored with In Situ Pull-Out Repairs. ePoster. *9th Biennial ISAKOS Congress*, Toronto, Canada, May 2013.

LaPrade RF, Engebretsen L, Levy B, Lind M, Wijdicks CA. Evidence-Based Treatment of Collateral Ligaments. *9th Biennial ISAKOS Congress*, Toronto, Canada, May 2013.

LaPrade RF. Symposium: Evidence-Based Treatment of Collateral Ligaments. Chairperson. *9th Biennial ISAKOS Congress*, Toronto, Canada, May 2013.

LaPrade RF. Program Chairman. *9th Biennial ISAKOS Congress*, Toronto, Canada, May 2013.

LaPrade RF. Combined Anatomic PCL and PLC Reconstruction. *ISAKOS Sports Rehabilitation Course: Global Perspectives for the Physical Therapist and Athletic Trainer*, Toronto, Canada, May 2013.

LaPrade RF. Surgical Options for Osteoarthritis. *ISAKOS Sports Rehabilitation Course: Global Perspectives for the Physical Therapist and Athletic Trainer*, Toronto, Canada, May 2013.

LaPrade RF, Philippon MJ, Nepple JJ. The Effect of an Acetabular Labral Tear, Repair, Resection, and Reconstruction on the Hip Fluid Seal. *International Society for Hip Arthroscopy (ISHA) Annual Meeting*, Munich, Germany, October 2013.

LaPrade RF. ACL Revisions. *Leddsaker og arthroscopisk kirurgi. Bløtdelsskader*, Hafjell, Norway, January 2013.

LaPrade RF. Meniscal Injuries. *Leddsaker og arthroscopisk kirurgi. Bløtdelsskader*, Hafjell, Norway, January 2013.

LaPrade RF. Surgical Treatment of Acute & Chronic Medial Knee Injuries. *Leddsaker og arthroscopisk kirurgi. Bløtdelsskader*, Hafjell, Norway, January 2013.

LaPrade RF. Improving Outcomes for Posterolateral Corner Injuries. *Mississippi Sports Medicine and Orthopaedic Center*, Jackson, MS, May 2013.

LaPrade RF. Life Lessons I Have Learned in Medicine. *Mississippi Sports Medicine and Orthopaedic Center*, Jackson, MS, May 2013.

LaPrade RF. PCL Current Concepts. *Mississippi Sports Medicine and Orthopaedic Center*, Jackson, MS, May 2013.

LaPrade RF. How to Build a Focused Research Program: The Oslo-Minnesota-Vail Example. *Norwegian School of Sport Sciences and Department of Sports Medicine at Oslo Sports Trauma Research Center sponsored Spring Seminar at Kleivstua*, Kleivstua, Norway, May 2013.

LaPrade RF. Orthopaedic Research and Education Foundation Clinical Research Award: Improving Outcomes for Posterolateral Corner Injuries. *ORS Annual Meeting*, San Antonio, TX, January 2013.

LaPrade RF. Anatomic Reconstruction of the Posterolateral Corner. *Global Insights: The Future of Hip & Knee Surgery*. *Smith & Nephew*, Copenhagen, Denmark, November 2013.

LaPrade RF. Management of Injuries to the Medial Knee Structures: Current Concepts. *Global Insights: The Future of Hip & Knee Surgery*. *Smith & Nephew*, Copenhagen, Denmark, November 2013.

LaPrade RF. ACL Graft Choices. *The Norwegian Arthroscopy Association Winter Meeting*, Kvitfjell, Norway, February 2013.

LaPrade RF. ACL Tunnel Positioning. *The Norwegian Arthroscopy Association Winter Meeting*, Kvitfjell, Norway, February 2013.

LaPrade RF. MCL Reconstruction. *The Norwegian Arthroscopy Association Winter Meeting*, Kvitfjell, Norway, February 2013.

LaPrade RF. Meniscal Root Avulsion. *The Norwegian Arthroscopy Association Winter Meeting*, Kvitfjell, Norway, February 2013.

LaPrade RF. Meniscal Suture. *The Norwegian Arthroscopy Association Winter Meeting*, Kvitfjell, Norway, February 2013.

LaPrade RF. Current Updates on Meniscal Root Tears 2013. *University of Oslo Hospital*, Oslo, Norway, May 2013.

LaPrade RF. Translational Research: From the Laboratory to the Operating Suite and Back. *Vail Hip Symposium*, Beaver Creek, CO, January 2013.

LaPrade RF. Knee Dislocation: Emergency Room Management. *Vail Valley Emergency Room Physicians Meeting*, Vail, CO, January 2013.

Martetschläger F, Horan MP, Warth RJ, Millett PJ. Tendon Graft Reconstruction for Sternoclavicular Joint Instability – Technique and Short-Term Results. Poster. *30th Annual Congress of AGA - Society for Arthroscopy and Joint Surgery*, Wiesbaden, Germany, September 2013.

Martetschläger F, Michalski M, Jansson K, Wijdicks C, Millett PJ. Biomechanical Evaluation of Knotless Anterior and Posterior Bankart Repairs. *40th Annual Meeting of Japan Shoulder Society*, Kyoto, Japan, September 2013.

Martetschläger F, Horan MP, Rios D, Millett PJ. The Bony Bankart Bridge Technique For Restoration of Anterior Shoulder Stability. ePoster. *9th Biennial ISAKOS Congress*, Toronto, Canada, May 2013.

Martetschläger F, Horan MP, Warth RJ, Millett PJ. Complications After Contemporary Acromioclavicular Joint Reconstructive Procedures. *AAOS Annual Meeting*, Chicago, IL, March 2013.

Martetschläger F, Horan MP, Warth RJ, Millett PJ. Complications After Contemporary Acromioclavicular Joint Reconstructions. ePoster. *AANA Annual Meeting*, San Antonio, TX, April 2013.

Martetschläger F, Horan MP, Warth RJ, Millett PJ. Tendon Graft Reconstruction for Sternoclavicular Joint Instability – Technique and Short-Term Results. ePoster. *AANA Annual Meeting*, San Antonio, TX, April 2013.

Martetschläger F, Horan MP, Rios D, Millett PJ. The Bony Bankart Bridge Technique for Restoration of Anterior Shoulder Stability. ePoster. *AANA Annual Meeting*, San Antonio, TX, April 2013.

Martetschläger F, Rios D, Horan MP, Millett PJ. Bony Bankart Bridge Technique for Restoration of Anterior Shoulder Stability. *AAOS Annual Meeting*, Chicago, IL, March 2013.

Millett PJ. AC Joint: Technique for Coracoclavicular (CC) Ligament Reconstruction. *14th Annual AAOS/AOSSM Sports Medicine Course: Elite Athletes to Weekend Warriors*, Park City, UT, February 2013.

Millett PJ. Complete the Tear or Fix In Situ: Partial Cuff Tears and PASTA Lesion. *14th Annual AAOS/AOSSM Sports Medicine Course: Elite Athletes to Weekend Warriors*, Park City, UT, February 2013.

Millett PJ. Distal Biceps Tendon Rupture: Technique and Results. *14th Annual AAOS/AOSSM Sports Medicine Course: Elite Athletes to Weekend Warriors*, Park City, UT, February 2013.

Millett PJ. Full Thickness Rotator Cuff Tears - Arthroscopic Repair: Technique, Perils, and Pitfalls. *14th Annual AAOS/AOSSM Sports Medicine Course: Elite Athletes to Weekend Warriors*, Park City, UT, February 2013.

Millett PJ. Subscapularis Tears: When Should I Do Surgery and How Best to Get There? *14th Annual AAOS/AOSSM Sports Medicine Course: Elite Athletes to Weekend Warriors*, Park City, UT, February 2013.

Millett PJ. Arthroscopic Treatment of Osteoarthritis in Young Patients. *30th Annual Congress of AGA - Society for Arthroscopy and Joint Surgery*, Wiesbaden, Germany, September 2013.

Millett PJ. Interactive Case Discussions Around the Shoulder Joint: Instability, Rotator Cuff, AC-Joint. *30th Annual Congress of AGA - Society for Arthroscopy and Joint Surgery*, Wiesbaden, Germany, September 2013.

- Millett PJ.** SpeedBridge Transosseous-Equivalent Rotator Cuff Repair. How to Get Reproducible Results. *30th Annual Congress of AGA - Society for Arthroscopy and Joint Surgery*, Wiesbaden, Germany, September 2013.
- Millett PJ.** Clavicle Fracture Fixation. *Arthrex 4th Annual Sports Medicine Fellowship Forum*, Naples, FL, May 2013.
- Millett PJ.** Double vs. Single Row Question and Answer. *Arthrex 4th Annual Sports Medicine Fellowship Forum*, Naples, FL, May 2013.
- Millett PJ.** Instability Solutions. *Arthrex 4th Annual Sports Medicine Fellowship Forum*, Naples, FL, May 2013.
- Millett PJ.** Proximal Humerus Fractures Options. *Arthrex 4th Annual Sports Medicine Fellowship Forum*, Naples, FL, May 2013.
- Millett PJ, Martetschläger F, Horan MP, Rios D, Millett PJ.** Complications Following Subpectoral Biceps Tenodesis with Interference Screw Fixation. ePoster. *9th Biennial ISAKOS Congress*, Toronto, Canada, May 2013.
- Millett PJ.** AC Joint Injuries. *AAOS Annual Meeting*, Chicago, IL, March 2013.
- Millett PJ.** Biceps and Subscapularis. 5SK ICL. *AAOS Annual Meeting*, Chicago, IL, March 2013.
- Millett PJ.** Surgical Skill Wet Lab. *AAOS Annual Meeting*, Chicago, IL, March 2013.
- Millett PJ.** Surgical Options for Recurrent Shoulder Dislocations. *SOMOS Annual Meeting*, Vail, CO, December 2013.
- Millett PJ.** AC Joint Dislocations and Clavicle Fractures. *Arthrex Surgical Skills Master's Shoulder Course*, Vail, CO, August 2013.
- Millett PJ.** Advancements in Instability Repair. *Arthrex Surgical Skills Master's Shoulder Course*, Vail, CO, August 2013.
- Millett PJ.** Advancements in Rotator Cuff Repair. *Arthrex Surgical Skills Master's Shoulder Course*, Vail, CO, August 2013.
- Millett PJ.** SpeedBridge. Surgical Demonstration. *Arthrex Medical Education Center*, Naples, FL, January 2013.
- Millett PJ.** SpeedBridge and SpeedFix Pearls Update. *Arthrex Medical Education Center*, Naples, FL, January 2013.
- Millett PJ.** AC Joint Dislocations and Clavicle Fractures. *Arthrex Surgical Skills Master's Shoulder Course*, Vail, CO, March 2013.
- Millett PJ.** Advancements in Instability Repair. *Arthrex Surgical Skills Master's Shoulder Course*, Vail, CO, March 2013.
- Millett PJ.** Advancements in Rotator Cuff Repair. *Arthrex Surgical Skills Master's Shoulder Course*, Vail, CO, March 2013.
- Millett PJ.** Proximal Humeral Fracture. *Arthrex Surgical Skills Master's Shoulder Course*, Vail, CO, March 2013.
- Millett PJ.** AC Joint Dislocations and Clavicle Fractures. *Arthrex Vail Shoulder Course*, Vail, CO, February 2013.
- Millett PJ.** Advancements in Rotator Cuff Repair. *Arthrex Vail Shoulder Course*, Vail, CO, February 2013.
- Millett PJ.** Pearls for Subscapularis Repair. *Arthrex Vail Shoulder Course*, Vail, CO, February 2013.
- Millett PJ.** Total Shoulder Arthroplasty. *Arthrex Vail Shoulder Course*, Vail, CO, February 2013.
- Millett PJ.** Case Base Learning IV: Making a Bad Situation Better. Panel. *AANA Fall Course*, Las Vegas, NV, November 2013.
- Millett PJ.** Glenohumeral Arthritis in the Young Patient. What to Do? *AANA Fall Course*, Las Vegas, NV, November 2013.
- Millett PJ.** Knotless Biologic Fixation of Rotator Cuff Tears with Collagen FiberTape Bridging Techniques. Focus Demonstration. *AANA Fall Course*, Las Vegas, NV, November 2013.
- Millett PJ.** Shoulder Laboratory Instructor. *AANA Fall Course*, Las Vegas, NV, November 2013.
- Millett PJ.** Arthroscopic Rotator Cuff Repair: State of the Art 2013. *Asociacion Argentina de Traumatologia del Deporte Congreso*, Buenos Aires, Argentina, April 2013.
- Millett PJ.** SLAP and Biceps. Get It Right in One Shot. *Asociacion Argentina de Traumatologia del Deporte Congreso*, Buenos Aires, Argentina, April 2013.
- Millett PJ.** Rotator Cuff Disorders: Current Concepts. *Grand Rounds Columbia University Medical Center*, New York, NY, June 2013.
- Millett PJ, Martetschläger F, Horan MP, Warth RJ.** Complications After Contemporary Acromioclavicular Joint Reconstructive Procedures. ePoster. *9th Biennial ISAKOS Congress*, Toronto, Canada, May 2013.
- Millett PJ.** The Bony Bankart Bridge Technique for Restoration of Anterior Shoulder Stability. ePoster. *9th Biennial ISAKOS Congress*, Toronto, Canada, May 2013.
- Millett PJ.** Management of Rotator Cuff Injuries. *Percival Pott Rotation - Annual Day St. Bartholomew's Hospital*, London, England, November 2013.

Millett PJ. Arthroscopic Treatment of Glenohumeral DJD. *Rocky Mountain Shoulder and Elbow Society 2013 Meeting*, Avon, CO, March 2013.

Millett PJ. Anatomic Rotator Cuff Repairs – Single vs. Double Rows. *Wrightington Arthroscopy Conference*, London, England, December 2013.

Millett PJ. DJD in Young Active Patients - Joint Preserving Options. *Wrightington Arthroscopy Conference*, London, England, December 2013.

Millett PJ. Large Subscapularis Repair – Tips & Tricks. *Wrightington Arthroscopy Conference*, London, England, December 2013.

Millett PJ. Massive Rotator Cuff Tears of Bridging Repair Technique. Live Surgical Demonstration. *Wrightington Arthroscopy Conference*, London, England, December 2013.

Millett PJ. The Bony Bankart Bridge Technique. *Wrightington Arthroscopy Conference*, London, England, December 2013.

Nepple J, Campbell K, Wijdicks C, Jansson K, LaPrade R, Philippon M. The Effect of an Acetabular Labral Tear, Repair, Resection, and Reconstruction on the Hip Fluid Seal. Podium. *ISHA Annual Meeting*, Munich, Germany, October 2013.

Padalecki J, Jansson K, Smith S, Pierce C, Dornan G, Wijdicks CA, LaPrade RF. Biomechanical Consequences of a Complete Radial Tear Adjacent to the Medial Meniscus Posterior Root Attachment Site: In Situ Pull-Out Repair Restores Derangement of Joint Mechanics. Poster. *ORS Annual Meeting*, San Antonio, TX, January 2013.

Padalecki J, Jansson K, Smith S, Pierce C, Dornan G, Wijdicks CA, LaPrade RF. Biomechanical Consequences of a Complete Radial Tear Adjacent to the Medial Meniscus Posterior Root Attachment Site. Podium. *AAOS Annual Meeting*, Chicago, IL, March 2013.

Petre BM, Smith SD, Jansson KS, de Meijer PP, Hackett TR, LaPrade RF, Wijdicks CA. Biomechanical Evaluation of Femoral Soft Tissue Fixation Techniques for ACL Reconstruction. Poster. *ORS Annual Meeting*, San Antonio, TX, January 2013.

Petre BM, Smith SD, Jansson KS, de Meijer PP, Hackett TR, LaPrade RF, Wijdicks CA. Fixed and Variable Loop Femoral Cortical Suspension Devices for Soft Tissue ACL Reconstruction: A Biomechanical Study. Poster. *9th Biennial ISAKOS Congress*, Toronto, Canada, May 2013.

Philippon MJ. Debate: Teacher vs. Student: Labral Reconstruction is Necessary for a Deficient Labrum. Podium. *3rd Annual Emerging Techniques in Orthopaedics Conference*, Las Vegas, NV, December 2013.

Philippon MJ. Labral Deficiency: Primary Debridement vs. Primary Reconstruction: How Do I Do It? Step by Step! Podium. *3rd Annual Emerging Techniques in Orthopaedics Conference*, Las Vegas, NV, December 2013.

Philippon MJ. Ligamentum Teres: Why I Reconstruct Sometimes? Podium. *3rd Annual Emerging Techniques in Orthopaedics Conference*, Las Vegas, NV, December 2013.

Philippon MJ. Acetabular Labral Tears: Debridement, Repair or Reconstruction. *5th International Hip Meeting*, Santander, Spain, February 2013.

Philippon MJ. Arthroscopic Osteochondral Mosaicplasty and Resurfacing of the Femoral Head. *5th International Hip Meeting*, Santander, Spain, February 2013.

Philippon MJ. Groin Pain after Open/ Arthroscopic FAI Surgery: The Role and Treatment of Adhesions. *5th International Hip Meeting*, Santander, Spain, February 2013.

Philippon MJ. FAI in Athletes. *86th Annual Meeting of the Japanese Orthopaedic Association*, Hiroshima, Japan, May 2013.

Philippon MJ. FAI Controversies: How Young? How Old? *AAOS Annual Meeting*, Chicago, IL, March 2013.

Philippon MJ. Hip Arthroscopy: Fundamental Techniques and Foundational Skills ICL: Pincer Impingement. *AAOS Annual Meeting*, Chicago, IL, March 2013.

Philippon MJ. Hip Arthroscopy: Fundamental Techniques and Foundational Skills ICL: The Modified Supine Position. *AAOS Annual Meeting*, Chicago, IL, March 2013.

Philippon MJ. Impact of Chondrolabral Dysfunction on the Athlete. Smith & Nephew Booth Talk. *AAOS Annual Meeting*, Chicago, IL, March 2013.

Philippon MJ. Sports Medicine/ Arthroscopy VII: Hip. Co-Moderator. *AAOS Annual Meeting*, Chicago, IL, March 2013.

Philippon MJ. CAM FAI. *AAOS/ American Association of Hip and Knee Surgeons (AAHKS)/Pediatric Orthopaedic Society of North America (POSNA) Hip Preservation in the Adolescent and Young Adult*, Chicago, IL, March 2013.

Philippon MJ. Case Study: FAI in a Young Professional Snowboarder. *AAOS/AAHKS/POSNA Hip Preservation in the Adolescent and Young Adult*, Chicago, IL, March 2013.

Philippon MJ. Ligamentous Instability of the Hip: Yes! Podium. *ISHA Annual Meeting*, Munich, Germany, October 2013.

Philippon MJ, Skendzel J, Goljan P, Briggs K. Hip Arthroscopy for FAI: Predictors of Patient Satisfaction and Conversion to Total Hip Arthroplasty 5 to 7 Years Following Arthroscopy. Podium. *AOSSM Annual Meeting*, Chicago, IL, July 2013.

Philippon MJ. Labral Reconstruction. Demonstration. *AOSSM Annual Meeting*, Chicago, IL, July 2013.

Philippon MJ, Skendzel J, Goljan P, Briggs K. Radiographic Evaluation of Pincer-Type FAI: Do Coxa Profunda and the Crossover Sign Guarantee Acetabular Overcoverage? ePoster. *AOSSM Annual Meeting*, Chicago, IL, July 2013.

Philippon MJ. Scientific Session - Hip. Moderator. *AOSSM Annual Meeting*, Chicago, IL, July 2013.

Philippon MJ, Geyer M, Fagrelus T, Briggs KK. Acetabular Labral Reconstruction with Iliotibial Band Autograft: Analysis at Minimum 3 Years Follow-Up. Podium. *AOSSM Specialty Day*, Chicago, IL, March 2013.

Philippon MJ. Clinical Case Panel: Arthroscopic Treatment of Hip Tendon Disorders. Panelist. *AANA Annual Meeting*, San Antonio, TX, April 2013.

Philippon MJ, Peixoto L, Goljan B, Briggs K. Physical Examination and Radiographic Findings Insufficient to Detect Ligamentum Teres Tears in Patients with Femoroacetabular Impingement. ePoster. *AANA Annual Meeting*, San Antonio, TX, April 2013.

Philippon MJ, Goljan P, Briggs KK. Quality of Life Assessment for Non-Operative Treatment Versus Arthroscopy for Femoroacetabular Impingement. ePoster. *AANA Annual Meeting*, San Antonio, TX, April 2013.

Philippon MJ. Reconstruction Techniques in Hip Arthroscopy: What's on the Horizon? *AANA Annual Meeting*, San Antonio, TX, April 2013.

Philippon MJ, Devitt P, Peixoto L, Goljan P, Ho CP, Briggs KK. Sensitivity and Specificity of MRI in Diagnosing Complete LT Tears. ePoster. *AANA Annual Meeting*, San Antonio, TX, April 2013.

Philippon MJ. Course 101 Hip Model Laboratory. *AANA Fall Course*, Las Vegas, NV, November 2013.

Philippon MJ. Hip Arthroscopy: My Approach to FAI in the Athlete. Surgical Demonstration. *AANA Fall Course*, Las Vegas, NV, November 2013.

Philippon MJ. Labral Cartilage: Repair or Reconstruct? Podium. *AANA Fall Course*, Las Vegas, NV, November 2013.

Philippon MJ. Mini Fellowship in Hip Arthroscopy. Laboratory. *AANA Fall Course*, Las Vegas, NV, November 2013.

Philippon MJ. FAI – Overcalled? Undertreatment? When and How to Address Hip Impingement. *AANA Specialty Day*, Chicago, IL, March 2013.

Philippon MJ, Ferro FP, Briggs KK. Arthroscopy Provides Relief of Symptoms and Functional Good Results in Patients with Primary Hip Synovial Chondromatosis. Podium. *Brazilian Congress of Arthroscopy and Sports Traumatology*, Fortaleza, Brazil, August 2013.

Philippon MJ, Ferro FP, Briggs KK. Return to Sport After Hip Arthroscopy for Femoroacetabular Impingement in Professional Football Players. Podium. *Brazilian Congress of Arthroscopy and Sports Traumatology*, Fortaleza, Brazil, August 2013.

Philippon MJ. Professional Soccer Players and Return to Competitive Sport After Hip Arthroscopy Due to Femoroacetabular Impingement. Podium. *Brazilian Orthopedic Surgery Congress*, Curitiba, Brazil, November 2013.

Philippon MJ. Advanced Arthroscopic Techniques. Moderator. *Harvard 43rd Annual Advances in Arthroscopy Course*, Cambridge, MA, October 2013.

Philippon MJ. Femoroacetabular Impingement: Treatment and Results of the Arthroscopic Approach with Labral Takedown. Podium. *Harvard 43rd Annual Advances in Arthroscopy Course*, Cambridge, MA, October 2013.

Philippon MJ. Labral Debridement Versus Repair: How to Decide and Do. Podium. *Harvard 43rd Annual Advances in Arthroscopy Course*, Cambridge, MA, October 2013.

Philippon MJ. The Hip Capsule–Cut It with Repair. Podium. *Harvard 43rd Annual Advances in Arthroscopy Course*, Cambridge, MA, October 2013.

Philippon MJ. Treatment Algorithms for NFL Players with Hip Injuries. *Herodius Meeting*, Kohler, WI, July 2013.

Philippon MJ. Labral Reconstruction. *10th Symposium on Joint Preserving and Minimally Invasive Surgery of the Hip*, Quebec City, Canada, May 2013.

Philippon MJ, Devitt B, Michalski M, Goldsmith MT, Wijdicks CA. A Qualitative and Quantitative Analysis of the Arthroscopically Relevant Anatomy of the Acetabulum. Poster. *ISHA Annual Meeting*, Munich, Germany, October 2013.

Philippon MJ, Michalski M, Devitt B, Campbell K, Goldsmith MT, LaPrade RF. Clinically Relevant Osseous and Soft Tissue Anatomy of the Proximal Femur. Poster. *ISHA Annual Meeting*, Munich, Germany, October 2013.

Philippon MJ. Capsular Reconstruction: A Complex Case Discussion. Podium. International Arthroscopy Meeting: 1st International Meeting About Regenerative Medicine Applied to the Hip. *5th Hip Arthroscopy International Course*, Sao Paulo, Brazil, December 2013.

Philippon MJ. Hip Arthroscopy Revision: What Hurts? Podium. International Arthroscopy Meeting: 1st International Meeting About Regenerative Medicine Applied to the Hip. *5th Hip Arthroscopy International Course*, Sao Paulo, Brazil, December 2013.

Philippon MJ. Hip Capsule and Hip Instability: Anatomy and Function. Podium. International Arthroscopy Meeting: 1st International Meeting About Regenerative Medicine Applied to the Hip. *5th Hip Arthroscopy International Course*, Sao Paulo, Brazil, December 2013.

Philippon MJ. History and Development of Femoroacetabular Treatment. Podium. International Arthroscopy Meeting: 1st International Meeting About Regenerative Medicine Applied to the Hip. *5th Hip Arthroscopy International Course*, Sao Paulo, Brazil, December 2013.

Philippon MJ. Labrum: Function, Preservation, and Reconstruction. Podium. International Arthroscopy Meeting: 1st International Meeting About Regenerative Medicine Applied to the Hip. *5th Hip Arthroscopy International Course*, Sao Paulo, Brazil, December 2013.

Philippon MJ. Comprehensive Approach to Hip Preservation. Laboratory. *ISHA Annual Meeting*, Munich, Germany, October 2013.

Philippon MJ. How to Educate People in Hip Arthroscopy. Panel. *ISHA Annual Meeting*, Munich, Germany, October 2013.

Philippon MJ. Innovations in Treatment of Hip Disorders in Athletes—Cell Therapies. Podium. *International Stem Cell Meeting*, San Diego, CA, September 2013.

Philippon MJ, Balldin BC, Wijdicks CA, Stull J, Jansson KS. Effect of Arthroscopic Notching During Osteoplasty of Cam Lesions for the Treatment of Femoroacetabular Impingement: A Biomechanical Analysis. Podium. *9th Biennial ISAKOS Congress*, Toronto, Canada, May 2013.

Philippon MJ, Wilson K, Giphart JE, Costello K, Decker M, Souza B. Hip and Pelvic Kinematics in Cam and Pincer FAI Patients During Constrained and Unconstrained Squatting. Podium. *9th Biennial ISAKOS Congress*, Toronto, Canada, May 2013.

Philippon MJ. Hip Arthroscopy in the Athlete. *9th Biennial ISAKOS Congress*, Toronto, Canada, May 2013.

Philippon MJ, Boykin R, Patterson D, Briggs K. Hip Flexion Strength and Torque after Arthroscopic Fractional Lengthening of the Iliopsoas Tendon. Podium. *9th Biennial ISAKOS Congress*, Toronto, Canada, May 2013.

Philippon MJ. Hip Labral Reconstruction Surgical Demonstration. Live Surgical Demonstration. *9th Biennial ISAKOS Congress*, Toronto, Canada, May 2013.

Philippon MJ. Hip Labral Reconstruction. Surgical Demonstration. *9th Biennial ISAKOS Congress*, Toronto, Canada, May 2013.

Philippon MJ, Briggs KK, Herzog M, Goljan P. Quality Of Life Assessment for Non-Operative Treatment Versus Arthroscopy for Femoroacetabular Impingement. Podium. *9th Biennial ISAKOS Congress*, Toronto, Canada, May 2013.

Philippon MJ, Peixoto L, Goljan P, Devitt B, Briggs K. Physical Examination and Radiographic Findings Insufficient to Detect Ligamentum Teres Tears in Patients with Femoroacetabular Impingement. ePoster. *9th Biennial ISAKOS Congress*, Toronto, Canada, May 2013.

Philippon MJ, Peixoto L, Goljan P, Devitt B, Briggs K. Prevalence of Ligamentum Teres Lesions in Femoroacetabular Impingement. ePoster Presentation. *9th Biennial ISAKOS Congress*, Toronto, Canada, May 2013.

Philippon MJ, Devitt B, Peixoto L, Goljan P, Ho CP, Briggs KK. Sensitivity and Specificity of MRI in Diagnosing Complete LT Tears. ePoster. *9th Biennial ISAKOS Congress*, Toronto, Canada, May 2013.

Philippon MJ. Soft Tissue Management in Arthroscopic Hip Preservation: What Do We Do with the Capsule and Labrum in 2013 and Does it Matter for My Patient. Lunchtime Workshop. *9th Biennial ISAKOS Congress*, Toronto, Canada, May 2013.

Philippon MJ, Briggs KK, Goljan P, Peixoto L. The Hip Dial Test to Diagnose Symptomatic Hip Instability. Podium. *9th Biennial ISAKOS Congress*, Toronto, Canada, May 2013.

Philippon MJ. Trainee Award Session. Moderator. *ISHA Annual Meeting*, Munich, Germany, October 2013.

Philippon MJ. When and Why I Reconstruct the Labrum. Podium. *ISHA Annual Meeting*, Munich, Germany, October 2013.

Philippon MJ, Briggs KK. Hip Joint Space Disability. Poster. *OARSI World Congress*, Philadelphia, PA, April 2013.

Philippon MJ. Hip Arthroscopy. *The 86th Annual Meeting of the Japanese Orthopaedic Association*, Hiroshima, Japan, May 2013.

Philippon MJ. Clinical Presentation of Hip Instability. *Vail Hip Symposium*, Vail, CO, January 2013.

Philippon MJ. Labral Reconstruction. *Vail Hip Symposium*, Vail, CO, January 2013.

Philippon MJ. Radiographic Exam of the Hip. *Vail Hip Symposium*, Vail, CO, January 2013.

Philippon MJ. Return to Play Following Hip Arthroscopy. *Vail Hip Symposium*, Vail, CO, January 2013.

Philippon MJ. Arthroscopic Approach to FAI. *Val D'Isere International Hip Course*, Val d'Isere, France, February 2013.

Philippon MJ. Results of Arthroscopic Treatment of FAI. *Val D'Isere International Hip Course*, Val d'Isere, France, February 2013.

Rios D, Jansson K, Martetschläger F, Boykin R, Millett P, Wijdicks C. Restoration of Normal Radius of Curvature When Performing an Osteochondral Allograft to the Glenoid Surface: An Anatomic Computed Tomographic Comparison. Poster. *ORS Annual Meeting*, San Antonio, TX, January 2013.

Rios D, Martetschläger F, Horan MP, Millett PJ. Complications Following Subpectoral Biceps Tenodesis with Interference Screw Fixation. ePoster. *AANA Annual Meeting*, San Antonio, TX, April 2013.

Rios D, Martetschläger F, Horan MP, Millett PJ. Complication After Biceps Tenodesis. *American Shoulder and Elbow Surgeons Specialty Course*, Chicago, IL, March 2013.

Rodkey WG, Briggs KK, Steadman JR. Grade IV Patellofemoral Chondral Defects Result in Increased Patient Disability. *11th World Congress of the International Cartilage Repair Society (ICRS)*, Izmir, Turkey, September 2013.

Rodkey WG, Briggs KK, Steadman JR. Microfracture Clinical Outcomes Are Not Influenced by Lesion Size: A 2- to 8-Year Follow-Up Study. *11th World Congress of the ICRS*, Izmir, Turkey, September 2013.

Rodkey WG, Steadman JR. Patellar Tendinitis: Surgical Approach, The Vail experience. *Barcelona Knee Meeting (BKM '13)*, Barcelona, Spain, February 2013.

Rodkey WG, Steadman JR. Return to Sports after Meniscectomy or Meniscus Replacement. *BKM '13*, Barcelona, Spain, February 2013.

Rodkey WG, Steadman JR. The Role of Platelet-Rich Plasma (PRP) to Treat Patellar Tendinitis. *BKM '13*, Barcelona, Spain, February 2013.

Rodkey WG, Steadman JR. What to Do? A Chondral Lesion and a Meniscus Tear at Age 40. *BKM '13*, Barcelona, Spain, February 2013.

Rodkey WG. 25 Years of Microfracture: What Have We Learned? *Dublin Knee Surgery for Sports Injuries*, Dublin, Ireland, September 2013.

Rodkey WG. Biology and Biomechanics of ACL Reconstruction Healing. *Dublin Knee Surgery for Sports Injuries*, Dublin, Ireland, September 2013.

Rodkey WG. Meniscus Repair Healing: Biological Enhancement Techniques. *Dublin Knee Surgery for Sports Injuries*, Dublin, Ireland, September 2013.

Rodkey WG. The Role of PRP in Treating Sports Medicine Injuries: An Update. *Dublin Knee Surgery for Sports Injuries*, Dublin, Ireland, September 2013.

Rodkey WG, Briggs KK, Steadman JR. The Effect of Lesion Size on Clinical Outcomes After Microfracture: A 2- to 8-Year Follow-Up Study. *European Federation of National Associations of Orthopaedics and Traumatology (EFORT) 14th Congress*, Istanbul, Turkey, June 2013.

Rodkey WG. Autologous Chondrocyte Implantation DEBATE: Why We Don't Use It and What the Options Are. *9th Biennial ISAKOS Congress*, Toronto, Canada, May 2013.

Rodkey WG. Collagen Meniscus Implants and Other Resorbable Meniscus Scaffolds. *Société Internationale de Chirurgie Orthopédique et de Traumatologie (SICOT) Orthopaedic World Conference*, Hyderabad, India, October 2013.

Rodkey WG, Briggs KK, Steadman JR. Effect of Lesion Size on Clinical Outcomes After Microfracture: A 2- to 8-Year Follow-Up Study. *SICOT Orthopaedic World Conference*, Hyderabad, India, October 2013.

Rodkey WG. Microfracture: The Vail Experience. Science, Technique, Lessons Learned, and Results. *SICOT Orthopaedic World Conference*, Hyderabad, India, October 2013.

Rodkey WG, Steadman JR. Meniscus Replacement with Collagen Meniscus Implants (CMI): Techniques, Tips and Tricks. *The Meniscus 2013*, Versailles, France, February 2013.

Rodkey WG. Microfracture: The Vail Experience. Technique and Lessons Learned. *Vail Hip Symposium*, Beaver Creek, CO, January 2013.

Rodkey WG. What's New in Cartilage Repair. Visiting Professor and Orthopaedic Grand Rounds. *Hospital de la Sta Creu I Sant Pau*, Barcelona, Spain, February 2013.

Rodkey WG. Chondral Regeneration and Cellular Therapy: Basic Science and Animal Model Studies. *Regenerative Cellular Therapy and Tissue Engineering*, Santiago, Chile, June 2013.

Smith S, Wijdicks CA, Jansson KS, Boykin R, Martetschlaeger F, de Meijer PP, Millett PJ, Hackett T. Stability of Mid-Shaft Clavicle Fractures After Plate Fixation Versus Intramedullary Repair and After Hardware Removal. Poster. *ORS Annual Meeting*, San Antonio, TX, January 2013.

Smith S, Wijdicks CA, Jansson KS, Boykin R, Martetschlaeger F, de Meijer PP, Millett PJ, Hackett T. Stability of Mid-Shaft Clavicle Fractures After Plate Fixation Versus Intramedullary Repair and After Hardware Removal. Poster. *9th Biennial ISAKOS Congress*, Toronto, Canada, May 2013.

Spiegel U, Horan MP, Smith S, Ho CP, Millett PJ. The Critical Shoulder Angle is Predictive of Rotator Cuff Tears and Shoulder Osteoarthritis and Is Better Assessed with Radiographs over MRI. ePoster. *Shoulder and Elbow Surgeons 2013 Closed Meeting*, Las Vegas, NV, October 2013.

Steadman JR, Rodkey WG. Chondral Lesions: Microfracture to Treat 2 to 4 cm² Medial Condyle Defects. *BKM '13*, Barcelona, Spain, February 2013.

Steadman JR, Rodkey WG. Collagen Meniscus Implant (CMI) Results: A Developer's View. *The Meniscus 2013*, Versailles, France, February 2013.

Steadman JR, Rodkey WG. Future of Stem Cells and Cartilage Repair in a Clinical Practice: Promises and Challenges. *Vail Hip Symposium*, Beaver Creek, CO, January 2013.

Steadman JR. Microfracture: The Vail Experience – The Science, Techniques, and Results. *Vail Hip Symposium*, Beaver Creek, CO, January 2013.

Surowiec RK, Smith WS, Wilson KJ, Dornan GD, Philippon MJ, Ho CP. T2 Values of Articular Cartilage in the Asymptomatic Hip: Subregional Method for Analysis and Reporting of Values. Podium. *ISHA Annual Meeting*, Munich, Germany, October 2013.

Viens NA, Wijdicks CA, Campbell KJ, LaPrade RF, Clanton TO. Biomechanical Comparison of Augmented Broström Repair Techniques to the Intact Anterior Talofibular Ligament. Poster. *AOFAS Annual Meeting*, Hollywood, FL, July 2013.

Waldrop N, Zirker C, Wijdicks CA, LaPrade RF, Clanton T. Radiographic Evaluation of Plantar Plate Injury: An In Vitro Biomechanical Study. Podium. *AAOS Annual Meeting*, Chicago, IL, March 2013.

Waldrop N, Zirker C, Wijdicks CA, LaPrade R, Clanton T. Radiographic Evaluation of Plantar Plate Injury. Poster. *9th Biennial ISAKOS Congress*, Toronto, Canada, May 2013.

Waldrop N, Wijdicks CA, Jansson KS, LaPrade R, Clanton T. Biomechanical Strength of Fixation of the Anterior Talofibular Ligament with Suture Versus Suture Anchor. Poster. *AAOS Annual Meeting*, Chicago, IL, March 2013.

Wijdicks C, Philippon M, Civitarese D, Costello K, Wages J, Giphart E, LaPrade R. Hip Kinematics in Ice Hockey Goaltenders Performing a Butterfly Motion and the Effects of a Mandated Change in Goalie Pad Width. Poster. *ORS Annual Meeting*, San Antonio, TX, January 2013.

Wijdicks CA, Goldsmith MT, Jansson KS, Smith S, Engebretsen L, LaPrade RF. Biomechanical Comparison of Anatomic Single- and Double-Bundle ACL Reconstructions: An In Vitro Study. Podium. *9th Biennial ISAKOS Congress*, Toronto, Canada, May 2013.

Wijdicks CA. Radiographic Evaluation of Plantar Plate Injury. ePoster. *9th Biennial ISAKOS Congress*, Toronto, Canada, May 2013.

Wijdicks CA. Stability of Mid-Shaft Clavicle Fractures After Plate Fixation Versus Intramedullary Repair and After Hardware Removal. ePoster. *9th Biennial ISAKOS Congress*, Toronto, Canada, May 2013.

Wilson KJ, Giphart JE, Kagnes K, Millett PJ. Alterations in Glenohumeral Kinematics in Patients with Rotator Cuff Tears Using Biplane Fluoroscopy. ePoster. *AANA Annual Meeting*, San Antonio, TX, April 2013.

Wilson KJ, Giphart JE, Kagnes K, Millett PJ. Alterations in Glenohumeral Kinematics in Patients with Rotator Cuff Tears Using Biplane Fluoroscopy. Podium. *9th Biennial ISAKOS Congress*, Toronto, Canada, May 2013.

EVENTS



GRAMMY AWARD WINNER DARIUS RUCKER HEADLINED “ROCK THE RESEARCH” FUNDRAISING EVENT FOR THE STEADMAN PHILIPPON RESEARCH INSTITUTE

Grammy Award-winning country music superstar Darius Rucker headlined the “Rock the Research” summer fundraising concert to benefit the Steadman Philippon Research Institute (SPRI). The annual event was held Monday, July 14, at the Gerald R. Ford Amphitheater in Vail, Colo. This marked Rucker’s fourth appearance at the SPRI event and first since 2012.

Bruce Smith, a National Football League Hall of Fame member, was a special guest of Dr. Richard Steadman.

“Darius is a fantastic performer who always puts on a great show,” said Richard Steadman, M.D., founder of The Steadman Clinic and co-chairman of SPRI, “but what makes his concerts here so special is that he is also a former patient of ours who embraces our mission of helping people remain active. We are grateful for Darius’ support.”

As the lead singer of Hootie & the Blowfish, Rucker was one of the most popular frontmen in mainstream pop/rock during the mid-’90s. The Grammy Award-winning band charted six Top 40 hits on the Billboard 100.

Rucker moved on to a solo recording and performing career, focusing primarily on country music. In 2009, he became the first African American to win the New Artist Award from the Country Music Association and only the second African American to win any award from the association.

Proceeds from “Rock the Research” and the corresponding live auction supported new research related to sports injury prevention and innovative treatments for orthopaedic injuries and musculoskeletal conditions. This includes the prevention and treatment of osteoarthritis, as well as new initiatives to prevent sports injuries in youth.

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 performed by Dr. Steadman. "He protected me. He did not let them rush me back onto 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.

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VAIL VALLEY MEDICAL CENTER 2014 STEADMAN PHILIPPON RESEARCH INSTITUTE GOLF CLASSIC PRESENTED BY RE/MAX, LLC

The Institute was selected by RE/MAX, LLC, the global real estate firm, to organize the 11th annual Golf Classic at Sanctuary, a premier golf resort located south of Denver.

Proceeds from the tournament support the development of new procedures and methodology to battle degenerative arthritis. The tournament was open to the public and included grateful patients and corporate supporters.

Since 2004, the Institute has raised more than \$1,460,000 from this golf tournament to support its research programs.

The Institute is grateful to Mr. Dave and Mrs. Gail Liniger, owners and co-founders of RE/MAX, LLC who developed Sanctuary and created this unique opportunity for the Institute to develop and enhance relationships with those who support our mission. In addition, we wish to express our sincere appreciation to the following sponsors and participants:

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ASSOCIATES

The Institute is proud to recognize its team of associates who carry out the research and educational mission in Vail. The staff has been selected for its diverse training and background in biomechanics, engineering, clinical research, veterinary science, and computer science. Together, the staff members take a multidisciplinary approach to their work in solving orthopaedic sports medicine problems.

ADMINISTRATION

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Steadman Philippon
Research Institute

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The Steadman Clinic
Steadman Philippon
Research Institute

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Statistician

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Research Engineer

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Adriana Saroki

Research Assistant

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STEADMAN PHILIPPON RESEARCH INSTITUTE

INDEPENDENT AUDITORS' REPORT

To the Board of Directors
Steadman Philippon Research Institute and Subsidiary
Vail, Colorado

We have audited the accompanying consolidated financial statements of Steadman Philippon Research Institute and Subsidiary, which are comprised of the consolidated statements of financial position as of December 31, 2013 and 2012, and the related consolidated statements of activities, functional expenses, and cash flows for the years then ended, and the related notes to the consolidated financial statements.

MANAGEMENT'S RESPONSIBILITY FOR THE FINANCIAL STATEMENTS

Management is responsible for the preparation and fair presentation of these consolidated financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

AUDITORS' RESPONSIBILITY

Our responsibility is to express an opinion on these consolidated financial statements based on our audits. We conducted our audits in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the consolidated financial statements. The procedures selected depend on the auditors' judgment, including the assessment of the risks of material misstatement of the consolidated financial statements, whether due to fraud or error. In making those risk assessments, the auditors consider internal control relevant to the entity's preparation and fair presentation of the consolidated financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

OPINION

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of Steadman Philippon Research Institute and Subsidiary as of December 31, 2013 and 2012, and the changes in their net assets and their cash flows for the years then ended in accordance with accounting principles generally accepted in the United States of America.

EKS&H LLLP

July 2, 2014
Denver, Colorado

Consolidated Statements of Financial Position

ASSETS	December 31,	
	2013	2012
Current assets		
Cash and cash equivalents	\$ 260,739	\$ 1,402,658
Accounts receivable	18,921	642
Accounts receivable, related parties	5,451	22,802
Contributions receivable, current portion	136,800	261,800
Prepaid expenses and other assets	27,189	977
Investments	5,175,573	4,606,283
Inventory	144,804	225,182
Total current assets	5,769,477	6,520,344
Contributions receivable, less current portion	92,421	174,342
Property and equipment, net	2,474,880	3,693,322
Investment, other	227,050	227,050
Deferred tax asset	14,885	-
Total assets	\$ 8,578,713	\$ 10,615,058
LIABILITIES AND NET ASSETS		
Current liabilities		
Accounts payable	\$ 157,686	\$ 199,385
Accrued expenses	242,368	336,697
Line-of-credit	263,500	-
Current portion of long-term debt	-	248,847
Current portion of capital leases	100,790	433,127
Current portion of deferred rent	-	153,616
Total current liabilities	764,344	1,371,672
Long-term liabilities		
Long-term debt, net of current portion	-	689,325
Capital leases, net of current portion	-	100,789
Deferred tax liability	-	6,425
Total liabilities	764,344	2,168,211
Commitments		
Net assets		
Unrestricted	7,373,711	7,079,142
Temporarily restricted	440,658	1,367,705
Total net assets	7,814,369	8,446,847
Total liabilities and net assets	\$ 8,578,713	\$ 10,615,058

Consolidated Statements of Activities

	For the Years Ended					
	December 31, 2013			December 31, 2012		
	Unrestricted	Temporarily Restricted	Total	Unrestricted	Temporarily Restricted	Total
REVENUES, GAINS, AND OTHER SUPPORT						
Contributions	\$ 955,974	\$ 698,898	\$ 1,654,872	\$ 998,080	\$ 457,593	\$ 1,455,673
Fundraising events	828,820	-	828,820	885,724	-	885,724
Grants and corporate partners	1,048,142	742,613	1,790,755	1,024,156	1,474,053	2,498,209
MRI income	962,514	-	962,514	962,514	-	962,514
Other income	2,133	-	2,133	3,228	-	3,228
In-kind contributions	111,071	-	111,071	201,835	-	201,835
	3,908,654	1,441,511	5,350,165	4,075,537	1,931,646	6,007,183
Net assets released from restrictions	2,368,558	(2,368,558)	-	2,162,605	(2,162,605)	-
Total revenues, gains, and other support	6,277,212	(927,047)	5,350,165	6,238,142	(230,959)	6,007,183
Expenses and losses						
BioMedical engineering	1,487,659	-	1,487,659	1,537,409	-	1,537,409
Center for translational and regenerative medicine research	241,760	-	241,760	236,647	-	236,647
Surgical skills laboratory	996,620	-	996,620	1,184,788	-	1,184,788
Center for outcomes-based orthopaedic research	851,876	-	851,876	833,904	-	833,904
Education department	577,207	-	577,207	361,025	-	361,025
Department of technology and multimedia communications	304,200	-	304,200	264,393	-	264,393
Imaging research	601,782	-	601,782	767,588	-	767,588
Management and general	625,659	-	625,659	789,462	-	789,462
Development	928,356	-	928,356	720,428	-	720,428
Total expenses and losses	6,615,119	-	6,615,119	6,695,644	-	6,695,644
Other income (expense)						
Investment return	578,194	-	578,194	471,317	-	471,317
Interest expense	(64,657)	-	(64,657)	(71,683)	-	(71,683)
Total other income	513,537	-	513,537	399,634	-	399,634
Rescinded pledge	-	-	-	(600,000)	-	(600,000)
Provision for income tax	118,939	-	118,939	(53,013)	-	(53,013)
Change in net assets	294,569	(927,047)	(632,478)	(710,881)	(230,959)	(941,840)
Net assets at beginning of year	7,079,142	1,367,705	8,446,847	7,790,023	1,598,664	9,388,687
Net assets at end of year	\$7,373,711	\$440,658	\$7,814,369	\$7,079,142	\$1,367,705	\$8,446,847

See notes to consolidated financial statements

Consolidated Statement of Functional Expenses

For the Year Ended December 31, 2013

	Program Services										Support Services			Total
	Biomedical Engineering	Center for Translational Regenerative Medicine Research	Surgical Skills Laboratory	Center for Outcomes-Based Orthopaedic Research	Education Department	Department of Technology and Multimedia Communications	Imaging Research	Total Program Services	Management and General	Development				
Salaries and benefits	\$ 666,245	\$ 155,314	\$ 83,449	\$ 699,376	\$ 394,540	\$ 213,133	\$ 79,788	\$ 2,291,845	\$ 271,939	\$ 312,013	\$ 2,875,797			
Consulting and contract labor	22,487	12,366	360	32,419	366	1,512	50,376	119,886	226,232	162,122	508,240			
Supplies (office, computer, lab)	290,380	652	270,890	20,660	2,462	9,416	3,232	597,692	4,275	5,402	607,369			
Events and fundraising	-	-	-	-	-	-	-	-	-	292,487	292,487			
Printing	31,689	585	451	4,131	351	1,159	314	38,680	1,161	30,566	70,407			
Maintenance and supplies	34,980	4,548	18,809	6,758	2,444	2,332	979	70,850	3,067	1,091	75,008			
Rent and leases	53,219	5,647	26,349	9,494	5,130	27,174	36,461	163,474	10,538	3,034	177,046			
Telephone and utilities	68,466	8,242	35,011	8,859	6,170	8,752	8,589	144,089	7,056	2,568	153,713			
Travel	16,978	24,301	760	26,171	25,115	289	5,000	98,614	44,158	103	142,875			
Legal and accounting	17,429	1,106	1,108	11,794	24,549	3,894	5,326	65,206	9,772	2,949	77,927			
Fellows	-	-	-	-	22,750	-	5,111	27,861	-	-	27,861			
Education meetings/lectures	-	2,500	-	-	46,168	-	-	48,668	-	-	48,668			
Direct mail/planned giving	-	-	-	-	-	-	-	-	-	98,164	98,164			
Meals and entertainment	3,841	1,266	744	2,859	11,737	-	250	20,697	1,893	254	22,844			
Gifts	1,104	1,420	1,045	1,517	632	379	253	6,350	6,010	452	12,812			
Postage	2,116	170	636	1,768	475	612	371	6,148	703	14,664	21,515			
Insurance	1,673	157	157	1,673	157	523	157	4,497	17,371	418	22,286			
Meeting fees/registrations and dues and subscriptions	4,485	2,786	150	4,835	24,561	179	5,509	42,505	814	475	43,794			
Bank/credit card fees	41	-	25	-	-	-	-	66	12,053	155	12,274			
Meetings (Board and SAC)	-	19,659	-	-	-	-	-	19,659	4,945	-	24,604			
Advertising	-	-	-	628	90	-	-	718	-	-	718			
Depreciation and amortization	1,215,133	240,719	439,944	832,942	567,697	269,354	201,716	3,767,505	621,987	926,917	5,316,409			
Total	\$ 1,487,659	\$ 241,760	\$ 996,620	\$ 851,876	\$ 577,207	\$ 304,200	\$ 601,782	\$ 5,061,104	\$ 625,659	\$ 928,356	\$ 6,615,119			

See notes to consolidated financial statements

Consolidated Statement of Functional Expenses

For the Year Ended December 31, 2012

	Program Services										Support Services			Total
	Biomedical Engineering	Center for Translational Regenerative Medicine Research	Surgical Skills Laboratory	Center for Outcomes-Based Orthopaedic Research	Education Department	Department of Technology and Multimedia Communications	Imaging Research	Total Program Services	Management and General	Development				
Salaries and benefits	\$ 657,071	\$ 159,690	\$ 79,448	\$ 644,712	\$ 223,778	\$ 182,516	\$ 171,800	\$ 2,119,015	\$ 151,856	\$ 121,587	\$ 2,392,458			
Consulting and contract labor	16,460	19,037	-	76,829	598	3,393	81,146	197,463	497,994	144,665	840,122			
Supplies (office, computer, lab)	315,397	1,770	428,181	9,485	760	7,885	17,919	781,397	11,399	7,362	800,158			
Events and fundraising	-	-	-	-	-	-	-	-	-	235,142	235,142			
Printing	6,273	1,126	430	5,432	304	408	47	14,020	1,231	67,322	82,573			
Maintenance and supplies	41,332	261	21,350	8,636	3,627	1,532	1,444	78,182	6,456	4,970	89,608			
Rent and leases	50,415	7,646	25,076	9,247	4,976	26,225	36,923	160,508	7,657	2,754	170,919			
Telephone and utilities	74,244	6,716	35,320	11,302	6,353	7,702	9,333	150,970	16,003	2,884	169,857			
Travel	20,659	16,540	526	25,688	(425)	2,879	13,044	78,911	20,965	4,188	104,064			
Legal and accounting	27,695	249	559	13,005	866	2,941	24,744	70,059	5,112	1,562	76,733			
Fellows	-	-	-	-	33,756	-	6,425	40,181	-	-	40,181			
Education meetings/lectures	-	-	-	-	59,566	-	-	59,566	-	-	59,566			
Direct mail/planned giving	-	-	-	-	-	-	-	-	-	81,976	81,976			
Meals and entertainment	3,895	2,500	873	3,592	427	1,090	467	12,844	11,772	21,995	46,611			
Gifts	3,026	3,776	414	1,991	221	714	521	10,663	15,976	3,787	30,426			
Postage	4,419	78	4,896	(799)	1,292	1,055	2,784	13,725	2,777	11,083	27,585			
Insurance	1,125	145	145	1,016	109	254	254	3,048	12,589	182	15,819			
Meeting fees/registrations and dues and subscriptions	9,454	2,928	250	3,205	14,388	315	457	30,997	350	250	31,597			
Bank/credit card fees	-	-	-	-	-	-	-	-	18,293	-	18,293			
Meetings (Board and SAC)	-	13,343	-	-	-	-	-	13,343	5,146	-	18,489			
Research grant	-	-	-	-	-	-	-	-	-	-	-			
Advertising	-	-	-	-	90	-	-	90	-	7,116	7,206			
Depreciation and amortization	1,231,465	235,805	597,468	813,341	350,686	238,909	367,308	3,834,982	785,576	718,825	5,339,383			
	305,944	842	587,320	20,563	10,339	25,484	400,280	1,350,772	3,886	1,603	1,356,261			
Total	\$ 1,537,409	\$ 236,647	\$ 1,184,788	\$ 833,904	\$ 361,025	\$ 264,393	\$ 767,588	\$ 5,185,754	\$ 789,462	\$ 720,428	\$ 6,695,644			

See notes to consolidated financial statements

Consolidated Statements of Cash Flows

For the Years Ended December 31

	2013	2012
Cash flows from operating activities		
Change in net assets	\$ (632,478)	\$ (941,840)
Adjustments to reconcile change in net assets to net cash (used in) provided by operating activities		
Depreciation and amortization expense	1,298,710	1,356,261
Net gain on investments	(615,165)	(485,795)
Rescinded pledge	-	600,000
Amortization of deferred rent	(153,616)	(153,624)
Donated stock	(15,933)	(32,503)
Deferred taxes	(21,310)	(115,575)
Changes in assets and liabilities		
Accounts receivable	(928)	(668)
Contributions receivable	206,921	(18,691)
Prepaid expenses and other assets	(26,212)	1,537
Inventory	80,378	276,498
Accounts payable	(41,699)	133,932
Accrued expenses	(94,329)	152,697
	616,817	1,714,069
Net cash (used in) provided by operating activities	(15,661)	772,229
Cash flows from investing activities		
Purchase of investments	(581,837)	(885,078)
Proceeds from sale of investments	643,645	1,461,400
Purchases of property and equipment	(80,268)	(103,801)
Net cash (used in) provided by investing activities	(18,460)	472,521
Cash flows from financing activities		
Payments on capital leases	(433,126)	(454,437)
Payments on long-term debt	(938,172)	(258,354)
Net borrowing (payments) on line-of-credit	263,500	(9,099)
Net cash used in financing activities	(1,107,798)	(721,890)
Net (decrease) increase in cash and cash equivalents	(1,141,919)	522,860
Cash and cash equivalents at beginning of year	1,402,658	879,798
Cash and cash equivalents at end of year	\$ 260,739	\$ 1,402,658

Supplemental disclosure of cash flow information:

Cash paid for interest was \$64,657 and \$71,683 for the years ended December 31, 2013 and 2012, respectively.

Cash paid for income taxes was \$0 and \$23,160 for the years ended December 31, 2013 and 2012, respectively.

Notes to Consolidated Financial Statements

NOTE 1

ORGANIZATION AND SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

ORGANIZATION

The Steadman Philippon Research Institute ("SPRI"), a non-profit organization, was incorporated in the state of Colorado on February 22, 1999, was founded in 1988, and is a tax-exempt organization under Section 501(c)(3) of the Internal Revenue Code ("IRC"). SPRI is located in Vail, Colorado, and 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. SPRI's primary sources of support are public donations, grants, special events, and corporate partners.

SPRI has agreements with several corporations that sponsor SPRI's research. This research is for the general use of and publication by SPRI. These agreements are recorded as income in the year the research is performed and payment is received.

SPRI created the SPRI Leasing Corporation ("Subsidiary"), a wholly owned subsidiary, in order to hold the assets, liabilities, revenues, and expenses derived from SPRI's MRI scanner.

PRINCIPLES OF CONSOLIDATION

The reporting entity referred to as Steadman Philippon Research Institute and Subsidiary (the "Institute") includes the accounts of SPRI and SPRI Leasing Corporation. All intercompany accounts and transactions have been eliminated in consolidation.

BASIS OF PRESENTATION

The Institute reports information regarding its financial position and activities according to three classes of net assets: unrestricted net assets, temporarily restricted net assets, and permanently restricted net assets.

Unrestricted amounts are those currently available at the discretion of the Board of Directors ("Board") for use in the Institute's operations, fundraising, and certain programs.

Temporarily restricted amounts are monies restricted by donors specifically for certain purposes or programs; these monies are available for use by the Institute for the restricted purpose.

Permanently restricted amounts are assets that must be maintained permanently by the Institute as required by the donor, but the Institute is permitted to use or expend part or all of any income derived from those assets. As of December 31, 2013 and 2012, the Institute did not have any permanently restricted amounts.

CASH AND CASH EQUIVALENTS

The Institute considers all highly liquid investments with a maturity of three months or less when purchased to be cash equivalents, unless held for reinvestment as part of the investment portfolio or otherwise encumbered.

ACCOUNTS AND CONTRIBUTIONS RECEIVABLE

Accounts and contributions receivable represent amounts due from individuals and organizations in support of the Institute's programs. Management considers all amounts collectible; therefore, no allowance has been recorded as of December 31, 2013 and 2012.

Unconditional gifts expected to be collected within one year are reported at their net realizable value. Unconditional gifts expected to be collected in future years are reported at the present value of estimated future cash flows. The resulting discount is amortized using the level-yield method and is reported as contribution revenue.

INVESTMENTS

The Institute reports investments in equity securities with readily determinable fair values and all investments in debt securities at their fair values with unrealized gains and losses included in the consolidated statements of activities.

The Institute holds alternative investments, which are not readily marketable and are carried at fair value as provided by the investment managers. The Institute reviews and evaluates the value provided by the investment managers and agrees with the valuation methods and assumptions used in determining the fair value of the alternative investments. Those estimated fair values may differ significantly from the values that would have been used had a ready market for these securities existed.

Investment return includes dividend, interest, and other investment income; realized and unrealized gains and losses on investments carried at fair value; and realized gains and losses on other investments. Investment return is reflected in the consolidated statements of activities as unrestricted, temporarily restricted, or permanently restricted based upon the existence and nature of any donor or legally imposed restrictions.

INVENTORY

Inventory is stated at the lower of cost (first-in, first-out method) or market. Inventory consists of donated medical supplies of medical implants used for medical research.

PROPERTY AND EQUIPMENT

Land, buildings and improvements, and equipment purchased by the Institute are recorded at cost. Donated fixed assets are capitalized at fair value at the date of donation. Depreciation is provided on the straight-line method based upon the estimated useful lives of the assets, which range from three to seven years. Leasehold improvements are amortized over the shorter of the lease term plus renewal options or the estimated useful lives of the improvements.

OTHER INVESTMENTS

During 2009, the Institute received a contribution of real estate, which was recorded at estimated fair value at the date of donation. The investment is assessed for impairment if events and circumstances warrant such a review. No such impairment was recognized during 2013 or 2012.

DEFERRED RENT

Tenant improvement allowances paid by the landlord are recorded as deferred rent and are recognized as a reduction of rent expense over the term of the related lease.

CONTRIBUTIONS

Gifts of cash and other assets received without donor stipulations are reported as unrestricted support. Gifts received with a donor stipulation that limits their use are reported as temporarily or permanently restricted support. When a donor-stipulated time restriction ends or a purpose restriction is accomplished, temporarily restricted net assets are reclassified to unrestricted net assets and reported in the consolidated statements of activities as net assets released from restrictions.

Gifts of land, buildings, equipment, and other long-lived assets are reported as unrestricted support unless explicit donor stipulations specify how such assets must be used, in which case the gifts are reported as temporarily or permanently restricted support. Absent explicit donor stipulations for the time that long-lived assets must be held, expirations of restrictions resulting in reclassification of temporarily restricted net assets as unrestricted net assets are reported when the long-lived assets are placed in service.

REVENUE RECOGNITION

MRI and other income are recognized at the time the services are provided.

FUNCTIONAL EXPENSES

Expenses incurred directly for a program service are charged to such program. Allocations of certain overhead costs are also allocated to programs on a pro rata basis of total space occupied by each service or by headcount.

RESCINDED PLEDGE

During the year ended December 31, 2012, a donor notified the Institute that they were rescinding the remaining \$600,000 of a pledge made in 2010. The Institute did not have any rescinded pledges during the year ended December 31, 2013.

INCOME TAXES

SPRI is exempt from federal income taxes under Section 501(c)(3) of the IRC. SPRI is not a private foundation within the meaning of Section 509(a) of the IRC.

SPRI Leasing Corporation is a for-profit corporation that is required to file a corporate income tax return for its operations and recognizes deferred tax assets and liabilities based upon differences between its basis of assets for tax and financial reporting purposes.

The Institute applies a more-likely-than-not measurement methodology to reflect the financial statement impact of uncertain tax positions taken or expected to be taken in a tax return. After evaluating the tax positions taken, none are considered to be uncertain; therefore, no amounts have been recognized as of December 31, 2013 and 2012. If incurred, interest and penalties associated with tax positions are recorded in the period assessed as general and administrative expense. No interest or penalties have been assessed as of December 31, 2013 or 2012. Tax years that remain subject to examination include 2010 through the current year for federal returns and 2009 through the current year for state returns.

USE OF ESTIMATES

The preparation of consolidated financial statements in conformity with generally accepted accounting principles requires management to make estimates and assumptions that affect the reported amounts of assets and

liabilities and disclosures of contingent assets and liabilities at the date of the consolidated financial statements and the reported amounts of revenue, expenses, gains, losses, and other changes in net assets during the reporting period. Actual results could differ from those estimates.

SUBSEQUENT EVENTS

The Institute has evaluated all subsequent events through the auditors' report date, which is the date the consolidated financial statements were available for issuance.

NOTE 2

FAIR VALUE MEASUREMENTS AND INVESTMENTS

The Institute values its financial assets and liabilities based on the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. In order to increase consistency and comparability in fair value measurements, the following fair value hierarchy prioritizes observable inputs used to measure fair value into three broad levels, which are described below:

Level 1: Quoted prices in active markets for identical assets or liabilities that are accessible at the measurement date. The fair value hierarchy gives the highest priority to Level 1 inputs.

Level 2: Other than quoted prices that are observable for the asset or liability either directly or indirectly.

Level 3: Unobservable inputs where little or no market data is available, which requires the reporting entity to develop its own assumptions.

In determining fair value, the Institute utilizes valuation techniques that maximize the use of observable inputs and minimize the use of unobservable inputs to the extent possible, as well as considers counterparty credit risk in its assessment of fair value. These classifications (Levels 1, 2, and 3) are intended to reflect the observability of inputs used in the valuation of investments and are not necessarily an indication of risk or liquidity.

Following is a description of the valuation methodologies used for assets measured at fair value:

Common Stock and Mutual Funds: Valued at the closing price reported on the active market on which the individual securities are traded.

Limited Partnerships: Valued based on the net asset value per share of the fund.

There have been no changes to valuation methodologies during the years ended December 31, 2013 and 2012.

Financial assets carried at fair value as of December 31, 2013 are classified in the table below in one of the three categories described above.

Description	Level 1	Level 2	Level 3	Total
Common stock	\$ 15,981	-	-	\$ 15,981
Equity mutual funds	785,304	-	-	785,304
Limited partnerships	-	3,749,666	-	3,749,666
Total	\$ 801,285	\$ 3,749,666	-	\$ 4,550,951

Financial assets carried at fair value as of December 31, 2012 are classified in the table below in one of the three categories described above.

Description	Level 1	Level 2	Level 3	Total
Common stock	\$ 25,305	-	-	\$ 25,305
Equity mutual funds	667,240	-	-	667,240
Limited partnerships	-	3,913,315	-	3,913,315
Total	\$ 692,545	\$ 3,913,315	-	\$ 4,605,860

Included in investments on the consolidated statements of financial position are money market funds in the amount of \$624,622 and \$423 at December 31, 2013 and 2012, respectively, which are not subject to fair value classification.

Investments in certain entities that calculate net asset value per share are as follows:

Fund Description	December 31, 2013 Fair Value	December 31, 2012 Fair Value	Unfunded Commitments	Redemption Frequency	Redemption Notice Period
Absolute Return Funds	\$ 3,749,666	\$ 3,913,315	None	Quarterly to Annually	30 to 90 Days

The Absolute Return Funds employ a strategy to achieve consistent positive, absolute returns with low volatility primarily by seeking to exploit pricing inefficiencies in equity and debt securities and by using a traditional hedge fund approach. The fair value of the investments has been calculated using the net asset value per share of the investments.

Investment return consists of the following:

	For the years ended December 31,	
	2013	2012
Dividends and interest - reinvested	\$ 73	\$ 6,364
Net realized and unrealized gains	615,165	485,795
Fees	(37,044)	(20,842)
Total return on investments	\$ 578,194	\$ 471,317

NOTE 3 CONTRIBUTIONS

Contributions receivable consist of the following:

	December 31,	
	2013	2012
Due in less than one year	\$ 136,800	\$ 261,800
Due in one to five years	100,000	186,800
	236,800	448,600
Less unamortized discount	(7,579)	(12,458)
	\$ 229,221	\$ 436,142

The discount rate used was 3.25% for 2013 and 2012.

NOTE 4 PROPERTY AND EQUIPMENT

The Institute's property and equipment consist of the following:

	December 31,	
	2013	2012
Equipment	\$ 554,828	\$ 508,974
Furniture and fixtures	137,814	140,043
Leasehold improvements	2,107,558	2,107,558
Machines and video equipment	1,148,087	1,146,156
Medical equipment	4,301,646	4,293,934
	8,249,933	8,196,665
Less accumulated depreciation and amortization	(5,775,053)	(4,503,343)
	\$ 2,474,880	\$ 3,693,322

NOTE 5 LINE-OF-CREDIT

The Institute has an unsecured line-of-credit with a bank available up to \$1,500,000, which bears interest at the prime rate plus 0.50% (3.75% at December 31, 2013) and matures in March 2018. As of December 31, 2013, the outstanding balance was \$263,500. As of December 31, 2012, there was no outstanding balance.

NOTE 6 LONG-TERM DEBT

Long-term debt consists of the following:

	December 31,	
	2013	2012
Notes payable to a bank paid in full during 2013.	-	938,172
Less current portion	-	(248,847)
Long-term portion of debt	\$ -	\$ 689,325

NOTE 7 CAPITAL LEASE

The Institute has acquired assets under the provisions of a capital lease. For financial reporting purposes, minimum lease payments relating to the assets have been capitalized. The lease expires in March 2014. Amortization of the leased property is included in depreciation expense.

The assets under capital lease have cost and accumulated amortization as follows:

	December 31,	
	2013	2012
Equipment	\$ 1,714,990	\$ 2,188,507
Less accumulated amortization	(1,236,921)	(1,663,474)
	\$ 478,069	\$ 525,033

Maturities of capital lease obligations are as follows:

	For the Year Ending December 31,
	2014
Amount representing interest	\$ 101,390
Present value of net minimum lease payments	(600)
Less current portion	100,790
Long-term capital lease obligation	(100,790)
	\$ -

NOTE 8 RETIREMENT PLAN

The Institute has a defined contribution retirement plan (the "Plan") under IRC Section 401(k). Employees are eligible to participate in the Plan after one year of service. The Institute's contributions to the Plan are determined annually. The Institute contributed \$36,477 and \$20,852 to the Plan in fiscal years 2013 and 2012, respectively.

NOTE 9 TEMPORARILY RESTRICTED NET ASSETS

The temporarily restricted net assets that have been restricted by the donors to be used only for specified purposes and/or are time restricted until payments on contributions receivable are received are as follows:

	December 31,	
	2013	2012
Assets available for		
Education	\$ 211,437	\$ 931,563
Assets available in future periods		
Education	74,213	74,213
Center for outcomes-based orthopaedic research	21,800	42,914
Imaging	-	100,000
Time restricted only	133,208	219,015
Total contributions receivable	229,221	436,142
	\$ 440,658	\$ 1,367,705

NOTE 10 RELATED PARTY TRANSACTIONS

During 2013 and 2012, the Institute received approximately \$984,000 and \$862,000, respectively, in contributions from related parties, including various Board members, employees, and medical staff at The Steadman Clinic (the "Clinic").

In addition, the Institute received \$962,514 from the Clinic during both 2013 and 2012, as a corporate sponsor and for the use of certain equipment.

The Institute owed a Board member \$30,000 for contracted management services, which is included in accounts payable as of December 31, 2013.

NOTE 11 INCOME TAXES

Income tax (benefit) expense has been computed at the statutory rates applicable during the period. The components of taxes on income are approximately as follows:

	For the Years Ended December 31,	
	2013	2012
Current		
Federal	\$ (86,000)	\$ 82,000
State	(12,000)	11,000
	(98,000)	93,000
Deferred		
Federal	(19,000)	(35,000)
State	(2,000)	(5,000)
	(21,000)	(40,000)
	\$ (119,000)	\$ 53,000

The Institute's deferred tax assets and liabilities are a result of the difference in the tax and book basis of depreciable assets.

NOTE 12 COMMITMENTS

OPERATING LEASES

The Institute leases facilities under non-cancelable operating leases expiring between January 2014 and February 2016, which call for both base rent payments and operating expenses. Rent under these leases for the years ended December 31, 2013 and 2012 was \$316,502 and \$316,486, respectively.

Future minimum lease payments under these leases are approximately as follows:

Year Ending December 31,	
2014	126,000
2015	127,000
2016	11,000
	\$ 264,000





A 501(c)(3) nonprofit organization

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