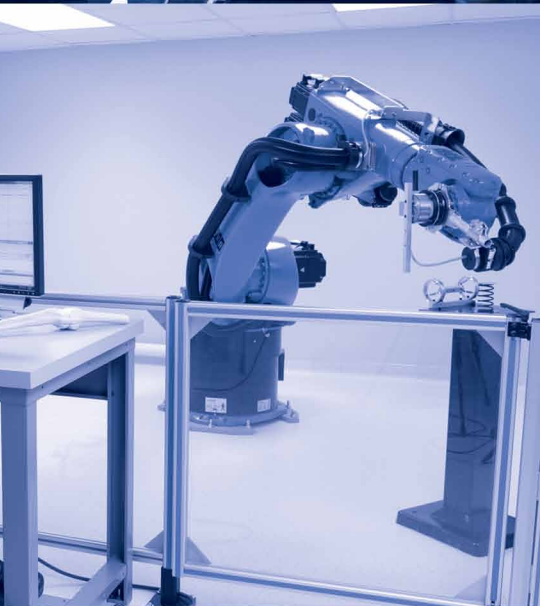
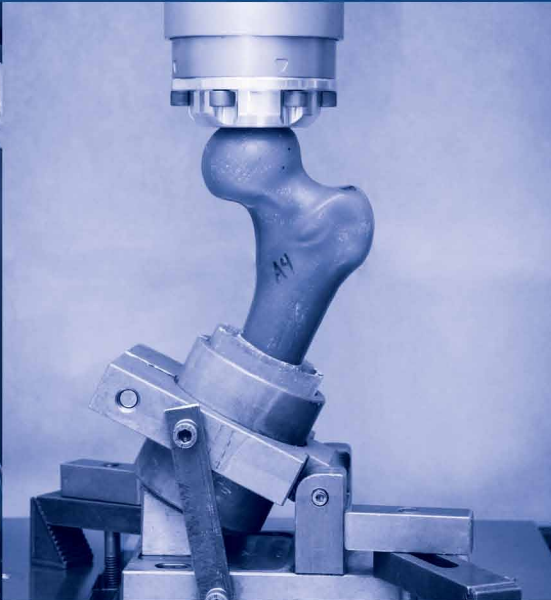


STEADMAN PHILIPPON RESEARCH INSTITUTE

2012 ANNUAL REPORT



An International Center For Research and Education — Keeping People ActiveSM

CONTENTS

2	The Year in Review
4	Board of Directors and Officers
9	Scientific Advisory Committee
11	Friends of the Institute
26	Corporate and Institutional Friends
27	Research and Education
30	Center for Translational and Regenerative Medicine Research
33	Center for Outcomes-Based Orthopaedic Research
38	Department of BioMedical Engineering
40	Surgical Skills Laboratory
41	Imaging Research
44	Education
54	Publications and Presentations
69	Awards and Recognition
73	Community
74	Events
76	Associates
77	Audited 2012 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, he 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.

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.



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 190 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,

We will look back at the year 2012 as one of enormous productivity and exciting promise for the Steadman Philippon Research Institute. All of our achievements were made possible through the support of generous individual donors and our corporate and institutional friends. We are most appreciative for your support as you have watched—and in large measure helped—make our vision become reality.

Your support in 2012 of \$6 million indicates that you believe in our mission. We are carefully managing your contributions and our corporate commitments. Our overhead rate is 23 percent, which means we are directly applying 77 percent of your donations to our research programs. Other well-known research institutions have overhead rates many times higher than ours.

Our research departments have initiated and completed a record number of research studies in 2012 and 2013. These studies have produced scholarly articles published in peer-reviewed journals, presentations made at national and international conferences, and recognition for our scientists at the highest levels of medicine and science. Our physicians and scientists continue to be recognized by some of the most prestigious professional organizations in the world.

In 2012, forty-nine publications appeared in journals such as *The American Journal of Sports Medicine*, the *Journal of Orthopaedic Research*, *Hand Surgery*, the *Journal of Bone and Joint Surgery*, and the *Journal of the American College of Surgeons*, among many others, as well as in the *National Library of Medicine*.

In this Annual Report, you will learn about exciting breakthroughs of which we are most proud:

- Dr. Marc Philippon's landmark donor-funded hip labral reconstruction study was published August 2013 as the lead article in the highest rated sports medicine journal, *The American Journal of Sports Medicine* (page 32). Because of philanthropic support, we were able to validate this innovative arthroscopic procedure here in Vail. This new procedure changes the landscape of arthroscopic hip surgery and illustrates the value of data collected by SPRI's Center for Outcomes-Based Orthopaedic Research.
- In 2012 and 2013, Dr. Steadman continued to be recognized for another groundbreaking research paper, *Ten-Year Survivorship Following Knee Arthroscopy in Patients with Moderate to Severe Osteoarthritis of the Knee*. For this research, he received the Richard O'Connor Research Award in May 2012 (page 28). The study was published in the February 2013 issue of *Arthroscopy*. Your gifts enabled Dr. Steadman and the SPRI team of researchers to develop this arthroscopic treatment package for patients who have osteoarthritis but are not ready to change their activity level or proceed to total knee replacement.
- In another significant achievement, The American Academy of Orthopaedic Surgeons (AAOS) and the Orthopaedic Research and Education Foundation (OREF) recognized donor-supported excellence in research, *Improving Outcomes for Posterolateral Knee Injuries*, with the prestigious 2013 OREF Clinical Research Award to Robert F. LaPrade, M.D., Ph.D., and a team of SPRI scientists (page 69). This is considered the highest research award for orthopaedic surgeons and scientists and has been called the "Orthopaedic Nobel Prize." Dr. LaPrade presented his winning paper at the Annual Meeting of the Orthopaedic Research Society and AAOS in March 2013.
- Our crown jewel is the Fellowship Program. Your philanthropy has enabled us to train more than 190 Steadman Philippon surgeons now practicing in leadership roles around the world. One of our 2011-2012 fellows, Dr. Jeff Padalecki, was the recipient of a major international accolade, The Albert Trillat Young Investigator's Award (page 71) for his research team's contributions to the understanding, care, and prevention of injuries to the knee. The award was presented in May 2013 by the International Society of Arthroscopy, Knee Surgery and Orthopaedic Sports Medicine (ISAKOS).
- Coen Wijdicks, Ph.D., director of the Department of BioMedical Engineering was named "Outstanding Reviewer of the Year" (page 70) for 2012 by the European Society of Sports Traumatology Knee Surgery and Arthroscopy (ESSKA).

- As part of health reform under the Patient Protection and Affordable Care Act, Karen Briggs, director of the Center for Outcomes-Based Orthopaedic Research, was invited to review grants for the Patient-Centered Outcomes Research Institute (PCORI) in Washington, D.C. (page 71).

Karen's participation, the record number of publications accepted in major medical journals, and the international recognition received by our physicians and scientists affirm the leadership role SPRI is playing in the world of healthcare and orthopaedics.

Finally, we realize that the next generation of scientists, teachers, and physicians reside in our own communities. In 2012, the Steadman Philippon Research Institute created the Education and Public Outreach Committee (EPOC) in partnership with the Eagle County School District, and Vail Mountain School. Chaired by Board member Senenne Philippon, EPOC's mission is to inspire and introduce the science, technology, engineering, and mathematics-oriented fields to elementary, middle, and high school students. The curriculum is directed by the scientists and physicians of SPRI, and the centerpiece of activity is the world-class research labs located at the Vail Valley Medical Center. Currently, we are offering tours to fifth graders, support and mentoring for science fairs, robotics competitions for middle schoolers, and a science club for high school students.

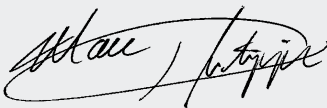
The Steadman Philippon Research Institute is productive, efficient, and good at what it does because of you. World-class physicians and scientists, cutting-edge facilities, and life-changing research wouldn't be possible without your support. We know that, and we want you to know how much we appreciate everything you do every day for SPRI.

On behalf of our dedicated board members, physicians, researchers, and staff, we again wish to express our gratitude. We look forward to your continued support and to updating you on exciting advances being made by the Steadman Philippon Research Institute.

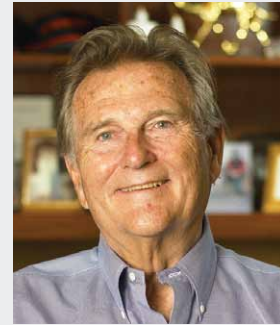
With sincere appreciation,



J. Richard Steadman, M.D.
Co-Chair



Marc J. Philippon, M.D.
Co-Chair



J. Richard Steadman, M.D.



Marc J. Philippon, M.D.

BOARD OF DIRECTORS AND OFFICERS

J. Richard Steadman, M.D.

Founder and Co-Managing Partner
The Steadman Clinic
Vail, Colo.

Marc J. Philippon, M.D.

Co-Managing Partner
The Steadman Clinic
Vail, Colo.

H.M. King Juan Carlos I of Spain

Honorary Trustee

Adam Aron

Chief Executive Officer
Philadelphia 76ers
Philadelphia, Pa.

Howard Berkowitz

Managing Director
BlackRock HPB
New York, N.Y.

Robert A. Bourne

Vice Chairman
CNL Financial Group, Inc.
Orlando, Fla.

Lodewijk J.R. de Vink

Blackstone Healthcare Partners
Former Chairman and
Chief Executive Officer
Warner Lambert, Inc.
Avon, Colo.

Julie Esrey

Trustee Emeritus
Duke University
Vail, Colo.

Stephanie Flinn

Hobe Sound, Fla.

George Gillett

Chairman
Booth Creek Management Corporation
Vail, Colo.

Earl G. Graves, Sr.

Chairman and Publisher
Earl G. Graves, Ltd.
New York, N.Y.

Ted Hartley

Chairman and Chief Executive Officer
RKO Pictures, Inc.
Los Angeles, Calif.

Frank Krauser

President and CEO
NFL Alumni (retired) and
Pro Legends, Inc.
Ft. Lauderdale, Fla.

Greg Lewis

President
Greg Lewis Communications
Basalt, Colo.

Tom Mars

Chief Executive Officer and President
The Steadman Philippon
Research Institute
Vail, Colo.

John G. McMillian

Chairman and Chief
Executive Officer (retired)
Allegheny & Western
Energy Corporation
Coral Gables, Fla.

Peter Millett, M.D., M.Sc.

The Steadman Clinic
Vail, Colo.

Larry Mullen, Jr.

Founder, Partner, and Drummer
U2
Dublin, Ireland

Cynthia L. Nelson

Cindy Nelson, LTD
Here 2 Help
Vail, Colo.

Mary K. Noyes

Freeport, Maine

Al Perkins

Chairman Emeritus
RevGen Partners
Denver, Colo.

Senenne Philippon

Vail, Colo.

Cynthia S. Piper

Trustee
Hazelden Foundation
Hamel, Minn.

Steven Read

Co-Chairman
Read Investments
Orinda, Calif.

Gary S. Rosenbach

Financial Advisor (retired)
Vail, Colo.

Kenneth Schanzer

President
NBC Sports (retired)
Avon, Colo.

Damaris Skouras

Founder and Chief Executive Officer
Global Reach Management Company
New York, N.Y.

Gay L. Steadman

Vail, Colo.

Stewart Turley

Chairman and Chief
Executive Officer (retired)
Eckerd Corporation
Bellaire, Fla.

Norm Waite

Vail, Colo.

IN MEMORIAM:**J. Michael Egan**

President and Chief Executive Officer
The Steadman Philippon
Research Institute
Vail, Colo.

The Honorable Jack Kemp

Chairman and Founder
Kemp Partners
Washington, D.C.

EMERITUS:**Harris Barton**

Managing Member
Hbam
Palo Alto, Calif.

Jack Ferguson

Founder and President
Jack Ferguson Associates
Washington, D.C.

H. Michael Immel

Executive Director (retired)
Alabama Sports Medicine and
Orthopaedic Center
Lafayette, La.

Arch J. McGill

President (retired)
AIS American Bell
Scottsdale, Ariz.

Betsy Nagelsen-McCormack

Professional Tennis Player (retired)
Orlando, Fla.

OFFICERS:**Tom Mars**

Chief Executive Officer and President

John McMurtry

Director of Development

Amy Ruther

Administration Director

Monica White

Controller/Treasurer



FIVE SKI CHAMPIONS LOOK BACK AND TO THE FUTURE WITH DR. RICHARD STEADMAN

Cindy Nelson, Phil Mahre, Christin Cooper-Taché, Steve Mahre, and Mark Taché remember the early days.

By Jim Brown

It was long before innovative surgical techniques like microfracture and the healing response. Before a massive and unparalleled database. Before a world-class clinic and research institute in Vail. An approach to injury rehabilitation that would change sports medicine forever was beginning to unfold in the home of Richard and Gay Steadman on Capri Street in South Lake Tahoe, California.

U.S. Ski Team members who had suffered career-threatening injuries were getting up as early as 6:00 a.m., which for teenage and early-20s skiers was a near medical miracle itself. Injured athletes were sitting on the Steadman's living room floor or perched on the dining room table doing range-of-motion and resistance exercises within days after complex surgeries. And Dr. Steadman was on the floor guiding, resisting, and gently pushing the skiers far beyond the edge of current medical practice.

"I guess a lot of people thought I was crazy," Steadman told a reporter. "In fact, I know they did. But I didn't wake up one morning with the sensation that motion was better. It had already been proven (in theory) by the Swiss."

While the skiers' competitors around the country and rest of the world were immobilized in hard casts for six weeks or longer after similar injuries, the Steadman patients were moving, walking, running, and sometimes skiing on bones that had been shattered and joints that had been twisted apart. Elite skiers have as many fractures and knee injuries as normal people have common colds.

Nourishing Body and Spirit

The athletes were not only working out at the Steadman home, they were

living there. "I really didn't know him that well," recalls Olympic Gold Medal winner Phil Mahre, "but Dr. Steadman and Gay took me into their home and treated me like one of their own children. What doctor does that? He would get up early to work with us, make rounds, perform operations, see patients in the clinic, attend meetings, and then come back home late that night to work with us again."

"Our house was certainly a revolving door for athletes during those years," remembers Liddy Steadman Lind. "My mom was amazing, always in the kitchen cooking delicious meals, happy to welcome the kids and make them feel like our home was their home. I think back on that and I'm amazed. My mom was as much a part of the recovery process as anyone on the team. She nourished body and spirit. It was so exciting to see the successes and the fulfillment my parents got from helping the kids overcome their injuries and achieve their goals."

Among those in-house patients during the early days were five past and future champions—Cindy Nelson, Phil Mahre, Christin Cooper, Steve Mahre, and Mark Taché. Here are their stories.

Cindy Nelson: "Who is this guy?"

"In 1977, I was leading in overall World Cup points," says Cindy Nelson, who won Olympic, World Championship, World Cup, and National medals, "but I crashed at the finish line in Germany and knew right away I had broken my leg. The doctors wanted to perform surgery before I left, but I wouldn't let them. I wanted to go back to the States for the operation."

"I woke up after surgery at Barton Memorial Hospital in South Lake Tahoe. Dr. Steadman leaned over the hospital bed, looked down at the open cast, and said, 'Let's take a look at this.'"

"What he saw wasn't pretty. He cradled my leg in his arms and said, 'Cindy, I want you to point your toes toward the wall.'"

"Right, Dr. Steadman. My leg is broken. I can't do that."

"No, it's not, Cindy. I just fixed it. Now point your toes toward the wall."

"I'm thinking, 'What? Who is this guy?' To my astonishment, I was able to point my toes at the wall 10 times."

"Now do it again," said Steadman. "Great."

"He sticks my leg back into the walking cast and says, 'Okay, let's go home.'"

"We went to his house and I stayed in a guest bedroom, the first of many times to follow."

"The recovery process was a remarkable piece of rehabilitation," comments Nelson. "Shortly after he began working with me, Dr. Steadman wanted me to put weight on the ankle (the one with four screws in it) to stimulate the area and promote healing. A photographer at the Tahoe Times took a picture of me jogging down the street on crutches. Richard was jogging along with me on his way to work."

Six weeks after surgery, he examined an x-ray, nodded his approval, and took the cast off. "Go back to the house and get your gear," he said. "We're going skiing."

"I skied as though I had never missed a day. My early impression of Dr. Steadman was forever forged as an almost God-like figure —'Steady.' A quiet,

gentle giant of genius, possessing a magical touch and totally unaware of his greatness.”

“He has an incredible pioneering spirit. He always wants to find the best solution for each individual patient. I credit him with having the most impact on my career than any other person. What he has done for me reaches far beyond my many surgeries, as I continue to feel his influence in my life every day. He’s a great surgeon and equally as great a man and friend.”

Phil Mahre: Career Saver

“I didn’t really know how severe my injury was until a press conference a few days after I had broken my ankle in March 1979,” says Phil Mahre, talking about his crash in the pre-Olympic giant slalom a year before the games. “I should have realized something was up when the surgery took four-and-a-half hours and he inserted seven screws, plus a two-inch plate. The ankle had been shattered into 20 pieces.”

“Most doctors would have said my career was over. I think Richard was even reluctant to say that I would be competitive after this kind of injury, but he assured the reporters that I would be okay.”

“Less than a year later, I won the silver medal in the Olympics back at Lake Placid. I’ve always said I had a great doctor, but Richard said he had a great patient. Those two things go together. A person can have a great surgeon, but if he or she doesn’t do the rehab, the results might be so-so.”

“I put my complete trust in Dr. Steadman. Whenever I got injured, he was the first person I would call. He reminds me a lot of my dad. He has a way with people. He touches people. He’s a big man in stature, but a real teddy bear at heart.”

“He’s always thinking; always something on his mind. Working on a new surgical technique downstairs in a basement lab for Richard is like being a kid in a candy store.”

Phil Mahre, on his Steadman-repaired legs, became one of the most successful ski champions the United States has ever produced—27 World Cup wins, three overall World Cup titles, two Olympic medals, one silver and one gold. Phil was the first American to win the overall World Cup title.

Christin Cooper: The Impatient Patient

“Am I ready? Am I ready? Can I go? Can I start training with the team again?” Seventeen year-old Christin Cooper (now Christin Cooper-Taché) had broken her ankle training downhill in Chile. A U.S. Ski Team teammate had been seriously injured minutes earlier.

Dr. Richard Steadman was a U.S. Ski Team physician. He flew back to Tahoe with both young skiers, settled them into his home, performed the needed surgeries, and began their rehabilitation program—same house, same guest room, same let’s-get-started-moving-those-joints attitude. He called Cooper his impatient patient.

“We were really his guinea pigs in the best sense of the word,” says Christin, a charter member of what was called the Tahoe Fracture Team.

“Dr. Steadman is known all over the

world for being progressive, but he also knows that none of this works if you come back too soon. If he tried something and you told him it worked, he put that information into his mind’s bank, thinking maybe we’ve been too conservative here. Maybe we’ll do it different from now on. He was changing the paradigm.”

“From the start, I realized that Richard Steadman is one of the most ‘present’ people I’ve ever met. From the moment he steps into your room, he treats the elite athlete and the weekend exerciser from Cincinnati with that full amount of presence. I learned to try to do that from him.”

“I tell people that Dr. Steadman will do everything possible not to operate. Even if he performs some innovative new procedure, getting back out there is all about rehab. That’s what he’s progressive about—working from the moment you get out of surgery. It’s something I learned early on and I’m glad I did. He changed the way of looking at what’s possible, and his thinking has influenced treatment, rehabilitation, and prevention across all sports. He made my skiing career possible and my second life pain-free.”

Phil Mahre becomes airborne as he skis during a training run on the downhill course at Aspen, Colorado, March 2, 1984. (AP Photo)



FIVE SKI CHAMPIONS LOOK BACK AND TO THE FUTURE WITH DR. RICHARD STEADMAN (CONT'D)

Christin had a career that included five World Cup wins, six National titles, three World Championship medals, and an Olympic silver medal.

Steve Mahre: Gold Medal Knees

"In the spring of 1979, I was playing volleyball at Lake Placid, came down kind of weird, and did something to my knee," says Steve Mahre, who, in addition to a slew of World Cup wins and World Championship medals, won an Olympic silver medal in the same race his brother won gold.

"I didn't know Dr. Steadman, but the U.S. Ski Team said this is the guy you're going to see, so that's what I did. Otherwise, I probably would have gone home or looked for someone else to operate on me."

"When he started making me do things right after surgery, I realized that he had a completely different approach. He was ahead of the game, then more doctors and athletes started doing it his way."

"In December of 1981, he did more work, repairing some meniscus damage in both knees. Within a day, at his home and at the clinic, I was doing exercises or riding a stationary bike. When we were finished, he said it looked like I had 'gold medal' knees. Six weeks later I won the gold medal at the World Championships in Austria (the U.S.'s first gold medal in a world championship men's ski race—ever). I was thinking, 'this man has something in his head that makes him able to predict the future.'"

"Richard Steadman never says, 'I don't think we can go beyond where we are right now.' Instead, he thinks we haven't even scratched the surface as to what can be changed or what will make something better."

Mark Taché: Giving Back

Mark represented the U.S. Team for eight years, competed on the World Cup Circuit and in two FIS World Championships, and retired from amateur skiing as the top-ranked American slalom skier in 1985. In 1986, he joined the World Pro Ski Tour, where in 1987 he earned top American honors.

"I wasn't the athlete with all the medals," says Mark, "but the Steadman's door was always open. Over the years, he operated on both of my knees, and they came back in great shape. I got to retire when I was ready to stop competing, not because of an injury. At an age where many of my peers are having joint replacements or have a limited lifestyle, I'm still very active, and I owe it completely to Dr. Steadman. He wasn't just looking at the short term, he was always looking ahead at what's going to happen later in life."

"Even now, before I go skiing, I make sure I do the warm-up exercises he taught me 30 years ago."

"Today, the Steadman Philippon Research Institute is one of the most important research institutions in the world. People don't get a lot of opportunities to give back directly to something that has given them so much, but this is our chance. We are all benefitting from the work that is going on here, and giving back is a way of closing the circle."

Monday, June 10, 2013

Remember those long days back in South Lake Tahoe or the frenetic pace Dr. Steadman established once he moved to Vail? It hasn't changed. A more-or-less typical day now begins at 7:00 a.m. with academic meetings, continues in the operating room or clinic from 9:00 a.m. until 5:00 p.m., and ends later that evening with meetings.

"This is a man who was put on earth to do what he is doing. He just won't stop. There is no end to his day," says Christin Cooper-Taché. She meant it literally and figuratively.

Dr. Steadman and his colleagues have trained hundreds of physicians, shared the results of their research with thousands, and impacted the lives of millions of people throughout the world. Yet, in Richard Steadman's visionary mind, his work is just getting started.

"Richard Steadman never says, 'I don't think we can go beyond where we are right now.' Instead, he thinks we haven't even scratched the surface as to what can be changed or what will make something better."

- Steve Mahre

SCIENTIFIC ADVISORY COMMITTEE

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.

Steven P. Arnoczky, D.V.M.

Director
Laboratory for Comparative
Orthopaedic Research
Michigan State University
East Lansing, Mich.

Stephen S. Burkhart, M.D.

The San Antonio Orthopaedic Group
San Antonio, Texas

Lars Engebretsen, M.D., Ph.D.

Professor
Orthopaedic Center Ullevål University
Hospital and Faculty of Medicine
University of Oslo and Oslo
SportsTrauma Research Center
Oslo, Norway

John A. Feagin, M.D.

Emeritus Professor of Orthopaedics
Duke University
Durham, N.C./Vail, Colo.

Troy Flanagan, Ph.D.

High Performance Director
U.S. Ski and Snowboard Association
(USSA) Center of Excellence
Park City, Utah

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

Director
Imaging Research
The Steadman Philippon
Research Institute
Vail, Colo.

Bryan T. Kelly, M.D.

Co-Director
Center for Hip Preservation
Hospital for Special Surgery
New York, NY

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

Assistant Professor
Orthopaedic Surgery
Harvard Medical School,
Harvard School of Public Health
Children's Hospital,
Boston, Department of
Orthopaedic Surgery
Boston, Mass.

Robert F. LaPrade, M.D., Ph.D.

Chief Medical Officer
The Steadman Clinic
Vail, Colo.

C. Wayne McIlwraith, D.V.M., Ph.D.

Director
Orthopaedic Research Center and
Orthopaedic Bioengineering
Research Laboratory
Colorado State University
Fort Collins, Colo.

Peter J. Millett, M.D., M.Sc.

Chief, Shoulder Surgery Service
The Steadman Clinic
Vail, Colo.

Marc J. Philippon, M.D.

Co-Managing Partner
The Steadman Clinic
Vail, Colo.

William G. Rodkey, D.V.M.

Chairman
Scientific Advisory Committee
Director
Center for Translational and
Regenerative Medicine Research
The Steadman Philippon
Research Institute
Vail, Colo.

J. Richard Steadman, M.D.

Co-Managing Partner
The Steadman Clinic
Vail, Colo.

John (JP) Warner, M.D.

Chief
Shoulder Surgery Service
Harvard University
Boston, Mass.

Savio Lau-Yuen Woo, Ph.D., D.Sc. (Hon.)

Ferguson Professor and Director
Musculoskeletal Research Center
University of Pittsburgh
Pittsburgh, Pa.

SCIENTIFIC ADVISORY COMMITTEE MEMBER NAMED HONORARY MEMBER OF ISAKOS



John A. Feagin, M.D.

DR. JOHN FEAGIN RECEIVES AWARD FROM DR. JOHN A. BERGFELD OF THE CLEVELAND CLINIC AT TORONTO CONGRESS

Retired Col. John Feagin, Jr., M.D., was named an honorary member the International Society of Arthroscopy, Knee Surgery and Orthopaedic Sports Medicine (ISAKOS) on May 12, 2013, at the group's biennial congress in Toronto. An international society of surgeons established to advance the worldwide exchange and dissemination of education, research, and patient care in arthroscopy and orthopaedic sports medicine, ISAKOS consists of more than 3,600 members from 90 different countries.

ISAKOS held biennial congresses in Brazil in 2011, Japan in 2009, and Italy in 2007, among other places. At the 9th annual congress in Toronto, Dr. Feagin, a member of the Scientific Advisory Committee at the Steadman Philippon Research Institute (SPRI), was recognized in an awards ceremony by renowned orthopaedic surgeon John A. Bergfeld, M.D., of The Cleveland Clinic.

"It's a great honor from a very important organization," said Feagin, upon receiving the honorary membership. "ISAKOS has helped advance sports medicine tremendously."

ISAKOS congresses include live surgical demonstrations, hands-on workshops, discussions and debates, technical exhibits, scientific paper sessions, symposia, instructional course lectures, and casual lunchtime lectures. But with the vast diversity of membership in ISAKOS, the conferences are known for their vitality and variety, as well as their high-quality presentations. At ISAKOS congresses, leaders like Feagin — from national and regional societies all over the world — meet to share important research and information.

"Dr. Feagin is a perfect candidate to become a member of ISAKOS," said Dr. Richard Steadman, "as their mission aligns so well SPRI's — keeping people of all ages physically active through orthopaedic research and education in arthritis, healing, rehabilitation, and injury prevention."

SPRI's Scientific Advisory Committee, of which Feagin is a member, consists of distinguished research scientists who represent the institute and serve as advisers for its research and education efforts, fellowship program and staff.

SPRI was founded in 1988 by orthopaedic surgeon Dr. Richard Steadman as the Steadman Sports Medicine Foundation, and has since gone on to influence the practice of orthopaedics throughout the world. Based in Vail, the 501(c)(3) charitable organization has become one of the most published organizations in orthopaedic sports medicine research and education.

ISAKOS will celebrate its 20th anniversary in 2015 at a biennial congress in Lyon, France.



Coley Gatlin, M.D.

On August 1, 2013, Texas native Coley Gatlin, M.D., began his work as the Griffin Visiting Scholar for Clinical Sports Medicine MRI.

The Visiting Scholar Program in Sports Medicine MRI is sponsored by the Chicago-based Kenneth and Anne Griffin Foundation. The Foundation is committed to improving the worlds of education, healthcare, and the arts.

Prior to 2012, the Visiting Scholar Program was sponsored by Siemens Medical Solutions USA.

After settling into his work as a visiting scholar, Dr. Gatlin visited with the editors of the *SPRI News* and talked about his life and his experiences since arriving in Vail.

SPRI: Tell our readers about your background.

DR. GATLIN: "I grew up and went to high school in Liberty Hill, Texas, a small town northwest of Austin, and I got my undergraduate degree at The University of Texas. My wife, Andrea, and I have four children —Caroline, 13; Claire, 11; Nathanael, 4; and Brandt, 6."

SPRI: What were some of your work experiences before coming to SPRI?

DR. GATLIN: "I was in private practice family medicine in Kerrville, Texas; medical director of a rural health clinic in Utopia, Texas; an emergency room physician at Peterson Regional Medical Center in Kerrville; and a radiology resident at The University of Texas Health Science Center in San Antonio."

DR. COLEY GATLIN NAMED FIRST RECIPIENT OF THE GRIFFIN VISITING SCHOLAR FOR CLINICAL SPORTS MEDICINE MRI

SPRI: Why did you decide on a career in medicine?

DR. GATLIN: "The primary force came from my experiences as an athlete growing up in a small town in Texas. I had several positive interactions with physicians interested in sports medicine, and I liked the idea of being able to provide my family, friends, and community with a higher level of care. My choice of a career in medicine was also driven by a desire to help others and to pursue something that I would always find challenging."

SPRI: How did you first learn about the Steadman Philippon Research Institute?

DR. GATLIN: "In searching through medical literature—specifically about sports medicine and knee injuries—and Dr. Richard Steadman's name kept appearing as the lead author or co-author of studies on the knee."

SPRI: How did you become aware of the Griffin Visiting Scholar for Clinical Sports Medicine MRI at SPRI?

DR. GATLIN: "I was looking for different musculoskeletal radiology fellowships and this one seemed like a perfect fit for my interests. The Griffin Visiting Scholar program is unique because it is more tailored toward sports medicine. When our radiology residency class had its unofficial graduation party, I think I won the de facto award for getting the best fellowship."

SPRI: What were your first impressions of SPRI and the Steadman Clinic?

DR. GATLIN: "I was very impressed. Two stories, multiple rooms, multiple athletes being treated. SPRI had all of the labs and other resources just a few steps away. I don't think I've ever seen a place that has such a variety of staff and facilities all in one place."

SPRI: Did anything surprise you?

DR. GATLIN: "When I got here, the SPRI Scientific Advisory Committee was meeting and the previous fellows were presenting

their research projects. I was really impressed with the level of expertise and the well-known clinicians from throughout the country, including representatives of the International Olympic Committee. Also, I was impressed by the quality of research conducted by the SPRI fellows in such a short period of time."

SPRI: What has been the most challenging aspect of your work at SPRI?

DR. GATLIN: "I came away from those meetings not knowing how I was going to do so much, but now I've seen that it is really a team effort. The work is organized and compartmentalized to help us do our best. It will still be a challenge to balance clinical responsibilities with research efforts and to develop a research project that will produce outcomes with clinical significance."

SPRI: What goes on during your typical day?

DR. GATLIN: "Reading MRIs of the foot, knee, ankle, shoulder, elbow, cervical spine, lumbar spine, etc.; taking notes; interacting with Dr. Ho on a minute-by-minute or hour-by-hour basis; working with other scholars and fellows; researching previous studies; answering questions; writing reports."

SPRI: What would you tell others about Vail?

DR. GATLIN: "It's a great place to spend a year or live a lifetime."

SPRI: What would you tell potential supporters about SPRI?

DR. GATLIN: "I would encourage people to support SPRI because of the clinical research conducted here that impacts patients at all levels. There are world-class orthopaedic surgeons and scientists at SPRI who will continue to be at the forefront of sports medicine research."

SPRI: Any final comments?

DR. GATLIN: "I would like to thank Mr. and Mrs. Griffin and their Foundation, as well as the Steadman Philippon Research Institute, for this wonderful opportunity. The Visiting Scholar Program is giving young physicians a chance to expand their knowledge and skills in ways that will help them grow professionally and make a positive contribution to the medical and scientific communities."

FRIENDS OF THE INSTITUTE

In 2012, SPRI received 1,148 separate gifts and support from individuals, foundations, and corporations. This combined support, including special events, amounted to \$5,041,441.

The Institute is grateful to all the individuals, corporations, and foundations for their support of the Institute in 2012. 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.



Fifth grade students from Edwards Elementary School. (Photo credit: Angelica Wedell)

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 over \$1 million.

MR. HERBERT ALLEN; ARTHREX, INC.; MR. AND MRS. GEORGE N. GILLETT, JR.; MR. KENNETH C. GRIFFIN; LINVATEC; ÖSSUR AMERICAS, INC.; SMITH & NEPHEW ENDOSCOPY; DR. AND MRS. J. RICHARD STEADMAN; VAIL VALLEY MEDICAL CENTER



2012 FRIENDS

\$500,000 - \$1,000,000

Smith & Nephew Endoscopy

\$100,000 - \$499,999

Mr. Herbert Allen
Anonymous
Arthrex, Inc.
Dr. Donald S. Corenman
Mr. Ephraim Gildor
Mr. and Mrs. Kenneth C. Griffin
Mrs. Connie Kemmerer
Mr. Jorge Paulo Lemann
Medequip, Inc.

Norwegian Health South-East
(Helse Sør-Øst) Regional Health Authority
Össur Americas, Inc.
Dr. and Mrs. Marc Philippon
Mr. and Mrs. Gary S. Rosenbach
Siemens
The Liniger Family Foundation
Vail Valley Foundation
Vail Valley Medical Center

\$25,000 - \$99,999

Mr. and Mrs. John M. Angelo
Mr. Thomas H. Bailey
Mr. and Mrs. Herbert Bank
Mr. and Mrs. Howard Berkowitz
Dr. and Mrs. Thomas Clanton
The James M. Cox, Jr. Foundation
Mr. and Mrs. Robert Engleby
Mr. and Mrs. Lawrence Flinn, Jr.
Mrs. Peggy Fossett
Mr. Richard Goodman
Mr. and Mrs. James A. Gordon
Mr. Donald W. Gustafson
Dr. Tom Hackett
Henry Crown and Company
Dr. and Mrs. Russell Hirsch
Mr. and Mrs. Peter R. Kellogg
Dr. and Mrs. Peter J. Millett
MJP Innovations
Mr. and Mrs. Larry Nisonoff
Mr. and Mrs. Michael Noell
Ms. Karen Rainwater
Mr. and Mrs. Stanley S. Shuman
Small Bone Innovations
Sonoma Orthopedic Products
Dr. and Mrs. J. R. Steadman
Mr. and Mrs. Richard F. Teerlink
Mr. and Mrs. Stewart Turley
Dr. Randy Viola

\$10,000 - \$24,999

Aarhus University Hospital Foundation
for Sports Traumatology
American Orthopaedic Foot & Ankle
Society, Inc.
Mr. and Mrs. Erik Borgen
Ms. Caryn Clayman
Mr. James S. Crown
Fred & Elli Iselin Foundation
G.E. Johnson Construction Company, Inc.
Mr. C. Brody Glenn
Mr. and Mrs. Milledge A. Hart, III
Mr. and Mrs. Ted Hartley
Hirsch & Associates
Hockey Equipment Certification Council
Mr. and Mrs. Michael O. Johnson
KSL Capital Partners
Mr. and Mrs. S. Robert Levine
Mrs. Betsy McCormack
Mr. Michael A. Merriman
Mr. and Mrs. Bruce A. Montoya
Mr. and Mrs. Tradd Newton
Mrs. Mary Noyes
Mr. Alan W. Perkins
Mr. and Mrs. Jay A. Precourt
Mr. and Mrs. Steven Read
Red Bull North America, Inc.
Mr. and Mrs. Arthur Rock
Mr. and Mrs. Kenneth T. Schiciano
Mr. and Mrs. Paul Schmidt
Stryker Trauma



EDUCATION AND RESEARCH GRANTS

Sharing our research findings throughout the world is a vital part of our educational and research mission. We wish to thank the following sponsors for their support:

**EUROPEAN VISITING SCHOLAR,
SPONSORED BY ARTHREX, INC.**

**BRAZILIAN VISITING SCHOLAR,
SPONSORED BY INSTITUTO BRAZIL DE
TECNOLOGIAS DA SAÚDE**

**VISITING SCHOLAR FOR CLINICAL
SPORTS MEDICINE MRI, SPONSORED
BY THE KENNETH AND ANNE
GRIFFIN FOUNDATION.**

**BIOSKILLS RESEARCH AND
EDUCATION GRANT, SPONSORED BY
SMITH & NEPHEW ENDOSCOPY**

Synthes USA Products, LLC
 Mr. Oscar L. Tang and Dr. Agnes
 Hsu-Tang
 Mr. and Mrs. William R. Timken
 Mr. and Mrs. Norm Waite
 Ms. Valerie Weber
 Mr. and Mrs. Patrick Welsh
 Mr. Rodney Wimmer
 Mr. Craig Yates, Sr.

\$1,000 - \$9,999

Alpine Bank
 Mr. Jeffrey Anderson
 ArthroCare Corporation
 Arthroscopy Association of
 North America
 Mr. and Mrs. Joe Bagan
 Mr. and Mrs. Ronald P. Baker
 Mr. and Mrs. Paul Baker
 Mr. Foster Bam
 Ms. Nancy Bechtle
 Michael J. Zamkow & Sue E. Berman
 Charitable Foundation
 Biomet, Inc.
 Mr. and Mrs. Bruce A. Blakemore
 Mr. and Mrs. John A. Boll
 Mr. and Mrs. Richard Bourret
 Mr. and Mrs. Robert Bowers
 Mr. and Mrs. David R. Brewer, Jr.
 Mr. and Mrs. Christopher W. Brody
 Mr. and Mrs. T. Anthony Brooks
 Ms. Dorothy W. Browning
 Mr. and Mrs. John L. Bucksbaum
 Ms. Beatrice Busch-von Gontard
 Mr. and Mrs. Preston Butcher
 Ms. Martha C. de Castilho
 Mr. Donald M. Campbell
 Mr. and Mrs. James R. Cargill
 Ms. Beverly Hay de Chevrier
 Mr. and Mrs. Pedro Cerisola
 Mr. and Mrs. Donald R. Chappel
 Mr. and Mrs. Michael Charles
 Mr. Lim Chee-Wah
 Mr. and Mrs. Hyonmyong Cho
 Clinical Trial Site Solutions
 Mr. Mike Collins
 Dr. and Mrs. Kenneth H. Cooper
 Mr. Marshall C. and Mrs. Jane R. Crouch
 Mr. and Mrs. Andrew P. Daly
 General and Mrs. Peter Dawkins
 Mr. and Mrs. John W. Dayton
 Delta Dental
 Mr. and Mrs. Thomas C. Dillenberg
 Diversified Radiology

Mr. and Mrs. Edward C. Dowling
 DRM Medical
 Mr. and Mrs. John M. Egan
 Mr. and Mrs. Lynn Elliott
 Dr. Gail Ellis
 Mr. Israel A. Englander
 Mr. and Mrs. William T. Esrey
 Dr. and Mrs. Frederick Ewald
 Dr. John A. Feagin and Mrs. Marty Head
 Dr. Sue Fogel
 Dr. Joe Fogel and Dr. Caroline Elliott
 Mr. John H. Steel and
 Mrs. Bunny Freidus
 Mr. Christopher B. Galvin
 Mr. and Mrs. Bradley Ghent
 Mr. and Mrs. George N. Gillett, Jr.
 Ms. Donna M. Giordano
 Mr. and Mrs. Matthew A. Gobec
 Mr. Paul Gordon
 The Flora Foundation
 The Greenburg-May Foundation, Inc.
 Mr. and Mrs. Peter S. Hearst
 Mr. Blake A. Helm
 Mr. Robert K. Hendricks
 Mr. and Mrs. Frank C. Herringer
 The William and Flora
 Hewlett Foundation
 Mr. James Hill
 Ms. Lyda Hill
 Mr. Charles Hirschler and
 Ms. Marianne Rosenberg
 Mr. and Mrs. David C. Hoff
 Mr. and Mrs. Graham Hollis
 Mr. and Mrs. Philip E. Hoversten
 Mr. and Mrs. George H. Hume
 Mr. and Mrs. Walter Hussman
 Admiral and Mrs. Bobby Inman
 Mr. Brice Jackson
 Ms. Mary H. Jaffe
 Mr. and Mrs. Thomas Jaffe
 Mr. and Mrs. John V. Jaggars
 Dr. Arlon Jahnke, Jr.
 Mr. and Mrs. Charles Johnson
 Mr. Charles C. Johnston
 Mr. and Mrs. Daniel S. Jones
 Dr. and Mrs. David Karli
 Dr. and Mrs. Malvin Keller
 Mr. and Mrs. Scott Kepner
 Ms. Vanessa K. Kerzner
 Mr. and Mrs. John Kirchner
 Mr. Gary Koenig
 Mr. and Mrs. Bob Krohn
 Dr. and Mrs. Robert F. LaPrade
 Mr. and Mrs. Gary Leeds
 Mr. and Mrs. Michael Leeds
 Mr. and Mrs. Robert Lemos

Linvatec
 Mr. and Mrs. John W. Mabee
 Mr. and Mrs. Thomas A. Mars
 Ms. Sandra Mason
 Mr. and Mrs. Charles McAdam
 Mr. Walter McCormack
 Mr. Jeffrey S. McCormick
 Mr. and Mrs. Arch McGill
 Mr. Bruce McKenna
 Ms. Linda McNamee
 MedSynergies-Surgical Division
 Mr. and Mrs. Eugene Mercy, Jr.
 Mr. Richard Michaux
 Mr. and Mrs. George Middlemas
 Mr. and Mrs. Kirk Mielenz
 Ms. Betty L. Mobley
 Mr. Alan D. Moore
 Mr. William and Mrs. Kay Morton
 Mr. and Mrs. Houston Munson
 Mr. and Mrs. Robert Musser
 Mr. James H. and
 Mrs. Katherine R. Mutchnik
 Mr. and Mrs. Don H. Nelson
 Ms. Barbara A. Nelson
 Pedro Vital Netto
 Newton Running
 Mr. and Mrs. James T. Niemeyer
 Northside Coffee & Kitchen
 Mr. Donald A. Nyman
 Mr. and Mrs. John Oltman
 Opedix
 ORP Hanger
 Orthopedic Rehabilitation Products, Ltd.
 Mr. John Osterweis
 Dr. and Mrs. Stan Pappelbaum
 Mr. and Mrs. Preston S. Parish
 Mr. and Mrs. Addison Piper
 Mr. Michael Price
 Mr. and Mrs. Paul Raether
 Mr. Karl E. Rathjen
 RevGen Partners
 RJG Foundation
 Mr. and Mrs. Sanford Robertson
 Dr. William Rodkey
 Mr. and Mrs. Michael D. Rose
 Ms. Jean Schikora
 Mr. and Mrs. Mark J. Schwartz
 Mr. Edward D. Scott
 Mr. and Mrs. Brad Seaman
 Mr. and Mrs. Gordon I. Segal
 Mr. O. Griffith Sexton
 Mr. Michael Shannon
 Mr. and Mrs. John Simon
 Ms. Damaris Skouras
 Mr. Michael Byram and
 Mrs. Ann B. Smead

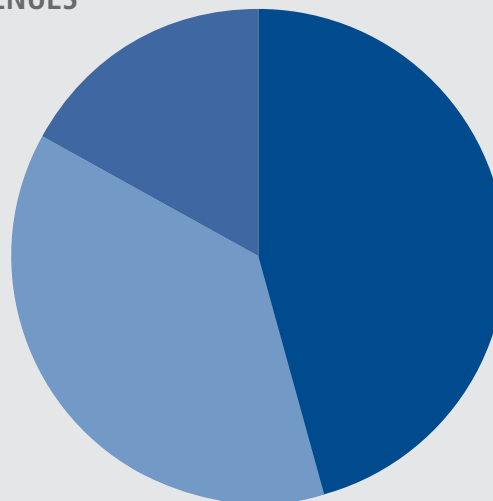
THE FACE OF PHILANTHROPY IN 2012

The Sonnenalp of Vail Foundation
 The Steadman Clinic
 Mr. Hans Storr
 Mr. and Mrs. Steve Stratton
 Mr. and Mrs. Mark Taché
 Mr. Vernon Taylor, Jr.
 Mr. and Mrs. H. Douglas Teague
 Mr. Barry Teeters
 Mr. Arthur Temple, III
 Mr. Walter Tendler
 Mr. and Mrs. Fred Teshinsky
 Mr. and Mrs. Paul Testwuide
 Mr. and Mrs. Jere W. Thompson
 Mr. and Mrs. James Tiampo
 Mr. and Mrs. Jeffrey Townsend
 Mr. Fred Tresca
 Dr. and Mrs. Luis H. Urrea, II
 US Bank
 US Ski and Snowboard
 Team Foundation
 Mr. and Mrs. Bronson Van Wyck
 Mr. and Mrs. Leo A. Vecellio, Jr.
 Ms. Marjorie R. Vickers
 Mr. and Mrs. Arthur W. Vietze
 Mr. James E. Walker
 Mr. and Mrs. Stephen D. Wehrle
 Mr. Blake Whealy
 Ms. Heather Whiteford
 Mr. and Mrs. George Wiegers
 Mr. Jeffrey R. Wood
 Mr. and Mrs. Richard J. Woodworth
 Mrs. Heather Yakely

\$500 - \$999

Mr. Lafe Anderson
 Ms. Joni Beal
 Mr. Robert P. Beattie
 Mr. Dale Benditz
 Mr. Brent Berge
 Ms. Carolyn Block
 Ms. Margo A. Blumenthal
 Mr. and Mrs. Larry Brown
 Mr. and Mrs. Ronald J. Byrne
 Mr. James F. Collett
 Mr. and Mrs. Russ Cyphers
 Ms. Susan Daniels
 Mr. and Mrs. Wayne B. Dondelinger
 Mr. and Mrs. Jamie Duke
 Mr. and Mrs. Chris Evans
 Mr. and Mrs. Herbert Fitz
 Mr. Jeremy Ford
 Mr. Dean Gentile
 Mr. and Mrs. Gary Gillis
 Goldman, Sachs & Co.

2012 REVENUES

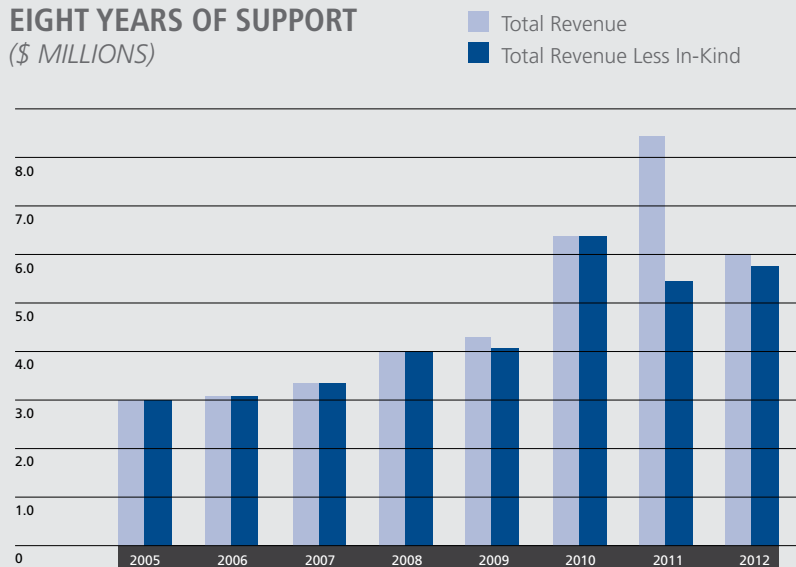


■ MRI and Other Revenue: \$965,742
 ■ Family and Friends: \$2,341,397
 ■ Corporate Support: \$2,700,044

SUPPORTING ORTHOPAEDIC RESEARCH AND EDUCATION

In 2012 individuals, corporations and foundations contributed \$6,007,183 to support the Institute's research and education programs.

EIGHT YEARS OF SUPPORT (\$ MILLIONS)





Mr. Marshall Gordon
 Mr. and Mrs. Michael Gordon
 Mr. John H. Gorman
 Mr. and Mrs. Charles Haime
 Mr. and Mrs. Bill Harriman
 Mr. and Mrs. William M. Hazard
 Mr. Steve Helms
 Here to Help of Vail, LLC
 Mr. William R. Hibbs
 Mr. and Mrs. Preston Hotchkis
 Mr. and Mrs. Kirk D. Huffard
 Ms. Liba Icahn
 Mr. and Mrs. Bill Jensen
 Mr. Robert G. Jones
 Mr. and Mrs. Peter Kalkus
 Mr. and Mrs. Robert E. Kavanagh
 Mr. and Mrs. Arthur Kelton, Jr.
 Mr. and Mrs. John Kurdilla
 Mr. and Mrs. Frederick C. Lane
 Ms. Cheryl Lee
 Mr. and Mrs. Joseph A. Mahoney
 Ms. Carol A. McCurley
 Dr. Michael J. Milne
 Ms. Cindy L. Nelson
 Mr. and Mrs. Andy Newberry
 Mr. Stephen M. O'Shaughnessy
 Dr. and Mrs. Scott Paschal
 Mr. Richard Pearlstone
 Mr. Greg Perkins
 Mr. Robert H. Pickens
 Mr. Matthew Read
 Mr. G. Shantanu Reddy
 Mr. and Mrs. Ronald H. Riley
 Mr. and Mrs. Michael Rothman
 Ms. Mary D. Sauve
 Mr. and Mrs. Marvin Schilling
 Mr. and Mrs. Keith Schneider
 Mr. Jeffrey S. Shinn
 Mr. Robert Simpson
 Mr. George A. Skouras
 Mr. and Mrs. H. William Smith
 The Patricia M. and H. William
 Smith, Jr. Foundation
 Mr. and Mrs. Lyon Steadman
 Ms. Debra Stein Wagner
 Mr. Penfield Tate
 Dr. and Mrs. William R. Weaver
 Mr. and Mrs. Richard Wenninger
 Dr. and Mrs. Stephen A. Wright

Mr. John T. Acklen
 Ms. Evelyn Albert
 Mr. Pinar M. Alisan
 Mr. and Mrs. John L. Allen
 Ms. Rona Altschuler
 Mr. Jamie Alverde
 Mr. and Mrs. Walter I. Anasovitch
 Mr. and Mrs. Jack R. Anderson
 Dr. Gary G. Andreoletti
 Mr. Irving Andrzejewski
 Dr. Julie Anthony
 Dr. and Mrs. Adam Anz
 Mr. Larry S. Arbuthnot and
 Ms. Ann Crammond
 Mr. Alfredo Asali
 Mr. and Mrs. John A. Baghott
 Mr. and Mrs. Bryant P. Barnes
 Ms. Elizabeth D. Baubigny
 Mr. and Mrs. Jack Beal
 Mr. and Mrs. Thomas Beat
 Dr. and Mrs. Quinn H. Becker
 Mr. Shlomo Ben-Hamoo
 Mr. and Mrs. Philip M. Bethke
 Ms. Susan Biddle
 Mr. and Mrs. Gary Biszantz
 Ms. Jane R. Blanch
 Mrs. Susan M. Brodine
 Mr. and Mrs. Robert Bruce
 Mr. Kenneth A. Bugosh
 Mr. Kurt Burghardt
 Mr. Bill Burns
 Mr. Paul D. Bushong
 Mr. and Mrs. Thomas Butler
 Mr. Rodger W. Bybee
 Mr. Harold E. Cahoy
 Mr. and Mrs. J. Marc Carpenter
 Ms. Marilyn M. Carr
 Mr. Nelson Case
 Mr. Robert L. Castrodale
 Chalat Hatten Koupal & Banker PC
 Dr. Lee S. Chapman
 Dr. Teresa Cherry
 Mr. Joe Chess
 Mr. Kurt Christiansen
 Mr. David J. Christie
 Mr. and Mrs. Kenneth Churich
 Mrs. Annemette Clausen
 Mr. John Coker
 Ms. Tiffany A. Cook
 Mr. and Mrs. Jonathan Coon
 Mr. and Mrs. Chris Cooper
 Mr. Justin Cooper
 Mr. Robert O. Copito
 Mr. and Mrs. Robert Corcoran
 Mr. and Mrs. Steven R. Corneillier
 Mr. and Mrs. Spencer Cornett

\$100 - \$499

Mr. Alberto A. Abed
 Dr. and Mrs. Jeffrey Abrams
 Mr. Peter Abuisi

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**

Ms. Penny Covert
 Dr. and Mrs. Shannon Cox
 Mr. Charlie Crevling
 Dr. Richard V. Crisera
 Mr. and Mrs. Donald W. Crocker
 Ms. Elizabeth D. Cronin
 Mr. Francisco Fernandez Cueto
 Mr. James L. Cunningham
 Dr. and Dr. Mark A. Curzan
 Mr. and Mrs. Robert J. Darretta
 Ms. Elizabeth De Baubigny
 Ms. Teresita Z. de Trigo
 Dr. and Mrs. Kenneth E. DeHaven
 Mr. and Mrs. Kenneth DeLine
 Mr. and Mrs. Frederick W. Deming
 Dr. Doug Dennis
 Ms. Renee M. Desnoyers
 Mr. Jack Devine
 Mr. Frederick A. Dick
 Dr. Willis N. Dickens
 Dr. Frederick W. Distelhorst
 Mr. Dan Drawbaugh
 Mr. George Duane
 Mr. Jack Durliat
 Ebersol-Saint James Family Trust
 Ms. Elise Ecanow
 Dr. and Mrs. Jack Eck
 Mr. Burton M. Eisenberg
 Mr. and Mrs. John Perryman Ellison
 Mr. and Mrs. Heinz Engel
 Ms. Slavica Esnault-Pelterie
 Mr. Johannes Faessler
 Ms. Eva Maria Felahy
 Dr. and Mrs. Sam Felahy
 Mr. John David Finholm
 Mr. Mark Fischer and Ms. Lari Goode
 Ms. Sistie Fischer
 Mr. and Mrs. Verlin W. Fisher
 Mr. John Fleming
 Mr. and Mrs. Walter Florimont
 Ms. Anne Foster
 Ms. Ingegerd Franberg
 Mr. Agustin Franco Macias
 Mr. Royle L. Freund
 Mr. John Frey
 Mr. and Mrs. Olin Friant
 Mr. and Mrs. Robert F. Fritch
 Dr. and Mrs. Russell C. Fritz
 Mr. and Mrs. Lon D. Garrison
 Gasthof Gramshammer, Inc.
 Ms. Pamela G. Geenen
 Mrs. Arlene C. Gerety
 Mr. and Mrs. Scott T. Gillespie
 Mr. and Mrs. Herb Glaser
 Mr. Bruce L. Goldman
 Dr. and Mrs. David Goldstein

Dr. and Mrs. Harvey M. Goldstein
 Mr. and Mrs. William A. Goodson
 Ms. Mary B. Goodspeed
 Ms. Marquerite R. Gorman
 Mr. and Mrs. Frank Gould
 Mr. and Mrs. Michael S. Graboski
 Mr. and Mrs. George T. Graff
 Mr. A. Wayne Griffith
 Ms. Joyce L. Gruenberg
 Mr. Kim Gustafson
 Dr. and Mrs. Topper Hagerman
 Mr. Robert M. Hammaker
 Mr. Curtis J. and
 Mrs. Maureen Q. Hammond
 Mr. Ivan Hass
 Mr. Richard A. Hathaway
 Mr. Corey P. Helm
 Ms. Rebecca Hernreich
 Mr. and Mrs. Mark O. Hiepler
 Dr. and Mrs. Norwood O. Hill
 Mr. and Mrs. Rob Hill
 Mr. and Mrs. William H. Hobart
 Mrs. Nancy G. Holland
 Mr. Brandon J. Holtrup
 Mr. Patrick S. Horvath
 Ms. Kim Hough
 Ms. Kathy Hubbard
 Ms. Loretta Hubbard
 Mr. Bill Hunnicutt
 Dr. Steve and Dr. Mary Hunt
 Mr. Caleb B. Hurtt
 Mr. and Mrs. Paul H. Huzzard
 Illinois Tool Works Foundation
 Mr. and Mrs. Donald C. Jackson
 Mrs. Josephine O. Jackson
 Mr. and Mrs. Arnold Jaeger
 Mr. Timothy I. Jenkins
 Ms. Susie Johnson
 Dr. Todd Johnston
 Mr. Donald W. Jones
 Mr. and Mrs. Michael B. Jones
 Mr. and Mrs. Darrell L. Jordan
 Mr. and Mrs. John Karoly
 Ms. Beth Kasser
 Mrs. Joanne Kemp
 Ms. Mary Ann Kempf-Koch
 Mr. and Mrs. Rick Kent
 Mr. and Mrs. Robert W. Kern
 Ms. Elke Klinkau
 Ms. Gwyn Gordon Knowlton
 Mr. and Mrs. Walt Koelbel
 Ms. Karen Korfanta
 Dr. George M. Kornreich
 Mr. and Mrs. Nic Korte
 Mr. William J. Kourbage
 Mr. Frank W. Krauser



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 individuals who have made a five-year \$125,000 commitment to the fellowship program to support medical research and education. In 2012, six 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
MR. AND MRS. STEVEN READ
MR. AND MRS. BRIAN P. SIMMONS

Mr. David M. Kuhl
 Mr. James Kurtz
 Mr. and Mrs. Roger Leavitt
 Mr. William A. Lederer
 Mr. John E. Leipprandt
 Mr. and Mrs. Mark F. Leonard
 Mr. Thomas C. Leonhardt
 Mr. Andre Lessard
 Brigadier General Samuel K. Lessey, Jr.
 Mr. Fredric W. Levin
 Mr. Burton Levy
 Dr. and Mrs. James W. Lloyd
 Mr. and Mrs. Ronn N. Loewenthal
 Mr. David R. Logan
 Mr. Carlos R. Lombardo
 Mr. Bernard B. Lopez
 Mr. Andrew M. Loveland
 Mr. Richard Lubin
 Mr. and Mrs. Michael A. Ludeman
 Ms. Kim Lundgren
 Mr. and Mrs. Antonio Madero
 Mr. and Mrs. James Mahaffey
 Mr. Michael J. Mahoney
 Mr. Paul F. Mahre
 Mr. John P. Manes
 Ms. Kathy W. Manifold
 Ms. Kristin Mapstone
 Ms. Audrey E. Marcoff
 Marriott Vail
 Mr. and Mrs. Michael Marsh
 Mr. John W. Martin
 Mr. and Mrs. Rocco J. Martino
 Mr. Frank Mastriana
 Dr. and Mrs. Charlie May
 Mr. Eion F. McDowell
 Ms. Patricia A. McGivern
 Mr. Robert L. McGrath
 Ms. Kimberly McKay
 Mr. Calvin McLachlan
 Mr. and Mrs. John G. McMurtry
 Mr. Peter R. McNally
 Mr. and Mrs. James M. McPhetres
 Dr. Stephen B. Meisel
 General George Miller
 Mr. Todd Milner
 Mr. David L. Mitchell
 Ms. Marla Mogul Jaffe
 Mr. and Mrs. Chandler J. Moisen
 Mr. and Mrs. Evan Moody
 Sr. Jorge Morales
 Mr. Dan Moskovitz
 Mr. Aubert J. Mowry
 Mr. and Mrs. A.J. Mowry
 Ms. Jane Muhrcke
 Mr. and Mrs. Bruce Nelson
 Dr. Todd Neugent
 Dr. Myron Nevins
 Ms. Raissa Nicol
 Mr. Michael Niemann
 Mr. John T. Nitta
 Dr. John R. Paddock
 Mr. Agus Pambudi
 Mr. and Mrs. Mark A. Pancratz
 Ms. DiAnn Papp
 Mr. William T. Parry
 Dr. and Mrs. Maurie Pelto
 Mr. John Perenchio
 Mr. and Mrs. William C. Perlitz
 Mr. and Mrs. Cary R. Perlman
 Ms. Ruth W. Perotin
 Mr. and Mrs. J. Douglas Pfeiffer
 Mr. William J. Phelan
 Mr. Rob Philippe
 Philippon Team
 Mr. John B. Phillips
 Ms. Jan Rymer Pickens
 Mr. James R. Pitts
 Mr. S. Daniel Ponce
 Dr. Robert H. Potts, Jr.
 Mr. and Mrs. Paul E. Price
 Mr. James A. Progin and
 Ms. Judy Holmes
 Mr. and Mrs. John Purchase
 Mr. and Mrs. Christopher Purrington
 Mr. John Quinlan
 Mr. and Mrs. Merrill L. Quivey
 Mr. Osvaldo Ramos
 Mr. Carl Rand
 Mr. and Mrs. Gary B. Rappaport
 Mr. and Mrs. Ronald Rasnic
 Ms. Beverly B. Rauch
 Mr. Scott Rella
 Mr. and Mrs. Eric Resnick
 Mr. and Mrs. Michael H. Rich
 Mr. Daniel J. Riehl
 Mr. Ray H. Riley
 Mr. Manuel A. Rivera Raba
 Mr. and Mrs. Wayne A. Robins
 Ms. Pamela K. Roehl
 Mr. Daniel G. Roig
 Ms. Angela Romagosa
 Mr. and Mrs. Neil F. Rosser
 Mr. John F. Ruggles
 Mr. and Mrs. Stanley Rumbough, Jr.
 Mr. and Mrs. Thomas L. Russell
 Mr. James T. Ryan
 Mr. and Mrs. Phillip K. Ryan
 Mr. Lee K. Sadrian
 Ms. Jolanthe Saks
 Mr. and Mrs. Donald Salanty
 Mr. and Mrs. Peter F. Sampson
 Mr. and Mrs. Steve Sanger
 Mr. Tom Saunders
 Mr. and Mrs. William D. Schaeffer
 Mr. and Mrs. Ken Schanzer
 Dr. David Schneider
 Mr. William J. Schneiderman
 Mr. William E. Schulz
 Mrs. Susie Sheridan
 Mr. and Mrs. Jeffrey J. Shuster
 Dr. David Silken and Dr. Maura Levine
 Mr. Richard J. Silverman
 Mr. Chuck Simmons
 Ms. Viki L. Simmons
 Mr. and Mrs. Virgil S. Simon
 Mr. Harvey Simpson
 Mr. Howard F. Sklar
 Mr. and Mrs. Alborne L. Slider
 Mr. Edmond W. Smathers
 Mr. and Mrs. James S. Smith
 Ms. Pam Smith
 Ms. Barbara A. Sosaya
 Mr. James L. Spiker
 Mr. and Mrs. Terry S. Stanford
 Dr. and Mrs. Bob Stanton
 Mr. and Mrs. Stephen M. Stay
 Mr. and Mrs. Daniel W. Stock
 Mr. John R. Stokley
 Mr. and Mrs. John B. Stone
 Mr. and Mrs. Dale Stortz
 Dr. John A. Strache
 Mr. and Mrs. Eric Strauch
 Mr. and Mrs. B. A. Street
 Ms. Elizabeth Strong
 Mr. and Mrs. Bruce C. Stuart
 Mr. Robert L. Stubing
 Mr. and Mrs. Patrick J. Sullivan
 Mr. and Mrs. Hjalmar S. Sundin
 Mr. and Mrs. Karl Swann
 Mr. and Mrs. Dominick A. Taddonio
 Mr. and Mrs. David S. Tamminga
 Ms. Kyra M. Taylor
 Mr. Matthew Teeters
 Mr. and Mrs. Ronald J. Tenbensen
 Mr. Stephen M. Tenney
 Mr. Christian Thomas
 Mr. and Mrs. Robert E. Thompson
 The Tinbeg Family
 Mr. Alan R. Titus
 Mr. and Mrs. Brett Tolly
 Ms. Eleanor Torre
 Mr. and Mrs. Mark Train
 Mr. and Mrs. Thomas Traylor
 Mr. William B. Tutt
 Mr. Harold and Mrs. Debbie Tyber

Ms. Corinna Ulrich
Mr. and Mrs. Bruce Ungari
Mr. Faustino A. Valino
Ms. Vickie G. Van Blois
Mr. Carl A. Vill, Jr.
Mr. Daniel E. Virnich
Mr. Steven J. Virostek
Ms. Sunny Vogel
Mr. and Mrs. Matthew V. Waidelich
Mr. Martin Waldbaum
Dr. and Mrs. David R. Wallace
Dr. Douglass Weiss
Dr. and Mrs. Wayne Wenzel
Mr. Bernard and Mrs. Joyce West
Mr. Larry Klingman and
Ms. Joella West
Ms. Sibylle J. Whittam
Mr. William Wilkerson
Ms. Marilyn H. Wilmerding
Mr. Randall M. Wilson
Mr. Ted J. Winninger
Mr. Felix B. Winston
Mr. and Mrs. Joel A. Wissing
Mr. John Wood
Ms. Linda D. Woodcock
Mr. Martin Wostenholme
Dr. and Mrs. S. Austin Yeargan
Mr. Richard B. and
Mrs. Vickie T. Zellmer
Mr. Joseph D. Zimmerman
Dr. and Mrs. Paul Zizza



THE FOUNDERS' LEGACY SOCIETY

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 to recognize 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:

MR. AND MRS. ROBERT M. FISHER
MS. MARGO GARMS
MR. ALBERT HARTNAGLE
MR. AND MRS. JOHN MCMURTRY
MR. AND MRS. EDWARD J. OSMERS
MR. AL PERKINS
MR. ROBERT E. REPP
MR. WARREN SHERIDAN

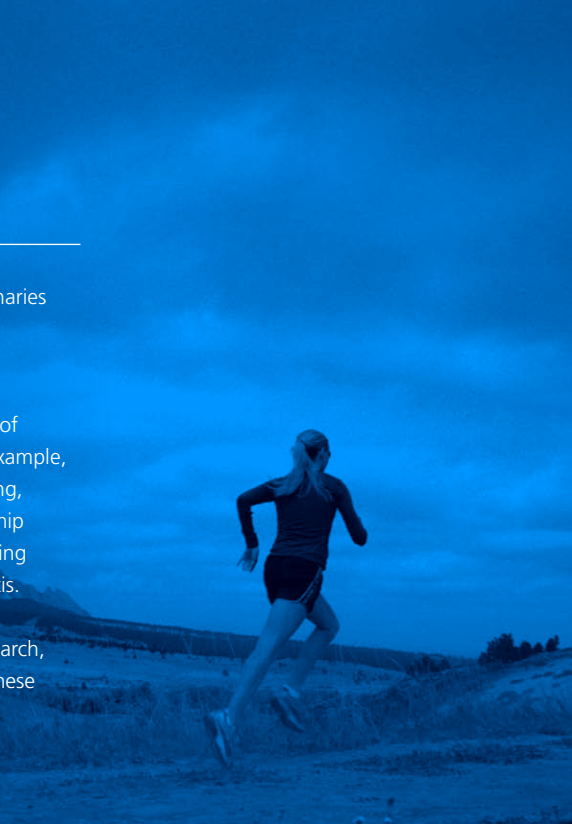


VISIONARIES

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:



Aarhus University Hospital Foundation
for Sports Traumatology
Mr. and Mrs. Edward C. Abraham
Mr. and Mrs. Don Ackerman
Aetna Foundation
Aircast, Inc.
Alpine Bank
Allegheny & Western Energy Corp.
Mr. and Mrs. John Alford
The Alix Foundation
Mr. Herbert Allen
Mr. and Mrs. James C. Allen
American Orthopaedic Foot & Ankle
Society, Inc.
American Airlines
American Express
American Academy of
Orthopaedic Surgeons
Mr. and Mrs. Harold Anderson
Mr. and Mrs. John M. Angelo
Anonymous
Mr. and Mrs. David B. Arnold, Jr.
Mr. and Mrs. Adam Aron
Arthrex, Inc.
ArthroCare Corporation
His Royal Highness Bin Majid Abdul Aziz
Butterfield & Robinson
Mr. John M. Bader
Mr. Thomas H. Bailey
Mr. and Mrs. Paul Baker
Mr. Foster Bam
Mr. and Mrs. Herbert Bank
Helen S. & Merrill L. Bank Foundation, Inc.

Ms. Susan Barnett
Ms. Nancy Bechtle
Mr. and Mrs. Melvyn Bergstein
Mr. and Mrs. Howard Berkowitz
Biomet, Inc.
Bionicare Medical Technologies, Inc.
Ms. Lyndall Boal
Mr. George Boedecker
Mr. and Mrs. John A. Boll
Mr. and Mrs. Erik Borgen
Dr. and Mrs. Martin Boublik
Mr. and Mrs. Robert A. Bourne
Dr. Dennis D. Bowman
Mr. Jack Boyle, III
W.L. Lyons Brown Charitable
Foundation, Inc.
Ms. Maria Brabb
Lord Brabourne
Mr. and Mrs. Bernard A. Bridgewater, Jr.
Mr. and Mrs. Peter L. Briger, Jr.
Mr. and Mrs. Michael C. Brooks
Red Bull North America, Inc.
Mr. and Mrs. Preston Butcher
Mr. Richard T. Butera
Dr. and Mrs. R. David Calvo
Mr. and Mrs. James R. Cargill
Mr. and Mrs. Russell L. Carson
Mr. and Mrs. Jim Castillo
Mr. and Mrs. Pedro Cerisola
Mr. Lim Chee-Wah
Mr. Jim Cimino
The Cliffs Communities
Dr. and Mrs. Thomas Clanton

Ms. Caryn Clayman
Mr. Bruce R. Cohn
Mr. and Mrs. Jonathan Coon
Dr. and Mrs. Kenneth H. Cooper
Dr. Donald S. Corenman
Ms. Joanne Corzine
The James M. Cox, Jr. Foundation
Mr. Archibald Cox, Jr.
Henry Crown and Company
Arie and Ida Crown Memorial
Mr. James S. Crown
Darwin Partners
Mr. Douglas N. Daft
Mr. Franco D'Agostino and
Ms. Alicia Ziegert
Mr. Norris Darrell, Jr.
Mr. and Mrs. Ronald V. Davis
General and Mrs. Peter Dawkins
DePuy Mitek
Mr. and Mrs. Michael S. Dell
Mr. and Mrs. Claiborne P. Deming
Diversified Radiology
Mr. and Mrs. Thomas C. Dillenberg
Dr. and Mrs. Charles J. Dillman
Mr. Neil and Dr. Michelle Donaldson
Mr. and Mrs. Edward C. Dowling
EBI Medical Systems
Mr. and Mrs. John M. Egan
Mr. J. Michael Egan
Mr. and Mrs. Phillip D. Elder
Mr. and Mrs. Henry B. Ellis
Dr. and Mrs. Steve Ellstrom
Encore

Mr. and Mrs. Robert Engleby
 Mr. and Mrs. Floyd English
 Mr. and Mrs. William T. Esrey
 Dr. John A. Feagin and Mrs. Marty Head
 Mr. Jack Ferguson and
 Mrs. Veronica Slajer
 Mr. and Mrs. Chad Fleischer
 Mr. and Mrs. Lawrence Flinn, Jr.
 Dr. Sue Fogel
 Mrs. Peggy Fossett
 Mr. Nic Frangos
 Frito Lay, Inc.
 Mr. and Mrs. James Gaither
 Mr. and Mrs. Robert Galvin
 Genzyme Biosurgery
 Mr. and Mrs. Bradley Ghent
 Mr. Ephraim Gildor
 Mr. and Mrs. George N. Gillett, Jr.
 Dr. James P. Gills
 Ms. Donna M. Giordano
 The Spiritus Gladius Foundation
 Mr. C. Brody Glenn
 Mr. Richard Goodman
 Mr. and Mrs. James A. Gordon
 Mr. and Mrs. David W. Graebel
 Ms. Jean C. Graham
 Mr. Earl G. Graves
 Mr. and Mrs. Trevor Gray
 Mr. and Mrs. Stephen Greenberg
 Mr. Kenneth C. Griffin
 Mr. Neal C. Groff
 Mr. and Mrs. James Grosfeld
 Mr. and Mrs. Martin D. Gruss
 Gumbo Foundation
 Mr. Donald W. Gustafson
 Mr. Kim Gustafson
 Mr. and Mrs. Ron Haan
 Mr. and Mrs. Steve Haber
 Dr. Tom Hackett
 Dr. and Mrs. Topper Hagerman
 Halliburton Foundation, Inc.
 Dr. and Mrs. Gaines Hammond
 Mr. and Mrs. Milledge A. Hart, III
 Mr. and Mrs. Ted Hartley
 Harlan Estate
 Dr. and Mrs. Richard J. Hawkins
 Mrs. Martha Head
 Howard Head Sports Medicine Center
 HealthONE, LLC
 Mr. and Mrs. Peter S. Hearst
 Hellman Family Foundation
 Mr. Blake A. Helm
 Mr. and Mrs. Frank C. Herringer
 Mr. and Mrs. Walter Hewlett
 The William and Flora
 Hewlett Foundation

Highline Sports & Entertainment
 Mr. and Mrs. Stephen Hilbert
 Ms. Lyda Hill
 Audrey Hillman Fisher Foundation
 Mr. Hayne Hipp
 Dr. and Mrs. Russell Hirsch
 Hilliard Family Fund
 Dr. Charles P. Ho
 Hockey Equipment Certification Council
 Mr. and Mrs. David C. Hoff
 Mr. and Mrs. Preston Hotchkis
 Mr. and Mrs. Charles Huether
 Hugoton Foundation
 Mr. and Mrs. George H. Hume
 Mr. and Mrs. Walter Hussman
 Mr. and Mrs. Roy Igersheim
 Dr. and Mrs. Frederick Ilfeld
 Mr. and Mrs. Michael Immel
 Admiral and Mrs. Bobby Inman
 Fred & Elli Iselin Foundation
 Mr. and Mrs. Douglas E. Jackson
 Mr. Brice Jackson
 Ms. Mary H. Jaffe
 Mr. and Mrs. John V. Jaggars
 Mr. and Mrs. Bill Jensen
 Mr. and Mrs. Charles Johnson
 Mr. and Mrs. Michael O. Johnson
 G.E. Johnson Construction Company, Inc.
 Mr. and Mrs. Evan Jones
 Mr. and Mrs. John W. Jordan, II
 Dr. and Mrs. Jay Kaiser
 Dr. and Mrs. David Karli
 Ms. Beth Kasser
 Key Bank
 Mr. and Mrs. Peter R. Kellogg
 Mr. John P. Kelly
 Mrs. Connie Kemmerer
 Mr. and Mrs. Jack Kemp
 Key Foundation
 Steven and Michele Kirsch Foundation
 Charles G. Koch Charitable Foundation
 Mr. and Mrs. Henry Kravis
 Mr. and Mrs. Bob Krohn
 Anthony H. Kruse Foundation
 KSL Capital Partners
 Mr. and Mrs. J.B. Ladd
 Mary Lanning Memorial Hospital
 Dr. and Mrs. Robert F. LaPrade
 Mr. Jorge Paulo Lemann
 Mr. and Mrs. Robert Lemos
 Mr. and Mrs. S. Robert Levine
 The Liniger Family Foundation
 Mr. and Mrs. Soren Lind
 Linvatec
 Mr. and Mrs. Walter Loewenstern
 Mr. and Mrs. Kent Logan

Mr. and Mrs. Frank J. Lynch
 Mr. Buck and Mrs. Laura Lee Lyon
 Maher Foundation
 The Mailman Foundation, Inc.
 Ernst & Wilma Martens Foundation
 Mr. and Mrs. Douglas Mackenzie
 Mr. and Mrs. John Madden, III
 Mr. David Maher
 Mr. and Mrs. John Maher
 Mr. Theodore Mallon
 Mr. John Manner
 The House of Remy Martin
 Mr. Herbert E. Marks
 Jack C. Massey Foundation
 Mrs. Alexandra Mastriana-Solal
 Mr. and Mrs. Roy May
 Mr. and Mrs. Frederick R. Mayer
 Mr. and Mrs. David Mazer
 Mr. and Mrs. Charles McAdam
 Mr. and Mrs. John P. McBride
 The McCormack Foundation
 Mrs. Betsy McCormack
 Mr. Rick McGarrey
 Mr. and Mrs. Arch McGill
 Mr. and Mrs. John McMillian
 Medequip, Inc.
 Meadowood Napa Valley
 Messner Reeves, LLP
 MedSynergies-Surgical Division
 Mr. and Mrs. Eugene Mercy, Jr.
 Mr. Michael A. Merriman
 Mr. and Mrs. George Middlemas
 The Minneapolis Foundation
 Mr. and Mrs. Ron Miller
 Dr. and Mrs. Peter J. Millett
 MJP Innovations
 Norman M. Morris Foundation
 Dr. James Montgomery
 Mr. and Mrs. Bruce A. Montoya
 Mr. and Mrs. Mike A. Myers
 Mr. and Mrs. Trygve E. Myhren
 Norman Family Charitable Foundation
 Dr. and Mrs. Glen D. Nelson
 Mr. and Mrs. Don H. Nelson
 Ms. Cindy L. Nelson
 Mr. and Mrs. Paul L. Newman
 Mr. and Mrs. Tradd Newton
 NFL Charities
 Stavros S. Niarchos Foundation
 Nippon Sigmax
 Mr. and Mrs. Larry Nisonoff
 Mr. and Mrs. Michael Noell
 Dr. and Mrs. Thomas Noonan
 Mr. Greg Norman
 Mr. Robert Norris

Norwegian Health South-East (Helse Sør-Øst) Regional Health Authority
 Ms. Mary Noyes
 Össur Americas, Inc.
 Mr. Edward D. O'Brien
 Mr. and Mrs. John Oltman
 Opus Medical, Inc.
 Opedix Labs
 Oratec Interventions, Inc.
 Ortho Supply, Inc.
 ORP Hanger
 Mr. and Mrs. Paul Oreffice
 Ormed GmbH & Co. KG
 Ortholink Physicians Corp.
 Ortho Rehab
 OrthoLogic
 Mr. John Osterweis
 Mr. and Mrs. Preston S. Parish
 Ms. Uta Ortiz Patino
 Pepsi Cola
 JP's Peace, Love & Happiness Foundation
 Mr. Nelson Peltz
 Mr. and Mrs. Bob Penkhus
 Perry Golf
 Mr. Alan W. Perkins
 The Perot Foundation
 Mr. James Petersen, Sr.
 Pfizer, Inc.
 Dr. and Mrs. Marc Philippon
 Philips Medical
 Mr. and Mrs. Addison Piper
 Piper Jaffray & Co.
 Dr. and Mrs. Kevin D. Plancher
 Mrs. Andrew Pollet
 Mr. David S. Pottruck
 Mr. and Mrs. Jay A. Precourt
 Mr. Michael Price
 Mr. Marc Prisant
 Mr. and Mrs. Tom Quinn
 The Rainforth Foundation
 Mr. and Mrs. Paul Raether
 Ms. Karen Rainwater
 Mr. and Mrs. Felix D. Rappaport
 Mr. and Mrs. George Rathman
 Mr. and Mrs. Steven Read
 ReGen Biologics
 RE/MAX International, Inc.
 RJG Foundation
 The Robbins Foundation
 Mr. George R. Roberts
 Mr. and Mrs. Sanford Robertson
 Mr. and Mrs. Wayne A. Robins
 Mr. and Mrs. Arthur Rock
 Dr. William Rodkey
 Mr. and Mrs. Michael D. Rose
 Mr. and Mrs. Gary S. Rosenbach
 Mrs. Nancy H. Russell
 Mr. Ronald Alvarez and Ms. Alice Ruth
 Mr. and Mrs. Larry W. Ruvo
 Mr. Jack Saltz
 Saucony, Inc.
 Mr. and Mrs. Kenneth T. Schiciano
 Mr. Craig Schiffer
 Dr. and Mrs. Theodore Schlegel
 Mr. and Mrs. Paul Schmidt
 Mr. William J. Schneiderman
 Mr. and Mrs. Charles Schwab
 Mr. Edward D. Scott
 Seabourn Cruise Line
 Julius Seaman Family Foundation
 Mr. and Mrs. Brad Seaman
 Mr. and Mrs. Gordon I. Segal
 Ms. Monica Seles
 Shark Shootout Charities
 Mr. and Mrs. O.B. Shelburne
 Mr. and Mrs. Stanley S. Shuman
 Siemens Medical Solutions USA
 Dr. and Mrs. James F. Silliman
 Mr. and Mrs. Brian Simmons
 Mr. and Mrs. John Simon
 Mr. and Mrs. Gary Sitzmann
 Ms. Damaris Skouras
 Mr. and Mrs. Rod Slifer
 Smith & Nephew Endoscopy
 Small Bone Innovations
 Mr. Michael Byram and Mrs. Ann B. Smead
 Mr. Michael Smith
 Mr. Thomas W. Smith
 Mr. and Mrs. Jack Smith
 The Sonnenalp of Vail Foundation
 Sonoma Orthopedic Products
 Mr. and Mrs. Erich Spangenberg
 Mr. and Mrs. Howard Specter
 Spectra Energy Foundation
 Steadman Philippon Research Institute
 Stryker Trauma
 Dr. and Mrs. J. R. Steadman
 The Steadman Clinic
 Steadman Family Foundation
 Steadman Hawkins Clinic Denver
 Mr. and Mrs. Lyon Steadman
 Mr. and Mrs. Charles L. Stephens
 Dr. William I. Sterett
 Stocker & Yale, Inc.
 Mr. Bram Stolk
 Mr. Hans Storr
 Mr. James E. Stowers, III
 Stryker Imaging
 Surgical Dynamics, Inc.
 Synthes USA Products, LLC
 Mr. and Mrs. Mark Taché
 Mr. Oscar L. Tang and Dr. Agnes Hsu-Tang
 Mr. Vernon Taylor, Jr.
 Mr. and Mrs. Richard F. Teerlink
 Mr. Tim Tenney
 Mr. and Mrs. Fred Teshinsky
 Mr. and Mrs. James Tiampo
 Mr. and Mrs. William R. Timken
 Mr. and Mrs. John C. Tlapek
 Mr. and Mrs. John Tolleson
 Mr. and Mrs. Stewart Turley
 U.S. Ortho Corporation
 University of Pittsburgh
 Dr. and Mrs. Luis H. Urrea, II
 US Bank
 Vail Resorts
 Vail Valley Foundation
 Vail Valley Medical Center
 Mr. Jack Van Valkenburgh
 Mr. and Mrs. Leo A. Vecellio, Jr.
 Verizon Communications, Inc.
 Mr. and Mrs. Arthur W. Vietze
 Dr. Randy Viola
 Mr. and Mrs. George Vonderlinden
 The Williams Family Foundation
 Mr. and Mrs. Norm Waite
 Mrs. Alice Walton
 Ms. Lucinda Watson
 Mr. Mark E. Watson, Jr.
 Mrs. Olive C. Watson
 Ms. Valerie Weber
 Mr. and Mrs. Stephen D. Wehrle
 Mr. and Mrs. Patrick Welsh
 Dr. and Mrs. Wayne Wenzel
 Mr. and Mrs. George Wiegiers
 Mr. Rodney Wimmer
 Ms. Mary Wolf
 Dr. and Mrs. Savio L.Y. Woo
 Wyeth Pharmaceuticals
 Mr. Craig Yates, Sr.
 Zimmer, Inc.



ALEXANDRA MASTRIANA-SOLAL TAKES THE STEADMAN PHILIPPON MESSAGE TO THE TOP OF KILIMANJARO

By Jim Brown

It wasn't your usual telephone call, but then the caller wasn't your usual person. Anyone with a movie marquee name like Alexandra Mastriana-Solal must have a story to tell, and she does.

THE CALLER

Alexandra Mastriana-Solal was born and raised in Paris. She came to the United States for her college education, received a B.A. from Tufts University, earned a M.A. in marketing at Emerson College, and later graduated from the University of Miami with a M.B.A. in international business. She's had more than 20 years of experience in the real estate industry and has worked for firms such as The Mills Corporation, The Rouse Company, and Arquitectonia, an international architecture, landscape, and design firm. She is now associated with Minola Realty in Fort Lauderdale, Florida. Alexandra also has a bad right knee, or at least it was bad before she met Dr. Richard Steadman.

THE INJURY

Alexandra injured her knee skiing in the French Alps when she was only 16 years old. "I missed a bump, heard something unusual in my knee, and knew that something was wrong. The doctor who examined me there told me I was a 'cry-baby,' and I raced the next day."

"I went back to Paris, where I was involved in modern dance, and the knee got worse and worse. I needed surgery and the surgeon removed the meniscus. He apparently did not notice a torn anterior cruciate ligament (ACL)."

Alexandra went off to college in the States, but had to take a room on the first floor of a dorm because she couldn't make it up and down stairs. After more pain and another surgery, she was told she might not be able to walk again without crutches, but a friend of her father arranged for her to see Dr. Steadman, then in Lake Tahoe.

"I don't know exactly what he did," says Alexandra. "I just asked him to fix it." He did, her rehab program lasted two full years, and there have been a few follow-up arthroscopic procedures since.

"Dr. Steadman and his wife, Gay, have always been extremely nice to me and they know my entire family," says Alexandra. "My sister and husband have also had surgeries with him."

Now, more than 25 years since her first operation with Dr. Steadman, Alexandra's "normal" training routine includes running between three and six miles, three or four times a week. She also bikes, swims, and skis. She does weight training and has added StairMaster work twice a week—wearing training boots.

THE CALL

On February 5, 2013, Alexandra called SPRI's chief development officer, John McMurtry, in Vail. "John, I am calling to ask if I could borrow a Steadman Philippon Research Institute flag or banner I could take with me for a photo on the top of Mount Kilimanjaro."

(Kilimanjaro is in Tanzania and is not only the tallest peak on the African continent, but also the tallest freestanding mountain in the world. It has an altitude of 19,336 feet (3.6 miles). It is a 45-mile trek to get to the summit and takes eight days to ascend, two to return. Every year 15,000 attempt to reach Uhuru Peak, the summit. Half of them don't make it.)

"The reason I am doing this is because I'm raising money for the Steadman Philippon Research Institute. I feel like I owe it to Dr. Steadman. I have asked my friends for donations," she told John, "and so far, I've raised more than \$10,000, which I will match. I would like to send a picture of me with the flag on top of Mount Kilimanjaro to my friends, who have generously given on my behalf."

THE APPEAL (TO HER SUPPORTERS)

"I am writing today to ask for your help in raising money for a cause that is dear to me. Most of you know about my lifelong struggles with my right knee. Some of you might even remember seeing me struggle to walk (without crutches) for years."

"Today, that struggle is merely a bad memory. I owe my recovery to a man I admire—Dr. Richard Steadman. He has helped me achieve the physical goals I have set for myself. I have run four half-marathons,

competed in a half-ironman event, and in February I will pursue a dream I have had for many years. I am planning to trek the highest peak in Africa—Mount Kilimanjaro.”

“The Steadman Philippon Research Institute’s mission is to keep people of all ages physically active. The Institute makes this possible through orthopaedic research and education in the areas of arthritis, healing, rehabilitation, and injury prevention.”

“Without that type of research, I would not lead a pain-free life, and I certainly wouldn’t be thinking about hiking up a mountain for 10 days. Knowing that we all need hips and knees for the rest of our lives, whether we are world-renowned athletes, weekend warriors, or just regular folks, this research is really important.”

THE FLAG

John McMurtry doesn’t keep a box of SPRI flags in his office. Until Alexandra called, there were no SPRI flags. But John quickly recognizes a unique person, a compelling story, and an opportunity to spread the SPRI message around the world. Alexandra and her new, one-of-a-kind SPRI flag left for Tanzania on February 19.

SHE DID IT

Alexandra officially arrived at the top of Kilimanjaro at 12:10 p.m. on March 2, 2013. “The trip was amazing—much more than I expected,” she said. “No one was there besides us. A snowstorm was brewing. It was beautiful, cold, and windy. From the first peak to the last, you have a magnificent view of many glaciers. I was extremely happy, but didn’t really feel the accomplishment until I was at camp that night. I called my husband and parents from a satellite phone. Reaching the peak was exhilarating.”

Reflecting on the experience, Alexandra says, “Staying active is what it’s all about. Even when you have a bad day of physical therapy, you have to concentrate on the next adventure, the next physical challenge.”

What might that challenge be? “I’d like to hike up Machu Picchu with my son.”

If she does, we’ll let you know. Her SPRI flag might be on its way to South America.



CORPORATE AND INSTITUTIONAL FRIENDS

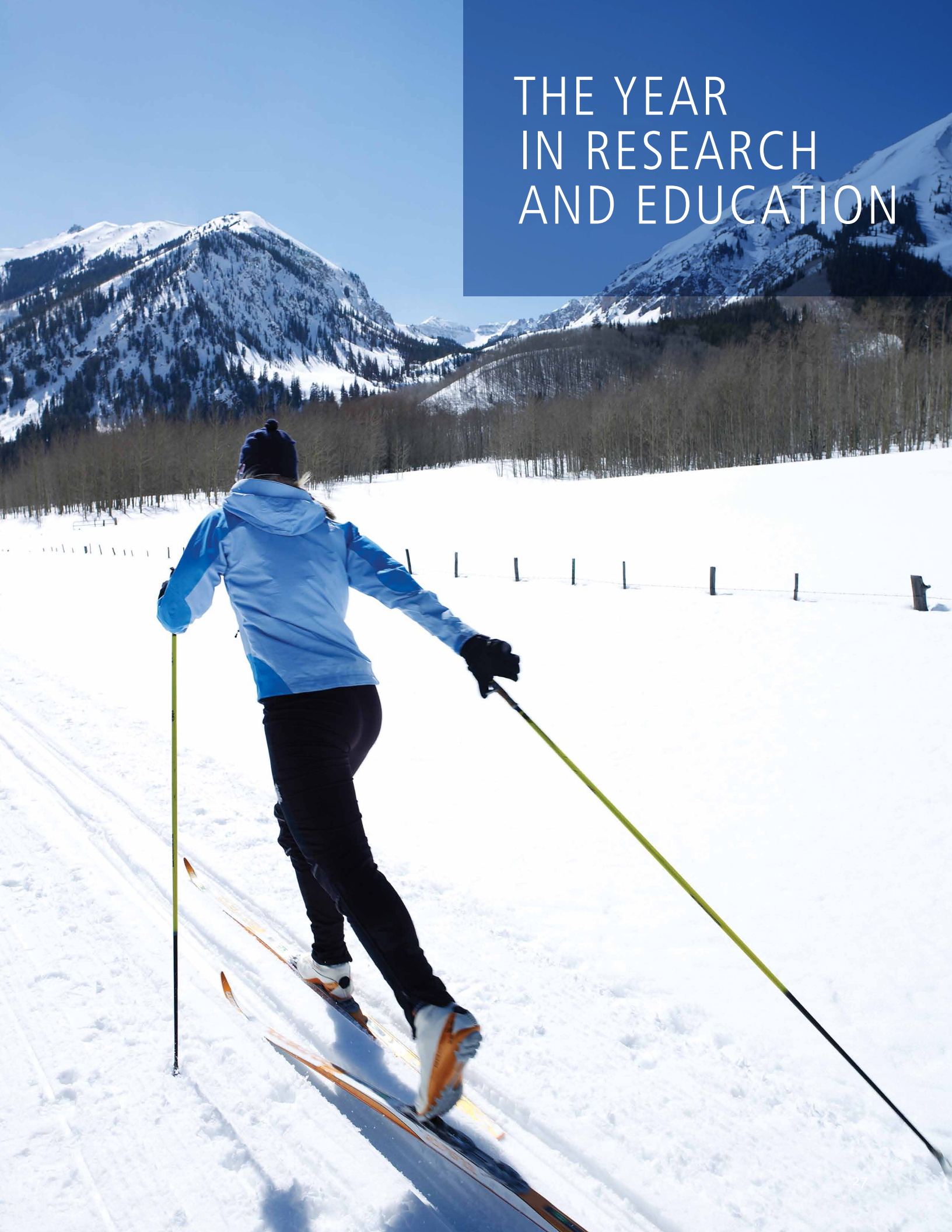
Corporate support helps fund our Institute's research and education programs in Vail, Colorado, and at six university sites. Corporate funding has increased as we have continued to deliver efficiencies in overhead, allowing us to direct more dollars into research. This year, 77 cents of every dollar raised went into research. The Institute is grateful for the generous support of our corporate donors. In 2012, we received \$2,700,044 in corporate support. This work will benefit patients and physicians for generations to come.

Alpine Bank
American Orthopaedic Foot & Ankle Society, Inc.
Arthrex, Inc.
ArthroCare Corporation
Biomet, Inc.
DRM Medical
G.E. Johnson Construction Company, Inc.
Goldman, Sachs & Co.
Henry Crown and Company
KSL Capital Partners
Linvatec
Medequip, Inc.
MedSynergies-Surgical Division
MJP Innovations
Newton Running
Norwegian Health South-East (Helse Sør-Øst) Regional
Health Authority
Opedix Labs
ORP Hanger
University of Oslo and Oslo Sports Trauma
Research Center
Össur Americas, Inc.
Red Bull North America, Inc.
RevGen Partners
Small Bone Innovations
Smith & Nephew Endoscopy
Siemens Medical Solutions USA
Sonoma Orthopedic Products
The Steadman Clinic
Stryker Trauma
Synthes USA Products, LLC
US Bank
Vail Resorts
Vail Valley Medical Center
Verizon Communications, Inc.

FOUNDATIONS

Aarhus University Hospital Foundation
for Sports Traumatology
The James M. Cox, Jr. Foundation
Ebersol-Saint James Family Trust
The Flora Foundation
Goodwin Foundation
The Greenburg-May Foundation, Inc.
The Hellman Family Foundation
The William and Flora Hewlett Foundation
The Fred & Elli Iselin Foundation
The Liniger Family Foundation
Norwegian Health South-East
(Helse Sør-Øst) Regional Health Authority
RJG Foundation
The Patricia M. and H. William Smith, Jr. Foundation
The Sonnenalp of Vail Foundation
US Ski and Snowboard Team Foundation
Vail Valley Foundation

THE YEAR IN RESEARCH AND EDUCATION



DR. RICHARD STEADMAN'S AWARD-WINNING RESEARCH SHOWS THAT ARTHROSCOPY MAY DELAY KNEE REPLACEMENT BY 5-10 YEARS

By Jim Brown

A study of patients with knee osteoarthritis conducted by Dr. Richard Steadman and his colleagues at the Steadman Philippon Research Institute in Vail found that an operation called "The Package" allows many patients to delay total knee replacement for up to 10 years.

For his landmark study, titled "Ten-Year Survivorship Following Knee Arthroscopy in Patients with Moderate to Severe Osteoarthritis of the Knee," Dr. Steadman was honored with the Richard O'Connor Research Award. The award was given by the Arthroscopy Association of North America at its annual meeting in 2012. The study was published in the February 2013 issue of *Arthroscopy*. Dr. Steadman's co-authors are Karen Briggs, M.P.H., Lauren Matheny, and Dr. Henry Ellis.

Few Options for Long-Term Relief

"Although thousands of people are diagnosed with knee osteoarthritis (OA) every year, there are few options that offer long-term relief," says Ms. Briggs, director of SPRI's Center for Outcomes-Based Orthopaedic Research. "Anti-inflammatory drugs and knee injections offer pain relief, but the reduction is usually short-lived, lasting about six months. Other options include arthroscopy or total knee replacement (TKR)."

Dr. Steadman has been one of the country's leading advocates of joint preservation, as opposed to joint replacement, throughout his distinguished career.

"Restoring and preserving joints for as long as possible is superior to joint replacement," he explains. "Much of our research has been focused on

joint-preservation procedures such as microfracture because they are generally less invasive and have better outcomes by allowing patients to resume their previous activity level and regain their full range of motion. This typically cannot be completely duplicated with artificial joints."

The Package

Through years of research, Dr. Steadman developed a procedure called "The Package," which is actually a series of arthroscopic procedures performed during a single operation to treat pre-arthritic and arthritic patients and to preserve joints. The Package is for patients who want to remain more active than a TKR would allow.

"The protocol we use at the Steadman Clinic is designed to address the pain generators in the knee," says Dr. Steadman.

"Nonsurgical treatment is the first step in management. This includes things like activity modification, physical therapy, oral anti-inflammatory drugs, and injectables such as steroids and viscosupplementation. Bracing is also considered in some patients."

"If nonsurgical management fails, arthroscopic surgery is the next step. In our experience, painful symptoms decrease about 70 percent of the time if arthroscopic surgery is used and followed by rehabilitation to maintain the gains obtained during surgery."

Instead of arthroscopic surgery, some people choose TKR, which according to Briggs, has been (until now) a predictable and reasonable surgical treatment for "end-stage" OA.

"However," she says, "this option may not be ideal for younger, active patients. Only 20 percent of TKR patients return to higher impact sports. In fact, a survey of orthopaedic surgeons recommended against activities such as racquetball, climbing, soccer, tennis, basketball, and jogging after TKR. Low impact exercises (walking, bicycling, swimming) are recommended instead."

A Decade of Data

Several studies have reported short- and medium-term benefits of knee arthroscopy, but there has been a conspicuous lack of long-term data. Dr. Steadman and his research team recognized this problem, and more than a decade ago, began accumulating data on 73 carefully selected patients who were referred to the Steadman Clinic because of their age and activity level, and who were thought to be candidates for TKR.

The purpose of the study was to evaluate the long-term outcomes of end-stage OA treated with a comprehensive knee arthroscopic package (The Package). They hypothesized that most patients with moderate and severe OA would likely have had TKR within 10 years. After gathering a decade of data, they found out something else.

The Results

The 69 people who were selected for the study and who responded to periodic questionnaires throughout the entire 10 years of research ranged in age from 37-78 (average age, 57). At least one other physician had recommended TKR. "Survivorship" was defined as not having undergone TKR during the decade since their arthroscopic surgery at the Steadman Clinic.

The findings showed that 60 percent of patients were able to delay knee replacement for five years; 47 percent for seven years, and 40 percent for 10 years. The average length of time before TKR was 6.8 years, and 13 patients showed good survivorship 10 years after the arthroscopic procedure. Overall, the participants reported a high level of satisfaction following arthroscopy.

“Avoiding TKR for five to 10 years is desirable in order to retain a significant activity level,” says Briggs. “In our study, younger patients and patients with moderate OA at the time of arthroscopy were more likely to delay replacement for a longer period of time when compared to older patients or patients with severe OA.”

Helping People Remain Active

“Knee arthroscopy is an effective procedure for severe degenerative joint disease, and there was no reason to do arthroscopic surgery in these patients,” says Dr. Steadman. “You just have to

do the right thing. The point is that you can do things arthroscopically in these end-stage knees. You want to take care of the degenerative changes. When joint surface contact pressures are decreased and the joint spaces are kept open, pain is relieved. Basically, we want to help people remain active and delay a joint replacement with this procedure.”

Dr. Steadman emphasizes the importance of rehabilitation and says its goals are to maintain joint volume and prevent scar tissue from reforming, while preserving joint mobility. Most of the exercises are designed to increase range of motion.

“Regaining strength is a second goal,” he says. “The rehabilitation program does not include exercises that elicit pain, and postoperative exercises are specifically tailored to each patient.”

Practical Implications

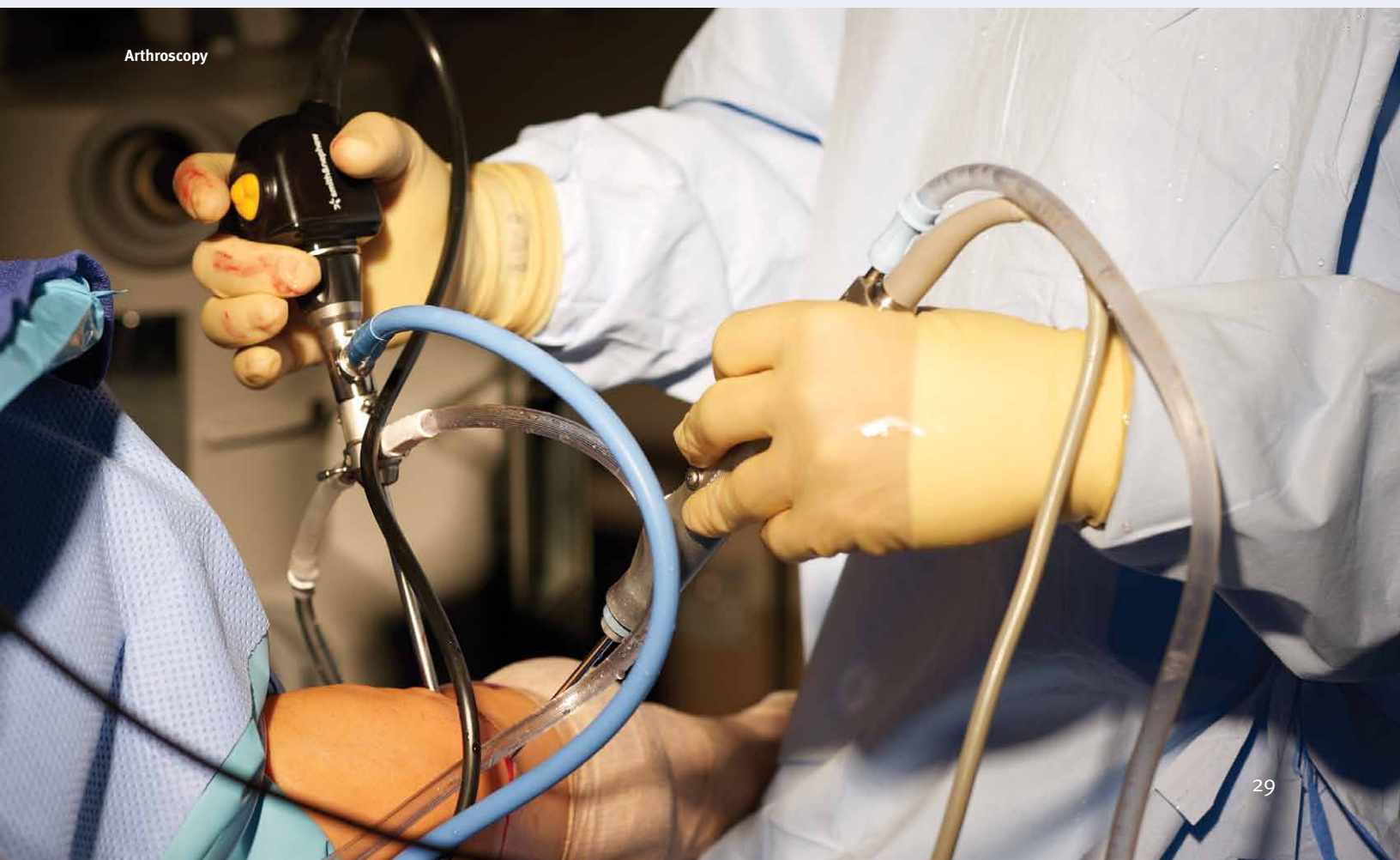
The Centers for Disease Control conservatively estimates that OA affects

27 million adults over the age of 25 and 70 percent of those 65 and over. Of those, 16 percent will develop OA in one or both knees. It is more common in women than in men. Untreated, knee OA progresses at an estimated four percent a year.

As mentioned earlier, non-invasive measures are the first line of defense against knee OA. If those measures don't work, the next step for moderate or severe knee arthritis does not automatically have to be TKR. Dr. Steadman's study clearly shows that arthroscopy is a viable option for many patients before TKR becomes the last resort.

He and his colleagues at the Steadman Clinic and Steadman Philippon Research Institute emphasize that the arthroscopic procedures analyzed in this study are not a cure for knee arthritis. However, they represent a treatment that relieves symptoms, improves function, and delays TKR.

Arthroscopy



CENTER FOR TRANSLATIONAL AND REGENERATIVE MEDICINE RESEARCH

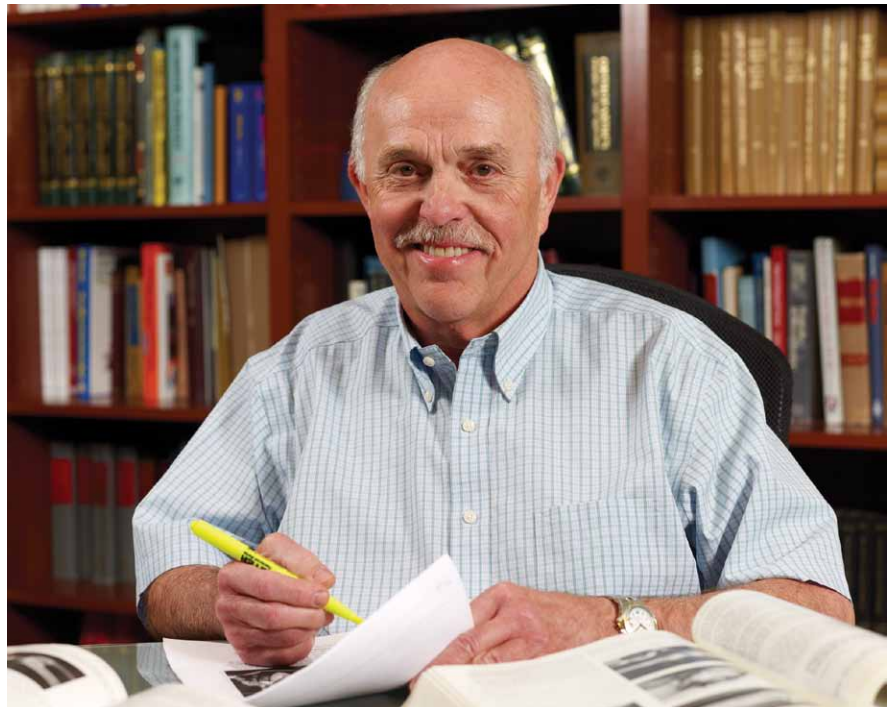
WILLIAM G. RODKEY, D.V.M., DIPLOMAT, ACVS, DIRECTOR, CENTER FOR TRANSLATIONAL AND REGENERATIVE MEDICINE RESEARCH

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 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 post-traumatic 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

- Ten publications in quality peer-reviewed journals and books.
- Sixteen presentations in six different countries.
- Served on two major international research committees.
- Served on the editorial review board 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, the microfracture technique and rehabilitation, and the use and dosage of platelet-rich plasma (PRP).

PUBLICATIONS

In 2012, the department had 10 publications in high quality journals and leading textbooks, including:

- Cartilage
- Sports Medicine and Arthroscopy Review
- Knee Surgery, Sports Traumatology, Arthroscopy

GRANTS

No outside grants or patents were obtained in 2012. Philanthropic donations were solicited for and used specifically for some of the CTRMR research studies.

COLLABORATIVE EFFORTS

CTRMР 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 more than 15 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.

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, and 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.



DR. MARC PHILIPPON'S LANDMARK HIP LABRAL RECONSTRUCTION STUDY PUBLISHED AS LEAD ARTICLE IN HIGHEST RATED SPORTS MEDICINE JOURNAL

Innovative arthroscopic procedure developed in Vail and validated by SPRI

A study conducted at the Steadman Philippon Research Institute by Marc Philippon, M.D., and his colleagues was the lead article in the August 2013 issue of *The American Journal of Sports Medicine*.

The *Journal* is the official publication of the American Orthopedic Society for Sports Medicine (AOSSM) and in 2012 was ranked as the highest among 157 scientific journals in terms of impact on the orthopaedic and sports medicine communities.

The title of the article is "Acetabular Labral Reconstruction with Iliotibial Band Autograft: Outcome and Survivorship Analysis at Minimum Three Years Follow-up."

Injuries to the acetabular labrum (cup-shaped socket) can be caused by impingement (mechanical disorder), dysplasia (abnormal formation), and acute trauma.

The purpose of the study was to evaluate the results of a technique developed at SPRI in which the labrum of the hip joint is reconstructed arthroscopically using a segment of the patient's own iliotibial band. The band is fibrous tissue that extends from the upper portion of the hip to the tibia (one of the two bones in the lower leg).

The procedure was performed on 76 hips in 75 patients over a four-year period, and patients' progress was monitored for between 36 and 70 months after the operation.

In 19 cases, the patients required total hip arthroplasty at an average of two years and four months. However, the average hip survival time without arthroplasty was nearly five years (59.1 months). Outcomes were measured using three tests performed before the procedure and again at a minimum of three years after surgery.

Significant increases were reported on the Modified Harris Hip Score, the Hip Outcome Score, and in patient satisfaction. The 76 percent of patients who did not require total hip arthroscopy reported improvement in function, as well as high satisfaction with the outcome. The research also revealed that joint space of 2 mm or less is a contraindication for the procedure.

According to Dr. Philippon, "This is an example of an orthopaedic procedure developed in Vail and validated by SPRI. The implications of this new procedure will be to improve patient care worldwide, which reflects our mission."

Dr. Philippon's co-authors were Mark R. Geyer, M.D., Karen Briggs, M.P.H., and Theodore Fagrelus.



Acetabular Labral Reconstruction With an Iliotibial Band Autograft

Outcome and Survivorship Analysis at Minimum 3-Year Follow-up

Mark R. Geyer,¹ MD, Marc J. Philippon,^{1†} MD, Theodore S. Fagrelus,¹ BA, and Karen K. Briggs,¹ MPH
Investigation performed at Steadman Philippon Research Institute, Vail, Colorado

Background: Injury to the acetabular labrum results from multiple causes including femoroacetabular impingement, dysplasia, and acute trauma. The patient's labrum can be reconstructed utilizing an iliotibial band autograft that is tubularized and fixed to the acetabular rim, substituting for the patient's own labrum.

Purpose/Hypothesis: The purpose of this study was to evaluate the midterm results of this technique with a follow-up from 3 to 6 years after reconstruction. The hypothesis was that midterm results would show excellent patient-reported outcomes and high patient satisfaction with outcome.

Study Design: Case series; Level of evidence, 4.

Methods: A retrospective review of a prospectively collected registry was undertaken that identified 75 patients (76 hips) who underwent arthroscopic labral reconstruction using an iliotibial band autograft by a single surgeon from February 2005 to August 2008. Modified Harris Hip Score (mHHS), Hip Outcome Score (HOS), and patient satisfaction level (on a scale of 1-10) were recorded preoperatively and postoperatively annually. Survivorship analysis curves were created to evaluate the effectiveness of this technique.

Results: Among 76 hips, 19 progressed to total hip arthroplasty at an average of 28 months from the procedure. Mean survival time (no arthroplasty) was 59.1 months (95% CI, 53.9-64.4). Follow-up on the surviving hips was available for 49 patients (69%) with a mean follow-up time of 48 months (range, 36-70 months). The mHHS significantly increased from a preoperative mean of 58.9 to the most recent follow-up score averaging 83 ($P < .0001$). HOS values in the sports and the activities of daily living subscales also increased significantly ($P = .0001$ and $P = .001$, respectively). Median patient satisfaction with outcome was 8. A joint space of ≤ 2 mm was found to be a poor prognostic factor for survival of the hip.

Conclusion: Arthroscopic labral reconstruction using an iliotibial band autograft resulted in a survivorship of 56 months. Of the 75% of patients who did not require total hip arthroplasty, improvement in function and high satisfaction with outcome were reported. Joint space of ≤ 2 mm is a contraindication for acetabular labral reconstruction.

Keywords: labral reconstruction; femoroacetabular impingement; labrum; autograft; iliotibial band

[†]Address correspondence to Marc J. Philippon, MD, Steadman Philippon Research Institute, 181 West Meadow Drive, Suite 1000, Vail, CO 81657 (e-mail: drphil@spri.com).

¹American Orthopedic and Knee Center, Houston, Texas.

Steadman Philippon Research Institute, Vail, Colorado.

Presented at the interim meeting of the AOSSM, Chicago, Illinois, March 2013.

One or more of the authors has declared the following potential conflict of interest or source of funding: M.R.G., T.S.F., K.C.B., and M.J.P. have received research funding from Smith & Nephew, Ocular Sciences, and Arthro, LLC. M.J.P. has received royalties from Smith & Nephew, Arthrocare, DonJoy, Stryker, and Elsevier and is a stockholder in HPCO, MDC, and Arthrocare. Smith & Nephew provided a research grant to fund this study.

The American Journal of Sports Medicine, Vol. 41, No. 8
DOI: 10.1177/0363546513507311
© 2013 The Author(s)

The evolution of treatments for hip injuries, particularly in the young patient, has been tremendous. A greater understanding of the anatomy, biomechanics, and pathological abnormalities of hip disorders, together with advances in technology, has made treatment of the hip one of the biggest advances in orthopaedics over the past decade. As part of this process, injury to the acetabular labrum appears as a common pathway in multiple causes such as femoroacetabular impingement, dysplasia, and acute trauma. The acetabular labrum has been shown to have an important function in sealing the central compartment, which increases hip stability as well as trapping synovial fluid in the central compartment.¹⁻³ A labral lesion or loss of labral tissue has been shown to be associated with early progression of hip joint arthritis.⁴

1739

Downloaded from ascelibrary.org by TUFTS UNIVERSITY on September 1, 2015

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

To better define its mission, the Department of Clinical Research changed its name in 2012. Collecting outcomes data for 20 years on orthopaedic procedures performed at the Steadman Clinic led to the new name, Center for Outcomes-Based Orthopaedic Research (COOR). Outcomes research has been defined as the study of the end results of medical treatment, which is intended to provide scientific evidence to support patient and physician decisions regarding care.

Our outcomes research is based on physician/patient assessment of improvement of function and quality of life, as well as patient satisfaction. Outcomes research provides a tool to link the patients' perspective and the effectiveness of health treatment, and will result in increased participation of patients in decision-making about the kind of care that they want. Our goal is to learn from patients and to validate treatment protocols in an effort to improve the quality of health care.

With health care reform, outcomes have taken center stage. Outcomes provide the tool to help address concerns over how the health care dollar is spent and the results of that expenditure. For example, if a patient needs an ACL reconstruction and one doctor's data shows that 60 percent of his or her patients need another surgery within one year, and another doctor's data shows only 10 percent of his patients need another surgery within the same time period, both patients and payers would select the second doctor. This type of information will be important to policy-makers, payers, and patients as they increasingly seek information about treatments and innovations.



Left to Right Front: Marilee Horan, M.P.H., Karen K. Briggs, M.P.H., M.B.A. Left to Right Back, Dawn Rossi, Ashley Darrough, and Lauren Matheny.

The key to successful analysis of outcomes is effective management of patient information. In 2011–2012, SPORT.DR was developed at SPRI. This program provides the ability to collect data using tablets, iPads, and email. Not only does this decrease the number of questionnaires we send out, but it also provides higher quality data. The data collection instruments can now require that all fields be complete, so the prevalence of missing data has greatly decreased. Doctors can get weekly reports on patient outcomes and in 2013, the patient report card will be developed to show each patient his or her progress.

KNEE STUDIES

Each year, approximately one million people undergo surgery to treat a meniscus tear. The meniscus root is responsible for providing stability to the meniscus by attaching it to the

tibia. Damage to either of these root attachments results in an inherently unstable meniscus. If these tears are undiagnosed and left untreated, this may lead to early degenerative joint disease. A study was completed by COOR on factors associated with meniscus root tears.

Lateral meniscus root tears were 10.3 times more likely to occur with an ACL tear than medial meniscus root tears. Medial meniscus root tears were 5.8 times more likely to occur with a chondral defect of the knee than lateral meniscus root tears. Patients showed significant decrease in their activity levels and function preoperatively when compared to the pre-injury scores. This paper was accepted for presentation at the 2013 American Academy of Orthopaedic Surgeons annual meeting.

For more than 20 years, Dr. Steadman has been performing the healing

response procedure for proximal tears of the ACL. In 2012, a paper was published showing the outcome of the procedure in patients over 40 years of age. Patients reported stable knees and were very satisfied with the outcome of the surgery.

For young patients, the best type of ACL reconstruction has been debated. In 2012, COOR published a Level 3 study comparing autograft (self tissue) patellar tendon reconstruction to allograft (donor tissue) reconstruction

in patients 18 years of age or younger. The study showed that allografts were more likely than autografts to fail in this young population, and usually within the first year. This provided more evidence for the effectiveness of the autograft reconstruction.

A focus of SPRI and COOR has always been improving function and activity in patients suffering from osteoarthritis. In 2012, several papers directed at this goal were published. A Level 3 study was published on the benefit

of injections of Hylan G-F 20 and corticosteroid. The study showed that this combination not only resulted in few complications, but also showed that patients experienced pain relief and improved function matching their expectations of the treatment prior to the injection. This study was supported by a grant from Genzyme.

A study was also published showing that patients with osteoarthritis (OA) who wear an unloader brace have significantly improved quality of life.

DR. MARC PHILIPPON PUBLISHED IN *ARTHROSCOPY* FOR HIS STUDY ON THE ARTHROSCOPIC TREATMENT FOR FEMOROACETABULAR IMPINGEMENT IN ADOLESCENTS

MECHANICAL CAUSES OF FAI AS OBSERVED ON AN AXIAL VIEW OF THE HIP JOINT.

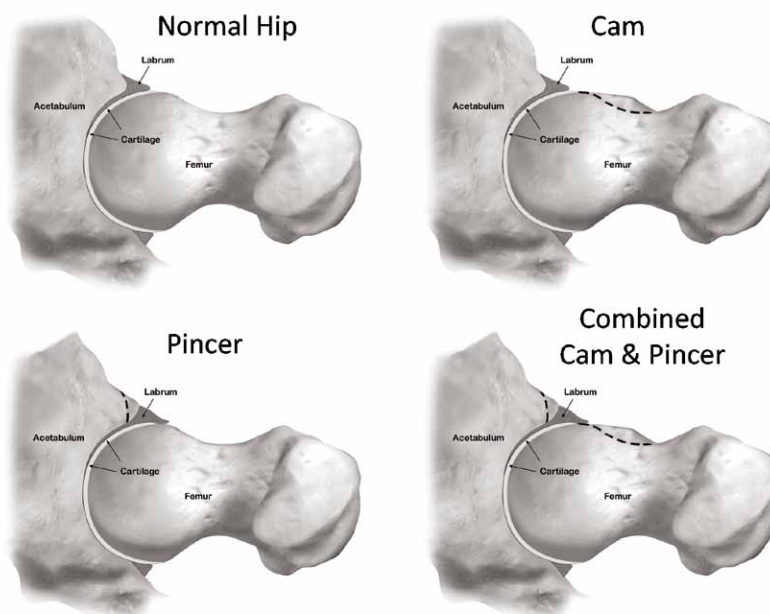
The reduced clearance leads to repetitive abutment between the femur and the acetabular rim.

Top Left: Normal hip.

Top Right: Reduced femoral head-neck offset (cam impingement).

Bottom Left: Excessive over coverage of the femoral head (pincer impingement).

Bottom Right: Combination of cam and pincer types of impingement.



Peer-reviewed publications are considered the gold standard among medical professionals. They offer critical information about how to best treat patients with certain medical problems. These studies are an important part of validating one's research, and researchers must include details about the scientific process used, as well as insight into the investigation and outcomes.

Dr. Marc Philippon is a hip specialist and an expert in treating femoroacetabular hip impingement. His study on treating the condition arthroscopically in adolescents (patients ranging in age from 11 to 16 years) was recently accepted and published in *Arthroscopy*.

The purpose of this particular study was to evaluate clinical outcomes after arthroscopic treatment for femoroacetabular impingement in the adolescent and pediatric population with a minimum of two years follow-up. The mean age for the study (at the time of surgery) was 15 years. Sixty-nine percent of the patients were girls and 31 percent were boys.

The conclusions indicate that hip arthroscopy in the pediatric and adolescent population is a safe procedure, with excellent clinical outcomes at two to five years. In this study, there was an association between alpha angle and age. Clinical scores showed a significant improvement after surgery; however, 13 percent of patients did require a second procedure for capsulolabral adhesions.

The patients also showed a decrease in disability due to OA and improvement in knee pain. These braces, designed to unload the degenerative compartment of the knee, can be an effective treatment to decrease pain and allow patients to maintain an active lifestyle. COOR continues to study the use of this unloader brace to determine which patients are more likely to benefit from the brace. This study is supported by Össur Americas, Inc.

In 2012, COOR was honored with the Richard O'Connor Award for the best research paper by the Arthroscopy Association of North America. This Level 3 paper showed how long patients put off having a total knee replacement by undergoing a comprehensive arthroscopic treatment package developed by Dr. Steadman. This study followed patients for 10 years and will provide physicians and patients more information on arthroscopy for OA of the knee.

Since Dr. Philippon arrived, he and Dr. Steadman have been investigating the association between knee injuries and hip injuries. In 2012, the first study was published in this line of research. The study showed that patients who have a decreased femoral head-neck offset are at higher risk for ACL injury. Studies like this one are continuing to better define how injury to one joint may affect the other joint.

HIP STUDIES

Femoroacetabular impingement (FAI) refers to abnormal bony growth of the femur and acetabulum causing the two bones to impinge. This triggers damage to other parts of the hip joint. In 2012, COOR published the first mid-term report of outcomes following the treatment of chondrolabral dysfunction due to FAI in the adolescent patient. Young patients had significant improvement in their function and were very satisfied with the outcome of their treatment. Also in 2012, outcome studies with follow-up of greater than five years were started on all patients with labral repairs and patients with labral reconstructions. These studies will be complete in 2013.

This study was funded, in part, by a Smith & Nephew Research Grant.

Many active people injure their hip during activities. This includes everyone from recreational athletes to professionals. In a collaboration with McMaster University, Dr. Philippon conducted a study that reviewed the current literature to determine if athletes could return to activity level following treatment for FAI. The study showed the rate of return to sport was 92 percent.



Grant Dornan, statistician

COOR also investigated if athletes can return to play after hip arthroscopy with microfracture. This Level 3 study compared elite athletes who required microfracture to those who did not. Sports included hockey, soccer, football, baseball, tennis, and golf. There was no difference in the rate of return to play between the groups. Athletes who had microfracture were able to return to play at the same high level of competition.

In order to better understand FAI and determine ways to prevent it or limit its impact on patient function and activity, it is important to understand who has FAI but does not require surgery. In 2012, a Level 3 study was published that looked at volunteers who had no hip pain or injury. All the volunteers underwent a hip exam and MRI. Over two-thirds of the volunteers had labral tears and 24 percent had chondral defects, which were more common in older patients. Many patients had hip damage without the symptoms. In addition to this study, COOR continues its study on peewee

hockey players with no hip pain. By following these young players over multiple years, we hope to find a link between the development of FAI and labral damage. These studies bring us closer to programs that can prevent or reduce the impact FAI has on the young and mature athlete.

As with the knee, COOR also focuses on prevention of OA in the hip. It is unclear if there is an age limit for the effective use of hip arthroscopy for the treatment of OA. In 2012, COOR published a study that determined the outcomes in patients over 50 years old treated for damage caused by FAI. The study showed that 90 percent of patients with greater than 2 mm of joint space did not require a total hip replacement three years after arthroscopy. These patients also showed significant improvement in function and decreased pain. The study identified limited joint space as a contraindication for hip arthroscopy. This study was funded, in part, by a Smith & Nephew Research Grant.

A new hip procedure was described and early outcomes reported in 2012. Arthroscopic reconstruction of the ligamentum teres is used in patients who have instability of the hip despite other efforts to improve it. Although this technique may be indicated in a small population, it is critical for these patients to improve their function and return them to activities of daily living. COOR continues to validate exciting new techniques in hip arthroscopy and longer outcomes on these procedures will be available in the future.

ANKLE STUDIES

At Vail Valley Medical Center, skiing and snowboarding injuries are encountered much more frequently than at other orthopaedic centers. Commonly missed diagnoses in snowboarding injuries are subtalar and talocalcaneal injuries (injuries to joints in the foot). These injuries are relatively uncommon outside of the snowboarding population. The mechanics of snowboarding place the ankle at risk for injury, which includes damage of both the bone and cartilage

surrounding the joint. Snowboard boots hold the feet in place, with the rear foot at 90 degrees to the axis of the board and the front foot positioned between 45 and 90 degrees. The grip placed on the heel by the boot restricts the motion at the joints of the hindfoot, forcing the body weight to impact on the heel bone.

Two patients sustained this type of injury while snowboarding (osteochondral lesions to the middle talocalcaneal articulations) and underwent MRI. Both cases showed fractures and damage to surrounding cartilage. This study aimed to bring attention to osteochondral injuries of the subtalar joint to increase timely diagnosis and improve patient outcome.

Returning to activity and function is one of the main goals of orthopaedic surgery, and it is especially important when treating athletes after an ankle injury. Along with diagnosing and treating sports-related injuries, monitoring recovery and determining readiness to return-to-play (RTP) are among the main roles of the team physician. A worldwide study revealed that the ankle was the most commonly injured site across 24 different sports. The re-injury rate in athletes is highly correlated with premature return to play.

In 2012, a study focused on establishing guidelines to allow an athlete to RTP was completed. Factors determining the readiness of an athlete to play include pain, instability, normal kinematics, balance, coordination, as well as psychological factors that may play a role. Four categories of functional testing of the ankle should include range of motion, balance and proprioception, agility, and strength. Given the high prevalence of ankle injuries in sports and the high correlation of premature RTP with re-injury, it is important to establish guidelines for clearance. This study helps to review objective measures that the physician can use to determine if an athlete can resume their activities.

SHOULDER STUDIES

COOR has looked at successful arthroscopic treatment in younger patients with early onset of shoulder OA with the prospect to delay the need for shoulder replacement with plastic and metal implants. In the U.S., about 53,000 people have shoulder replacement each year, but these implants only have a 10- to 15-year useful life span, so there is a need to delay replacement surgery for as long as possible. COOR published the results of patients with end-stage painful shoulder OA undergoing the comprehensive arthroscopic management (CAM) procedure developed by Dr. Millett.

The CAM surgery reduced pain, improved function, and provided reasonable short-term durability for young, active patients with advanced shoulder OA and may serve as a joint preserving alternative to replacement. Patients with less than 2 mm of joint space had a higher failure rate, but overall the study showed a survivorship rate of 85 percent at two years after surgery.

Many active people injure their shoulder during activities such as biking or snow sports, and the injuries affect everyone from the recreational athlete to the professional. Injuries to the acromioclavicular (AC) joint represent up to 12 percent of all traumatic shoulder girdle injuries. Injuries are classified from sprains (grade I-III) to severely displaced AC joints (grade III-V). While grades I and II are treated conservatively, grades IV-V usually require surgical intervention.

Although the management of type III injuries is still debatable, many publications advocate early surgical reconstruction in select high-functioning patients such as manual laborers and overhead-throwing athletes. However, surgical intervention of the AC joint is not without risk.

COOR contacted patients who had various surgical reductions of the AC joint to determine the incidence and

type of complications experienced. Surgical procedures to treat disrupted AC ligaments resulted in an overall complication rate of 27.1 percent (16/59). Survivorship rate of not experiencing a complication was 86.2 percent at 12 months and 83.2 percent at 24 months. Good to excellent surgical outcomes were found in those patients who did not have a complication.

Injuries from bicycling were the most common cause of clavicle fractures (collar bone), followed by contact sports. Younger men (age 10-19 years old) are most at risk for clavicle fractures. About 40 percent of fractures to the shoulder occur in the clavicle. Non-operative treatment is standard for most midsection clavicle injuries, unless the two bone pieces are separated (displaced) from each other.

Published reports indicate improved outcomes with operative treatment that allows the bone to heal in its original position. COOR undertook a polling study to assess agreement between orthopaedic surgeons regarding their treatment preferences for clavicle fractures. Fractures were presented in a series of preoperative x-rays, and surgeons were asked if they would operate or not and then compare their choice with recent medical recommendations.

The study revealed a rather large disagreement in decision-making by the more senior shoulder surgeons versus others, but there was a very high agreement of 91 percent when comparing treatment choice with recent published medical recommendations.

PROJECTIONS

2012 was a record year for the Center for Outcomes-Based Orthopaedic Research. We look forward to providing more information so informed health care decisions can be made.

STEADMAN PHILIPPON RESEARCH INSTITUTE REPORTS RECORD YEAR IN PUBLICATION OF PEER-REVIEWED ORTHOPAEDIC RESEARCH STUDIES



Photo credit: Barry Eckhaus

In the field of healthcare, peer review and publication of clinical and scientific studies certify that the absolute highest standards in the research process have been met. BioMedical Engineering scientists from the Steadman Philippon Research Institute will have 33 studies completed by year-end. These orthopaedic research studies include injury prevention, clinical observation, and assessment in all areas of orthopaedic sports medicine.

The Department of BioMedical Engineering at SPRI, a world leader in orthopaedic and sports medicine research, reports a record number of research papers in PubMed. PubMed's database is a service of the U.S. National Library of Medicine, which provides online access to collections of peer-reviewed and accepted research studies for the medical community. For 2012, the Department of BioMedical Engineering will have 16 orthopaedic studies published, another seven papers accepted for publication, and 10 papers in peer review.

Independent, unbiased, critical assessment of medical conditions, treatments, and patient outcomes is integral to validating clinical research. SPRI's orthopaedic research studies

include injury prevention, clinical observation, and assessment in all areas of orthopaedic sports medicine. These studies certify that the absolute highest standards in conducting, recording, and reporting the research have been met. Once an orthopaedic research study is submitted to a professional journal by a research team, a peer review committee scrutinizes it, and only the best papers are accepted for publication.

The large number of SPRI studies published in a 12-month period is an extraordinary accomplishment and the highest indicator of the quality of their research.

Dr. Marc Philippon, orthopaedic hip surgeon and SPRI Board member, stated, "It is not only about the quantity, but also the quality of publications within SPRI that allow for high impact in our orthopaedic community. Our publications are accepted to the top journals."

According to Dr. Coen Wijdicks, director of the Department of BioMedical Engineering at SPRI, "Peer-reviewed publications that incorporate relevant research studies provide a significant credible resource among peers. Because it is published in such a large forum, the result is high impact and captures a large audience."

The Steadman Philippon Research Institute is engaged in various orthopaedic research studies throughout the year. In 2012, some of the published studies included:

- "The effects of arm elevation on the 3-dimensional acromiohumeral distance: a biplane fluoroscopy study with normative data"
- "Anatomic suture anchor versus the Broström technique for anterior talofibular ligament repair: a biomechanical comparison"
- "Femoroacetabular impingement treated with PRP and bone marrow concentrate aspirate in a professional soccer player"
- "Recruitment and activity of the pectineus and piriformis muscles during hip rehabilitation exercises: an electromyography study"
- "The management of injuries to the medial side of the knee"

"Without a peer review process for medical research, there would be very little validity to published studies. It is well recognized that peer-reviewed publications have gone through vigorous peer review and represent the highest levels of scholarly work. It has always been our goal, and it will continue to be our goal, to plan to publish our orthopaedic research studies in the highest level journals starting from the point of initial design of our works," states Dr. Robert LaPrade, chief medical research officer of the Institute.

In 2011, SPRI completed construction of its multi-million dollar, state-of-the-art laboratories and surgical skills facilities. The principal goal for these facilities is to understand the demands on joints for certain sports or motions, how injuries occur and how they can be best treated, and to offer physicians, SPRI fellows, and international research scholars the ability to practice current and new surgical techniques in a simulated operating room environment.

DEPARTMENT OF BIO MEDICAL ENGINEERING

COEN A. WIJDICKS, PH.D., DIRECTOR, SENIOR STAFF SCIENTIST; TRAVIS TURNBULL, PH.D., RESEARCH ENGINEER; MARY GOLDSMITH, M.SC., SENIOR ROBOTICS ENGINEER; SEAN D. SMITH, M.SC., RESEARCH ENGINEER; KATHERINE WILSON, M.SC., RESEARCH ENGINEER; RACHEL SUROWIEC, M.SC., RESEARCH SCIENTIST

The Department of BioMedical Engineering is a multidisciplinary laboratory that applies quantitative, analytical, and integrative methods to the field of orthopaedic medicine. The Department includes subdisciplines of biomechanics, musculoskeletal mechanics, biomedical imaging, and orthopaedic engineering.

The staff integrates clinical care, research, and education with the resources of world-renowned medical doctors in order to improve the treatment of musculoskeletal diseases.

This focused approach is designed to maintain and enhance athletic performance, health, and quality of life for the professional, semi-professional, collegiate, high school, and recreationally active individual through an emphasis on bench-to-bedside research. The programs provided by the Department are unique and diverse, and they encompass a complete range of services for the physically active or those wishing to return to an active lifestyle after injury. Our goals are to enhance improved patient care nationally and internationally with a focus on high level research published in top-level peer-reviewed journals.

In 2012, the Department continued to pursue its theme of evolving in terms of expanding technical responsibilities of staff members and challenging areas of research. The theme of excellence was once again reflected by the number and quality of peer-reviewed publications, presentations, patents, and collaborative efforts between the Steadman Clinic and the Steadman Philippon Research Institute, as well as with institutions in the United



Left to Right: Rachel Surowiec, Katherine Wilson, Travis Turnbull, Mary Goldsmith, Sean Smith, Coen Wijdicks, Matt Rasmussen, Brady Williams, Chris LaPrade

States and other countries. Finally, the Department's theme of expectations was reinforced as it continued to meet the high standards of the scientific community and to meet the needs of patients who benefit from biomedical research conducted at SPRI.

ACCOMPLISHMENTS

In 2012, studies were published or presented (on podium or poster) that involved:

- Suspension devices for anterior cruciate ligament (ACL) reconstruction
- Radiographic landmarks for posterior cruciate ligament (PCL) reconstruction
- Arthroscopic anatomy of PCL
- Pressure sensor output changes in the presence of liquid exposure
- Platelet-rich plasma and bone marrow aspirate therapy for hip injuries
- Accuracy of biplane fluoroscopy for tracking knee joint movements
- Pre- and post-operative function after scapula reconstruction
- Biplane fluoroscopic study of high knee valgus
- Anatomic analysis of the meniscus
- Comparison of surgical treatments for ankle ligament repair
- Digital photography in an orthopaedic setting
- Femoroacetabular impingement in a professional soccer player
- Historical perspective of PCL bracing
- Accuracy of MRI and MRA resonance arthrogram versus arthroscopy in shoulder tendon injuries
- Management of injuries to the medial side (inside) of the knee
- Outcomes after surgical management of shoulder fractures
- Current concepts of coracoid (in the shoulder) impingement
- Recruitment and activity of specific muscles during hip rehabilitation

- Statistical shape model-based femur kinematics from biplane fluoroscopy
- Surgical technique for medial knee reconstruction
- Biplane fluoroscopy study of 3-D arm elevation on acromiohumeral distance

Podium Presentations

- Biomechanical comparison of techniques for ankle ligament repair
- Biomechanical analysis of rotator cuff repairs
- Arthroscopic anatomy of PCL
- Biomechanical analysis of massive rotator cuff repairs
- Effect of clavicle shortening in rotations of the shoulder complex
- Fluoroscopic assessment of femoral kinematics

Poster Presentations

- Computed tomographic comparison during a bone and cartilage allograft procedure
- Biomechanical analysis of the effect of arthroscopic notching during surgery for hip impingement
- Radiographic evaluation of plantar plate injury
- Radiographic landmarks in PCL reconstructions
- Biomechanical analysis of rotator cuff injuries
- Quantitative anatomic analysis of meniscus procedures
- Biomechanical analysis of massive rotator cuff repairs
- Arthroscopically pertinent anatomy of PCL
- Effects of arm elevation on acromiohumeral distances
- Recruitment and activity of muscles during hip rehabilitation
- Tibiofemoral contact in landing
- Articular cartilage T2 values in sub-regions of the knee

PUBLICATIONS, PATENTS, GRANTS

The Department of BioMedical Engineering of the Steadman Philippon Research Institute, strives to have a direct effect on keeping people active

through research and education. One of the ways that is accomplished is by having its research published in “high impact,” peer-reviewed journals, such as *Arthroscopy*, *Hand Surgery*, *the Journal of Orthopaedic Surgery*, *The Journal of Bone and Joint Surgery*, *Sport Rehabilitation*, and *The American Journal of Sports Medicine*. The publications provide credibility among peers in the scientific and medical communities and reach a large audience of readers throughout the world.

In 2012, the Department produced 21 publications and 21 abstracts, resulting in seven podium presentations, and 14 poster presentations before professional organizations such as the Orthopaedic Research Society (ORS), the American Academy of Orthopaedic Surgeons (AAOS), the American Orthopaedic Foot & Ankle Society (AOFAS), the International Society of Arthroscopy, Knee Surgery & Orthopaedic Sports Medicine (ISAKOS), and the European Society of Sports Traumatology Knee Surgery and Arthroscopy (ESSKA).

BioMedical Engineering staff members received two international awards and the Department was awarded academic and corporate grants of more than \$750,000.

COLLABORATIVE EFFORTS

The Department collaborated with Steadman Philippon physicians J. Richard Steadman, M.D., Marc Philippon, M.D., Peter Millett, M.D., Robert LaPrade, M.D., Tom Hackett, M.D., Thomas Clanton, M.D., and Randy Viola, M.D.

Sports Medicine fellows included Tyler C. Collins, M.D., Christopher Espinosa-Ervin, M.D., Scott C. Faucett, M.D., Edmund A. Ganai, M.D., Jared T. Lee, M.D., Jeffrey J. Nepple, M.D., Jack Skendzel, M.D., Nicholas A. Viens, M.D. (Foot and Ankle fellow), and W. Sean Smith, M.D. (Imaging fellow).

International scholars from 2012 to the present were Daniel Rios, M.D., Cathrine Aga, M.D., Peter-Paul de Meijer, M.D., Frank Martetschläger, M.D., Asbjorn Aroen, M.D., Ph.D., Fernando Ferro, M.D., Bernado Crespo, M.D., Uli Speigl, M.D., and Brian Devitt, M.D.

Summer Undergraduate Research Fellowships were awarded to students from the University of Michigan, University of Iowa, Colorado State University, and Colorado College.

National collaborators included The Steadman Clinic, Colorado State University, Vail Valley Medical Center, and the American Orthopaedic Foot & Ankle Society. International collaborative research efforts were conducted with the University of Oslo, AARHUS University (Denmark), University of Queensland (Australia), IBTS (Brazil), and the Arthroscopy Association of North America.

COMMUNITY OUTREACH

The Department provides special guidance for young scholars in the Vail Valley area and beyond. In 2012, outreach activities included lab tours for 5th-12th grade Eagle County students, two-week high school student internships, and Vail Ski and Snowboard Academy science fair judging for high school students.

PROJECTIONS

The Department will continue to follow a program of research leading to measurable outcomes, collaboration with national and international institutions, and community outreach. It will also pursue its mission of advancing patient care, developing and validating innovative surgical and rehabilitation techniques, and using state-of-the-art biomedical techniques to teach advanced surgical protocols.

SURGICAL SKILLS LABORATORY

KELLY R. ADAIR, DIRECTOR

The Surgical Skills Laboratory is continuing to evolve and advance orthopaedics through education. In the last year we have had the opportunity to perform 144 labs, 14 sponsored by industry companies and the remaining 130 performed by our sports medicine and international fellows. We have hosted labs in all major joints of the human body, including, but not limited to, the knee, hip, shoulder, elbow, foot and ankle, and hand and wrist. The diverse opportunities significantly increase the chance for physicians and medical professionals to increase their knowledge base.

We are allowing surgeons and medical professionals the opportunity to refine their skills and product training in an interactive, hands-on environment. The more advanced training we can offer, the more modernized surgeons there are in the future of medicine. Medical education is not only an important aspect to a surgeon's future, but also to the many patients who are treated by them. As advancements in research and development occur, the ultimate goal is to benefit patients by optimizing outcomes through enhanced training.

Thank you all for the continued support. We wouldn't be the world leader in research into the causes, prevention, and treatment of orthopaedic disorders without you. You all are an integral part in helping us facilitate our mission of "Keeping People Active" and educating the worldwide orthopaedic community, one person at a time.



Left to Right: Kelly Adair, Sean Smith

IMAGING RESEARCH

CHARLES P. HO, M.D., PH.D., DIRECTOR, IMAGING RESEARCH; COLEY GATLIN, M.D., GRIFFIN VISITING SCHOLAR FOR CLINICAL SPORTS MEDICINE MRI; RACHEL SUROWIEC, M.SC., RESEARCH SCIENTIST; KATHERINE WILSON, M.SC., RESEARCH ENGINEER

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 BioMedical Engineering and other departments.

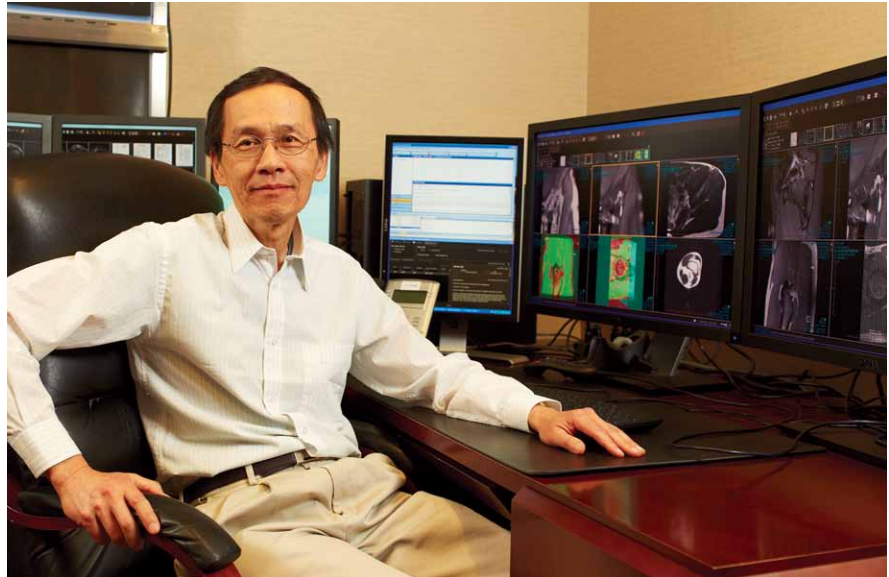
STAFF

In October 2012, the Imaging Research staff was absorbed under the umbrella of the Department of BioMedical Engineering. This change was implemented as a way to take advantage of staff member skill sets and to add additional capacity to both Imaging Research and BioMedical Engineering without duplicating efforts. Dr. Ho continues to direct Imaging Research projects, while Dr. Coen Wijdicks supervises Imaging Research personnel as part of the Department of BioMedical Engineering.

Imaging Research continues to utilize the services of an Imaging Research fellow. The fellowship program was sponsored for three years by Siemens Medical Solutions USA. The 2012–13 fellow was William Sean Smith, M.D., a board certified radiologist. Moving forward, the fellowship is now sponsored by the Ken and Anne Griffin Foundation and titled the Griffin Visiting Scholar for Clinical Sports Medicine MRI.

TECHNOLOGY

The Imaging Research data registry continued to expand in 2012, and now includes 250–300 new cases per month. New tablet-based data collection methods developed by the Center for Outcomes-Based Orthopaedic Research



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

(COOR) have made the process less time-consuming and more efficient. Collection of data that initially included information on knee and hip patients and then shoulder patients, now also includes data on foot and ankle patients.

RESEARCH

Imaging Research extended its three-year program of screening young hockey athletes with hip injuries and expanded those screenings to include young skiers. By comparing the data collected from the two groups, the information may help identify the activities in both sports that present greater risks of injury or predisposition to certain hip abnormalities.

The department moved forward in its efforts to quantify imaging diagnoses of articular cartilage and soft tissues. The results have expanded the knowledge of biomarkers and have

made the quantification process more reproducible. Imaging Research continued its collaboration with Siemens, including using phantom materials with established and more stable T1 and T2 values as standards for comparison with clinical mapping values in patients. These values provide a more sensitive determination of the health of body cartilage and tissues. The department not only has the results of imaging and biomarkers, but also has histological data of operative materials that can be compared to biomarker values.

Imaging Research is also extrapolating the mapping research techniques to examining biomarkers of tissue health in other soft tissues, such as tendons and ligaments in the shoulder's rotator cuff and ligaments supporting the knee. Similar investigations have been approved to study the tendons of the ankle.



Imaging Research has begun to examine the role of magnetic resonance imaging (MRI) for modeling bone and soft tissues. Bone modeling has traditionally been conducted using computer tomography (CT), but the process cannot model soft tissue and it involves limited exposure to radiation. The goal is to develop bone modeling with MRI to obviate the need for CT with its inherent radiation exposure, to expand soft tissue knowledge currently limited with CT, and to combine that information with motion studies to determine the forces that affect bone and soft tissue.

COLLABORATIVE EFFORTS

Imaging Research is collaborating with Siemens and academic research centers throughout the United States and Europe to plan multicenter trial studies to establish biomarker mapping procedures that are consistent and reproducible. Each center would use the type of phantom materials already

mentioned. Planning for the program began in 2012 and trials are expected to begin in late 2013 or early 2014.

The department continued its association with Colorado State University in obtaining histological data (microscopic structure tissue) regarding the studies of the hip.

Imaging Research also entered research collaborations with the University of Queensland and with the Commonwealth Scientific and Industrial Research Organization (CSIRO), both in Brisbane, Australia. CSIRO is Australia's national science agency, which develops practical and personalized research and technology initiatives from the research at and in conjunction with the University of Queensland.

PROJECTIONS

Imaging Research will continue its efforts to advance biomarker research, with a specific goal of making the information

more applicable for clinical use. Biomarker findings must become reproducible for widespread application and must be consistent from time-point to time-point, as well as from patient to patient.

The department will expand its efforts in bone and soft tissue modeling research, determining how they function together and the forces that are involved.

As new projects develop and expand, Imaging Research will work with the Department of BioMedical Engineering to take advantage of the appropriate skills of personnel in both areas. The goal is economy of scale—becoming larger in size by combining the staff of two departments, while eliminating duplication of efforts and increasing efficiency.



In 2012, Dr. Peixoto was awarded the Dr. Luiz Resende Puech Award for the best clinical research paper at the 44th Brazilian National Congress in Salvador, Bahia, Brazil. His co-authors include Dr. Marc Philippon and Karen Briggs, director of the Center for Outcomes-Based Orthopaedic Research, along with Dr. Peter Goljan and Dr. Brian Devitt. Dr. Peixoto (r) receives the award from Dr. Geraldo Motta, the president of the Brazilian Society of Orthopedic Surgery.

He is a young professional, married, and the father of a two-year-old son. He has a great job and an exciting future. He likes hamburgers, is a Denver Broncos fan, and stays in shape by surfing, skiing, and working out in a gym.

Is this another American success story? No, it's another Brazilian success story with an American twist.

Lourenço Peixoto, M.D., is an award-winning orthopaedic surgeon from Brazil who recently completed a year of advanced training as a visiting scholar at the Steadman Philippon Research Institute. Six years into his career, the Rio de Janeiro resident is highly trained, internationally published, and one of Brazil's rising medical stars.

Being a rising star is common in the Peixoto family. His wife, Andrea, is a cardiologist. An older brother and sister are both anesthesiologists, and his younger brother is an attorney.

Dr. Peixoto is the latest in a line of orthopaedic surgeons who have come to SPRI as visiting scholars. The Brazilian Visiting Scholar Program is sponsored by businessman and banker Jorge Paulo Lemann. The physician-scholars work with SPRI surgeons and scientists to learn new surgical techniques, observe clinical practices, attend professional meetings, conduct research, and submit the results of their research to professional journals.

Dr. Peixoto was chosen from a field of approximately 30 applicants in Brazil for the Visiting Scholar award. It was not the first time he has received special recognition. In 2011, he won the Jorge Paulo Lemann Award for Hip Arthroscopy Research, and

VISITING SCHOLARS PROGRAM BRINGS BRAZILIAN PHYSICIAN TO THE INSTITUTE

AWARD-WINNING BRAZILIAN SURGEON DR. LOURENÇO PEIXOTO COMPLETES "LIFE-CHANGING" YEAR AT STEADMAN PHILIPPON

By Jim Brown

in 2012 he was awarded the Dr. Luiz Resende Puech Award for the best clinical research paper at the 44th Brazilian National Congress in Salvador, Bahia, Brazil. His co-authors included SPRI's Dr. Marc Philippon and Karen Briggs, M.P.H., director of the Center for Outcomes-Based Orthopaedic Research, along with Dr. Peter Goljan and Dr. Brian Devitt.

Unexpected Honor, Difficult Decision

"The Visiting Scholar award was a great and unexpected honor, but the decision to accept it was difficult," says Dr. Peixoto. "I had to leave my wife and our 1 ½-year-old son, but my wife was totally supportive of this opportunity. After leaving Brazil, I talked with my family almost every day. Skype saved my life."

Being away from his family was not his only adjustment. He had never seen snow, but while in Vail he learned to ski. He became a member of the active community of Vail by riding a bicycle to work (16 miles round trip), skiing, and exercising at a gym.

His friends told him he would gain weight in the U.S., but he did just the opposite. Self-described as being overweight when he arrived, Dr. Peixoto lost 22 pounds during his stay. "I am happy, healthy, and skinny," he says.

Dr. Peixoto became interested in medicine as a teenager and decided to specialize in orthopaedic surgery and hip arthroscopy while in medical school. "I had more rotations in the hip group than in other disciplines during my residency. The more I learned about it, the more I liked it and the more I became comfortable with hip replacement and hip arthroscopy."

During his 12 months at Steadman Philippon, he spent an average of three days a week reading, researching, and writing papers, as well as attending meetings. "The most exciting part of my week was being in the operating room with Dr. Philippon," says Dr. Peixoto. "He is a very good teacher and surgeon. It was not unusual to have visitors from all over the world observing his procedures."

Dr. Peixoto also spent at least one day a week in clinical practice, helping with physical exams, measuring movements, and interacting with patients. "The Steadman Clinic and SPRI have friendly and easy-going work environments, but everyone is always busy, hard-working, and outcomes-oriented. Visiting scholars are not here for a vacation. We can have a great time, but the doctors here and our sponsors back in Brazil want us to work hard and produce good results."

One Year Changed My Life

"I'm a much better physician now than I was a year ago," observes Dr. Peixoto. "Just one year has changed my life, and I'm not the only one. I see others who come to Vail as young doctors and leave as experienced practitioners and researchers. Of all the things I have learned here, I think improved surgical skills are the most important."

Dr. Peixoto is now back in Brazil and beginning a practice at Hospitalys, a new orthopaedic center built and managed by Amil Par, the largest managed healthcare organization in Brazil, in partnership with the Hospital for Special Surgery in New York. He will be the hospital's hip arthroscopy surgeon.

Dr. Peixoto's goals are ambitious. "I want to publish papers, hold an important position in the Brazilian Hip Society, and have visibility in the international medical community."

Based on his accomplishments so far, we can expect Dr. Peixoto to exceed those goals and to share the knowledge he gained at Steadman Philippon with the rest of the world.

One other prediction: Even though at home in Brazil, he'll be almost 5,000 miles from Colorado but still a lifelong Denver Broncos fan.

EDUCATION

WELCOME 2012–2013 FELLOWS



Front Row: Peter Millet, M.D., M.Sc., Edmund Ganai, M.D., Marc Philippon, M.D., Robert LaPrade, M.D., Ph.D.; 2nd Row: Christopher Espinoza-Ervin, M.D., Scott Faucett, M.D., Jared Lee, M.D., J. Richard Steadman, M.D.; 3rd Row: Tyler Collins, M.D., Jack Skendzel, M.D., Nicholas Viens, M.D., Tom Hackett, M.D.; Back Row: Jeffrey Nepple, M.D., Randy Viola, M.D., Tom Clanton, M.D.

NINE NEW PHYSICIANS INTRODUCED

Each year, a select group of orthopaedic surgeons is chosen from a field of more than 150 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. Every 18 months after their training at SPRI, they will return with past fellows for further education and to exchange the additional knowledge they have gained since completion of fellowship training. 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 nine SPRI fellows.

Tyler C. Collins, M.D.

Dr. Collins grew up in Colorado, where he learned to ski at the age of three. After high school, he attended the University of Virginia, played varsity baseball, and was Academic All-ACC. He graduated with high honors from the School of Engineering and Applied Science with a Bachelor of Science degree in systems engineering. From Virginia, he switched coasts and attended medical school at the University of Southern California where he was a Dean's scholar. Dr. Collins remained at USC for his residency training, where he spent the majority of his time treating the underserved population in Los Angeles. His research interests include fixation of proximal humerus fractures, needle arthroscopy of the knee, reliability and reproducibility of shoulder fracture classification systems, and objective shoulder strength after fixation of clavicle fractures.

After traveling throughout the country, Dr. Collins is thrilled to be back in Colorado and feels extremely fortunate to train at the Steadman Clinic.

Christopher Espinoza-Ervin, M.D.

Dr. Espinoza-Ervin graduated from the University of Oklahoma with a Bachelor of Science degree in microbiology. He completed his medical degree at the University of Colorado School of Medicine. While in medical school, he was awarded an NIH grant to fund research focused on the treatment of orthopaedic trauma.

During the completion of his orthopaedic surgery residency at the University of Texas Southwestern, he assisted with team coverage of high school, collegiate, and professional sports. His research focused on the treatment of lower extremity trauma, shoulder arthroscopy, and the pediatric knee. He was selected as a chief resident and honored with the Vert Mooney Award for Academic Achievement.

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

Born and raised in Santa Monica, California, Dr. Faucett matriculated at Middlebury College in Vermont, where he studied economics and chemistry. As an undergraduate, he also refined his skills as a telemark skier and began to volunteer with the town's rescue squad. By his fourth year, he was appointed to the Board of Directors and attained the rank of captain, specializing in technical and water rescue.

After graduation, he attended Dartmouth Medical School, earning a Master of Science degree in health care policy and leadership as he pursued his growing interest in orthopaedic surgery and sports medicine. Scott chose to remain at Dartmouth Hitchcock Medical Center for the opportunity to focus on health policy and his other research interests: clinical epidemiology and cost effectiveness decision analysis. Throughout his residency, he provided physician coverage for the Dartmouth varsity athletes.

Edmund "Edton" A. Ganal, M.D.

Dr. Ganal graduated magna cum laude with Revelle Provost honors from the University of California, San Diego, with a degree in biochemistry and cell biology. He was a member of Phi Beta Kappa, and played NCAA soccer. Edton volunteered on a medical mission to the Philippines before attending Tufts University School of Medicine on a Health Professional Scholarship. Dr. Ganal completed general surgery internship, then served as a battalion surgeon with the Marines. He deployed to Iraq in support of Operation Iraqi Freedom. After completing orthopaedic residency at Naval Medical Center San Diego, he was stationed at Newport, Rhode Island, where he deployed to Afghanistan for Operation Enduring Freedom and took care of combat casualties.

Jared T. Lee, M.D.

Dr. Lee attended Brigham Young University where, as a student-athlete, he graduated magna cum laude with a Bachelor of Arts in history and was a member of Phi Kappa Phi. As an undergraduate, Dr. Lee played football at Ricks Junior College and was team captain, an All-American, and inducted into the Ricks College Athletic Hall of Fame. Recruited to Brigham Young University, he was named team captain, all-conference safety, 1st team academic All-American, and received the prestigious National Football Foundation and College Football Hall of Fame post-graduate scholarship. Prior to medical school, he signed as a free agent with the Cincinnati Bengals and later worked for Forest Laboratories. He received his medical degree from the University of Washington School of Medicine, where he was elected a member of Alpha Omega Alpha and graduated with honors. Dr. Lee completed residency training in the Harvard Combined Orthopedic Residency Program and served as administrative chief resident for the Massachusetts General Hospital. He was recognized for the highest average score on the orthopaedic in-training examination among the graduating residents. His research interests include biomechanics and traumatic injuries to the sternoclavicular joint, which has resulted in numerous presentations.

Jeffrey J. Nepple, M.D.

Dr. Nepple grew up in Templeton, Iowa. He graduated summa cum laude from Truman State University (Kirksville, Missouri) with a degree in mathematics. While at Truman, he played NCAA Division II basketball and was elected team co-captain his senior year. He then attended Washington University School of Medicine in St. Louis and was given the Brookings and Carter Research Award during his final year. Dr. Nepple completed his residency training at Washington University in St. Louis. During his time in St. Louis,

he was involved in team coverage of the St. Louis Rams football and Blues hockey. He also spent two weeks in Port-au-Prince, Haiti, as part of a medical mission group treating orthopaedic conditions after the earthquake. While at Washington University, his research focused on young adult hip disease and femoroacetabular impingement. He also received the AOSSM NCAA Research Award in 2011 for research on knee articular cartilage disease in football players at the NFL Combine. His research efforts resulted in numerous publications and presentations. After completing his training, Dr. Nepple will return to Washington University in St. Louis.

Jack Skendzel, M.D.

Dr. Skendzel graduated magna cum laude from the University of Notre Dame. While at Notre Dame, he spent six months in London studying and traveling throughout Europe. After college, he attended medical school at Georgetown University in Washington, D.C. Dr. Skendzel then returned to his native Michigan and completed his orthopaedic surgery residency at the University of Michigan. During his residency, he completed several research projects and was published in journals such as the *Journal of Arthroplasty*, the *American Journal of Sports Medicine*, and *Arthroscopy*. He also served as an administrative chief resident for the orthopaedic program and covered local high school football teams, as well as collegiate basketball and hockey.

FOOT AND ANKLE FELLOW

Nicholas A. Viens, M.D.

Dr. Viens graduated magna cum laude from Duke University, where he earned a Bachelor of Arts degree in history and membership in Phi Beta Kappa. He was awarded highest distinction in his major and the William T. Laprade Prize for the outstanding thesis in the Department of History. Dr. Viens attended the Duke University School of Medicine and furthered his interests in clinical orthopaedics and research. He completed orthopaedic surgery residency at Duke University Medical Center and was very involved with the resident selection and education processes. He was an American Orthopaedic Foot and Ankle Society Resident scholar, an American Orthopaedic Association Resident Leadership Forum nominee, and a John A. Feagin, Jr., M.D., Leadership Program Medical scholar. Dr. Viens has co-authored publications in the *Journal of Bone and Joint Surgery*, *Clinical Orthopaedics and Related Research*, *Foot and Ankle International*, the *Journal of Arthroplasty*, and the *Journal of Surgical Orthopaedic Advances*. His clinical and research interests include foot and ankle athletic and traumatic injuries, as well as treatment of arthritic conditions of the foot and ankle, including total ankle replacement.

Having grown up in Waterville, Maine, where he earned his Eagle Scout and was active in sports and camping, Dr. Viens is looking forward to spending a year in the

mountains and enjoying the snow with his wife, Lindsey, and son, Henry.

SPORTS MEDICINE IMAGING FELLOW

W. Sean Smith, M.D.

Dr. W. Sean Smith is a graduate of Xavier University and the University of Cincinnati College of Medicine, where he was on a US Navy Health Professions Scholarship. His internship was at the University of Chicago Hospitals and Clinics (1984), which was followed by three years active duty in the medical clinic at Willow Grove Naval Air Station in Willow Grove, Pennsylvania. He completed his radiology residency at the National Naval Medical Center in Bethesda, Maryland (1991), and then spent three more years on active duty as the head of the Department of Radiology at the US Naval Hospital, Camp Lester, in Okinawa, Japan. Upon returning to the United States, he completed a combined Musculoskeletal Fellowship at the Armed Forces Institute of Pathology and the University of Maryland (1995).

The next two years were spent in Augusta, Georgia, where he was an assistant professor of radiology, and at the VA Medical Center, where he was head of the Department of Radiology. In 1997 he entered private practice with Charleston Radiologists in Charleston, South Carolina. While there, he worked closely with the local orthopaedic surgeons, especially those who served the area's high school, college, and professional sports teams.

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 2012–2013 Steadman Philippon fellowship class are **Mr. and Mrs. Lawrence Flinn, Mr. and Mrs. Brian P. Simmons, 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.**

STEADMAN PHILIPPON RESEARCH INSTITUTE SALUTES LT. COMMANDER EDMUND GANAL, M.D.

By Jim Brown



Lieutenant Commander Edmund A. Ganal, M.D., United States Navy, is the latest in a distinguished line of military officers and orthopaedic surgeons who have completed the Steadman Philippon Research Institute Sports Medicine Fellowship Program.

Dr. Ganal, a veteran of military operations in both Iraq and Afghanistan, began his 12-month fellowship in August of 2012 and will complete his SPRI training in July 2013. He will continue his military service as an orthopaedic surgeon specializing in sports medicine based at Naval Station Newport (R.I.). He and his colleagues will provide medical services for every Naval installation in New England.

“The connection between sports medicine and injuries sustained during military service are very similar,” says Dr. Ganal. “At Newport, about 90 percent of the injuries and conditions we will treat are sports medicine in nature, although they happen with people in military service.”

Dr. Ganal graduated magna cum laude from the University of California, San Diego, with a degree in biochemistry and cell biology. He was a member of Phi Beta Kappa, played two years of NCAA soccer, and began to think about a career in medicine. He volunteered for a medical mission to the Philippines (assisting his father, who is a general surgeon) before attending Tufts University School of Medicine through the Health Professions Scholarship Program.

Service in Iraq, Afghanistan

Dr. Ganal has served with the 1st Marine Division at Camp Pendleton, at the Naval Medical Center in San Diego, and at the Naval Station in Newport. He deployed to Iraq in support of Operation Iraqi Freedom and later to Afghanistan for Operation Enduring Freedom. In Iraq, Dr. Ganal was the general medical officer for an infantry combat unit of 2,000 soldiers.

“In Afghanistan,” he recounts, “I was in a forward surgical unit, as well as a main hospital. A general surgeon, an anesthesiologist, and I operated out of a tent, trying to stabilize combat casualties before getting patients off to the next level of care. You don’t really see what the military is all about until you do an actual operational tour. The lesson that I took away from those experiences was an appreciation of what infantry soldiers accomplish and what they have to endure while they serve their country.”



WHERE ARE THEY NOW. . ?

The graduating class of 2011–2012 Steadman Philippon fellows is busy establishing new careers in orthopaedics.

ADAM ANZ, M.D.

Dr. Anz is practicing at the Andrews Orthopaedic and Sports Medicine Center in Gulf Breeze, Florida.

CHRISTIAN BALLDIN, M.D.

Dr. Balldin is practicing with the San Antonio Orthopaedic Group in San Antonio, Texas.

ROBERT BOYKIN, M.D.

Dr. Boykin is establishing his practice at Blue Ridge Bone and Joint in Knoxville, Tennessee.

MARK GEYER, M.D.

Dr. Geyer has joined the practice at the Athletic Orthopedics and Knee Center in Houston, Texas.

JEFFREY PADALECKI, M.D.

Dr. Padalecki has moved to Austin, Texas, and is practicing at the Austin Regional Clinic.

BENJAMIN PETRE, M.D.

Dr. Petre is now in Queen Ann, Maryland, practicing sports medicine at the Orthopedic and Sports Medicine Center.

NORMAN WALDROP, M.D.

Dr. Waldrop is establishing his sports medicine practice at the Andrews Orthopaedic and Sports Medicine Center in Birmingham, Alabama.

Meet Dr. Claire Ganal

The person most responsible for Dr. Ganal's success, according to Dr. Ganal himself, is his wife, Claire. "We met in medical school, got married shortly thereafter, and I transferred from the Air Force to the Navy so we could be stationed in the same locations," says Dr. Ganal.

Dr. Claire Ganal is a former officer in the Navy, a practicing pediatrician, and mother of Sofia, Christopher, and Brendan Ganal. When Brendan was born, Lt. Commander Ganal was in Afghanistan and his wife was back in Newport.

It was a "FaceTime delivery," according to the Ganals. The Internet connection between the U.S. and Afghanistan was unreliable, but they did their best to maintain daily contact, especially during Dr. Claire Ganal's pregnancy. About a half-hour before she delivered, the couple connected via iPad's FaceTime, and Lt. Commander Ganal was able to be with his wife, at least electronically, for the birth of their son. He saw Brendan in person for the first time three months later.

The Steadman Philippon Fellowship Experience

Dr. Ganal knew about the reputation of the Steadman Clinic and the Steadman Philippon Research Institute, but he didn't consider applying for the SPRI fellowship until the chief resident (a former SPRI fellow) at San Diego Naval Medical Center suggested it. During the following months, Dr. Ganal met Scientific Advisory Committee member Dr. John Feagan, as well as Dr. Steadman, Dr. Philippon, and other SPRI physicians at a conference in Vail. He applied, was accepted, and soon began his fellowship program.

"The Steadman Philippon Research Institute has world-class surgeons, scientists, and staff members, as well as world-class facilities," says Dr. Ganal. "There are few, if any, fellowship programs that offer a complete package

of clinical training, high-level research, and educational opportunities. We get all the support we need during our year at SPRI."

The focus of Dr. Ganal's research at SPRI, working with Dr. Millett, Dr. Ho, and others, has involved MRI mapping of the rotator cuff and injuries to structures that make up the cuff. Their research, which is scheduled for completion this summer, may soon help surgeons around the world better diagnose and treat shoulder injuries.

For the next three years, Dr. Ganal's primary focus will be on clinical treatment of sports injuries, but he also hopes to be able to follow his patients' outcomes over longer periods of time using the model that SPRI has developed to build its massive patient database.

Dr. Ganal, the pediatrician, will be a stay-at-home mother/part-time pediatrician until the children are all in school. In addition, she is currently getting a master's degree in medical education through Cincinnati Children's Hospital.

Dr. Edmund Ganal and Dr. Claire Ganal are great examples of America's military officers, health professionals, and parents. It has been an honor to have them as part of the Steadman Philippon Research Institute's family for the past year. We salute them and expect even greater things from them in the future.



Dr. Ganal scrubbing into a surgery in a Forward Resuscitative Surgery System operating tent May 2011. Despite the austere conditions, he was able to rapidly perform damage control surgery on several combat casualties.



A DAY IN THE LIFE OF AN INTERNATIONAL RESEARCH SCHOLAR

By Brian Devitt, M.D.

Brian Devitt, M.D.

[Editor's Note: Dr. Brian Devitt, of Ireland, recently completed a year as an international research scholar at the Steadman Philippon Research Institute and is now a clinical fellow in orthopaedic sports medicine at Mount Sinai Hospital in Toronto, Canada. Shortly after his stay in Vail, he recorded the events during a typical day at home and at work while at SPRI.]

I awake rested. I can finally sleep well at altitude. Our house is always warm because of the baby. Getting up at 6:00 a.m. is no longer such a hardship. I suppose I'm used to it. Spring is here at last, so I'm back on the bike. I enjoy the solitude of cycling in the morning. The exercise wakes me up. The journey is downhill through five miles of beautiful mountain scenery. The Steadman Clinic is located in the village at the foot of a vast ski resort. It's a small hospital with a big reputation, but is surprisingly modest in appearance.

Today is Monday. I make my way down to the laboratory and change into scrubs. We have testing today, so I can get away with it. The week starts with Grand Rounds. We are privileged to have some outstanding guest speakers. This morning, Dr. Brian Cole delivers an outstanding lecture on the state of the art treatment of cartilage defects of the knee. He's an extremely impressive and accomplished individual, and also very personable. I am charged with the responsibility of leading him on a tour of the BioMedical Engineering laboratory.

Our first stop is the Biomotion Laboratory, in the basement of the parking structure. The large room houses a Vicon motion capture system, force plates, and bi-planar fluoroscopy, which are all used to analyze neuromuscular performance following surgical intervention. Our next visit is to the Surgical Skills Laboratory, where I spend the majority of my time. This area is remarkable and is equipped with a vast array of instruments and equipment found in the operating room. We have fantastic access to fresh frozen cadavers to perform surgery and carry out anatomical dissections, which is a great perk of the job.

Just next-door is the Biomechanical Testing Laboratory. The robot assumes center stage here. Today, we are testing a posterior cruciate ligament (PCL) reconstruction of the knee, so everything has already been set up. The robot is a very sophisticated piece of equipment that permits the analysis of knee kinematics following ligament reconstruction by placing the joint through a full range of motion, while applying loads to mimic

normal physiological stresses. My role is to carry out the surgery. This can be challenging, as the knee is inverted and mounted upside down to facilitate testing.

In the far corner of the room there is an Instron machine, which we use to test the pull-out strength of the fixation. The final piece of equipment is the Microscribe, which is essentially a three-dimensional ruler used to quantify the location of pertinent anatomical structures and which forms the foundation of all our biomechanical studies. My main project this year has been to identify the arthroscopically relevant anatomy of the hip.

There is a wonderful atmosphere in the laboratory with a constant stream of music playing in the background. I hardly recognize any of it. I work very closely with engineers, research assistants, and medical students, who are mostly in their late twenties. We finish the tour in the conference room, where the weekly BioMedical Engineering meeting has just convened. Dr. Robert

LaPrade, the director of the international scholar program and an expert in multiligamentous knee reconstruction, chairs the meeting. We discuss our ongoing projects and provide updates on our progress. He is a prodigious researcher and is very involved in our studies, maintaining a regular presence in the laboratory. The meeting is short today. I return to the laboratory to start testing.

Testing days can be long. Thankfully, we have changed our testing protocol to perform the surgical reconstruction at the beginning of the day. In our previous project, the reconstruction was the final component of our study, so we frequently operated late into the evening. Max, a third year medical student from Wisconsin, assists me during the procedure. The double bundle PCL reconstruction goes well. We've done over 40 now, so we're getting quicker. We are using a new jig today, which involves a tricky set up. We finally get it to work and reward ourselves with a coffee. During the ski season, we would often go out for a quick ski over lunch. Today, I turn my attention to completing a manuscript I've been working on. I like to stay close to the laboratory just in case there are any problems.

I meet my mentor, Dr. John Feagin, for lunch. He is, without doubt, the most interesting person I have come across during my fellowship here. The founder of the ACL study group, he is regarded as one of the

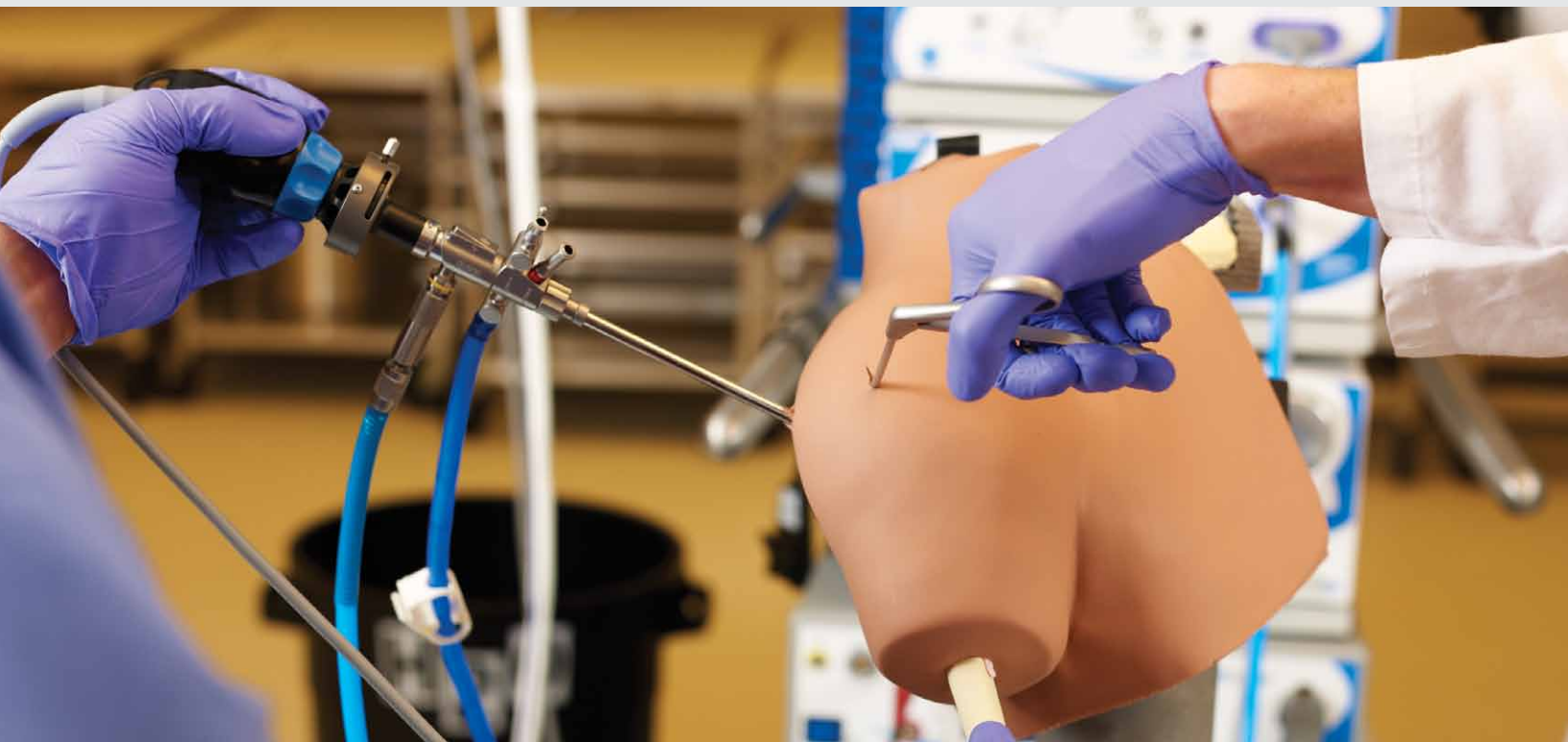
forefathers of sports medicine in the United States. He retired a number of years ago but stays involved in an advisory capacity. In the late 1960s, as a medical student, he visited the Rotunda hospital in Dublin for eight weeks and has maintained a fond interest in Ireland since. We are working on a book chapter together, which is a great honor. Being of Irish heritage, he is a wonderful storyteller and recounts fascinating tales of his experience working with such orthopaedic luminaries as John Charnley and Bernhard Georg Weber. Dr. Feagin runs a monthly 'classics club,' where we discuss a variety of seminal articles that influenced the practice of sports surgery. He is very generous with his time and I leave every meeting more informed and better for the experience.

There is an add-on case in the operating room this afternoon, which Dr. LaPrade has invited me to observe. He is performing an ACL, PCL, and posterolateral corner reconstruction, which is typical of the injuries he treats. He is a fine surgeon, and credits his ability to perform such complex surgery with excellent results to his strong foundation in clinical anatomy. He is a quick, decisive, and efficient operator. He chooses his tunnel positions with the confidence of a surgeon who has done it hundreds of times. He makes it look easy. He is a busy surgeon, who performs approximately 400 - 500 cases a year, which are comprised mostly of complex soft tissue reconstructions, meniscal transplants, or the treatment of cartilage defects. The ski slopes

provide a conveyor belt of clients. The case takes approximately two-and-a-half hours. Prior to leaving, I arrange to simulate the reconstruction in the skills laboratory the following day with the clinical fellow.

The cycle home is uphill and requires more energy. Tachycardia and tachypnea envelop me before long. Exercising at 8,600 feet is hard work. I get home just before 6:00 p.m. My job is to give the baby a bath in the evenings. I look forward to it immensely. Our little girl, Sadie, is to celebrate her first birthday next Friday. Being on fellowship is wonderful for family life. One of the advantages of doing a research fellowship is that I don't take calls. We eat dinner together and talk about our plans for our next fellowship destination, Toronto, in July. We have really enjoyed living in Vail, but are equally excited about our next adventure.

Our evenings are very laid back. We don't have a television, which was a conscious decision we made when we arrived. I read the Irish Times online every evening to stay in touch with news at home. Occasionally, we watch a movie. I find myself getting tired much earlier nowadays. I used to worry when I arrived whether I had made the right decision to come here as a research scholar. I no longer question that choice. Sleep is sound and not difficult to find.



UNIVERSITY OF WISCONSIN MEDICAL STUDENTS COMPLETE BIOMEDICAL RESEARCH ASSISTANTSHIP PROGRAM AT SPRI

Kevin Campbell and Max Michalski spend a year in research, now set to earn their degrees in medicine.

By Jim Brown

Kevin Campbell and Max Michalski, both natives of Wisconsin, graduates of the University of Wisconsin, and fourth-year medical students at Wisconsin's School of Medicine and Public Health, now have one more thing in common. They recently completed a one-year term as research assistants in the Department of BioMedical Engineering at the Steadman Philippon Research Institute.

The assistantships offer medical students an opportunity to work with the physicians and scientists at SPRI on a variety of biomedical research projects. Among their responsibilities are collaborating with the BioMedical Engineering staff to design research methods and operating procedures, as well as to perform and oversee data collection, database development, and analysis of studies. They are also expected to submit, present, and publish scientific work.

Kevin Campbell

Kevin and Max both had parents who encouraged them to aim high and pursue careers in medicine. Kevin's father (Greg), grandfather, and great-grandfather were all pharmacists, and his mother, Therese, is a business manager. Kevin's sister, Alyssa, recently graduated from New York University's School of Law.

"My father had an accident about five years ago and his leg was broken," says Kevin. "The orthopaedic surgeon who treated him and worked with my family was very compassionate and



Kevin Campbell

able to do something with my dad that no one else could have done. The care he provided was the kind I want to provide for other families."

"I didn't originally plan to take off a year between my third and fourth years in med school to focus on research," he says, "but the assistantship was the impetus to move forward. This program prepares you very well for an orthopaedic residency and helps develop skills you will ultimately use for the rest of your career. The doctors here do a good job of providing surgical care for their patients, but they are also researchers. That's the kind of combination I would like in my future career."

"What makes orthopaedic surgery different from other specialties is the patient, especially those who are



Max Michalski

athletes or who are physically active," says Kevin, who was a swimmer, football player, and track and field athlete in high school (he's also been a national-level competitor in sailing). "They are really motivated and involved in their recovery, and it's rewarding to provide care for that kind of patient population."

"When I first walked into SPRI, I thought I was in heaven," recalls Kevin. "Vail is a pretty place, the people were nice, and the Institute presented endless opportunities for researchers and surgeons."

Much of Kevin's research dealt with the anatomy of the ankle and with hip disease. "The practical value of the ankle anatomy research," says Kevin, "is to give surgeons a better idea of how to do ankle repairs. The hip studies show the importance of

repairing the labrum (the rim around the hip joint) in patients with hip injuries or disease and validate Dr. Marc Philippon's surgical procedures."

Max Michalski

Phill and Carol Michalski were just as influential in guiding their son toward a rewarding career. "My father received his undergraduate and master's degrees in mechanical engineering. My mom was a volleyball and basketball player at Wisconsin, so I played sports from the time I was a kid (football and basketball in high school; a skier now). She was also a math teacher in high school, and I was pretty good in math and science. She recognized my engineering potential, but she also knew I wanted to go into medicine and suggested the biomedicine option."

"The most important message I am taking away from this experience is how those three facets of orthopaedic surgery are related to each other."

Kevin Campbell

"Once I started researching the assistantship position," says Michalski, "I was really impressed with the advanced research being conducted at Steadman Philippon. Everyone at Wisconsin had great things to say about the Clinic and the Research Institute. It was a chance to work with surgeons and others who are well-known throughout the orthopaedic community."

When they started their work at SPRI, Max and Kevin were quickly immersed in multiple research projects. "The learning curve was pretty steep, but I was happy to get this opportunity," says Max, who has an undergraduate degree in biomedical engineering and a master's degree in biomechanical engineering, both from Wisconsin. "One of the challenges was managing the sheer number of ongoing research projects. It taught both of us how to set priorities and stay focused. After a while, all of the hours in the lab became second nature."

"The lab here is like nothing else on earth," he says. "It is really unique and gives you all the tools you need to conduct state-of-the-art research. There are not only physicians and scientists, but also engineers, statisticians, medical illustrators, audio-visual experts, and others who support the research. The staff is really what makes SPRI run."

One of Max's research projects at SPRI involves the hip and providing surgeons with quantitative data regarding the anatomy of the hip, acetabulum (the cup-shaped cavity at the base of the hip bone), and femur (the bone that extends from the pelvis to the knee).

"We are building on the work that Dr. Robert LaPrade has done on the knees and applying that knowledge to the hip. It will become a resource for surgeons to know precisely where everything should be when doing surgery."

Looking Ahead

"At Steadman Philippon, you get to see basic research, surgical medicine, and treatment outcomes," says Kevin. "The most important message I am taking away from this experience is how those three facets of orthopaedic surgery are related to each other."

For Max, the reward was the overall amount of knowledge he gained. "I still have a lot to learn, but this year has given me an amazing advantage. I've spent time in the labs, in the operating room, and in meetings with some of the best minds in the medical world. I learned from talking with them, watching them work, and trying to understand the way they think."

Kevin and Max will return to the University of Wisconsin during the next academic year to complete their studies and then move on to their residencies in orthopaedic surgery.

After that?

"It would be nice to return to Steadman Philippon or another research institute to complete a fellowship," says Kevin. "The sports medicine fellowship here is the best in the country," adds Max. "Coming back would be a dream."

SPRI LAUNCHES COMMUNITY EDUCATION OUTREACH

Realizing that the next generation of scientists, teachers, and physicians reside in our own communities, the Steadman Philippon Research Institute has created the Education and Public Outreach Committee (EPOC) in partnership with the Eagle County School District, and Vail Mountain School.

EPOC's mission is to inspire and introduce the science, technology, engineering, and mathematics-oriented fields to elementary, middle, and high school students. The curriculum is directed by the scientists and physicians of SPRI, and the centerpiece of activity is the world-class research labs located at the Vail Valley Medical Center.

The team of scientists offers laboratory tours, scientific presentations, mentoring of student projects, involvement in school science fairs, and internships. "Having world-class research scientists as a sounding board really gives students a sense of validation and pride," said Gabe Scherzer, a Vail Mountain School science teacher.

THE THREE-TIERED PROGRAM INCLUDES:

5th grade tours of the SPRI laboratories.

6th, 7th, and 8th grade school visits by SPRI staff scientists including science fairs, classroom or assembly lectures, and support for science-related projects such as robotics competitions.

High school students will be invited to join the SPRI Science Club. Members will have an opportunity to meet physicians and scientists, attend orthopaedics lecture series, and participate in research projects. They will also receive a SPRI Science Club t-shirt as a member gift.

Since 2011, the EPOC program has provided lab tours for 5th–12th grade Eagle County School District and Vail Mountain School students, mentored middle school science fairs, lectured at school assemblies, and provided two summer high school student internships.

According to Coen A. Wijdicks, Ph.D., director of the Department of BioMedical Engineering, "Our young scientists hold the key to the future. These experiences allow students to exercise the resources they learn in their science classes and apply scientific methods and techniques to various topics and experiments. It is very rewarding mentoring the students and working with them on ways to better understand the dynamics behind producing an authentic experiment."



Coen Wijdicks, Ph.D. (left) director, BioMedical Engineering, discusses the characteristics of the KUKA KR 60 Robot to fifth graders from Edwards Elementary School. (Photo credit: Angelica Wedell)

PUBLICATIONS AND PRESENTATIONS



PUBLICATIONS AND PRESENTATIONS

In 2012, principal investigators and fellows published papers in scientific and medical journals and delivered presentations to a variety of professional and lay audiences worldwide.

2012 PUBLICATIONS

Alradwan H, Philippon MJ, Farrokhyar F, Chu R, Whelan D, Bhandari M, Ayeni OR. Return to Preinjury Activity Levels After Surgical Management of Femoroacetabular Impingement in Athletes. *Arthroscopy*. 2012;28(10):1567-76. Epub 2012 Jul 13.

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):1862-69.

Anderson CJ, Ziegler CG, Wijdicks CA, Engebretsen L, LaPrade RF. Arthroscopically Pertinent Anatomy of the Anterolateral and Posteromedial Bundles of the Posterior Cruciate Ligament. *J Bone Joint Surg Am*. 2012;94(21):1936-45.

Anz AW, Rodkey WG. Biological Enhancement of Meniscus Repair and Replacement. *Sports Med Arthrosc*. 2012;20(2):115-120.

Boykin RE, Stull JD, Giphart JE, Wijdicks CA, Philippon MJ. Femoroacetabular Impingement in a Professional Soccer Player. *Knee Surg Sports Traumatol Arthrosc*. 2012;21(5):1203-11. Epub 2012 Jul 3.

Boykin RE, Philippon MJ, Patterson D, Briggs KK. Results of Arthroscopic Labral Reconstruction of the Hip in Elite Athletes. *Arthroscopy*. 2012;28(6 Suppl 1):e22.

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; Aug 21. Epub ahead of print.

Briggs KK, Matheny LM, Steadman JR. Can Hylan G-F 20 with Corticosteroid Meet the Expectations of Osteoarthritis Patients? *Am J Orthop*. 2012;41(7):311-5.

Briggs KK, Willimon SC, Ames J, Herzog MM, Philippon MJ. Hip Arthroscopy in the Adult Dysplastic Hip. *Arthroscopy*. 2012;28(6 Suppl 2):e63.

Briggs KK, Matheny LM, Steadman JR. Improvement in Quality of Life With Use of an Unloader Knee Brace in Active Patients with OA: A Prospective Cohort Study. *J Knee Surg*. 2012;25(5):417-21. Epub 2012 May 21.

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):1684-8. Epub 2012 Oct 7.

Clanton TO, Matheny LM, Jeronimus A, Jarvis HC. Return to Play in Athletes Following Ankle Injuries. *Sports Health*. 2012;6:471-4.

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):2606-11. Epub 2012 Aug 12.

Dewing CB, Horan MP, Millett PJ. Two-Year Outcomes of Open Shoulder Anterior Capsular Reconstruction for Instability From Severe Capsular Deficiency. *Arthroscopy*. 2012;28(1):43-51. Epub 2011 Oct 5.

Domb BG, Philippon MJ, Giordano BD. Arthroscopic Capsulotomy, Capsular Repair, and Capsular Plication of the Hip: Relation to Atraumatic Instability. *Arthroscopy*. 2013;29(1):162-73. Epub 2012 Aug 15.

Ejnisman L, Philippon MJ, Lertwanich P, 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.

Ellis HB, Matheny LM, Briggs KK, Pennock AT, Steadman JR. Outcomes and Revision Rate After Bone-Patellar Tendon-Bone Allograft Versus Autograft Anterior Cruciate Ligament Reconstruction in Patients Aged 18 Years or Younger with Closed Physes. *Arthroscopy*. 2012;28:1819-25. Epub 2012 Oct 24.

Engebretsen L, Wijdicks CA, Anderson CJ, Westerhaus B, LaPrade RF. Evaluation of a Simulated Pivot Shift Test: A Biomechanical Study. *Knee Surg Sports Traumatol Arthrosc*. 2012;20(4):698-702. Epub 2011 Nov 5.

Foad A, Wijdicks CA. The Accuracy of Magnetic Resonance Imaging and Magnetic Resonance Arthrogram Versus Arthroscopy in the Diagnosis of Subscapularis Tendon Injury. *Arthroscopy*. 2012;28(5):636-41. Epub 2012 Jan 24.

Gaskill TR, Lee JT, Boykin RE, van der Meijden OA, Millett PJ. Open Reduction and Internal Fixation of Fractures of the Clavicle. In: Levine WN, Cadet ER, and Ahmad CS, eds. *Shoulder & Elbow Trauma*. London, UK: JP Medical Ltd.; 2012:143-150.

- Gaskill TR, Ryan M, Philippon MJ.** Beyond Basic Recovery: Return to Baseball After Labral Debridement of Repair. *Orthopaedic Rehabilitation of the Athlete: Getting Back in the Game.* Elsevier. 2012: In Press.
- Gaskill TR, Philippon MJ.** Complex Hip Reconstruction. In: Byrd JWT, ed. *Operative Hip Arthroscopy.* 3rd Ed. New York, NY: Springer; 2012:377-384.
- Gaskill TR, Philippon MJ.** Letter to the Editor on "Surgical Hip Dislocation for Femoroacetabular Impingement." *Am J Sports Med.* 2012;40:NP1-3.
- Gaskill TR, Philippon MJ.** My Approach to Femoroacetabular Impingement. In: Byrd JWT, ed. *Operative Hip Arthroscopy.* 3rd Ed. New York, NY: Springer; 2012:237-248.
- Gaskill TR, Philippon MJ.** Surgical Hip Dislocation for Femoroacetabular Impingement. *Am J Sports Med.* 2012;40(1):NP1-2.
- Geeslin AG, LaPrade RF.** Outcomes of Treatment of Acute Grade-III Isolated and Combined Posterolateral Knee Injuries: A Prospective Case Series and Surgical Technique. *J Bone Joint Surg Am.* 2012;93(18):1672-83.
- Giphart JE, van der Meijden OA, Millett PJ.** The Effects of Arm Elevation on the 3-Dimensional Acromiohumeral Distance: A Biplane Fluoroscopy Study With Normative Data. *J Shoulder Elbow Surg.* 2012;21(11):1593-600. Epub 2012 Feb 22.
- Giphart JE, Elser F, Dewing CB, Torry MR, Millett PJ.** The Long Head of the Biceps Tendon Has Minimal Effect on In Vivo Glenohumeral Kinematics. A Biplane Fluoroscopy Study. *Am J Sports Med.* 2012;40(1):202-12. Epub 2011 Sep 30.
- Giphart JE, Zirker CA, Myers CA, Pennington WW, LaPrade RF.** Accuracy of a Contour-Based Biplane Fluoroscopy Technique for Tracking Knee Joint Kinematics of Different Speeds. *J Biomech.* 2012;45(16):2935-8. Epub 2012 Sep 25.
- Giphart JE, Stull JD, LaPrade RF, Wahoff MS, Philippon MJ.** Recruitment and Activity of the Pectineus and Piriformis Muscles During Hip Rehabilitation Exercises: An Electromyography Study. *Am J Sports Med* 2012;40(7):1654-63. Epub 2012 Apr 20.
- Gomoll AH, Filardo G, de Girolamo L, Espregueira-Mendes J, Marcacci M, Rodkey WG, Steadman JR, Zaffagnini S, Kon E.** Surgical Treatment for Early Osteoarthritis. Part I: Cartilage Repair Procedures. *Knee Surg Sports Traumatol Arthrosc.* 2012;20:450-66. Epub 2011 Nov 24.
- Griffin DR, Parsons N, Mohtadi NG, Safran MR; Multicenter Arthroscopy of the Hip Outcomes Research Network.** A Short Version of the International Hip Outcome Tool (iHOT-12) for Use in Routine Clinical Practice. *Arthroscopy.* 2012;28(5):611-6;quiz 616-8.
- Hamming D, Braman JP, Phadke V, LaPrade RF, Ludewig PM.** The Accuracy of Measuring Glenohumeral Motion With a Surface Humeral Cuff. *J Biomech.* 2012;45(7):116 1-8. Epub 2012 Mar 3.
- Herzog M, Briggs KK, Philippon MJ.** Common Mechanisms of Hip Injury and Associated Hip Pathology in Professional Skiers and Snowboarders. *Journal of ASTM International.* 2012;9:4.
- 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):1064-70. Epub 2012 May 24.
- 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):612-4. Epub 2012 Oct 31.
- Jarvis HC, Matheny LM, Clanton TO.** Stingray Injury to the Webspace of the Foot. *Orthopedics.* 2012;35(5):e762-5.
- Johannsen AM, Civitarese DM, Padalecki JR, Goldsmith MT, Wijdicks CA, LaPrade RF.** Qualitative and Quantitative Anatomical Analysis of the Posterior Root Attachments of the Medial and Lateral Menisci. *Am J Sports Med.* 2012;40(10):2342-7. Epub 2012 Sep 7.
- Johnston TL, Schenker M, Philippon MJ.** Hip Alpha Angles as Radiographic Predictors of Chondral Injury and Decreased Hip Range-of-Motion in Femoroacetabular Impingement. *Arthroscopy.* 2012;28(8 Suppl 2):e304.
- Kelly B, Martin RL, Philippon MJ.** Factors Associated With Labral Pathology in the Hip. *Arthroscopy.* 2012;28(8 Suppl 1):e94.
- Kelly B, Philippon MJ.** The Role of Capsulolabral Complex Hip Injuries in Return to Play for Professional Football Athletes. *Arthroscopy.* 2012;28(8 Suppl 1):e91.
- Kocher MS, Frank JS, Nasreddine AY, Safran MR, Philippon MJ, Sekiya JK, Kelly BT, Byrd JW, Guanche CA, Martin HD, Clohisy JC, Mohtadi NG, Griffin DR, Sampson TG, Leunig M, Larson CM, Ilizaliturri VM Jr, McCarthy JC, Gambacorta PG.** Intra-Abdominal Fluid Extravasation During Hip Arthroscopy: A Survey of the MAHORN Group. *Arthroscopy.* 2012;28(11):1654-1660.e2. Epub 2012 Sep 16.
- LaPrade RF, Wijdicks CA.** The Management of Injuries to the Medial Side of the Knee. *J Orthop Sports Phys Ther.* 2012;42(3):221-233. Epub 2012 Feb 29.
- LaPrade RF, Spiridonov SI, Nystrom LM, Jansson KS.** Prospective Outcomes of Young and Middle-Aged Adults With Medial Compartment Osteoarthritis Treated With a Proximal Tibial Opening Wedge Osteotomy. *Arthroscopy.* 2012;28(3):354-64. Epub 2011 Dec 14.
- LaPrade RF, Wijdicks CA.** Surgical Technique: Development of an Anatomic Medial Knee Reconstruction. *Clin Orthop Relat Res.* 2012; 470(3):806-14.

- 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(2):438-44. Epub 2012 May 31.
- Martetschläger F, Kraus TM, Hardy P, Millet PJ.** Arthroscopic Management of Anterior Shoulder Instability With Glenoid Bone Defects. *Knee Surg Sports Traumatol Arthrosc.* 2012; Sept 14. Epub ahead of print.
- Martetschläger F, Rios D, Boykin RE, Giphart JE, de Waha A, Millett PJ.** Coracoid Impingement – Current Concepts. *Knee Surg Sports Traumatol Arthrosc.* 2012;20(11):2148-55. Epub 2012 Apr 24.
- Martetschläger F, Rios D, Millett PJ.** Coracoplasty: Indications, Techniques, and Outcomes. *Tech Shoulder Elbow Surg.* 2012;13(4):177-81.
- 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. A Technical Note With Video Illustration. *Knee Surg Sports Traumatol Arthrosc.* 2013;21(7):1642-6. Epub 2012 Oct 7.
- Martetschläger F, Rios D, van der Meijden OA, Millett PJ.** Subscapularis Tendon Repair Options. *Tech Shoulder Elbow Surg.* 2012;13(2):60-66.
- 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 Shoulder Elbow Surg.* 2012;22(2):215-21. Epub 2012 Aug 30.
- Vaishnav S, Zoric B, Millett PJ.** Recurrent Instability due to Capsular Deficiency. In: Provencher MT and Romeo AA, eds. *Shoulder Instability: A Comprehensive Approach.* Philadelphia, PA: Elsevier; 2012:450-6.
- Millett PJ, Gaskill T, Burkhart SS.** Double Row Rotator Cuff Repair Strategies. *Tech Shoulder Elbow Surg.* 2012;13(2):55-9.
- Millett PJ.** Life After Fellowship: Pearls & Pitfalls. A Roundtable Discussion on Finding a Job That Sticks. *AAOS Now.* 2012; Aug 2.
- 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):445-9. Epub 2012 Nov 1.
- Millett PJ, Gaskill T, van der Meijden OA.** Surgical Anatomy of the Shoulder. *Instructional Course Lecture.* 2012;61:87-95.
- Millett PJ, Gaskill TR, Horan MP, van der Meijden OA.** Technique and Outcomes of Endoscopic Scapulothoracic Bursectomy and Partial Scapulectomy. *Arthroscopy.* 2012;28(12):1776-83. Epub 2012 Oct 16.
- Mohtadi NG, Griffin DR, Pedersen ME, Chan D, Safran MR, Parsons N, Sekiya JK, Kelly BT, Werle JR, Leunig M, McCarthy JC, Martin HD, Byrd JW, Philippon MJ, Martin RL, Guancho CA, Clohisy JC, Sampson TG, Kocher MS, Larson CM; Multicenter Arthroscopy of the Hip Outcomes Research Network.** The Development and Validation of a Self-Administered Quality-Of-Life Outcome Measure for Young, Active Patients With Symptomatic Hip Disease: The International Hip Outcome Tool (iHOT-33). *Arthroscopy.* 2012;28(5):595-605; quiz 606-10.e1.
- Myers CA, Torry MR, Shelburne KB, Giphart JE, LaPrade RF, Woo SL, Steadman JR.** In Vivo Tibiofemoral Kinematics During 4 Functional Tasks of Increasing Demand Using Biplane Fluoroscopy. *Am J Sports Med.* 2012;40(1):170-8. Epub 2011 Oct 13.
- Pennock AT, Philippon MJ.** Arthroscopic Reconstructive Techniques of the Hip. In: Byrd JWT, Puddu G, Panni EAS, eds. *Surgical Techniques in Orthopaedics and Traumatology.* Rome, Italy: CIC Edizioni Internazionali; 2012: In Press.
- 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):416-22. Epub 2012 Dec 20.
- Philippon MJ, Peixoto LP, Goljan P.** Acetabular Labral Tears: Debridement, Repair, Reconstruction. *Oper Techn Sport Med.* 2012;20:281-6.
- Philippon MJ, Schroder e Souza BG, Briggs KK.** Advanced Techniques and Frontiers in Hip Arthroscopy. In: Johnson DH, ed. *Operative Arthroscopy.* 4th Ed. Philadelphia, PA: Lippincott, Williams & Wilkins; 2012:572-80.
- Philippon MJ, Torrie A, Turner AS, Kelly B, Arnoczky S.** Arthroscopic Hip Labral Repair: Assessment of Healing in an In Vivo Model. *Arthroscopy.* 2012;28(8 Suppl 2):e306.
- Philippon MJ, Pennock A, Gaskill TR.** Arthroscopic Ligamentum Teres Reconstruction: Surgical Techniques and Early Outcomes. *J Bone Joint Surg Br.* 2012;94(11):1494-8.
- Philippon MJ, Jarvis HC.** Arthroscopic Management of a Femoral Head Osteochondral Defect Using Autologous Osteochondral Transfer, Platelet-Rich Plasma and Microfracture. *Curr Orthop Pract.* 2012;23(6):629-33.

- Philippon MJ, Patterson DC, Briggs KK.** Hip Arthroscopy and Femoroacetabular Impingement in the Pediatric Patient. *J Pediatr Orthop.* 2013;33 Suppl 1:S126-30.
- Philippon MJ, Peixoto LP.** Capsular Laxity Including Patients With Ehler-Danlos. In: McCarthy J Jr, Villar, R, and Noble PC, eds. *Diagnosis and Surgical Treatment of Hip Disease: A Worldwide Perspective on Approaches and Outcomes.* New York, NY: Springer; 2012: In Press.
- Philippon MJ, Schroder e Souza BG.** Capsule Pathology in the Hip. *International Society of Arthroscopy, Knee Surgery and Orthopedic Sports Medicine - European Society of Sport Traumatology, Knee Surgery and Arthroscopy Standard Terminology.* 2012: In Press.
- Philippon MJ, Dewing C, Briggs KK, Steadman JR.** Decreased Femoral Head-Neck Offset: A Possible Risk Factor for ACL injury. *Knee Surg Sports Traumatol Arthrosc.* 2012; Jan 28. Epub ahead of print.
- Philippon MJ, Goljan P, Briggs KK.** FAI: From Diagnosis to Treatment. *Tech Orthop.* 2012;27:167-71.
- Philippon MJ, Schroder e Souza BG, Briggs KK.** Hip Arthroscopy for Femoroacetabular Impingement in Patients Aged 50 Years or Older. *Arthroscopy.* 2012;28(1):59-65. Epub 2011 Oct 7.
- Philippon MJ, Schroder e Souza BG, Briggs KK.** Hip Arthroscopy for Structural Hip Problems. In: Berry DF, Lieberman HR, eds. *Surgery of the Hip.* Philadelphia, PA: Elsevier; 2013:697-709.
- 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.* New York, NY: Springer; 2012: In Press.
- Philippon MJ, Koppersmith DA, Clark AM, Noonan TJ.** Hip Range of Motion in Professional Baseball Players. *Arthroscopy.* 2012;28(8 Suppl 2):e271.
- 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):2492-6. Epub 2013 Jan 5.
- Philippon MJ, Briggs KK, Fagrelus T, Patterson DC.** Labral Refixation: Current Techniques and Indications. *HSS J.* 2012;8(3):240-4.
- Philippon MJ.** Labral Repair and Rim Trimming. In: Sekiya J, Ranawat A, Safran M, Leunig M, eds. *Hip Arthroscopy and Open Surgery.* Philadelphia, PA: Elsevier; 2011.
- Philippon MJ, Ejnisman L, Ellis HB, Briggs KK.** Outcomes 2 to 5 Years Following Hip Arthroscopy for Femoroacetabular Impingement in the Patient Aged 11 to 16 Years. *Arthroscopy.* 2012;28(9):1255-61. Epub 2012 May 4.
- Philippon MJ, Skendzel J.** Outcomes in Return to Sport. In: Bedi A, ed. *Sports Hip Injuries.* 2012: In Press.
- Philippon MJ, Peixoto LP.** Partial Joint Replacement – Prosthetic. In: McCarthy J Jr, Villar R, Noble PC, eds. *Diagnosis and Surgical Treatment of Hip Disease: A Worldwide Perspective on Approaches and Outcomes.* New York, NY: Springer; 2012: In Press.
- Philippon MJ, Briggs KK.** Pelvis, Groin and Hips. In: Bahr R, ed. *The IOC Manual of Sports Injuries: An Illustrated Guide to the Management of Injuries in Physical Activity.* Hoboken, NJ: Wiley-Blackwell; 2012:293-338.
- Philippon MJ, Meyer JL, Briggs KK, Koppersmith DA.** Preparticipation Hip Evaluation of College Football Players to Identify Athletes at Increased Risk of Chondal Labral Dysfunction of the Hip. *Arthroscopy.* 2012;28(9 Suppl):e469.
- 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. 2012: In Press.
- 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):1071-84. Epub 2012 Apr 8.
- Register B, Pennock AT, Ho CP, Strickland CD, Lawand A, Philippon MJ.** Prevalence of Abnormal Hip Findings in Asymptomatic Participants: A Prospective, Blinded Study. *Am J Sports Med.* 2012;40(12):2720-4. Epub 2012 Oct 25.
- Rios D, Martetschläger F, Gaskill TR, Millett PJ.** Comprehensive Arthroscopic Management (CAM) Procedure for Shoulder Osteoarthritis. *Techniques in Shoulder and Elbow Surgery.* 2012;13(4):182-6.
- Rodkey WG.** Menaflex™ Collagen Meniscus Implants (CMI). Rationale, Development, Surgical Technique, and United States Clinical Outcomes. *Tecniche Chirurgiche in Ortopedia e Traumatologia (Surgical Techniques in Orthopaedics and Traumatology).* 2012: In Press.
- Rodkey WG.** New on the Horizon: Meniscus Reconstruction Using Menaflex™, a Novel Collagen Meniscus Implant. In: Doral MN, ed. *Sports Injuries - Prevention, Diagnosis, Treatment and Rehabilitation.* Berlin – Heidelberg, Germany: Springer-Verlag; 2012:335-340.
- Ryan M, Braun S, Millett PJ.** Surgical Approaches to the Foot and Ankle. In: Altchek D, DiGiovanni CW, Dines JS, Positano RG, eds. *Foot and Ankle in Sports Medicine.* Philadelphia, PA: Lippincott William & Wilkins; 2012:67-83.
- Schenker M, Johnston TL, Philippon MJ.** Radiographic Evidence of Acetabular Dysplasia as a Predictor of Hip Joint Instability and Laxity. *Arthroscopy.* 2012;28(8 Suppl 2):e306.

Sethi PM, Rajaram A, Beitzel K, Hackett TR, Chowanec 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):451-7. Epub 2012 Jun 26.

Steadman JR, Rodkey WG, Briggs KK. Débridement and Microfracture for Full-Thickness Articular Cartilage Defects. In: Scott WN, ed. *Innall & Scott Surgery of the Knee.* Philadelphia, PA: Elsevier; 2012:207-213.

Steadman JR, Matheny LM, Briggs KK, Rodkey WG, Carreira DS. Outcomes Following Healing Response in Older, Active Patients: A Primary Anterior Cruciate Ligament Repair Technique. *J Knee Surg.* 2012;25(3):255-260. Epub 2012 May 21.

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.* 2012;29(2):220-5.

van der Meijden OA, Wijdicks CA, Jansson K, Gaskill TR, Millett PJ. Biomechanical Analysis of Massive Rotator Cuff Tear Repairs: Extended Linked Repairs and Augmented Repairs. *Knee Surg Sports Traumatol Arthrosc.* 2012;20(1):S95.

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.

van der Meijden OA, Gaskill TR, Millett PJ. Glenohumeral Joint Preservation: A Review of Management Options for Young, Active Patients with Osteoarthritis. *Adv Orthop.* 2012;2012:160923. Epub 2012 Mar 27.

van der Meijden OA, Westgard P, Chandler Z, Gaskill TR, Kokmeyer D, Millett PJ. Rehabilitation After Rotator Cuff Repair: Current Concepts Review and Evidence-Based Guidelines. *Int J Sports Phys Ther.* 2012;7(2):197-218.

van der Meijden OA, Gaskill TR, Millett PJ. Treatment of Clavicle Fractures: Current Concepts Review. *J Shoulder Elbow Surg.* 2012;21(3):423-9. Epub 2011 Nov 6.

Waldrop NE 3rd, Wijdicks CA, Jansson KS, LaPrade RF, Clanton TO. Anatomic Suture Anchor Versus the Broström Technique for Anterior Talofibular Ligament Repair: A Biomechanical Comparison. *Am J Sports Med.* 2012;40(11):2590-6. Epub 2012 Sep 7.

Warth RJ, Martetschläger F, Gaskill TR, Millett PJ. Acromioclavicular Joint Separations. *Curr Rev Musculoskelet Med.* 2012;6(1):71-8.

Wijdicks FJ, van der Meijden OA, Millett PJ, Verleisdonk EJ, Houwert RM. Systematic Review of the Complications of Plate Fixation of Clavicle Fractures. *Arch Orthop Trauma Surg.* 2012;132(5):617-25. Epub 2012 Jan 10.

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

Willimon SC, Ellis HB, Millett PJ. Distal Clavicle Fixation in the Skeletally Immature. *Tech Shoulder Elbow Surg.* 2012;13(2):81-5.

2012 PRESENTATIONS

Ames JA, Horan MP, van der Meijden O, Millett PJ. The Influence of Acromion Index Size on Outcomes Following Arthroscopic Repair of Full Thickness Rotator Cuff Tears. *15th European Society of Sports Traumatology, Knee Surgery & Arthroscopy (ESSKA) Congress,* Geneva, Switzerland, May, 2012.

Baka N, de Bruijne M, van Walsum T, Kaptein BL, Giphart JE, Schaap M, Niessen WJ, Lelieveldt BPF. Fluoroscopic Assessment of Femoral Kinematics Using a Statistical Shape Model. *20th European Orthopedic Research Society Annual Meeting,* Amsterdam, Netherlands, September, 2012.

Boykin R, Briggs KK, Philippon MJ. Pre-participation Screening in Elite Youth Tennis Players. *15th ESSKA Congress,* Geneva, Switzerland, May, 2012.

Boykin R, Philippon MJ, Patterson D, Dee A, Briggs KK. Results of Arthroscopic Labral Reconstruction of the Hip in Elite Athletes. Podium. *31st Arthroscopy Association of North America (AANA) Annual Meeting,* Orlando, FL, May, 2012.

Boykin R, Philippon MJ, Patterson D, Dee A, Briggs KK. Results of Arthroscopic Labral Reconstruction of the Hip in Elite Athletes. Podium. *American Orthopaedic Society for Sports Medicine (AOSSM) Annual Meeting,* Baltimore, MD, July, 2012.

Boykin R, Philippon MJ, Patterson D, Dee A, Briggs KK. Results Of Arthroscopic Labral Reconstruction of the Hip in Elite Athletes. ePoster. *International Society for Hip Arthroscopy (ISHA) Annual Meeting,* Boston, MA, September, 2012.

Briggs KK, Philippon MJ. Sport Participation Level in Patients With Hip Injuries. *15th ESSKA Conference,* Geneva, Switzerland, May, 2012.

Briggs KK, Matheny LM, Clanton TO. Psychometric Properties of Commonly Used Outcomes Scores in Patients with Foot and Ankle Injuries. *American Orthopaedic Foot and Ankle Society (AOFAS) Annual Meeting,* San Diego, CA, June, 2012.

Briggs KK, Rodkey W, Steadman JR, Matheny L. Does Kellgren-Lawrence Grade Correlate With Arthroscopic Findings in the Knee? Poster. *31st AANA Annual Meeting,* Orlando, FL, May, 2012.

Briggs KK, Matheny LM, Steadman JR, Rodkey WG. Comparison of Factors Associated With Early Osteoarthritis vs. Moderate to Severe Osteoarthritis of the Knee. *15th ESSKA Congress*, Geneva, Switzerland, May, 2012.

Briggs KK, Rodkey W, Steadman JR, Matheny L. Does Kellgren-Lawrence Grade Correlate With Arthroscopic Findings in the Knee? *15th ESSKA Congress*, Geneva, Switzerland, May, 2012.

Briggs KK, Rodkey WG, Matheny LM, Steadman JR. The Tegner Activity Scale Index as a Measure of Early Regained Activity Following Knee Arthroscopy. Poster. *15th ESSKA Congress*, Geneva, Switzerland, May, 2012.

Briggs KK, Matheny LM, Steadman JR, Rodkey WG. Comparison of Factors Associated With Early Osteoarthritis vs. Moderate to Severe Osteoarthritis of the Knee. *International Cartilage Repair Society*, Montreal, Canada, May, 2012.

Briggs KK, Rodkey W, Steadman JR, Matheny L. Does Kellgren-Lawrence Grade Correlate With Arthroscopic Findings in the Knee? Poster. *International Cartilage Repair Society*, Montreal, Canada, May, 2012.

Briggs KK. Using a Database in Clinical Practice. *ISHA Annual Meeting*, Boston, MA, September, 2012.

Briggs KK. Documenting Outcomes Following Hip Arthroscopy. *Vail Hip Arthroscopy Symposium*, Vail, CO, March, 2012.

Clanton TO. Acute and Chronic Syndesmosis Injuries – Diagnosis and Treatment. *2012 Shanghai International Foot and Ankle Surgery Forum*, Shanghai, China, April, 2012.

Clanton TO. Treatment Strategies for Posterior Tibial Tendon Insufficiency. *2012 Shanghai International Foot and Ankle Surgery Forum*, Shanghai, China, April, 2012.

Clanton TO. Treatment Strategies for Posterior Tibial Tendon Insufficiency. Keynote Lecture. *9th International Forum on Orthopaedic Sports Medicine & Arthroscopic Surgery & 22nd Chinese Endoscopy Doctor Conference*, Shanghai, China, April, 2012.

Clanton TO. Navicular Stress Fractures and Bipartite Navicular: What We Do. *American Academy of Orthopaedic Surgeons (AAOS) International Orthopaedic Foot & Ankle Symposium*, Orlando, FL, November, 2012.

Clanton TO. Os Peroneum Syndrome: Resolutions. *AAOS International Orthopaedic Foot & Ankle Symposium*, Orlando, FL, November, 2012.

Clanton TO. The Subtle Cavus: Unilateral/Bilateral: Do You Have to Cut the Heel? *AAOS International Orthopaedic Foot & Ankle Symposium*, Orlando, FL, November, 2012.

Clanton TO. Hands-On Surgical Skills Lab - Replacement System B 2 Discussion. Hands-On Surgical Skills Lab. *AAOS Total Ankle Arthroplasty*, Rosemont, IL, March, 2012.

Clanton TO. Hands-On Surgical Skills Lab - Replacement System B Discussion. Hands-On Surgical Skills Lab. *AAOS Total Ankle Arthroplasty*, Rosemont, IL, March, 2012.

Clanton TO. Hands-On Surgical Skills Lab - Replacement System B. Hands-On Surgical Skills Lab. *AAOS Total Ankle Arthroplasty*, Rosemont, IL, March, 2012.

Clanton TO. Hands-On Surgical Skills Lab - Replacement System B 2. Hands-On Surgical Skills Lab. *AAOS Total Ankle Arthroplasty*, Rosemont, IL, March, 2012.

Clanton TO. Closure and Post-Op Care. *AAOS Total Ankle Arthroplasty*, Rosemont, IL, March, 2012.

Clanton TO. Cases and Questions. *AAOS Total Ankle Arthroplasty*, Rosemont, IL, March, 2012.

Clanton TO. Hands-On Surgical Skills Lab - Replacement System D 2 Discussion. Hands-On Surgical Skills Lab. *AAOS Total Ankle Arthroplasty*, Rosemont, IL, March, 2012.

Clanton TO. Hands-On Surgical Skills Lab - Replacement System D. Hands-On Surgical Skills Lab. *AAOS Total Ankle Arthroplasty*, Rosemont, IL, March, 2012.

Clanton TO. Panel Discussion and Questions. *AAOS Total Ankle Arthroplasty*, Rosemont, IL, March, 2012.

Clanton TO. Video Demonstration - Replacement System D. Video Demonstration. *AAOS Total Ankle Arthroplasty*, Rosemont, IL, March, 2012.

Clanton TO. Foot and Ankle Injuries in Sports. Webinar. *AOFAS Webinar*, Online, April, 2012.

Clanton TO. Lateral Ankle Ligament Reconstruction. *Arthrex Web Seminar*, Online, December, 2012.

Clanton TO. Lateral Ankle: Tenodesis Graft Reconstruction. *ArthroLondon*, London, England, September, 2012.

Clanton TO. MRI & Surgical Correlation of Turf Toe: Hallux MTP Capsular-Ligamentous Sesamoid Complex. *Current Issues of MRI in Orthopaedics & Sports Medicine*, San Francisco, CA, August, 2012.

Clanton TO. Eliminate Hardware Removal with Knotless Ankle TightRope: Taking a Closer Look at the Mal-Reduction and Implant Removal of Screws vs. the TightRope @ Arthrex Ankle Fracture Solutions. Webinar. *Foot Innovate: Webinar*, Online, October, 2012.

Clanton TO. Acute Ankle Injuries in Skiing and Snowboarding. Instructor: On Hill Practical Stations. *Medical Emergencies in Skiing and Snowboarding (MESS)*, Vail, CO, December, 2012.

Clanton TO. Sports Injuries and Trauma: Achilles Repair Options. *Orthopaedic Foot and Ankle Fellows Course*, Aurora, CO, October, 2012.

Clanton TO. Sports Injuries and Trauma: Soft Tissue Injuries. *Orthopaedic Foot and Ankle Fellows Course*, Aurora, CO, October, 2012.

Clanton TO. Trauma: Total Ankle Replacement. *Orthopaedic Foot and Ankle Fellows Course*, Aurora, CO, October, 2012.

Gaskill TR, van der Meijden O, Horan MP, Millett MP. Outcomes After Arthroscopic Scapulothoracic Bursectomy and Partial Scapulectomy. Poster. *15th ESSKA Congress*, Geneva, Switzerland, May, 2012.

Gaskill TR, van der Meijden O, Horan MP, Millett MP. Outcomes After Arthroscopic Scapulothoracic Bursectomy and Partial Scapulectomy. *AAOS Annual Meeting*, San Francisco, CA, February, 2012.

Gaskill TR, van der Meijden O, Horan MP, Millett MP. Outcomes After Arthroscopic Scapulothoracic Bursectomy and Partial Scapulectomy. *31st AANA Annual Meeting*, Orlando, FL, May, 2012.

Geyer M, Philippon MJ, Fagrelus T, Briggs KK. Acetabular Labral Reconstruction With Iliotibial Band Autograft: Outcome and Survivorship Analysis at Minimum 3 Years Follow-Up. *ISHA Annual Meeting*, Boston, MA, September, 2012.

Giphart JE, Hvidston J, Torry MR, Hackett TR. Effect of Clavicle Shortening on In Vivo Rotations of the Shoulder Complex During Abduction. *Orthopaedic Research Society (ORS) Annual Meeting*, San Francisco, CA, February, 2012.

Giphart JE, van der Meijden OAJ, Millett PJ. The Effects of Arm Elevation on Acromiohumeral Distances: A Biplane Fluoroscopy Study With Normative Data. *ORS Annual Meeting*, San Francisco, CA, February, 2012.

Johannsen A, Civitarese D, Goldsmith M, Padalecki J, Wijdicks CA, LaPrade R. Quantitative Anatomical Analysis of the Posterior Root Attachments of the Medial and Lateral Menisci. *AOSSM Annual Meeting*, Baltimore, MD, July, 2012.

Johannsen A, Westcott D, LaPrade R, Wijdicks CA, Engebretsen L. Radiographic Landmarks for Tunnel Positioning in Posterior Cruciate Ligament Reconstructions. *15th ESSKA Congress*, Geneva, Switzerland, May, 2012.

Johannsen A, Westcott D, Wijdicks CA, Engebretsen L, LaPrade R. Radiographic Landmarks for Tunnel Positioning in PCL Reconstructions. *ORS Annual Meeting*, San Francisco, CA, February, 2012.

LaPrade R, Anderson C, Westcott D, Ziegler C, Wijdicks CA, Engebretsen L. Arthroscopically Pertinent Anatomy of the Anterolateral and Posteromedial Bundles of the Posterior Cruciate Ligament. *15th ESSKA Congress*, Geneva, Switzerland, May, 2012.

LaPrade RF. Clinically Relevant Anatomy and Biomechanics of the Medial Side of the Knee and Early Results of an Anatomical Reconstruction. *11th Turkish Sports Traumatology Arthroscopy and Knee Surgery Congress*, Ankara, Turkey, October, 2012.

LaPrade RF. Posterolateral Corner Injuries of the Knee Panel. Moderator. *11th Turkish Sports Traumatology Arthroscopy and Knee Surgery Congress*, Ankara, Turkey, October, 2012.

LaPrade RF. Treatment of Acute Posterolateral Corner Injuries. *11th Turkish Sports Traumatology Arthroscopy and Knee Surgery Congress*, Ankara, Turkey, October, 2012.

LaPrade RF. Posterolateral Corner: Repair, Reconstruction, and Outcomes. *13th Annual AAOS/AOSSM Sports Medicine Course: Elite Athletes to Weekend Warriors*, Vail, CO, March, 2012.

LaPrade RF. Superficial MCL and Posteromedial Injury: Don't Confuse With a Posterolateral Knee Injury. *13th Annual AAOS/AOSSM Sports Medicine Course: Elite Athletes to Weekend Warriors*, Vail, CO, March, 2012.

LaPrade RF. Osteotomies Around the Knee. *13th Annual AAOS/AOSSM Sports Medicine Course: Elite Athletes to Weekend Warriors*, Vail, CO, March, 2012.

LaPrade RF. Biomechanics, Exam and Stress X-Rays. PLC Instructional Course Lecture. *15th ESSKA Congress*, Geneva, Switzerland, May, 2012.

LaPrade RF. Radiofrequency and Meniscal Tissue: From Resection to Repair. Keynote Lecture. PLC Instructional Course Lecture. *15th ESSKA Congress*, Geneva, Switzerland, May, 2012.

LaPrade RF. Faculty: Young Sports Medicine Specialists' Workshop. Faculty. *AOSSM Annual Meeting*, Baltimore, MD, July, 2012.

LaPrade RF. Knee Live Surgical Demonstration Workshop: Lateral-Sided PLC Reconstruction. *AOSSM Annual Meeting*, Baltimore, MD, July, 2012.

LaPrade RF. Knee Management and Interventions for the Maturing Athlete: Literature Review. *AOSSM Annual Meeting*, Baltimore, MD, July, 2012.

LaPrade RF. Arthroscopically Pertinent Landmarks for Tunnel Positioning in Single-Bundle and Double-Bundle Anterior Cruciate Ligament Reconstructions. *Anterior Cruciate Ligament Study Group*, Jackson Hole, WY, February, 2012.

LaPrade RF. Biologic Arthroplasty (Meniscal and Osteochondral Transplants). *Arthrex Surgical Skills Master's Knee Course*, Vail, CO, August, 2012.

LaPrade RF. Posterolateral Corner and MCL Reconstruction/Repair. *Arthrex Surgical Skills Master's Knee Course*, Vail, CO, August, 2012.

- LaPrade RF.** Biologic Arthroplasty (Meniscal and Osteochondral Transplants). *Arthrex Surgical Skills Master's Knee Course*, Vail, CO, December, 2012.
- LaPrade RF.** ACL Anatomy and Anatomic Tunnel Placement. *Arthroscopic Surgery 2012 (Metcalf) Knee Workshop*, Scottsdale, AZ, January, 2012.
- LaPrade RF.** Injury to the Lateral Side of the Knee and Surgical Management. *Arthroscopic Surgery 2012 (Metcalf) Knee Workshop*, Scottsdale, AZ, January, 2012.
- LaPrade RF.** Managing the Failed Multi-Ligament Repaired Knee. *Arthroscopic Surgery 2012 (Metcalf) Knee Workshop*, Scottsdale, AZ, January, 2012.
- LaPrade RF.** Medial Knee Reconstruction. Surgical Demonstration. *Arthroscopic Surgery 2012 (Metcalf) Knee Workshop*, Scottsdale, AZ, January, 2012.
- LaPrade RF.** Meniscus Anatomy and Repair. *Arthroscopic Surgery 2012 (Metcalf) Knee Workshop*, Scottsdale, AZ, January, 2012.
- LaPrade RF.** Anatomic Posterolateral Reconstruction: State of the Art. *31st AANA Annual Meeting*, San Francisco, CA, February, 2012.
- LaPrade RF.** Physical Examination of the Knee: Video Examples. *Concepts in Sports Medicine 2012*, Edina, MN, April, 2012.
- LaPrade RF.** Rehab Complex Knee Construction and Ligament Repair. *Concepts in Sports Medicine 2012*, Edina, MN, April, 2012.
- LaPrade RF.** ACL Revisions. *Joint Injuries and Arthroscopic Surgery: Soft Tissue Injuries 2012*, Hafjell, Norway, January, 2012.
- LaPrade RF.** Anatomy and Biomechanics of the Knee. *Joint Injuries and Arthroscopic Surgery: Soft Tissue Injuries 2012*, Hafjell, Norway, January, 2012.
- LaPrade RF.** Meniscal Injuries. *Joint Injuries and Arthroscopic Surgery: Soft Tissue Injuries 2012*, Hafjell, Norway, January, 2012.
- LaPrade RF.** Posteromedial Knee Injuries. *Joint Injuries and Arthroscopic Surgery: Soft Tissue Injuries 2012*, Hafjell, Norway, January, 2012.
- LaPrade RF.** Multi-Ligamentous Knee Injuries. *Maine Society of Orthopedic Surgeons 2012 Annual Fall Scientific Meeting*, Portland, ME, September, 2012.
- LaPrade RF.** FCL/PLC Reconstruction. *Mayo Clinic Knee Dislocation and Multiligament Knee Reconstruction Course*, Rochester, MN, September, 2012.
- LaPrade RF.** Anatomy and Clinically Relevant Biomechanics of the Medial Knee. *Rex L. Diveley Lectureship 2012*, Kansas City, MO, April, 2012.
- LaPrade RF.** Examination of the Athlete's Knee. *Rex L. Diveley Lectureship 2012*, Kansas City, MO, April, 2012.
- LaPrade RF.** Meniscal Transplants. *Rex L. Diveley Lectureship 2012*, Kansas City, MO, April, 2012.
- LaPrade RF.** Osteotomies Around the Knee. *Rex L. Diveley Lectureship 2012*, Kansas City, MO, April, 2012.
- LaPrade RF.** Posterolateral Knee Injuries: Why and How I Treat Them. *Rex L. Diveley Lectureship 2012*, Kansas City, MO, April, 2012.
- LaPrade RF.** Surgical Treatment of Acute and Chronic Medial Knee Injuries. *Rex L. Diveley Lectureship 2012*, Kansas City, MO, April, 2012.
- LaPrade RF.** The Posterolateral Corner: How Not to Miss; What Else Goes With It; and How to Do? *Society of Military Orthopaedic Surgeons 54th Annual Meeting*, Naples, FL, December, 2012.
- LaPrade RF.** Examination of the Athletic Knee. Lecture. *SPRI Orthopaedics & Spine Lecture Series*, Vail, CO, September, 2012.
- LaPrade RF.** Posterolateral Knee Injuries: Why and How I Treat Them. *Steadman Clinic Grand Rounds*, Vail, CO, August, 2012.
- LaPrade RF.** Examination of the Athlete's Knee. *Steadman Clinic Grand Rounds*, Vail, CO, July, 2012.
- LaPrade RF.** Discussion of Clinical Situations – International Experience. Moderator. *VII Curso Avançado de Cirurgia do Joelho*, São Paulo, Brazil, August, 2012.
- LaPrade RF.** Acute and Chronic Medial Knee Injuries. *VII Curso Avançado de Cirurgia do Joelho*, São Paulo, Brazil, August, 2012.
- LaPrade RF.** Medial Knee Anatomy and Biomechanics. *VII Curso Avançado de Cirurgia do Joelho*, São Paulo, Brazil, August, 2012.
- LaPrade RF.** Acute Posterolateral Corner Knee Injuries. *VII Curso Avançado de Cirurgia do Joelho*, São Paulo, Brazil, August, 2012.
- LaPrade RF.** Chronic Posterolateral Corner Knee Injuries. *VII Curso Avançado de Cirurgia do Joelho*, São Paulo, Brazil, August, 2012.
- LaPrade RF.** Posterolateral Corner Knee Anatomy and Biomechanics. *VII Curso Avançado de Cirurgia do Joelho*, São Paulo, Brazil, August, 2012.
- Lucas E, Surowiec R, Giphart JE, Fitzcharles E, Petre B, Ho C.** Normative Articular Cartilage T2 Values in Clinically Relevant Subregions of the Knee. *10th World Congress of the International Cartilage Repair Society*, Montreal, Canada, May, 2012.

Matheny LM, Briggs KK, Clanton TO.

Use of the Lysholm Score to Document Function in Patients With Foot and Ankle Injuries. *15th ESSKA Congress*, Geneva, Switzerland, May, 2012.

Matheny LM, Briggs KK, Clanton TO.

Sport Activity Level in Patients With Foot and Ankle Injuries. Speciality Day Program. *AOFAS Annual Meeting*, San Francisco, CA, February, 2012.

van der Meijden OA, Wijdicks C, Jansson K, Gaskill T, Millett PJ.

The Influence of Bio-Implant Augmentation of MRCT: A Biomechanical Analysis. Poster. *ORS Annual Meeting*, San Francisco, CA, February, 2012.

Millett PJ, Horan MP, Pennock A,

Rios D. Comprehensive Arthroscopic Management (CAM) Survivorship: Alternative to Arthroplasty in Active Patients with Advanced Shoulder Osteoarthritis. Poster. *International Cartilage Repair Society*, Montreal, Canada, May, 2012.

Millett PJ. Normal Variants of Shoulder Arthroscopy. *13th Annual AAOS/AOSSM Sports Medicine Course: Elite Athletes to Weekend Warriors*, Vail, CO, March, 2012.

Millett PJ. Point-Counterpoint: The Engaging Hill-Sach's Lesion – Bone Grafting? *13th Annual AAOS/AOSSM Sports Medicine Course: Elite Athletes to Weekend Warriors*, Vail, CO, March, 2012.

Millett PJ. Partial Cuff Tears and PASTA Lesion. *13th Annual AAOS/AOSSM Sports Medicine Course: Elite Athletes to Weekend Warriors*, Vail, CO, March, 2012.

Millett PJ. Technique for Arthroscopic Biceps Tenodesis. *13th Annual AAOS/AOSSM Sports Medicine Course: Elite Athletes to Weekend Warriors*, Vail, CO, March, 2012.

Millett PJ. Distal Biceps Tendon Rupture: Single-Incision Technique for Repair and Results. *13th Annual AAOS/AOSSM Sports Medicine Course: Elite Athletes to Weekend Warriors*, Vail, CO, March, 2012.

Millett PJ. Chondral Lesions & Osteoarthritis in the Glenohumeral Joint. *17th Shoulder Course*, Munich, Germany, October, 2012.

Millett PJ. Multidirectional Shoulder Instability. *17th Shoulder Course*, Munich, Germany, October, 2012.

Millett PJ. AC Joint: Technique for CC Ligament Reconstruction. *13th Annual AAOS/AOSSM Sports Medicine Course: Elite Athletes to Weekend Warriors*, Vail, CO, March, 2012.

Millett PJ. AC & SC Injuries, Glenoid, and Scapula Fractures. *AAOS Annual Meeting*, San Francisco, CA, February, 2012.

Millett PJ. Biceps and Subscapularis 7SK ICL. *AAOS Annual Meeting*, San Francisco, CA, February, 2012.

Millett PJ. Microfracture: The Vail Experience – The Science, Techniques, and Results. *AOSSM Annual Meeting*, Baltimore, MD, July, 2012.

Millett PJ. Posterior Instability. *AOSSM Annual Meeting*, Baltimore, MD, July, 2012.

Millett PJ. Revision Rotator Cuff Repair. *AOSSM Annual Meeting*, Baltimore, MD, July, 2012.

Millett PJ. Clavicle Fractures. Live Demonstration at Lab. *Arthrex Corporate Meeting*, Vail, CO, August, 2012.

Millett PJ. Surgical Demonstration on Advances in SpeedBridge Techniques With Collagen FiberTape, Pearls and Tips. *Arthrex Corporate Meeting*, Phoenix, AZ, September, 2012.

Millett PJ. Managing Glenoid Bone Loss: Suture Plate/Strut Graft and Stimblast for Proximal Humeral. *Arthrex North American Sports Medicine Symposium*, January, 2012.

Millett PJ. Managing Glenoid Bone Loss: The Latarjet: How and When to Do It. *Arthrex North American Sports Medicine Symposium*, January, 2012.

Millett PJ. Advancements in Rotator Cuff Repair. *Arthrex Sports Medicine Course Schedule – Master's Shoulder Course*, Vail, CO, June, 2012.

Millett PJ. AC Joint Dislocations. *Arthrex Surgical Skills Shoulder Symposium*, Vail, CO, February, 2012.

Millett PJ. Advancements in Rotator Cuff Repair. *Arthrex Surgical Skills Shoulder Symposium*, Vail, CO, February, 2012.

Millett PJ. Posterior Instability. *Arthrex Surgical Skills Shoulder Symposium*, Vail, CO, February, 2012.

Millett PJ. Proximal Humerus Fracture. *Arthrex Surgical Skills Shoulder Symposium*, Vail, CO, February, 2012.

Millett PJ. Total Shoulder Arthroplasty. *Arthrex Surgical Skills Shoulder Symposium*, Vail, CO, February, 2012.

Millett PJ. Arthroscopic Rotator Cuff Repair: Single Row, Double Row, and Knotless Repairs. *Arthrex Surgical Skills Shoulder Symposium*, Naples, FL, March, 2012.

Millett PJ. Live Demonstrations Speedbridge With Augmentation. *Arthrex Surgical Skills Shoulder Symposium*, Naples, FL, March, 2012.

Millett PJ. Rotator Cuff Augmentation. *Arthrex Surgical Skills Shoulder Symposium*, Naples, FL, March, 2012.

Millett PJ. Wet Lab. *Arthrex Surgical Skills Shoulder Symposium*, Naples, FL, March, 2012.

Millett PJ. Rotator Cuff Repair. Live Demonstration. *ArthroLondon*, London, England, September, 2012.

Millett PJ. Technique and Clinical Results of Transosseous-Equivalent Rotator Cuff Repair. 2012 Course. *ArthroLondon*, London, England, September, 2012.

Millett PJ. Iliac Crest Grafting for Large Glenoid Bone Loss. *AANA Fall Course*, Phoenix, AZ, November, 2012.

Millett PJ. Wet Lab Faculty. *AANA Fall Course*, Phoenix, AZ, November, 2012.

Millett PJ. Clinical Case Panel – Rotator Cuff Repair: Strategies and Techniques. Case Presentation, Q & A. *31st AANA Annual Meeting*, Orlando, FL, May, 2012.

Millett PJ. Failed SLAP Repairs. *31st AANA Annual Meeting*, Orlando, FL, May, 2012.

Millett PJ. Subcoracoid Impingement and Coracoidplasty. *31st AANA Annual Meeting*, Orlando, FL, May, 2012.

Millett PJ. Rotator Cuff Repair. Live Demonstration. *Living at Our Peak Event: Recover Faster – Recover Better*, Vail, CO, September, 2012.

Millett PJ. AC Joint Dislocations. *Military Surgeons - Master Shoulder Course*, Vail, CO, June, 2012.

Millett PJ. Advancements in Rotator Cuff Repair. *Military Surgeons - Master Shoulder Course*, Vail, CO, June, 2012.

Millett PJ. Total Shoulder Arthroplasty in 2012. *Military Surgeons - Master Shoulder Course*, Vail, CO, June, 2012.

Millett PJ. Physical Examination of the Shoulder. *SPRI Academic Lecture*, Vail, CO, November, 2012.

Millett PJ. Management of Complex Instability of the Shoulder. Invited Guest Speaker. *65th Virginia Orthopaedic Society Annual Meeting*, Williamsburg, VA, May, 2012.

Millett PJ. Rotator Cuff Repair. Invited Guest Speaker. *65th Virginia Orthopaedic Society Annual Meeting*, Williamsburg, VA, May, 2012.

Millett PJ. Biceps Tenodesis: Simple Solution to a Complex Problem. *VuMedi In-Person Event*, San Francisco, CA, November, 2012.

Millett PJ. Clavicle Fracture Cases. *VuMedi In-Person Event*, San Francisco, CA, November, 2012.

Millett PJ. Complications of Anatomic AC Joint Reconstruction: Case Presentation. *VuMedi In-Person Event*, San Francisco, CA, November, 2012.

Millett PJ. Interesting Arthroscopy Case. *VuMedi In-Person Event*, San Francisco, CA, November, 2012.

Millett PJ. My Worst Case. *VuMedi In-Person Event*, San Francisco, CA, November, 2012.

Nowak DD, Briggs KK, Philippon MJ. Predictors of Grade IV Cartilage Lesions in the Hip. Poster. *AAOS Annual Meeting*, San Francisco, CA, February, 2012.

Philippon MJ, LaPrade RF, Briggs KK, Pierce C, Stull J. Prevalence of Acetabular Labral Tears in Asymptomatic Young Athletic Subjects. A Prospective Investigation Using Magnetic Resonance Imaging (MRI). Poster. *AOSSM Annual Meeting*, Baltimore, MD, July, 2012.

Philippon MJ, Herzog MM, Briggs KK. Prevalence of Chondral Defects of the Hip in Professional Hockey Players vs. Non-Contact Professional Athletes. Poster. *AOSSM Annual Meeting*, Baltimore, MD, July, 2012.

Philippon MJ, Herzog MM, Briggs KK. Prevalence of Chondral Defects of the Hip in Professional Hockey Players vs. Non-Contact Professional Athletes. Poster. *10th World Congress of the International Cartilage Repair Society*, Montreal, Canada, May, 2012.

Philippon MJ, Register BC, Pennock AT, Ho CP, Lawland A, Strickland C, Briggs KK. Abnormal MRI Findings in Asymptomatic Individuals and Hip Screening in Young Athletes. *Herodicus Society Annual Meeting*, White Sulphur Springs, WV, June, 2012.

Philippon MJ, Fields M, Fagrelus T, Briggs K. Comparison of Radiographic Joint Space Findings in Standing and Supine X-Rays in Patients With Femoroacetabular Impingement. ePoster. *ISHA Annual Meeting*, Boston, MA, September, 2012.

Philippon MJ, Briggs KK. Diagnostic Value of the Faber Test in Patients With Cam Impingement. ePoster. *ISHA Annual Meeting*, Boston, MA, September, 2012.

Philippon MJ, Willimon SC, Herzog MM, Briggs KK. Hip Arthroscopy in Pediatric Dysplastic Hip. *ISHA Annual Meeting*, Boston, MA, September, 2012.

Philippon MJ, Patterson D, Briggs KK. Incidence of Chondral Lesions of the Hip in Pediatric Patients. ePoster. *ISHA Annual Meeting*, Boston, MA, September, 2012.

Philippon MJ, Fagrelus T, Briggs KK. Outcomes in Professional Golfers Following Hip Arthroscopy. ePoster. *ISHA Annual Meeting*, Boston, MA, September, 2012.

Philippon MJ, Patterson D, Bogueira B, Briggs KK. Outcomes of Hip Arthroscopy in Elite Soccer Players. ePoster. *ISHA Annual Meeting*, Boston, MA, September, 2012.

Philippon MJ, Peixoto L, Briggs KK. Prevalence of Tears of the Ligamentum Teres. ePoster. *ISHA Annual Meeting*, Boston, MA, September, 2012.

Philippon MJ, Fagrelus T, Briggs K, Ho C. Specificity and Sensitivity of MRI in Diagnosing Grade 4 Chondral Lesions in the Hip. ePoster. *ISHA Annual Meeting*, Boston, MA, September, 2012.

Philippon MJ. Cartilage Repair in the Hip Joint. Moderator. *10th World Congress of the International Cartilage Repair Society*, Montreal, Canada, May, 2012.

Philippon MJ. Change in Thinking in Treating Cartilage Defects in the Hip. *10th World Congress of the International Cartilage Repair Society*, Montreal, Canada, May, 2012.

Philippon MJ. Microfracture/Bone Marrow Stimulation Introduction. Moderator. *10th World Congress of the International Cartilage Repair Society*, Montreal, Canada, May, 2012.

Philippon MJ. Overview & Introduction. *10th World Congress of the International Cartilage Repair Society*, Montreal, Canada, May, 2012.

Philippon MJ. Athlete's Hip and Groin: Evaluation and Diagnosis. *13th Annual AAOS/AOSSM Sports Medicine Course: Elite Athletes to Weekend Warriors*, Vail, CO, March, 2012.

Philippon MJ. Miscellaneous Lower Extremity Issues. Moderator. *13th Annual AAOS/AOSSM Sports Medicine Course: Elite Athletes to Weekend Warriors*, Vail, CO, March, 2012.

Philippon MJ. Panel Discussion and Case Presentations. *13th Annual AAOS/AOSSM Sports Medicine Course: Elite Athletes to Weekend Warriors*, Vail, CO, March, 2012.

Philippon MJ. Role of Hip Arthroscopy in Elite Athletes: Tips & Techniques. *13th Annual AAOS/AOSSM Sports Medicine Course: Elite Athletes to Weekend Warriors*, Vail, CO, March, 2012.

Philippon MJ. FAI in a Professional Football Player: A Case Report. Smith & Nephew Booth Presentation. *15th ESSKA Congress*, Geneva, Switzerland, May, 2012.

Philippon MJ. Labral Management: Debridement, Repair, or Reconstruction. *15th ESSKA Congress*, Geneva, Switzerland, May, 2012.

Philippon MJ. Outcomes of Arthroscopic Treatment of FAI: What Evidence Do We Have For Long-Term Benefit? *1st Melbourne International Hip Arthroscopy Meeting*, Melbourne, Australia, January, 2012.

Philippon MJ. What Is Hip Instability, How Do We Assess It Clinically and Arthroscopically, and How Should We Treat It? *1st Melbourne International Hip Arthroscopy Meeting*, Melbourne, Australia, January, 2012.

Philippon MJ. When and How to Reconstruct the Labrum and Outcomes. *1st Melbourne International Hip Arthroscopy Meeting*, Melbourne, Australia, January, 2012.

Philippon MJ. All Capsules Should be Repaired. Debate. *2012 Emerging Technologies in Orthopedics*, Las Vegas, NV, December, 2012.

Philippon MJ. Is it the Labrum to Repair or the Bone That Is the Problem? *2012 Emerging Technologies in Orthopedics*, Las Vegas, NV, December, 2012.

Philippon MJ. Labral Reconstruction: When to Do It, How to Do It's Step by Step – Can You Do It Too? *2012 Emerging Technologies in Orthopedics*, Las Vegas, NV, December, 2012.

Philippon MJ. Returning to the Beginning: How Do I Start My Hip Arthroscopy Practice? Panel Discussion. *2012 Emerging Technologies in Orthopedics*, Las Vegas, NV, December, 2012.

Philippon MJ. Femoroacetabular Impingement: Overview and Indications for Treatment. *30th Annual GWN Eggers Lectureship at the University of Texas Medical Branch*, Galveston, Texas, May, 2012.

Philippon MJ. Clinical Case Panel #3 – Hip Arthroscopy: Indications and Limitations. Panel Member. *31st AANA Annual Meeting*, Orlando, FL, May, 2012.

Philippon MJ. Treatment of Labral Tears and FAI: How I Decide. Feature Lecture #4. *31st AANA Annual Meeting*, Orlando, FL, May, 2012.

Philippon MJ. The Approach to Differential Diagnosis and Treatment of Hip Pain. *4th International Olympic Committee Advanced Team Physician Course*, Oslo, Norway, June, 2012.

Philippon MJ. Arthroscopic Treatment of Pincer Impingement. *Advances in Arthroplasty*, Boston, MA, October, 2012.

Philippon MJ. Controversies in Treatment Panel Discussion. *Advances in Arthroplasty*, Boston, MA, October, 2012.

Philippon MJ. Hip Panel: The Operative Set-up: How Do I Do It? *Advances in Arthroplasty*, Boston, MA, October, 2012.

Philippon MJ. The Capsule: Cut it – WITH Repair. *Advances in Arthroplasty*, Boston, MA, October, 2012.

Philippon MJ. Arthroscopic Acetabuloplasty and Labral Surgery. Instructional Course Lecture. *AAOS Annual Meeting*, San Francisco, CA, February, 2012.

Philippon MJ. Ask the Expert Session in the Hands-On Lab. Smith & Nephew Booth Talk. *AAOS Annual Meeting*, San Francisco, CA, February, 2012.

Philippon MJ. Expectations of Return to High Level Activities After FAI Surgery. AANA Specialty Day. *AAOS Annual Meeting*, San Francisco, CA, February, 2012.

Philippon MJ. FAI Surgery in Elite Athletes. Smith & Nephew Booth Talk. *AAOS Annual Meeting*, San Francisco, CA, February, 2012.

Philippon MJ. Femoroacetabular Impingement. *AAOS Annual Meeting*, San Francisco, CA, February, 2012.

Philippon MJ. On the Horizon. Symposium on Hip Arthroscopy: Where We Are and What's Ahead. *AAOS Annual Meeting*, San Francisco, CA, February, 2012.

Philippon MJ. Supine Hip Arthroscopy: Portals and Fundamentals. Instructional Course Lecture. *AAOS Annual Meeting*, San Francisco, CA, February, 2012.

Philippon MJ. FAI Impingement - CAM. Spotlight Video. *AOSSM Annual Meeting*, Baltimore, MD, July, 2012.

Philippon MJ. Hip Arthroscopy in the Aging Athlete. *AOSSM Research Workshop: The Maturing Athlete*, Baltimore, MD, July, 2012.

Philippon MJ. Hip Adhesions. *AANA Masters Course*, Chicago, IL, July, 2012.

Philippon MJ. Hip Instability. How Do We Assess It and How Should We Treat It? *AANA Masters Course*, Chicago, IL, July, 2012.

- Philippon MJ.** Outcomes of Arthroscopic Treatment of FAI: What Evidence Do We Have for Long-Term Benefit? *AANA Masters Course*, Chicago, IL, July, 2012.
- Philippon MJ.** Limits of Resection: Limits, Depth and Extent of Excision – Adaptation of Criteria According to the Case and Physical Activity. *Barcelona Hip Meeting*, Barcelona, Spain, June, 2012.
- Philippon MJ.** Treatment of Unstable Chondral Injury: When the Labrum Should Be Removed, Chondral Resection Limits, Role of Microfracture. *Barcelona Hip Meeting*, Barcelona, Spain, June, 2012.
- Philippon MJ.** Does Treatment of FAI Differ in Athletes? *Bernese Hip Symposium*, Bern, Switzerland, March, 2012.
- Philippon MJ.** Is Looping the Labrum the Best Method for Reattachment? *Bernese Hip Symposium*, Bern, Switzerland, March, 2012.
- Philippon MJ.** Live Surgical Demonstration. *Hip Arthroscopy Meeting With Dr. Philippon*, Borgotaro, Italy, June, 2012.
- Philippon MJ.** What's New in Hip Arthroscopy. *Hip Arthroscopy Meeting with Dr. Philippon*, Borgotaro, Italy, June, 2012.
- Philippon MJ.** How Early to Operate Case Studies. *ISHA Annual Meeting*, Boston, MA, September, 2012.
- Philippon MJ.** Post Operative Weight-Bearing. *ISHA Annual Meeting*, Boston, MA, September, 2012.
- Philippon MJ.** Hip Arthroscopy: From Diagnosis to Patient Outcome. *Naval Medical Center*, Norfolk, VA, June, 2012.
- Philippon MJ.** Contraindications to Hip Arthroscopy: What I Have Learned. *Orthopedic Surgery Controversies*, Napa, CA, September, 2012.
- Philippon MJ.** Hip Arthroscopy Panel. *Orthopedic Surgery Controversies*, Napa, CA, September, 2012.
- Philippon MJ.** Labral Reconstruction, Indications and Techniques. *Orthopedic Surgery Controversies*, Napa, CA, September, 2012.
- Philippon MJ.** Snapping Hip. *Orthopedic Surgery Controversies*, Napa, CA, September, 2012.
- Philippon MJ.** Current State of the Art in Arthroscopic Treatment of FAI. *Pediatric Orthopaedic Society of North America*, Denver, CO, May, 2012.
- Philippon MJ.** Hip Arthroscopy in Athletes. *3rd Finnish Hip Course. UKK Institute*, Tampere, Finland, September, 2012.
- Philippon MJ.** Labral Reconstruction. *3rd Finnish Hip Course. UKK Institute*, Tampere, Finland, September, 2012.
- Philippon MJ.** Live Surgical Demonstration: FAI + Labrum. *3rd Finnish Hip Course. UKK Institute*, Tampere, Finland, September, 2012.
- Philippon MJ.** Outcomes Following Hip Arthroscopy. *3rd Finnish Hip Course. UKK Institute*, Tampere, Finland, September, 2012.
- Philippon MJ.** Hip Arthroscopy in the Elite Athlete. *University of Miami Miller School of Medicine, Orthopaedic Surgery Alumni Day*, Miami, FL, October, 2012.
- Philippon MJ.** Hip Arthroscopy: From Diagnosis to Patient Outcome. *University of Toronto Grand Rounds*, Toronto, Canada, April, 2012.
- Philippon MJ.** Labral Grafting: Indications, Techniques and Results. *University of Warwick's Sports Hip Surgery Meeting*, Warwick, England, June, 2012.
- Philippon MJ.** Overcoverage: Rim Trimming and Labral Reattachment. *University of Warwick's Sports Hip Surgery Meeting*, Warwick, England, June, 2012.
- Philippon MJ.** Return to Sport: Advising Athletes and Teams. *University of Warwick's Sports Hip Surgery Meeting*, Warwick, England, June, 2012.
- Philippon MJ.** Keys to Success in Treating Impingement and Labral Repairs. *Vail Hip Arthroscopy Symposium*, Vail, CO, March, 2012.
- Philippon MJ.** Labral Reconstruction. *Vail Hip Arthroscopy Symposium*, Vail, CO, March, 2012.
- Philippon MJ.** Ligamentum Teres Reconstruction. *Vail Hip Arthroscopy Symposium*, Vail, CO, March, 2012.
- Philippon MJ.** Live Surgical Demonstration at Vail Valley Surgery Center. *Vail Hip Arthroscopy Symposium*, Vail, CO, March, 2012.
- Philippon MJ.** Outcome in Pediatric Patient. *Vail Hip Arthroscopy Symposium*, Vail, CO, March, 2012.
- Philippon MJ.** Outcomes Following Arthroscopy in Patients With Acetabular Dysplasia. *Vail Hip Arthroscopy Symposium*, Vail, CO, March, 2012.
- Philippon MJ.** FAI: Overview and Indications for Treatment. Vail, CO, January, 2012.
- Register BC, Pennock AT, Philippon MJ, Ho CP, Lawland A, Strickland C, Briggs KK.** Prevalence of Abnormal Hip Findings in Asymptomatic Subjects: A Prospective, Blinded Study. *15th ESSKA Congress*, Geneva, Switzerland, May, 2012.
- Register BC, Pennock AT, Philippon MJ, Ho CP, Lawland A, Strickland C, Briggs KK.** Prevalence of Hip Pathology in Asymptomatic Subjects. A Prospective Investigation Using Magnetic Resonance Imaging (MRI). *AAOS Annual Meeting*, San Francisco, CA, February, 2012.

Rios D, Martetschläger F, Horan MP, Millett PJ. Complications Following Subpectoral Biceps Tenodesis With Interference Screw Fixation. ePoster. *2012 American Shoulder and Elbow Surgeons Closed Meeting*, Sea Island, GA, October, 2012.

Rios D, Jansson K, Martetschläger F, Wijdicks C, Millett PJ. Restoration of Normal Curvature When Performing an Inlay Osteochondral Allograft to the Glenoid Surface: An Anatomic Computed Tomographic Comparison. ePoster. *2012 American Shoulder and Elbow Surgeons Closed Meeting*, Sea Island, GA, October, 2012.

Rodkey WG. Published Study Results of Meniscus Reconstruction With Scaffolds. *Gesellschaft für Arthroskopie und Gelenkchirurgie*, Zurich, Switzerland, September, 2012.

Rodkey WG. Biology and Biomechanics of ACL Reconstruction Healing. *Knee Surgery for Sports Injuries*, Dublin, Ireland, September, 2012.

Rodkey WG. Meniscus Repair Healing: Biology, Imaging, Clinical Results. *Knee Surgery for Sports Injuries*, Dublin, Ireland, September, 2012.

Rodkey WG. The Role of PRP in Treating Sports Medicine Injuries: An Update. *Knee Surgery for Sports Injuries*, Dublin, Ireland, September, 2012.

Rodkey WG. Twenty-five Years of Microfracture: What Have We Learned? *Knee Surgery for Sports Injuries*, Dublin, Ireland, September, 2012.

Rodkey WG. Collagen Meniscus Implantation – Science, Technique, and Results. *Société Internationale de Chirurgie Orthopédique et de Traumatologie Orthopaedic World Conference*, Dubai, United Arab Emirates, November, 2012.

Rodkey WG. Microfracture: The Vail Experience – The Science, Techniques, and Results. *Société Internationale de Chirurgie Orthopédique et de Traumatologie Orthopaedic World Conference*, Dubai, United Arab Emirates, November, 2012.

Rodkey WG. Promise and Challenges for Employing Stem Cell Therapies in a Very Active Clinical Practice. *The Stem Cell Summit*, Houston, TX, October, 2012.

Rodkey WG. Outcomes in Cartilage Surgery: What's Proven? *Update in Knee Osteoarthritis in Active Patients (Clinica Las Condes)*, Santiago, Chile, October, 2012.

Rodkey WG. What's New in Cartilage Repair?: But NOT Proven! *Update in Knee Osteoarthritis in Active Patients (Clinica Las Condes)*, Santiago, Chile, October, 2012.

Shelburne KB, Ali A, Clary CW, Giphart JE, Torry MR, Rullkoetter P. Tibiofemoral Contact in Landing Using Biplane Fluoroscopy-Driven Finite Element Modeling. *ORS Annual Meeting*, San Francisco, CA, February, 2012.

Steadman JR, Ellis HB, Briggs K, Matheny LM. Outcomes and Survivorship at 10 Years Following Arthroscopic Treatment Package for Osteoarthritis of the Knee. Poster. *15th ESSKA Congress*, Geneva, Switzerland, May, 2012.

Steadman JR, Ellis HB, Briggs KK, Matheny LM. 10-Year Arthroplasty Conversion Rates After Arthroscopic Treatment for Osteoarthritis of the Knee. Poster. *AAOS Annual Meeting*, San Francisco, CA, February, 2012.

Steadman JR, Ellis HB, Briggs KK, Matheny LM. 10-Year Survivorship Following Knee Arthroscopy in Patients with Moderate to Severe Osteoarthritis of the Knee. Award. *31st AANA Annual Meeting*, Orlando, FL, May, 2012.

Steadman JR, Ellis HB, Briggs KK, Matheny LM. 10-Year Survivorship Following Knee Arthroscopy in Patients With Moderate to Severe Osteoarthritis of the Knee. *Herodicus Society Annual Meeting*, White Sulphur Springs, WV, July, 2012.

Steadman JR. Arthroscopic Treatment of the Degenerative Knee. *13th Annual AAOS/AOSSM Sports Medicine Course: Elite Athletes to Weekend Warriors*, Vail, CO, March, 2012.

Steadman JR. Differing Experiences in the Role of Team Physician for a National Team and a Professional Team. *13th Annual AAOS/AOSSM Sports Medicine Course: Elite Athletes to Weekend Warriors*, Vail, CO, March, 2012.

Steadman JR. Microfracture. *13th Annual AAOS/AOSSM Sports Medicine Course: Elite Athletes to Weekend Warriors*, Vail, CO, March, 2012.

Steadman JR. The Mature Athlete. Clinical Wisdom/Master's Experience and Recommendations. *AOSSM Annual Meeting*, Baltimore, MD, July, 2012.

Steadman JR. Arthroscopic Treatment of a Degenerative Knee: To Do. Debate. *15th ESSKA Congress*, Geneva, Switzerland, May, 2012.

Steadman JR. Sports Medicine ACL Surgery: How Are We Doing? *15th ESSKA Congress*, Geneva, Switzerland, May, 2012.

Steadman JR. The Evolution and Treatment of Knee Disorders in the Active Population. *Mt. Sinai Medical Center Grand Rounds*, New York, NY, June, 2012.

Steadman JR. History of Microfracture. *Vail Hip Arthroscopy Symposium*, Vail, CO, March, 2012.

Stull J, Philippon MJ, Giphart JE, Wahoff M, LaPrade RF. Recruitment and Activity of the Pectineus and Piriformis Muscles During Hip Rehabilitation Exercises: An EMG Study. *ORS Annual Meeting*, San Francisco, CA, February, 2012.

van der Meijden O, Wijdicks C, Jansson K, Gaskill TR, Millett PJ. Biomechanical Analysis of Massive Rotator Cuff Repairs: Extended Linked Repairs and Augmented Repairs. *15th ESSKA Congress*, Geneva, Switzerland, May, 2012.

van der Meijden OA, Wijdicks C, Jansson T, Gaskill T, Millet PJ. Biomechanical Analysis of Massive Rotator Cuff Repairs: Extended Linked Repairs and Augmented Repairs. Poster. *AAOS Annual Meeting*, Baltimore, MD, July, 2012.

van der Meijden OA, Wijdicks C, Jansson T, Gaskill T, Millet PJ. Biomechanical Analysis of Massive Rotator Cuff Repairs: Extended Linked Repairs and Augmented Repairs. ePoster. *31st AANA Annual Meeting*, Orlando, FL, May, 2012.

van der Meijden OA, Wijdicks C, Jansson T, Gaskill T, Millet PJ. Biomechanical Analysis of Massive Rotator Cuff Repairs: Extended Linked Repairs and Augmented Repairs. *European Federation of National Association of Orthopaedics and Traumatology Congress*, Berlin, May, 2012.

Victoria VHB, Millett PJ. Nonunion of Acromial Fracture: An Occult Cause of Shoulder Pain in a Collegiate Football Player. Poster. *2012 National Athletic Trainers' Association Annual Meeting & Clinical Symposia*, St. Louis, MO, June, 2012.

Waldrop N, Wijdicks CA, Jansson T, LaPrade RF, Clanton T. Anatomic Suture Anchor Versus the Broström Technique for Anterior Talofibular Ligament Repair: A Biomechanical Comparison. *AOFAS Annual Meeting*, San Diego, CA, June, 2012.

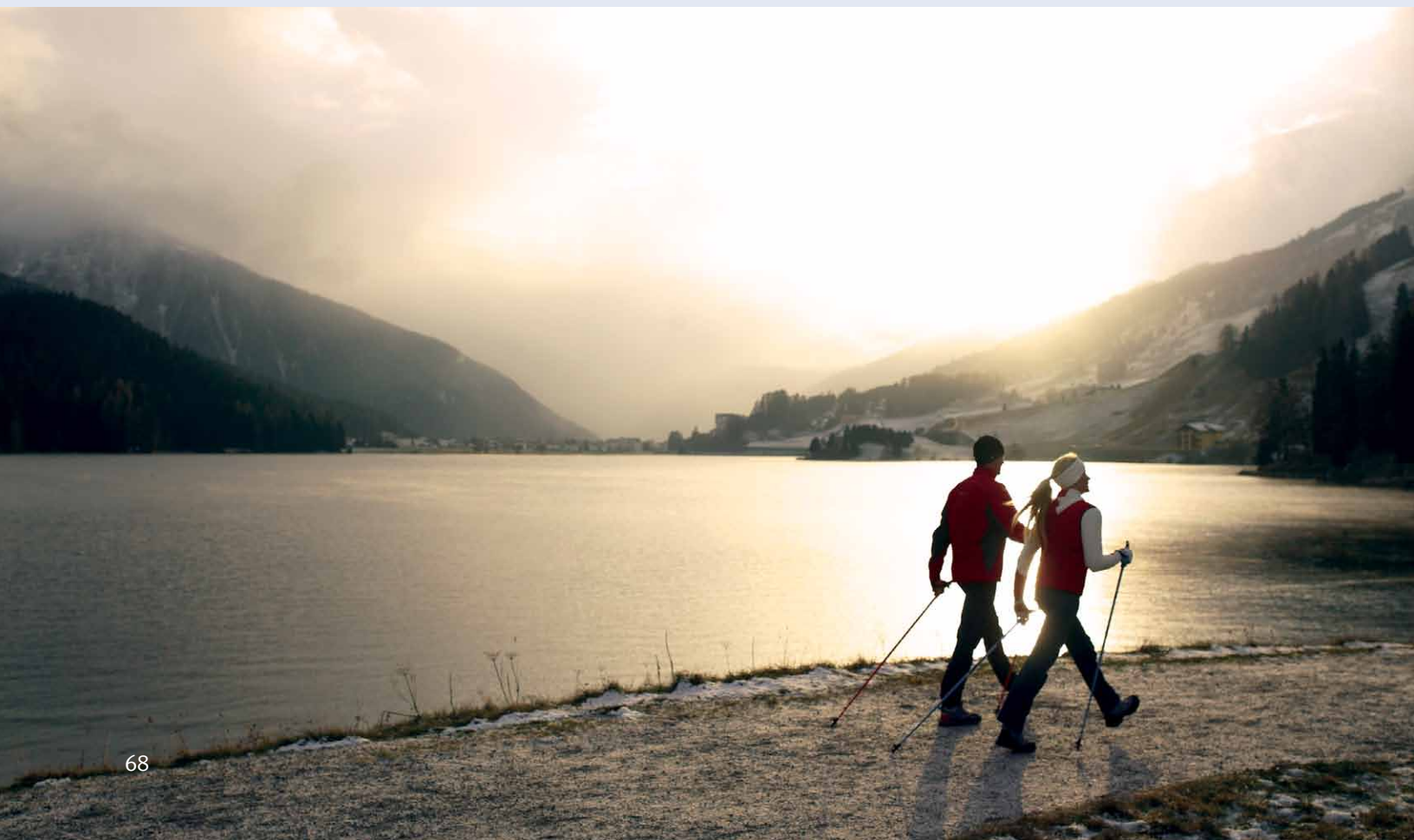
Waldrop N, Zirker C, Wijdicks CA, LaPrade R, Clanton T. Radiographic Evaluation of Plantar Plate Injury: An In Vitro Biomechanical Study. *AOFAS Annual Meeting*, San Diego, CA, June, 2012.

Westcott D, Anderson C, Ziegler C, Wijdicks CA, Engebretsen L, LaPrade R. Arthroscopically Pertinent Anatomy of the Anterolateral and Posteromedial Bundles of the Posterior Cruciate Ligament. *ORS Annual Meeting*, San Francisco, CA, February, 2012.

Wijdicks FJ, van der Meijden OA, Millett PJ, Verleisdonk EJ, Houwert RM. Complications Plate Fixation Midshaft Clavicle Fractures: A Systematic Review. Poster. *13th European Congress of Trauma & Emergency Surgery*, Basel, Switzerland, May, 2012.

Wijdicks FJ, van der Meijden OA, Millett PJ, Verleisdonk EJ, Houwert RM. Systematic Review of Complications After Intra-Medullary Fixation of Mid-Shaft Clavicle Fractures. Poster. *13th European Congress of Trauma & Emergency Surgery*, Basel, Switzerland, May, 2012.

Willimon SC, Herzog MM, Ames JB, Briggs KK, Philippon MJ. Hip Arthroscopy in the Adult Dysplastic Hip. Poster. *31st AANA Annual Meeting*, Orlando, FL, May, 2012.



AWARDS AND RECOGNITION



J. Richard Steadman, M.D.

RICHARD O'CONNOR AWARD

Dr. J. Richard Steadman, founder and chairman of the Board for the Steadman Philippon Research Institute, was recently honored with the Richard O'Connor Research Award. Dr. Steadman, internationally known for his work as an orthopaedic knee surgeon, received the award for the research paper titled "Ten-Year Survivorship Following Knee Arthroscopy in Patients with Moderate to Severe Osteoarthritis of the Knee" (see Research Update, page 28). Dr. Steadman developed this arthroscopic treatment package for patients who have osteoarthritis but are not ready to change their activity level or proceed to total knee replacement.

This paper showed that a large number of patients could delay total knee replacement for 10 years. His co-authors on the award-winning paper are Karen Briggs, M.P.H., Lauren Matheny, and Henry Ellis, M.D. Dr. Steadman's presentation and many others were highlighted at the Arthroscopy Association of North America's 31st Annual Meeting in Orlando, Florida, May 17–18.



Robert F. LaPrade, M.D., Ph.D.

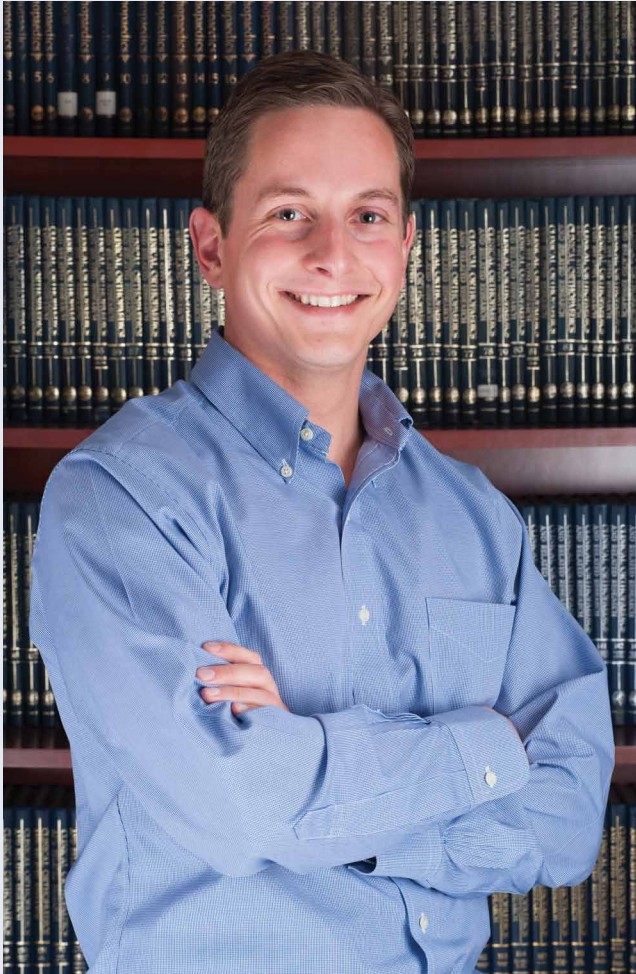
ROBERT F. LAPRADE, M.D., PH.D., AWARDED "ORTHOPAEDIC NOBEL PRIZE"

The American Academy of Orthopaedic Surgeons and the Orthopaedic Research and Education Foundation announced today that Robert F. LaPrade, M.D., Ph.D., has been awarded the highly competitive and prestigious 2013 OREF Clinical Research Award for his submitted paper on "Improving Outcomes for Posterolateral Knee Injuries." Dr. LaPrade will be presenting his winning paper at the annual meetings of the Orthopaedic Research Society and the American Academy of Orthopaedic Surgeons in 2013.

"I am very humbled to have been chosen to receive this award," said Dr. LaPrade. "I am also very grateful to my family for their support and to my many colleagues who have been an essential part of my research over the past 15 years. 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. In addition to the posterolateral knee for which this award was based, we have similar ongoing programs for the medial knee and MCL, anterior cruciate ligament, and posterior cruciate ligament."

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).

COEN WIJDICKS, PH.D., NAMED “OUTSTANDING REVIEWER OF THE YEAR” BY EUROPEAN SOCIETY OF SPORTS TRAUMATOLOGY KNEE SURGERY AND ARTHROSCOPY (ESSKA)



Coen Wijdicks, Ph.D.

Coen Wijdicks, Ph.D., director of the Department of BioMedical Engineering and senior staff scientist with the Steadman Philippon Research Institute in Vail, was recently named “Outstanding Reviewer of the Year” for 2012 by the European Society of Sports Traumatology Knee Surgery and Arthroscopy (ESSKA).

The announcement was made in the journal *Knee Surgery, Sports Traumatology, Arthroscopy (KSSTA) - The Official Journal of ESSKA*.

Dr. Wijdicks has been an instrumental contributor towards many diverse research studies affiliated with the Institute. His research focus is on translational research for current clinical needs, with an emphasis on a bench-to-bedside focus. Some of his studies include novel methods to stimulate tissue regeneration via biologic growth factors to promote healing; radiographic quantification related to common injuries of the knee and shoulder; and the development of new ligament reconstructions with biomechanical validation to optimize surgical reconstructions of common ligament injuries.

He has published over 60 peer-reviewed scientific articles in high-level journals, presented over 100 abstracts at national and international meetings, and received over 10 awards for his and colleagues’ overall excellence in research. Most notably, in June of 2010 Dr. Wijdicks was awarded the prestigious Nicola’s Foundation Young Researcher Award, which is given for the best scientific manuscript in the field of knee surgery at the bi-annual ESSKA congress.

The Institute extends its congratulations to Dr. Wijdicks for his extraordinary efforts.



Jeff Padalecki, M.D. (Photo credit Barry Eckhaus)

SPRI RESEARCH TEAM HONORED BY ISAKOS FOR STUDY ON MENISCAL TEARS AND REPAIRS

A team of SPRI researchers was honored by the International Society of Arthroscopy, Knee Surgery and Orthopaedic Sports Medicine (ISAKOS) for a study that examined the biomechanical consequences of a torn meniscus and a procedure to repair the injury. The research was conducted and funded by the Steadman Philippon Research Institute.

The full title of the study is “Biomechanical Consequences of a Complete Radial Tear Near the Medial Meniscus Posterior Root Attachment Site: In-Situ Pullout Repair Restores Derangement of Joint Mechanics.” The findings were presented at a May meeting of the biennial ISAKOS Congress in Toronto.

The Steadman Philippon physicians, scientists, and researchers who collaborated on the study included staff from both the Department of BioMedical Engineering and the Center for Outcomes-Based Orthopaedic Research. Specifically, Dr. Jeff Padalecki, Kyle Jansson, Sean Smith, Grant Dornan, Dr. Casey Pierce, Dr. Coen Wijdicks, and Dr. Robert LaPrade.

For his contribution to the research, Dr. Padalecki, a Sports Medicine fellow at SPRI in 2011–2012, was named recipient of the Albert Trillat Young Investigator’s Award. The award provides recognition for a young researcher who has conducted outstanding clinical laboratory research contributing to the understanding, care, or prevention of injuries to the knee.

The Young Investigator’s Award is named in the memory of Professor Albert Trillat, past president and founder of the International Society of the Knee. Professor Trillat was one of the pioneers in knee surgery and sports traumatology.



Karen K. Briggs, M.B.A., M.P.H.

KAREN BRIGGS TO COUNSEL CONGRESSIONAL PATIENT-CENTERED OUTCOMES RESEARCH INSTITUTE

As part of the comprehensive federal health care reform, Karen Briggs, director of the Center for Outcomes-Based Orthopaedic Research at the Steadman Philippon Research Institute, was invited to review grants for the Patient-Centered Outcomes Research Institute (PCORI) in Washington, D.C. The nonprofit PCORI is authorized by Congress to conduct research to provide information about the best available evidence to help patients and their health care providers make more informed decisions. PCORI’s research gives patients a better understanding of the prevention, treatment, and care options available, and the science that supports those options.

The 2010 Patient Protection and Affordable Care Act authorized the creation of PCORI to respond to a widespread concern that, in many cases, patients and their health care providers, families, and caregivers do not have the information they need to make choices aligned with their desired health outcomes.



Dr. Hackett (right) with Alex Diebold following his second place finish in the FIS World Cup snowboard event in the Sochi, Russia Pre-Olympic test event.

UNITED STATES SKI AND SNOWBOARD ASSOCIATION HONORS DR. HACKETT WITH THE 2013 J. LELAND SOSMAN AWARD

Presented in recognition of service to the USSA's Physician Pool

Dr. Tom Hackett has been a valuable and dependable member of the USSA Physician Pool as both a head team physician for U.S. Snowboarding and a member of the Medical Committee for 10 years. He was named to three different Olympic Winter Games and has played an integral role in planning for the upcoming Games in Sochi, Russia.

According to USSA CEO Bill Marolt, "Dr. Hackett's dedication and contributions to the athletes in all USSA sports, both on the road and in his practice in Vail, are commendable. He showed time and time again his willingness to go the extra mile to give athletes truly world-class healthcare. USSA is indebted to have such an exceptional physician as a member of our medical staff."

Dr. Steadman was recognized in 2008 with the J. Leland Sosman Award.

COMMUNITY

WHEN BEING WRONG IS RIGHT

*Reprinted by Permission
Randy Wyrick
Vail Daily | Vail, Colorado*

Science fair challenges students' assumptions. Staff and interns from Steadman Philippon Research Institute help judge the science fair.

Sometimes being wrong takes you to the right answer, as Vail Mountain School students learned in their annual science fair. Earlier in the year, Vail Mountain School held its annual science fair. Prior to the competition, local Vail Valley students had the opportunity to consult with research scientists from the Steadman Philippon Research Institute to discuss ways to refine their experiments to yield the most meaningful data.

Science fairs across the country are meant to be a learning experience for students and provide creative ways for them to think through their experiments.

Students at Vail Mountain School, with the help of real researchers, learned that while getting to the answer is good, actually working through the scientific method is even better. SPRI is known worldwide for the research and development of new procedures and techniques in the advancement of orthopaedic medicine. Students from the seventh and eighth grade worked through the advice of SPRI researchers to plan, analyze, rethink, and then make sense of their findings.

"Science is messy," said Jaymee Squires of Walking Mountains Science Center. Squires was one of the guest judges of this year's Vail Mountain School science fair. Getting to the answer is good. Working through the scientific method is better. Students plan, analyze, and rethink their work, and then make sense of their findings.



Mary Goldsmith, M.Sc., Senior Robotics Engineer at SPRI, demonstrates the scientific method with young students who visited the SPRI labs during an earlier visit. There's a process — the scientific method — and students practice working through it.

Along the way students learn stuff, sometimes that their original idea — their hypothesis — might not be supported by actual facts, even though they seemed like a good idea at the time. They're like tattoos and most political affiliations that way.

"The process helps students gain confidence for working with real-life situations where there really is no right answer," Squires said. "There's a process — the scientific method — and students practice working through it."

They solve their own problems along the way, instead of a teacher leading them through it.

"Having survived these challenges leaves students feeling empowered and confident in their ability to really do science," Squires said.

The scientific method has not changed, but the questions have. Students tapped experts at the Steadman Philippon Research Institute, who provided advice and feedback about experiments.

"Having world-class research scientists as a sounding board really gives students a sense of validation and pride," said Gabe Scherzer, a Vail Mountain School science teacher. Staff and interns from the Steadman Philippon Research Institute helped judge the science fair, as did other experts from Walking Mountains Science Center, Eagle River Watershed Council, the U.S. Forest Service, and the Vail Recreation District.

EVENTS



Left to Right: Phil Mahre, Cindy Nelson, Christin Cooper-Taché, Steve Mahre, and Mark Taché (Photo credit: Barry Eckhaus)

HALL OF FAME SKIERS JOIN SINGER-SONGWRITER EDWIN MCCAIN TO HONOR DR. J. RICHARD STEADMAN AND THE STEADMAN PHILIPPON RESEARCH INSTITUTE, JULY 5, 2013

The Steadman Philippon Research Institute hosted the annual “Rock the Research” event July 5th in Vail, commemorating the Silver Anniversary Celebration of the Institute and recognizing the contributions of SPRI founder and U.S. Ski Team physician, Dr. J. Richard Steadman. Five world-class skiers and former members of the U.S. Ski Team were in attendance to help honor the man who surgically repaired and rehabilitated their career-threatening injuries back in the ‘70s and ‘80s. In addition, alternative-rock singer and songwriter Edwin McCain headlined the fundraising concert at the Ritz-Carlton, Bachelor Gulch. Former patient, SPRI supporter, and Heisman Trophy winner Gen. Pete Dawkins served as master of ceremonies.

Skiers Cindy Nelson, Phil Mahre, Christin Cooper-Taché, Steve Mahre, and Mark Taché were excited to be at the live event to credit the doctor they say helped guide them from surgery through rehabilitation. When the Institute was still all but a dream to Dr. Steadman, these injured athletes (and others) could be found sitting on the living room floor or stretched out on the dining room table of Dr. Steadman’s home doing resistance exercises and range-of-motion moves days following their complex surgeries. It was Dr. Steadman himself who pushed the current medical standards of that era and worked side-by-side on the floor with these skiers guiding, resisting, and pushing them beyond the edge of then current rehab techniques.

All proceeds from the evening supported the research and education programs of SPRI, most notably in the areas of joint preservation and joint restoration research, along with new initiatives in youth sports injury prevention.

SPRI is most grateful to the following sponsors and participants:

Arthrex, Inc.
ATI Jet
Howard and Judy Berkowitz
Dr. Thomas Clanton
Caryn Clayman
John Paul and Eloise DeJoria
The Doctor’s Company and Arthur J. Gallagher
Dawkins Family Foundation
The Denver Broncos
Duckhorn Vineyards
Dr. Russell Hirsch
KSL Capital Partners
Patrick Matthews
Messner Reeves, LLP
Medequip
Mount-N-Frame
Napa Valley Reserve
Olatec Industries
Össur Americas, Inc.
Paderewski Fine Art
Michael Price
S & H Independent Premium Brands
Jim Shpall and Applejack Wine & Spirits
Silent Partners Limousines
Smith & Nephew Endoscopy
The Steadman Clinic
Ann B. Smead and Michael M. Byram
Southern Wine and Spirits
Tang Family Foundation
US Ski and Snowboard Foundation
Vail Resorts
Vail Catering Concepts
Vail Valley Medical Center
Vail Valley Pharmacy & The Nisonoff Family
Veuve Clicquot
Mr. and Mrs. Patrick Welsh



Left to Right: General Pete Dawkins, Gay Steadman, Christin Cooper-Taché, Dr. Richard Steadman, Mark Taché, Phil Mahre, and Holly Mahre. (Photo credit: Barry Eckhaus)



**VAIL VALLEY MEDICAL CENTER 2013 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 again hold the 10th 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 \$1,300,000 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:

PRESENTING SPONSOR
RE/MAX, LLC

TITLE SPONSOR
Vail Valley Medical Center

SILVER SPONSORS
Compass Bank, Tom Hackett, M.D., MedSynergies-Surgical Division, Sonnenalp Resort of Vail, and US Bank

BRONZE SPONSORS
Tom Clanton, M.D., The Doctors Company, EKS&H, John Feagin, M.D., Arthur J. Gallagher & Co., Helm Surgical/Arthrex, The Hussman Foundation, Medequip, Messner Reeves, LLP, ORP a Hanger Company, Össur Americas, Inc., Marc Philippon, M.D., Richard Steadman, M.D., and Norm Waite

INDIVIDUAL SPONSORS
Bledsoe Brace Company, Mary Noyes, Dan Drawbaugh, Dale Decker, and Sam Decker

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

Tom Mars
Chief Executive Officer and President

Amy Ruther
Administration Director

Monica White, CPA
Controller

Megan Bryant
Administrative Assistant

DEVELOPMENT

John G. McMurtry, M.A., M.B.A.
Director of Development

Lynda Sampson
Senior Development Officer

CENTER FOR TRANSLATIONAL AND REGENERATIVE MEDICINE RESEARCH

William G. Rodkey, D.V.M.
Director

SURGICAL SKILLS LABORATORY

Kelly Adair
Director

CENTER FOR OUTCOMES-BASED ORTHOPAEDIC RESEARCH (COOR)

Karen K. Briggs, M.B.A., M.P.H.
Director

Ashley Darrough
Data Collection Coordinator

Grant Dornan, M.S.
Statistician

Marilee Horan, M.P.H.
Coordinator of Upper Extremity Research

Lauren Matheny
Coordinator of Lower Extremity Research

Dawn Rossi
Administrative Assistant

Rachel Abrams, M.D.
Research Assistant

Dawn Ommen, M.D.
Research Assistant

Ryan Warth, M.D.
Research Assistant

Evan James
Research Assistant

Nick Johnson, M.D.
Research Assistant

BIOMEDICAL ENGINEERING

Coen A. Wijdicks, Ph.D.
Director/Senior Staff Scientist

Mary Goldsmith, M.Sc.
Senior Robotics Engineer

Sean Smith, M.Sc.
Research Engineer

Travis Turnbull, Ph.D.
Research Engineer

Rachel Surowiec, M.Sc.
Research Scientist

Katharine Wilson, M.Sc.
Research Engineer

Matt Rasmussen
Research Assistant

Chris LaPrade
Research Assistant

Brady Williams
Research Assistant

IMAGING RESEARCH

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

Coley Gatlin, M.D.
Griffin Visiting Scholar

W. Sean Smith, M.D.
Imaging Fellow

EDUCATION

Robert F. LaPrade, M.D., Ph.D.
Deputy Director, Sports Medicine Fellowship Program
Director, International Scholar Program

Kelly Stoycheff
Education & Fellowship Coordinator

Doug Gillard
Spine Research Coordinator

Bernardo Crespo, M.D.
Visiting Research Scholar

Simon Euler, M.D.
Visiting Research Scholar

Fernando Ferro, M.D.
Visiting Research Scholar

Ulrich Spiegl, M.D.
Visiting Research Scholar

DEPARTMENT OF TECHNOLOGY AND MULTIMEDIA COMMUNICATION

Jason M. Gregg
Director

Barry Eckhaus
AudioVisual/Multimedia Manager

Angelica Wedell
AudioVisual/Multimedia Technician

EXECUTIVE EDITOR

Jim Brown, Ph.D.



Department of Technology and Multimedia Communication
Front left to right: Angelica Wedell, Jason M. Gregg, and Barry Eckhaus

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, 2012 and 2011, 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 CONSOLIDATED 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 audits 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, 2012 and 2011, 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 16, 2013
Denver, Colorado

CONSOLIDATED STATEMENTS OF FINANCIAL POSITION

ASSETS	December 31	
	2012	2011
Current assets		
Cash and cash equivalents	\$ 1,402,658	\$ 879,798
Accounts receivable	642	10,463
Accounts receivable, related parties	22,802	12,313
Contributions receivable, current portion	261,800	438,300
Prepaid expenses and other assets	977	2,514
Investments	4,606,283	4,664,307
Inventory	225,182	501,680
Total current assets	6,520,344	6,509,375
Contributions receivable, less current portion	174,342	579,151
Property and equipment, net	3,693,322	4,945,782
Investments - other	227,050	227,050
Total assets	\$ 10,615,058	\$ 12,261,358
LIABILITIES AND NET ASSETS		
Current liabilities		
Accounts payable	\$ 199,385	\$ 65,453
Accrued expenses	336,697	184,000
Line-of-credit	-	9,099
Current portion of long-term debt	248,847	246,991
Current portion of capital leases	433,127	510,698
Current portion of deferred rent	153,616	153,622
Total current liabilities	1,371,672	1,169,863
Long-term liabilities		
Long-term debt, net of current portion	689,325	949,535
Capital leases, net of current portion	100,789	477,655
Deferred tax liability	6,425	122,000
Deferred rent, net of current portion	-	153,618
Total liabilities	2,168,211	2,872,671
Commitments		
Net assets		
Unrestricted	7,079,142	7,790,023
Temporarily restricted	1,367,705	1,598,664
Total net assets	8,446,847	9,388,687
Total liabilities and net assets	\$ 10,615,058	\$ 12,261,358

See Notes to Financial Statements

CONSOLIDATED STATEMENTS OF ACTIVITIES

	For the Years Ended					
	December 31, 2012			December 31, 2011		
	Unrestricted	Temporarily Restricted	Total	Unrestricted	Temporarily Restricted	Total
REVENUES, GAINS, AND OTHER SUPPORT						
Contributions	\$ 998,080	\$ 457,593	\$ 1,455,673	\$ 1,164,196	\$ 537,374	\$ 1,701,570
Fundraising events	885,724	-	885,724	361,888	-	361,888
Grants and corporate partners	1,024,156	1,474,053	2,498,209	737,507	1,250,962	1,988,469
MRI income	962,514	-	962,514	1,323,540	-	1,323,540
Other income	3,228	-	3,228	15,115	-	15,115
In-kind contributions	201,835	-	201,835	3,047,230	-	3,047,230
	4,075,537	1,931,646	6,007,183	6,649,476	1,788,336	8,437,812
Net assets released from restrictions	2,162,605	(2,162,605)	-	1,774,630	(1,774,630)	-
Total revenues, gains, and other support	6,238,142	(230,959)	6,007,183	8,424,106	13,706	8,437,812
Expenses and losses						
BioMedical engineering	1,537,409	-	1,537,409	1,519,245	-	1,519,245
Center for translational and regenerative medicine research	236,647	-	236,647	239,314	-	239,314
Surgical skills laboratory	1,184,788	-	1,184,788	986,725	-	986,725
Center for outcomes-based orthopaedic research	833,904	-	833,904	894,944	-	894,944
Education department	361,025	-	361,025	375,304	-	375,304
Department of technology and multimedia communications	264,393	-	264,393	228,300	-	228,300
Imaging research	767,588	-	767,588	839,220	-	631,537
Management and general	789,462	-	789,462	631,537	-	659,574
Development	720,428	-	720,428	708,733	-	708,733
Total expenses and losses	6,695,644	-	6,695,644	6,423,322	-	6,423,322
Other income (expense)						
Investment return	471,317	-	471,317	(135,285)	-	(135,285)
Interest expense	(71,683)	-	(71,683)	(85,218)	-	(85,218)
Total other income (expense)	399,634	-	399,634	(220,503)	-	(220,503)
Rescinded pledge	(600,000)	-	(600,000)	-	-	-
Provision for income tax	(53,013)	-	(53,013)	(217,971)	-	(217,971)
Change in net assets	(710,881)	(230,959)	(941,840)	1,562,310	13,706	1,576,016
Net assets at beginning of year	7,790,023	1,598,664	9,388,687	6,227,713	1,584,958	7,812,671
Net assets at end of year	\$7,079,142	\$1,367,705	\$8,446,847	\$7,790,023	\$1,598,664	\$9,388,687

See Notes to Financial Statements

CONSOLIDATED STATEMENTS OF CASH FLOWS

	For the Years Ended December 31	
	2012	2011
Cash flows from operating activities		
Change in net assets	\$ (941,840)	\$ 1,576,016
Adjustments to reconcile change in net assets to net cash provided by operating activities		
Depreciation and amortization expense	1,356,261	1,232,320
Net (gain) loss on investments	(485,795)	139,404
Rescinded pledge	600,000	-
Amortization of deferred rent	(153,624)	(153,624)
Donated stock	(32,503)	-
Donated inventory	-	(728,000)
Donated property and equipment	-	(2,319,230)
Deferred taxes	(115,575)	21,000
Changes in assets and liabilities		
Accounts receivable	(668)	321,573
Contributions receivable	(18,691)	160,826
Prepaid expenses and other assets	1,537	(500)
Inventory	276,498	226,320
Accounts payable	133,932	7,109
Accrued expenses	152,697	(69,105)
	1,714,069	(1,161,907)
Net cash provided by operating activities	772,229	414,109
Cash flows from investing activities		
Purchase of investments	(885,078)	(9,924)
Proceeds from sale of investments	1,461,400	8,036
Purchases of property and equipment	(103,801)	(1,558,556)
Net cash provided by (used in) investing activities	472,521	(1,560,444)
Cash flows from financing activities		
Payments on capital leases	(454,437)	(434,151)
Net (payments) borrowings on long-term debt	(258,354)	1,178,165
Net payments on line-of-credit	(9,099)	(330,920)
Net cash (used in) provided by financing activities	(721,890)	413,094
Net increase (decrease) in cash and cash equivalents	522,860	(733,241)
Cash and cash equivalents at beginning of year	879,798	1,613,039
Cash and cash equivalents at end of year	\$ 1,402,658	\$ 879,798

Supplemental disclosure of cash flow information:

Cash paid for interest was \$71,683 and \$85,218 for the years ended December 31, 2012 and 2011, respectively.

Cash paid for income taxes was \$23,160 and \$246,889 for the years ended December 31, 2012 and 2011, respectively.

CONSOLIDATED STATEMENT OF FUNCTIONAL EXPENSES

For the Year Ended December 31, 2012

	Program Services							Support Services			
	BioMedical Engineering	Center for Translational	Surgical Skills Laboratory	Center for Outcomes	Education Department	Department of Technology	Imaging Research	Total Program Services	Management and General	Development	Total
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
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
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 Financial Statements

CONSOLIDATED STATEMENT OF FUNCTIONAL EXPENSES

For the Year Ended December 31, 2011

	Program Services							Support Services			
	BioMedical Engineering	Center for Translational	Surgical Skills Laboratory	Center for Outcomes	Education Department	Department of Technology	Imaging Research	Total Program Services	Management and General	Development	Total
Salaries and benefits	\$ 778,641	\$ 125,641	\$ 75,448	\$ 552,562	\$ 180,089	\$ 157,767	\$ 237,002	\$ 2,107,150	\$ 276,165	\$ 137,878	\$ 2,521,193
Consulting and contract labor	42,064	21,394	291	188,149	1,350	6,197	52,329	311,774	47,984	65,088	424,846
Supplies (office, computer, lab)	93,616	4,186	371,950	47,337	2,383	4,292	9,742	533,506	12,532	4,174	550,212
Events and fundraising	-	-	-	-	-	-	-	-	10,000	280,379	290,379
Printing	8,669	1,229	128	3,404	264	396	210	14,300	863	96,312	111,475
Maintenance and supplies	42,113	67	15,659	11,019	2,600	1,108	1,029	73,595	5,653	4,041	83,289
Rent and leases	35,963	8,385	18,625	10,222	5,544	22,780	38,298	139,817	6,437	2,986	149,240
Telephone and utilities	56,822	4,929	26,264	15,036	6,964	7,315	14,901	132,231	12,268	3,118	147,617
Travel	78,549	44,218	263	23,666	-	1,982	64,993	213,671	69,457	5,856	288,984
Legal and accounting	42,473	214	493	12,916	993	2,949	8,843	68,881	8,419	1,554	78,854
Fellows	-	-	-	-	71,523	-	5,279	76,802	-	-	76,802
Education meetings/lectures	-	-	-	-	68,909	-	-	68,909	-	-	68,909
Direct mail/planned giving	-	-	-	-	-	-	-	-	-	85,128	85,128
Meals and entertainment	8,627	4,773	941	1,593	965	635	3,297	20,831	19,222	850	40,903
Gifts	5,466	3,170	509	3,880	960	1,036	1,905	16,926	42,019	3,199	62,144
Postage	3,047	(29)	19,462	(4,004)	423	264	773	19,936	2,867	11,463	34,266
Insurance	1,503	194	194	1,358	145	339	339	4,072	90,888	242	95,202
Meeting fees/registrations											
and dues and subscriptions	16,183	3,502	-	2,445	18,063	20	-	40,213	4,030	2,380	46,623
Bank/credit card fees	-	-	-	-	-	-	-	-	12,338	-	12,338
Meetings (Board and SAC)	-	7,441	-	-	-	-	-	7,441	1,478	-	8,919
Research grant	-	10,000	-	-	-	-	-	10,000	-	-	10,000
Advertising	2,000	-	-	390	90	-	-	2,480	450	749	3,679
	1,215,736	239,314	530,227	869,973	361,265	207,080	438,940	3,862,535	623,070	705,397	5,191,002
Depreciation and amortization	303,509	-	456,498	24,971	14,039	21,220	400,280	1,220,517	8,467	3,336	1,232,320
Total	\$ 1,519,245	\$ 239,314	\$ 986,725	\$ 894,944	\$ 375,304	\$ 228,300	\$ 839,220	\$ 5,083,052	\$ 631,537	\$ 708,733	\$ 6,423,322

See Notes to Financial Statements

NOTES TO 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 (collectively, 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, 2012 and 2011, 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, 2012 and 2011.

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 and consists of medical supplies. Inventory consists of donated medical supplies of medical implants and cadaveric specimens 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.

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.

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, 2012 and 2011. 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, 2012. Tax years that remain subject to examination include 2009 through the current year for federal returns and 2008 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, 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.

RECLASSIFICATIONS

Certain amounts in the 2011 consolidated financial statements have been reclassified to conform to the 2012 presentation.

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, 2012 and 2011.

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	As of December 31,			Total
	Level 1	Level 2	Level 3	
Common stock	\$ 25,303	-	-	\$ 25,303
Equity mutual funds	667,240	-	-	667,240
Limited partnerships	-	3,913,315	-	3,913,315
Total	\$ 692,545	\$ 3,913,315	-	\$ 4,605,860

Financial assets carried at fair value as of December 31, 2011 are classified in the table below in one of the three categories described above.

Description	As of December 31,			Total
	Level 1	Level 2	Level 3	
Equity mutual funds	\$ 576,116	-	-	\$ 576,116
Limited partnerships	-	3,033,586	-	3,033,586
Total	\$ 576,116	\$ 3,033,586	-	\$ 3,609,702

Included in investments on the consolidated statements of financial position are money market funds in the amount of \$423 and \$1,054,605 at December 31, 2012 and 2011, respectively, which are not subject to fair value classification.

Investments in certain entities that calculate net asset value per share are as follows:

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:

	As of December 31,	
	2012	2011
Dividends and interest - reinvested	\$ 6,364	\$ 4,119
Net realized and unrealized gains (losses)	485,795	(139,404)
Other Fees	(20,842)	-
Total return on investments	\$ 471,317	\$ (135,285)

NOTE 3 CONTRIBUTIONS

Contributions receivable consist of the following:

	As of December 31,	
	2012	2011
Due in less than one year	\$ 261,800	\$ 437,550
Due in one to five years	186,800	623,600
	448,600	1,061,150
Less unamortized discount	(12,458)	(43,699)
Total	\$ 436,142	\$ 1,017,451

The discount rate used was 3.25% for 2012 and 2011.

NOTE 4 PROPERTY AND EQUIPMENT

The Institute's property and equipment consist of the following:

	As of December 31,	
	2012	2011
Equipment	\$ 508,974	\$ 454,166
Furniture and fixtures	140,043	140,043
Leasehold improvements	2,107,558	2,104,529
Machines and video equipment	1,146,156	1,428,392
Medical equipment	4,293,934	4,293,934
	8,196,665	8,421,064
Less accumulated depreciation and amortization	(4,503,343)	(3,475,282)
Total	\$ 3,693,322	\$ 4,945,782

NOTE 5 LINE-OF-CREDIT

The Institute has an unsecured line of credit with a bank, which bears interest at the prime rate per annum less 0.25% (3.00% at December 31, 2012). As of December 31, 2012, there was no outstanding balance. As of December 31, 2011, the outstanding balance was \$9,099.

Subsequent to year end, the Institute canceled the line of credit and entered into a new unsecured line of credit agreement with a different bank. The amount available on the new line of credit is \$1,500,000. Draws on the line of credit bear interest at prime plus 0.50% and the line of credit matures in March 2018. Subsequent to year end, the Institute used the new line of credit to pay off the long term debt.

NOTE 6 LONG-TERM DEBT

	December 31,	
	2012	2011
Note payable to a bank, interest accruing at 4.75%, payable in monthly installments of principal and interest of \$958. The note is unsecured. The note was paid in full during 2012.	\$ -	\$ 7,520
Note payable to a bank, interest accruing at 4.00%, payable in monthly installments of principal and interest of \$10,805, due May 2016. The note is unsecured.	413,009	523,358
Note payable to a bank, interest accruing at 4.00%, payable in monthly installments of principal and interest of \$13,739, due June 2016. The note is secured by all business assets.	525,163	665,648
	938,172	1,196,526
Less current portion	(248,847)	(246,991)
Total	\$ 689,325	\$ 949,535

Maturities of the notes payable are as follows:

For the Year Ending December 31,	
2013	\$ 248,847
2014	271,589
2015	282,811
2016	134,925
Total	\$ 938,172

Subsequent to year end, the Institute drew on its line of credit to pay off the long term debt in full.

**NOTE 7
CAPITAL LEASES**

The Institute has acquired assets under the provisions of capital leases. For financial reporting purposes, minimum lease payments relating to the assets have been capitalized. The leases expire between June 2013 and March 2014. Amortization of the leased property is included in depreciation expense.

The assets under capital leases have cost and accumulated amortization as follows:

	December 31,	
	2012	2011
Equipment	\$ 2,188,507	\$ 2,188,507
Less accumulated amortization	(1,663,474)	(1,209,027)
	\$ 525,033	\$ 979,480

Maturities of capital lease obligations are as follows:

For the Year Ending December 31,	
2013	\$ 443,797
2014	101,415
Total minimum lease payments	545,212
Amount representing interest	(11,296)
Present value of net minimum lease payments	533,916
Less current portion	(433,127)
Long-term capital lease obligation	\$ 100,789

**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 \$20,852 and \$13,584 to the Plan in fiscal years 2012 and 2011, 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 as follows:

	December 31,	
	2012	2011
Assets available for		
Education	\$ 931,563	\$ 581,963
Assets available in future periods		
Education	74,213	122,663
BioMedical engineering	-	289,833
Center for outcomes-based orthopaedic research	42,914	353,196
Imaging	100,000	100,000
Time restricted only	219,015	151,009
Total contributions receivable	436,142	1,016,701
	\$ 1,367,705	\$ 1,598,664

**NOTE 10
RELATED PARTY TRANSACTIONS**

During 2012 and 2011, the Institute received approximately \$862,000 and \$534,000, 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 and \$1,323,540 from the Clinic during 2012 and 2011, respectively, as a corporate sponsor and for the use of certain equipment.

**NOTE 11
INCOME TAXES**

Income tax expense has been computed at the statutory rates applicable during the period. The components of taxes on income are as follows:

	For the Years Ended December 31,	
	2012	2011
Current		
Federal	\$ 82,000	\$ 256,000
State	11,000	36,000
	93,000	292,000
Deferred		
Federal	(35,000)	44,000
State	(5,000)	6,000
	(40,000)	50,000
	\$ 53,000	\$ 342,000

The Institute's deferred tax 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 December 2013 and February 2016, which call for both base rent payments and operating expenses. Rent under these leases for the years ended 2012 and 2011 was \$170,919 and \$149,240, respectively.

Future minimum lease payments under these leases, which include the repayments for tenant improvement allowances, are as follows:

Year Ending December 31,	
2013	\$ 313,924
2014	126,120
2015	127,062
2016	10,722
	\$ 577,828





A 501(c)(3) nonprofit organization

181 West Meadow Drive, Suite 1000
Vail, Colorado 81657
970-479-9753
fax: 970-479-9733
www.sprivail.org