

Chairman. "This is a great example of multiple minds being better than one mind."

Dan Drawbaugh, CEO of The Steadman Clinic and SPRI, remarked that the goal for this summit was to encourage new collaborations and to build upon existing ones.

Dr. Johnny Huard, SPRI Chief Scientific Officer and Summit Co-Chair, spoke about his dream. "I dream that we can do science that translates to the clinic. Surgeons and scientists need to work together—to be a team that can make big things happen."

The three-day conference included speakers from throughout the United States representing universities and medical institutions such as the Mayo Clinic, Harvard, Northwestern, University of Pittsburgh, University of Texas Health Science Center at Houston, and Carnegie Mellon.

A Snowboarding Legend: How **Kelly Clark Became the Most Dominant Athlete in the History** of the Sport

> . . . . . . p8

SPRI's Distinguished Research Scientist Dr. William Rodkey to Retire

> . . . . . p10

#### **BUILDING FOR THE FUTURE**

Dr. J. Richard Steadman, the Co-Chair and Founder of SPRI and Founder of The Steadman Clinic, and a man who has seen many changes throughout his distinguished career, remarked on his hopes for the future. "We are not at the end. Getting people together who are willing to listen to each other is the kind of thing that builds for the future."

Topics at the Summit focused on improving the ways in which platelet rich plasma could be used in healing tissue, cutting-edge surgical techniques for shoulders and knees, and the importance of stem cell therapies to improve the lives of people affected by a variety of conditions.

Throughout the Summit, speakers and guests were interviewed about their

experiences at the event and the work they are collaborating on with fellow researchers and doctors. The interview with Dr. Huard can be seen online at youtube.com/user/SpriVail and on Steadman Philippon's Facebook page.

#### FROM LAB TO CLINIC

Dr. Chris Evans of the Mayo Clinic spoke on approaches to cartilage repair. "We are trying to develop gene therapy approaches to improving the healing of cartilage and doing it in a way that is technically simple. We want it to be delivered at point of care so the patient comes in and gets what we have to offer, leaves, and doesn't have to come back."

Dr. Linda Sandell, a pioneer in orthopaedic research and professor in the Department of Orthopaedic Surgery at the University of Washington in St. Louis, spoke about wound healing and stopping osteoarthritis at the time of injury repair, and how science can translate work from the lab into the clinic.

#### **INNOVATION AND LEADERSHIP**

"It is just great to be here in Vail," said Dr. Matthew Provencher of The Steadman Clinic. "I'm so proud to be a part of how we can translate theories to clinical calls to action for the people in this room to do more."

If the exchange of ideas at this year's Vail Scientific Summit is an indication of game-changing collaboration in the future, the Steadman Philippon Research Institute will have reinforced its position as an innovative leader in the world of regenerative medicine.

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"It's just amazing what is being done here, this is a great example of multiple minds being better than one mind."

- Dr. Marc Philippon, SPRI Co-Chairman



L-R, Dan Drawbaugh, Chief Executive Officer; Johnny Huard, Ph.D., Chief Scientific Officer; J. Richard Steadman, M.D., Co-Chairman; Marc J. Philippon, M.D., Co-Chairman; and Mike Shannon, Chairman of the Board, Vail Valley Medical Center.



Dr. Marc Philippon, Co-Chairman of the Steadman Philippon Research Institute and Partner, The Steadman Clinic, was presented the inaugural Joseph C. McCarthy Award for Achievement in Advancing Knowledge and Scholarship in Hip Joint Preservation.

The award was made during the annual meeting of the International Society for Hip Arthroscopy (ISHA) in San Francisco, September 17. It was given in recognition of Dr. Philippon's innovation, research, and teaching in hip arthroscopy.

The award carries the name of the renowned Boston General Hospital

orthopaedic surgeon and founding member of ISHA, Dr. Joseph McCarthy.

"We are proud of Dr. Philippon's many achievements and his contributions to orthopaedic sports medicine," says Dan Drawbaugh, President and Chief Executive Officer of The Steadman Clinic and Steadman Philippon Research Institute. "His pioneering research and clinical expertise have improved the lives of patients around the world."

Dr. Philippon is internationally known for his joint preservation techniques. Using the various instruments he has designed, he has improved arthroscopic hip surgery for treating painful joint injuries. Dr. Philippon is often recognized as the preeminent authority in the arthroscopic treatment of femoroacetabular impingement, a condition in which abnormally shaped bones of the hip cause damage to the labrum and articular cartilage.

In 2012, Dr. Philippon received the American Academy of Orthopaedic Surgeons Achievement Award in recognition of his outstanding contributions to the orthopaedic surgery field. He is recognized by his peers in *U.S. News and World Report* as being among the top one percent in the nation in his specialty.

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## **Stewart and Linda Turley:**

## Bringing Commitment, Experience, and Perspective to Their Support of SPRI

Stewart and Linda Turley know a lot about the work and the worldwide reputation of The Steadman Clinic and the Steadman Philippon Research Institute.

Stew, as his friends refer to him, has been a friend of SPRI Founder Dr. Richard Steadman and his wife, Gay, since before there was a clinic or research institute in Vail. The Turleys have both been patients at The Steadman Clinic, and Stew has served on SPRI's Board of Directors since 1999. Stew and Linda have a home in the Vail Valley, and they've supported many of the research initiatives now in place at SPRI.

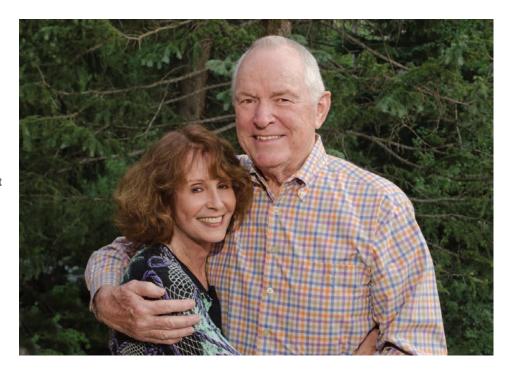
In addition, Stew and Linda bring a lifetime of experience in business, healthcare, and philanthropic work to SPRI and the Vail Valley community.

Stew retired in 1997 from the Eckerd Corporation (Eckerd Drugs), where he served as Chairman and CEO for 22 years. Among his many other honors and duties, he is a Trustee and past-Chairman of the U.S. Ski and Snowboard Team Foundation, which is where he and Richard Steadman first met.

Linda, a registered nurse, practiced in the areas of plastic and reconstructive surgery and home health. She held positions in medical sales, marketing, and management, and served as Executive Director of the Florida Geriatric Research Foundation.

#### **EDUCATION AND MEDICINE FOCUS**

"The major focus of our giving has been in education and medicine," says



Stewart. "We like to think we are giving to organizations (like SPRI) that make a difference in positive ways. We also try to focus on certain areas with enough support to make an impact."

Of the many SPRI initiatives where the Turleys' support has made an impact, two stand out—one that's been in place for many years; the other is relatively new.

"One of the things we became interested in some time ago was the Fellowship Program," says Linda. "We love the opportunity to support and become acquainted with these outstanding young Fellows and feel that our sponsorship is a gift that keeps giving."

"During their fellowships, and then as they go to many places in the United States and the world," continues Linda, "they are ambassadors for and examples of the world-class medicine and research that is practiced at The Steadman Clinic and Steadman Philippon Research Institute."

"I don't think many people realize that The Steadman Clinic physicians devote their time and energy to SPRI research and the Fellowship Program, without being compensated," says Stew. "They choose to do it because they want to share their knowledge and expertise with other professionals for the benefit of many more patients."

The Turleys recently made a contribution to support the regenerative medicine initiative and stem cell research at SPRI.

"We think it is very important to the future of medicine, and it ties in very well to orthopaedic medicine," says Stew. "The advancement of knowledge in the application of stem cell therapy is going to result in remarkable benefits. We wanted to help that effort move forward in a meaningful way."

#### **QUANTITY AND QUALITY**

"One of Dr. Steadman's greatest legacies is recruiting to The Clinic and SPRI some of the best orthopaedic surgeons and research scientists in the world," says Stew. "I can't say enough about the quality and transfer of knowledge that these physicians share with others every day. While the quantity of work is impressive, especially for a relatively small institution, the quality is even more outstanding."

Stew tells the story of a distinguished orthopaedic surgeon who belongs to a well-regarded practice in another part of the country. He needed hip surgery, and his research helped him determine that Dr. Marc Philippon was the best qualified person to treat his condition.

After his experience in Vail, he commented to Stew that he had never been as impressed as he was with The Steadman Clinic and the Steadman Philippon Research Institute.

#### THE CHALLENGE OF GROWTH

"As any organization grows, management and governance have to grow also in order to be effective," explains Stew. "It's certainly part of the challenge we have faced, but growth is a positive challenge. It all comes with the need for additional funding, and SPRI needs that external support."

"We feel that as the public becomes more aware of Dr. Johnny Huard's work in regenerative medicine and SPRI's association with outside agencies such as the National Institutes of Health, the Department of Defense, and National

Aeronautics and Space Administration, they will be willing to invest money in SPRI's various research initiatives."

#### **MOVING FORWARD**

"As people grow older, they have more aches, pains, and joint problems," say the Turleys. "As a result, orthopaedic and regenerative medicine will become even more important. The growth and development of the Steadman Philippon Research Institute will enable medical research to meet the demand for leadingedge clinical practice."

"We hope to encourage others to contribute to this exciting research initiative. All gifts, regardless of size, will be wisely utilized for the benefit of all of us now and for generations to come."

"I can't say enough about the quality and transfer of knowledge that these physicians share with others every day. While the quantity of work is impressive, especially for a relatively small institution, the quality is even more outstanding."



## SPRI Names Biomotion Innovator Scott Tashman, Ph.D., as Director of BioMedical Engineering



By Jim Brown, Ph.D.

"When the people at the Steadman Philippon Research Institute decide they want something to happen, it happens," says Scott Tashman, Ph.D. "There is a real sense of common goals and teamwork. That ability to go from an idea to execution in a short period of time is impressive."

When SPRI decided it wanted someone to build the premier biomotion lab in the world and provide expertise and direction for the Department of BioMedical Engineering, it went straight to Dr. Tashman, who is arguably the most qualified person in the world to take on both assignments.

Like SPRI Chief Scientific Officer Dr.
Johnny Huard, Dr. Tashman holds dual
appointments at the University of Texas
Health Science Center Houston and the
Steadman Philippon Research Institute.
And like Dr. Huard, he held a similar
position at the University of Pittsburgh
School of Medicine prior to his Houston and
SPRI appointments.

"Dr. Huard and I were in the same department at Pitt and we talked occasionally, but we didn't work together," says Dr. Tashman. "I accepted the position at Houston knowing that I would work closely with him on a number of projects. Now that we are at both UT Houston and SPRI, we can work together even more closely."

## BASIC SCIENCE AND CLINICAL APPLICATION: CLOSING THE GAP

"Dr. Huard's early work was very much in the basic science of regenerative medicine, which was some distance from clinical application," he continues. "My work was mostly with patients and was directly clinically applicable, so there was a considerable gap between our areas of focus."

"Our appointments at both research institutions are making it possible to close that gap. He is moving closer to clinical care and I'm moving closer to basic science. We can do clinically applicable research in Vail that would be difficult to do in Houston, and Dr. Huard and I can do basic science at Houston that we can't do at Vail."

#### **UNIQUELY QUALIFIED**

To say that Dr. Tashman is highly qualified to take on the challenges that accompany his new position at SPRI is an understatement. He is uniquely qualified. He has a B.S. in biomedical engineering and a M.Eng. degree from Rensselaer Polytechnic

Institute in Troy, New York, and a Ph.D. in mechanical engineering from Stanford.

As a pioneer and preeminent leader in biomotion research, he directed one of the first video-motion analysis laboratories and designed the first high-speed biplane radiographic imaging system for accurately measuring dynamic joint function.

He built two of the foremost biomotion labs in the U.S.—one at Henry Ford Hospital in Detroit and one at the University of Pittsburgh.

#### **BUILDING THE BIOMOTION LAB**

Now he's assembling the components and training the personnel for what will become the premier biomotion lab in the world at SPRI. Those components include:

- An instrumented treadmill that can record forces in lower limbs while people are walking and running.
- Video-motion analysis hardware and software to assess body motion and coordination.
- A biplane X-ray imaging system for dynamic assessment of joint function, including cartilage, ligaments, and tendons.

- A wireless electromyography system to assess neuromuscular function.
- Three-dimensional, real-time, biofeedback for guiding rehabilitation and sports training.
- Wearable sensor systems to measure motion outside the lab, such as on a sports field or ski slope.

"The ability to use all of these technologies together is especially powerful because they all tell us about how people move and how motion is coordinated," says Dr. Tashman. "In addition, they tell us how muscles and joints are functioning."

#### WHAT HAPPENS INSIDE THE LAB?

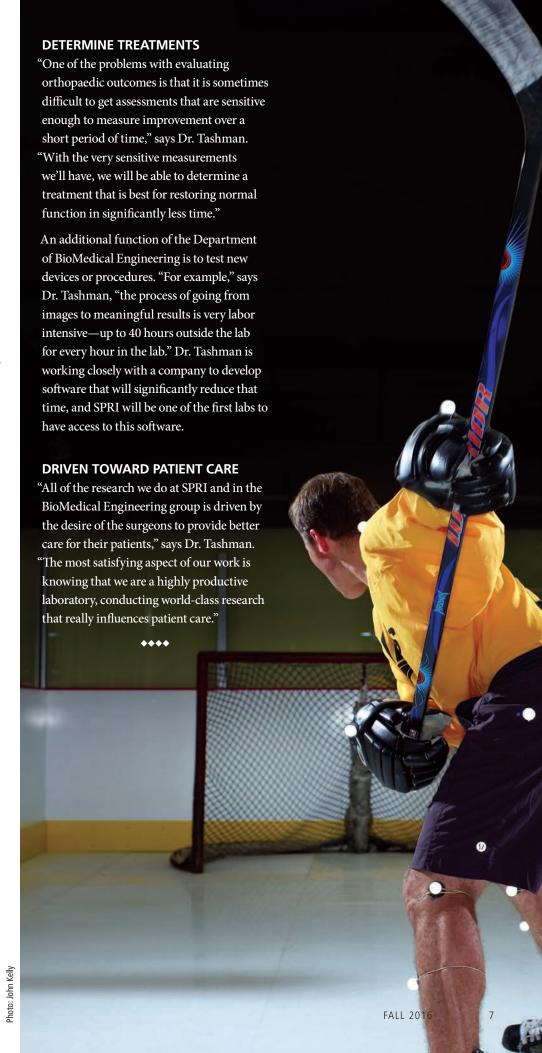
SPRI News asked Dr. Tashman what a visitor might see going on inside SPRI's Biomotion Lab when it is fully operational.

"What people will see is a person doing some sort of physical activity," says Dr. Tashman. "It might be a soccer player recovering from an ACL injury running on a treadmill or an older person with osteoarthritis going up a set of stairs. They might see a hockey player with a hip problem simulating a game-like movement or a pitcher with a shoulder problem going through the throwing motion."

These kinds of activities will be monitored, recorded, measured, scanned, or assessed in some way to determine what might be causing an injury, how to recover from one, or how to prevent injuries.

At least a half-dozen research projects are in the planning stages or ready to start when the lab is fully built out, which is expected to be in December. In the meantime, equipment is being installed, proposals are being written, and training has begun.

The Biomotion Lab will be an addition to the BioMedical Engineering Department's fully operational Biomechanical Laboratory, supervised by Travis Turnbull, Ph.D., that has been turning out high-impact research for many years.



#### - Patients in the News-



How Kelly Clark Became the Most Dominant Athlete in the History of the Sport

By Jim Brown, Ph.D.

Kelly Clark, all five feet, four inches of her, is already a snowboarding legend—a four-time Olympian with one gold and two bronze medals. She has seven X Games gold medals, five World Snowboard Tour titles, six Grand Prix titles, and eight U.S. championships.

In one year alone, she won an Olympic gold medal, an X Game gold, the U.S. Open championship, and the Overall Grand Prix title.

In short, she is the most dominant athlete in the history of snowboarding and the most "medaled" halfpipe specialist ever, male or female.

That's not all. At age 33, she's still at it—ranked second in the world—while three top-10 rivals are half her age.

This is a story of how Kelly Clark reached the top and how she plans to stay there, by overcoming a career-threatening injury with the help of Steadman Clinic doctors and SPRI research.

## RIGHT PLACE, EARLY START, SUPPORTIVE PARENTS

"I grew up in a small town in Vermont and my dad was a skier," she explains. "He had me on skis when I was two, and I started snowboarding when I was seven."

She was competing by the time she got to high school and enrolled in the Mount Snow Academy, a school that allowed students to attend classes half-day and snowboard the other half. By age 16 she had made the U.S. Snowboard Team. At 18, she won her Olympic gold medal in Salt Lake City.

"I started snowboarding before it was cool. It has elements of creativity and individuality. Two people can do the same trick, but it looks different because each one brings his or her own style to it. In that regard, snowboarding is unique."

United States' Kelly Clark competes in the women's snowboard half pipe qualifying at the Rosa Khutor Extreme Park at the 2014 Winter Olympics in Krasnaya Polyana, Russia.

(AP Photo/Sergei Grits)

"I also had 'a moment' when I was 14," she told CNN. "That was the first year the Olympics included snowboarding as a sport. I recorded the snowboarding events from Nagano, Japan, on VHS tape and watched them after school. I knew then that's what I wanted to do with my life."

Her parents were supportive, but she was on the clock. "Basically, I had one year after high school to show them I could make this a career, and that year turned out to be a breakout season when I started getting first-place finishes. Even then, it wasn't a sure thing until I had that Olympic experience and snowboarding kind of blew up around the world."

#### **FOUR YEARS FOR 30 SECONDS**

"Basically, I train four years for a 30-second halfpipe run," she says. "Snowboarders have a very small amount of time to be excellent. At the end of the day, no one can do what we try to do. My sports psychologist says it's 95 percent physical and five percent mental, but that five percent can completely erase the 95 percent if you let it.

"It may look like we're making it up, but every single trick is pre planned," she continues. "I know the kind of run I want to make in the Olympics two years out and work toward that goal."

Off the snow, Kelly trains six days a week, with a two-week break in the spring. "There are building weeks and recovery weeks," she says, "with two days of agility drills, two strength days, four days of cardio, and five days of core and mobility training. Getting ready for the Olympics involves about 25 hours of training a week just on fitness, not snowboarding."

"At my age, I tend to pace myself in practice more than before and try to train smarter, not harder. I want my best runs of the day to be when the judges are watching."

Clark's remarkable success has led the U.S. Snowboard Team to study her as a possible prototype in order to gather data on what it takes to be successful in such a demanding sport.

"There really isn't much data because snowboarding is still a relatively new sport," she explains. "We don't know what kind of body type, body composition, and mental makeup is best for us. Now, we're trying to figure it out."

## "I KNEW IMMEDIATELY THAT SOMETHING WAS WRONG"

"I had been aware that I didn't have the mobility in my hips that I had when I was younger, but it wasn't really a concern. But about a year ago I started having much more limited motion and discomfort in my glutes and lower back. It gradually got worse and I kind of limped my way through the season."

"I crashed in Norway at the X Games and knew immediately that something was wrong with my hip. I returned to the U.S. and saw Dr. Hackett at The Steadman Clinic in Vail. He was our team doctor and familiar with my medical history. He sent images of my hip to Dr. Marc Philippon, and within days I was back in Vail for surgery on a hip labral tear (ring of cartilage around the hip joint socket), cam impingement (bone tissue overgrowth on the femur), and hamstring avulsion (tendon torn away from the bone)."

"I had a friend who had similar surgery a few years earlier," says Clark. "I was amazed at how much development in the procedure and rehab protocol had taken place in that short amount of time. The doctors at The Clinic and SPRI are constantly finding better ways to perform the procedures and to speed up recovery."

Her rehab exercises began at 7 in the morning after her surgery, a practice pioneered by SPRI's Dr. Richard Steadman four decades ago. The recovery/ rehabilitation protocols are constantly being refined as a result of research conducted at SPRI.

"Looking at my scars, it seems like Dr. Philippon gets in and out quickly and efficiently. No extra time on the operating table or moving instruments around unnecessarily that can lead to excessive scar tissue. That makes a big difference in the recovery process."

## SEVEN MONTHS, SURGERY TO SLOPES

Clark's surgery was on March 14. She was cleared to resume all activities in late August and scheduled to return to snow in New Zealand on October 10. Seven months, surgery to slopes. Her goal is to make the Olympic team a year from now.

"I want to be able to enjoy my next two years and make another Olympic run," she says. "My decision to go ahead with surgery was not only because I wanted to compete again, but to have a good quality of life when I've finished competing."

"I would tell people who have similar injuries, whether or not they are athletes, that I wouldn't go anywhere else in the world for treatment. You want to be in the best place with the best people who will do anything they can to help you get better, quicker."

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#### The Kelly Clark Foundation

Kelly Clark lives her message of inspiration through The Kelly Clark Foundation, which gives opportunities to young people and helps them reach their highest potential through snowboarding. Since the organization's inception six years ago, her foundation has awarded more than \$125,000 in grants and scholarships to eliminate financial barriers for talented young athletes across the country.

# SPRI's Distinguished Research Scientist Dr. William Rodkey to Retire

By Jim Brown, Ph.D.

William G. Rodkey, D.V.M., the first, the longest-serving, and one of the most distinguished scientists to ever serve at the Steadman Philippon Research Institute, will retire on December 31, after 26 years of service.

Dr. Rodkey's legacy, along with that of SPRI Founder Dr. Richard Steadman, will include ground-breaking advances in regenerative medicine that were made long before the term first appeared in professional literature.

"I met Dr. Steadman in 1976 when I was on active duty in the Army and he was practicing in Lake Tahoe," says Dr. Rodkey. "In about 1980 we started doing projects together, and that continued for the next decade."

#### **MILITARY SERVICE AWARDS**

Dr. Rodkey's accomplishments while in the service of our country earned him numerous awards and military decorations, including the United States of America Legion of Merit Medal, the Meritorious Service Medal, the Army Commendation Medal with four Oak Leaf Clusters, the Humanitarian Services Medal, the Order of Military Medical Merit, and the U.S. Secretary of the Army Research and Development Achievement Award.

From 1985 to 1991, Colonel Rodkey was Chairman of the Military Trauma Research Division for the Letterman Army Institute of Research in San Francisco.

He remembers the details of the conversation that led to his first position at what would become the Steadman Hawkins Research Foundation, later to become the Steadman Philippon Research Institute.

#### A HANDSHAKE DEAL

"Dr. Steadman knew that I was getting close to being military-retirement eligible, which coincided with the time he was about to leave Tahoe and establish an orthopaedic sports medicine research organization," says Rodkey. "It was a Sunday morning at his house, and we were having a cup of coffee. He had no idea where he was going to end up because he was being recruited by a number of places."

Dr. Steadman said, "I don't know where I'm going, but I'd like for you to join me, wherever that might be."

"I agreed, we shook hands, and a couple of years later it happened."

#### **PUTTING THE PIECES TOGETHER**

"He and I considered other locations and institutions, but the ultimate decision was to establish a foundation here in Vail because it was the best opportunity and the best lifestyle. Basically, I was the first staff member. At first, we spent a lot of time with planning and construction, then adding key staff members like Karen Briggs (1993) and John McMurtry (1994)."

"Karen started assembling the clinical research database, which has now probably become the world's largest collection of orthopaedic sports medicine datapoints. We were focused on trying to put science behind some of the things Dr. Steadman had been doing empirically, such as microfracture and the healing response for ACL injuries. We

"Everything we did in those early years (and continuing in today's SPRI) was the result of a team effort. I am very proud of having been a part that team."

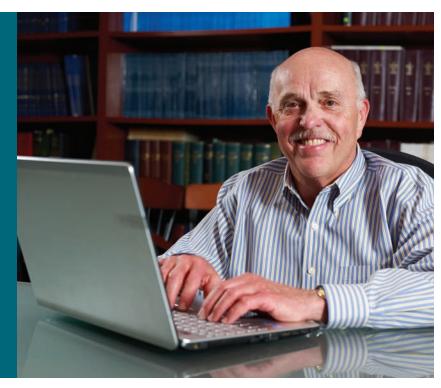


Photo: John Kelly

also started looking at different scenarios and were able to go into the lab with animal models. Those research initiatives had a direct effect on how Dr. Steadman improved his clinical techniques."

McMurtry was named Vice President for Program Advancement, a position that required putting the Foundation/Institute in a position to fund its research activities on a long-term basis.

#### **LANDMARK ADVANCES**

Among the many landmark accomplishments of the Institute over the years was getting early publications on basic science that confirmed Dr. Steadman's belief that certain procedures needed to be done and would work. Those publications in high-impact journals got the attention of other surgeons who became interested in doing microfracture and the healing response, among other innovative procedures.

Dr. Rodkey was directly involved in the development and refinement of a meniscus scaffold that was eventually approved by the FDA. It was (and is) another example of how regenerative medicine was already being practiced at SPRI.

"Everything we did in those early years (and continuing at today's SPRI) was the result of a team effort," says Dr. Rodkey. "I am very proud of having been a part of that team."

## CONTINUATION OF DR. STEADMAN'S VISION

Dr. Rodkey makes a compelling case for the continued support of SPRI and its expanded mission that puts regenerative medicine at the forefront.

"What Dr. Philippon, Dr. Huard, and all of the physicians/scientists here are doing is a continuation of Dr. Steadman's original vision," he says.

"Stay tuned. I hope those who read this newsletter will continue to support SPRI, because regenerative medicine is really what we've been doing all along—but now at a much more sophisticated and advanced level."

#### **NOT GOING AWAY**

Dr. Rodkey has no plans to spend his retirement in a rocking chair (his words). "That's not my style. I will do a fair amount of consulting work for biotech companies. I serve on editorial review boards for a number of journals, and I'll stay very much involved in sports medicine and orthobiologics research.

"Now that I don't have to be in the office every morning at 8 a.m." he adds, "I hope to catch a few more trout and ski a few more powder days."

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