



A LEGACY OF OUTCOMES RESEARCH, A FUTURE OF CLINICAL TRANSLATION

HIGH-IMPACT RESEARCH LEADS TO HIGH-IMPACT HONORS

Since its founding in 1988, **Steadman Philippon Research Institute (SPRI)** has maintained a pioneering philosophy in regard to sports medicine and orthopaedic research. **SPRI launched one of the first patient outcomes databases in the field of orthopaedics, and over thirty years later, SPRI's Center for Outcomes-Based Orthopaedic Research (COOR) is tracking over 45,000 patient surgeries. No orthopaedic research database in the world is as rich, large and long-standing.**

THE PROOF IS IN THE OUTCOMES

This outcomes database enables SPRI scientists and The Steadman Clinic physicians to validate surgical techniques and biologic therapies, and it has led to making many revolutionary procedures—microfracture and arthroscopic hip repair—the standard of care.

The outcomes database is a vital proof point for SPRI and The Steadman Clinic, because when we indicate that our physicians are the best, we have the outcomes behind it:

- Post-surgically, The Steadman Clinic patients achieve greater physical health status than the healthy US adult population, on average
- The Steadman Clinic has the highest revision referral rate (referred from other orthopaedic providers) of any other practice in the United States
- The Steadman Clinic has very low revision rates in primary cases (less than half the average), despite performing the most complex cases

Because of the outcomes database, SPRI is able to confirm that The Steadman Clinic physicians and their surgical techniques are truly world class.

PUBLISHING HONORS FOR SPRI



**ARTHROSCOPY
PUBLISHED “THE TOP
50 MOST INFLUENTIAL
ARTICLES IN HIP
ARTHROSCOPY,”
WHICH NAMED
SPRI CO-CHAIRMAN
DR. MARC J. PHILIPPON
AS THE WRITER OF THE
MOST INFLUENTIAL
PAPER OF ALL-TIME.**

In 2018, the *Journal of the American Academy of Orthopaedic Surgeons* (JAAOS) published an article entitled “Orthopaedic Academic Activity in the United States: Bibliometric Analysis of Publications by City and State” to analyze the academic output of orthopaedic publications. JAAOS audited the 15 highest ranked orthopaedic journals between 2010–2014 and revealed that per capita, Vail, Colorado was the leader of publications per surgeon—a finding that demonstrates SPRI’s productive publishing in the field.

Arthroscopy Measures Influence

At the end of 2020, the peer-reviewed journal of *Arthroscopy* published “The Top 50 Most Influential Articles in Hip Arthroscopy,” which named SPRI Co-Chair Dr. Marc J. Philippon as the writer of the most influential paper of all-time. Dr. Philippon’s leading paper received 464 citations—146 more citations than the second paper on the list. Dr. Philippon was also an author on six of the top ten papers featured in the study.

In May 2021, *Arthroscopy* published, “The Top 100 Most-Cited Articles on Arthroscopy: Most Popular Topic is Rotator Cuff Rather Than Cartilage in the Last 5 Years,” which highlighted the 100 most-cited articles on arthroscopic surgery published from 1950–2020. The results of this study indicated that the most prolific institution was SPRI (5% of the most-cited articles) and the most prolific first author was Dr. Philippon (4% of the articles), further demonstrating SPRI’s commitment to important research and publishing our scientific discoveries.

High-Impact Results

These publication honors not only indicate that SPRI and its scientists and physicians are active publishers in high-impact journals, but also validate the significance of the research being conducted at SPRI—acknowledging citations and influence indicates that year after year, the research performed at SPRI is being cited by other researchers and physicians in the field. More than any other institution, the field of orthopaedic sports medicine looks to COOR’s evidence-based medicine research to inform their clinical decision making.



Dr. Marc J. Philippon works alongside 2019–2020 fellow Dr. Tim Beals in the operating room



BROADENING SPRI'S HORIZON

SPRI was recently awarded a seventh National Institutes of Health (NIH) grant, which is focused on cartilage tissue engineering with pluripotent stem cells. As SPRI investigates this new study and continues its work on five federally funded clinical trials, the institute looks to build off of its foundation in orthopaedic research to further investigate new applications for research in two key areas.

CANCER AND SENESCENT CELLS

In SPRI's Center for Regenerative Sports Medicine (CRSM), Dr. Johnny Huard and his team have been studying senescent cells and profiling human patient samples to investigate whether supplements may improve or eradicate senescent (aging) cells. Because there is a correlation between these cells and diseases like cancer, the CRSM team has begun to profile different cancer cell types in its lab as a proof of concept for this research inquiry. With proximity to the renowned Shaw Cancer Center and strong relationship with Vail Health, there is tremendous potential in making new discoveries about how supplements may delay disease progression or thwart cancer development when used preventatively.

Thanks to philanthropy, SPRI has been able to conduct senescent cell profiling on 180 human patients. Most other institutions are still studying senescent cells pre-clinically, and with SPRI's rich, human data, the institute is able to investigate new applications for its findings sooner than its peers.

MUSCLE HEALING AFTER INJURY

Although orthopaedic and sports medicine research largely focuses on joints and ligaments, muscles are an integral component of healthy human activity. However, it is challenging to treat muscle injuries, and the standard of care for most muscle injuries is to rest the muscle and give it time to heal on its own. More serious strains may require surgical repair and rehabilitation, which can lead to a long recovery for injured patients.

SPRI's Department of Imaging Research has been working on a muscle imaging study with an industry partner to understand how magnetic resonance imaging (MRI) can be used as a diagnostic tool in muscle injury, and how MRI can be used to study muscle healing. Under the principal investigatorship of Dr. Huard, SPRI has recently submitted a grant application that is focused on using orthobiologics in conjunction with therapeutics to aid in the healing of hamstring injuries, which could help patients resume their activities sooner than with traditional treatment.



Surgical Skills Lab Coordinator Ramesses Akamefula demonstrates scope to local students

A CUT ABOVE: **Outstanding Education in SPRI's Surgical Skills Lab**

FROM LOCAL STUDENTS TO SKI PATROLLERS, THE LAB PROVIDES A UNIQUE, ONE-OF-A-KIND LEARNING EXPERIENCE

When Ramesses Akamefula joined SPRI as the Surgical Skills Lab Coordinator in the summer of 2018, he knew that he was about to embark on a distinctive work experience. He had previously worked with Dr. Matthew Provencher, Steadman Clinic physician and Co-Director of SPRI's Sports Medicine Fellowship, when he volunteered for him at Massachusetts General Hospital before Dr. Provencher came to practice and teach in Vail. When Dr. Provencher called him to let him know the Surgical Skills position was soon to open up as its previous lab coordinator was heading to medical school, Ramesses jumped at the opportunity, even though he wasn't exactly sure what it would entail. Within a couple of weeks, he'd packed up and moved to Vail. "It's as close as you can get to surgery without being at a live operation," Ramesses explains. "I'm a visual, hands-on learner, and I've been able to immerse myself in surgical techniques. It was a rare opportunity I had to take."

PRACTICE CREATES CONFIDENCE

In his role as lab coordinator, Ramesses works closely with the clinical fellows as they practice surgical procedures. He observes instruction from SPRI's elite faculty and says that he witnesses surgical innovation as it happens. "I see this cycle of education in the lab," he says. "The lab is a place to ask and answer questions, to find things out. I work with researchers, attendings, fellows, scientists—there is constant innovating and creating."

Ramesses explains that to become an expert at a procedure, it's estimated that it takes at least 30 times in practice, and most other clinical fellowships offer under 10 opportunities to practice on a specimen. "Our fellows are in the lab at least 90 times in the course of their year here," he says. "It's all about repetition—and in doing these reps, observing our attendings and each other—they come out of their year here with confidence and a comfort level in surgery that I don't think you can find anywhere else."

EDUCATION FOR EVERYONE

While the lab is an undeniable feature of SPRI's clinical fellowships, it is also an education tool for young students across western Colorado, who participate in SPRI's youth education programs. The students try their hands at scoping model joints and get an up-close look at surgical techniques and instrumentation.

The Surgical Skills Lab also hosts other visitors for a differentiating learning experience, including ski patrollers from local ski mountains. Through these visits, the ski patrollers get a completely new understanding of the injuries they're assessing on the mountain—now they know what these injuries look like from the inside.

"It's just another way our local ski patrols are set apart—this newfound knowledge. When they come to our lab, they get to participate in a trauma surgery and be surgeons for the day. It gives them a totally new perspective when they're assessing an injury on the hill."

When asked if Ramesses preferred working with any group in the lab, he indicated that he enjoyed working with everyone. "I make the most out of every group—no matter who walks through the door, I can learn something. There's a reciprocal nature of the lab. Every opportunity is a learning experience."