

# ISAKOS

## ISAKOS NEWSLETTER 2018 • VOLUME I

Current Concepts on Arthroscopy, Knee Surgery & Orthopaedic Sports Medicine



12<sup>th</sup> Biennial  
**ISAKOS**  
**CONGRESS** 2019  
Cancun, Mexico • May 12-16, 2019  
**CALL FOR**  
**ABSTRACTS**

APPLY ONLINE  
FOR AWARDS &  
FELLOWSHIPS  
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## New Year Momentum

It's a new year—and with that comes opportunity for a fresh start and an energized sense of motivation. We have a lot of exciting things happening with ISAKOS this year! As our members, we hope you seize the chance to participate in the wide variety of ISAKOS educational offerings.

Coming off of the success of the ISAKOS Congress in Shanghai, we are working full steam ahead for the 12<sup>TH</sup> Biennial Congress in Cancun, Mexico. Call for Abstracts opened on September 1, 2017—the submission deadline is September 1, 2018. We encourage you to submit your abstracts early and to apply for ISAKOS Awards and Fellowships. There is a new award being offered this term—the Paolo Aglietti Knee Arthroplasty Award, in recognition of Professor Aglietti's numerous contributions to knee surgery as a prolific researcher, teacher and surgeon. Also new this year is the ISAKOS Global Traveling Fellowship. This sports orthopaedic focused Fellowship will provide the opportunity for four surgeons to travel with a godfather to up to six medical centers over two weeks, before attending the ISAKOS Biennial Congress. Visit the ISAKOS website to learn more about these awards and fellowships.

A dozen Surgical Demonstrations from the Shanghai Congress are now available on Global Link, ISAKOS' online education portal. View the world's leading surgeons perform and share their techniques and expertise. Surgical Demo online courses are also now available, with pre and post questions as well as a completion certificate. Global Link in itself is in the midst of a review and upgrade. ISAKOS Committees are diligently analyzing Global Link content to ensure our members have access to only the best and most relevant information, in a more user and device friendly format. Stay tuned for more details!

*Journal of ISAKOS* is also kicking off the new year with an announcement—*JISAKOS* is now accepting original research! Being that our Society's journal is only in its third year, it's a big and exciting step! We invite you to consider submitting your next paper and reach the global orthopaedic community. For more information about *JISAKOS* or how to submit, please visit [jisakos.bmj.com](http://jisakos.bmj.com).

The ISAKOS Board of Directors and the Office have welcomed new members recently. Daniel C. Wascher MD, from the University of New Mexico School of Medicine, has accepted a position as an ISAKOS Board of Directors Member at Large. He takes the place of Allen Anderson, MD who sadly, passed away last November. A Memoriam for Dr. Anderson can be found on page 18 of this newsletter. The ISAKOS Office also welcomed a new member, Chanel Tilghman, who is in charge of Member Services. Chanel is a graduate of the University of Southern California, can speak Spanish and Korean, and has a passion for theater. Please help us welcome both Dr. Wascher and Chanel to the ISAKOS family!

We hope you find a way to participate in our society this year. Ride the new year momentum, get involved, and help ISAKOS achieve its mission; to advance the worldwide exchange and dissemination of education, research and patient care in arthroscopy, knee surgery and orthopaedic sports medicine. One easy way to do so—enjoy this issue of the ISAKOS Newsletter!

# ISAKOS: The Perspective of the World



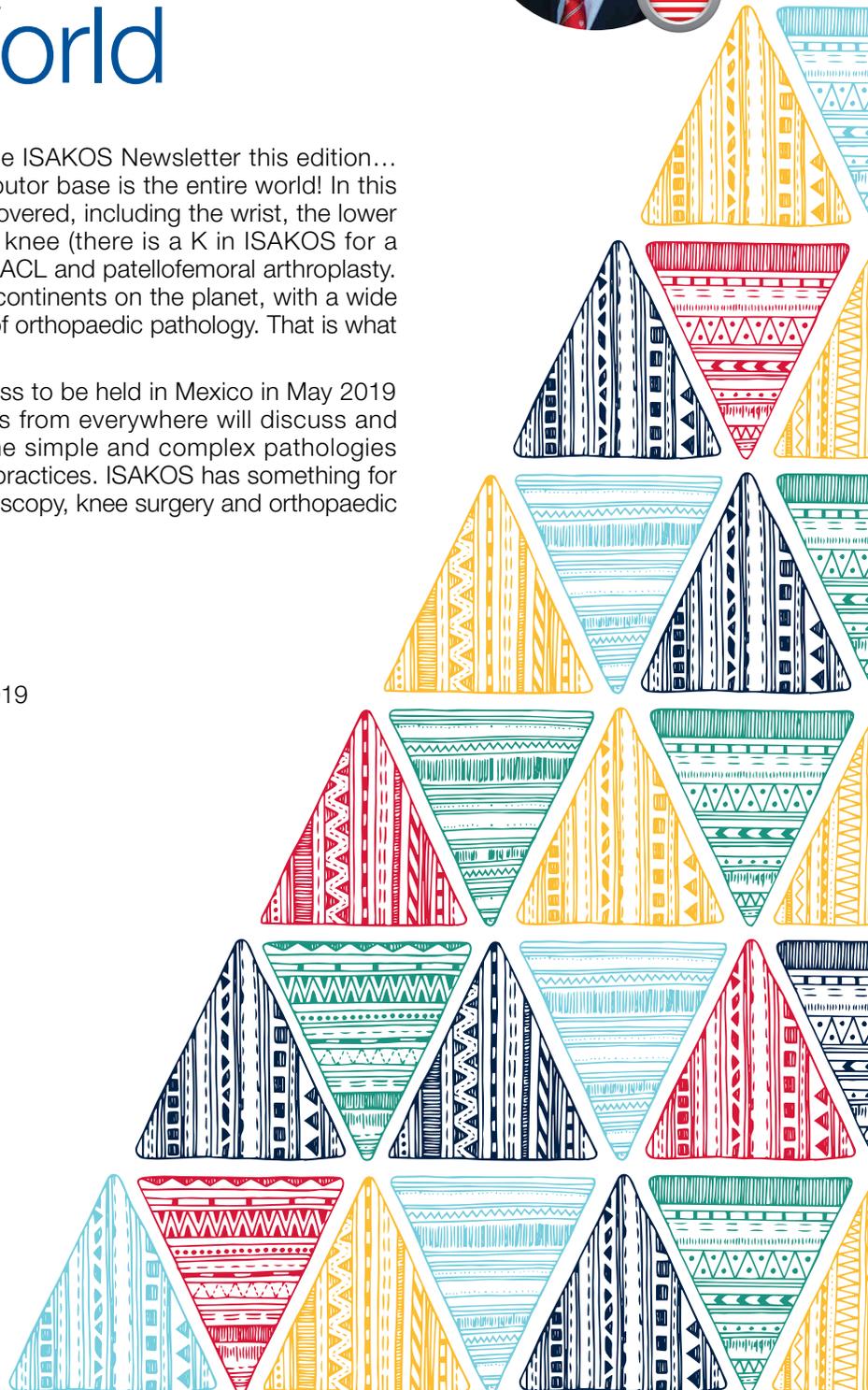
We have another great issue of the ISAKOS Newsletter this edition... and why wouldn't we? Our contributor base is the entire world! In this volume, we have the entire body covered, including the wrist, the lower leg, the ankle, and of course the knee (there is a K in ISAKOS for a good reason) with articles on both ACL and patellofemoral arthroplasty. Our contributing authors cover all continents on the planet, with a wide variety of perspectives for a range of orthopaedic pathology. That is what ISAKOS is all about.

If you find this exciting, the Congress to be held in Mexico in May 2019 will be the live-version. Presenters from everywhere will discuss and debate the best way to handle the simple and complex pathologies that we deal with every day in our practices. ISAKOS has something for everyone who is interested in arthroscopy, knee surgery and orthopaedic sports medicine.

I hope to see you there!

**Robert G. Marx, MD**

ISAKOS Newsletter Editor 2017–2019





## Greetings from ISAKOS

I am honored to write this editorial for the ISAKOS Newsletter, my second as ISAKOS President. It is truly an amazing, and humbling opportunity to follow in the footsteps of the past presidents, who helped form this society, and made it an international leader in Arthroscopy, Knee Surgery, and Orthopaedic Sports Medicine. Coming off the heels of the incredibly successful 11<sup>TH</sup> Biennial Congress in Shanghai, we have many exciting things happening in our society, and our newsletter.

First, Shiyi Chen and his colleagues in Shanghai, as well as Julian Feller and Stefano Zaffagnini should be congratulated on a tremendously successful Biennial Congress. Along with Michele Johnson, and her tremendous staff at the ISAKOS Office, the meeting really became one of the most successful meetings ever. The program was outstanding, and from a cultural and educational perspective, the meeting was unsurpassed.

Bob Marx, Editor of the ISAKOS Newsletter, and the Newsletter Committee have done a fantastic job making this newsletter a major benefit for our society and membership. The information, current concepts, and point-counterpoint are informative at the highest level. The content is first-rate. With each of the committees contributing to the newsletter, the content is of the utmost quality in content and information. The newsletter also provides important information on what is happening with the society and our meetings.

Now, I'd like to update you on what my plans are and where our society is going. Certainly, my aim is to continue the great work of my predecessors, including Philippe Neyret. This includes solidifying the interim meetings with our partner societies, off sequence from our Biennial Congress, as well as the surgical skills courses. This year we are collaborating with AOSSM to provide an International Perspective on Hip Arthroscopy in the Athlete. This course will be held in April at the Orthopaedic Learning Center in Chicago, Illinois. We will also be partnering with AOSSM on their Knee Preservation and Osteotomy course. We are also currently cultivating other partnerships for future courses and meetings—more information will be available on the ISAKOS website.

I am holding bi-monthly calls, alternating with the entire Board and just the executive committee. Also, a few committee chairs are invited each time to give an update on the progress of their committees. The committees should be commended for their outstanding work. David Parker and Jon Karlsson should also be recognized for their efforts acting as liaisons between the Board and committees. We also had an ad hoc committee, consisting of Roland Jakob, Per Renstrom, Barry Teitjens and Chris Harner, create and implement criteria for ISAKOS Honorary Membership.

There are many new things happening with ISAKOS, making these exciting times for our society. Global link is being reviewed in its entirety to determine the quality, breadth and scope of content—assuring only the highest quality content is available to our members. Luigi Pedrizini is leading the charge with all the committees and their chairs participating in the review of content. We believe Global Link is a very valuable benefit for our members; providing access to surgical technique videos/courses, as well as pertinent debates and symposia.

Beginning with Volume 3 of *JISAKOS*, we are now publishing original research to complement our traditional content of systematic reviews and state of the art manuscripts—which have traditionally provided us a way to share our unique world-wide perspective on all aspects of orthopaedic sports medicine and knee surgery. As a society of international leaders in our field, including original scientific research from around the world is something that only ISAKOS can do.

I encourage you to look at the January 2018 issue of *JISAKOS*, as there are five outstanding original research papers. If you are interested in submitting an article, please visit [jisakos.bmj.com](http://jisakos.bmj.com). We are all very excited about this new addition to *JISAKOS*, a natural maturation step for our journal.

C. Niek van Dijk, the *JISAKOS* Editor in Chief, and his team, including Leendert Blankevoort, the Managing Editor, are doing a fantastic job with our journal, in partnership with BMJ Publishing. Along with the guidance of the Journal Advisory Group (JAG), led by John Bartlett, the Journal is on a solid path to increased recognition and presence in a crowded orthopaedic journal space.

I encourage you, our members, to participate in our Society—through committees, as well as potentially serving as a reviewer for our Journal. Additionally, a new bar has been set for the Biennial Congress. Program Chair, Stefano Zaffagnini, and Deputy Chair, Volker Musahl, are aiming to surpass Shanghai with our next Congress in Cancun. Please reserve the dates in your schedule to attend the 12<sup>TH</sup> Biennial Congress in Cancun on May 12 – 16, 2019. Also, don't forget to submit your abstracts and apply for awards / fellowships at [isakos.com.com/2019congress](http://isakos.com.com/2019congress). There is a new Paolo Aglietti Knee Arthroplasty Award being offered, as well as expanded opportunities for research grants and scholarships. Visit the ISAKOS website to learn more about available opportunities and how you can participate or get more involved.

**Marc R. Safran, MD**

ISAKOS President, 2017–2019



12<sup>TH</sup> Biennial

**ISAKOS**  
**CONGRESS** 2019

Cancun, Mexico • May 12–16, 2019

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ABSTRACTS**

SUBMISSION DEADLINE  
SEPTEMBER 1, 2018

## From Rookie to Pro: *JISAKOS* Now Publishes Original Research!



C. Niek Van Dijk, MD, PhD  
Journal of ISAKOS Editor in Chief  
Amsterdam, NETHERLANDS

### Big News for 2018!

This year *JISAKOS* has come of age, and enters the main arena. For NASCAR fans amongst you, it is the year we cast off our rookie's yellow-stripe. As for baseball fans, please forgive me—I'm a Dutchman, and just don't understand how a rookie makes the grade. The calculation seems rather complicated.

But for journals, it is simple enough. A journal only reaches maturity when it publishes original research; and not just meta-studies, but bold new ideas and techniques. When it's confident enough to go out and compete with long-established journals, compete with them for the best new minds and the best new work. At *JISAKOS* we think we are ready for this, our next challenge. So this year we'll be publishing original research. And we invite you all to submit your manuscripts!

### Why Another Journal?

As you remember, it was a long-cherished dream for ISAKOS to have its own journal. But there was much soul-searching before we took the plunge. At the time I joked about the Duke of Edinburgh, by way of elucidation. Somebody brave once asked him why he'd married the Queen of England. His reply was cryptic, but it suggested volumes: "because she was there..."

The Duke might have waxed lyrical: "she is the world's most desirable bride, and her husband will inherit a thousand years of tradition and prestige (not to mention the money)". He could have been offhand: "well, somebody had to, and I was a Prince, so I was on the short-list". And he might have added, as was his style: "it's a damn difficult job, but it does need doing, and doing properly". All of these applied, and more.

We were not suggesting that the noble Duke did a SWOT analysis and a time-and-motion, before he proposed marriage. But we certainly did, before we launched *JISAKOS*. Most men dream of marrying royalty, after all, but there were pressing questions we needed to face.

Why launch another orthopaedic sports-medicine journal when the field was already crowded? What could we add that others had missed, and how could we establish ourselves? After all, every journal has its own mission statement and scope, and they all read much the same. I doubt that anybody would notice if they all got muddled and substituted, one for another.

The Duke of Edinburgh might have replied: "well, every successful association needs a journal, just as every man needs a well-fitting suit, and every Queen needs someone like me". That is, no professional society was complete without its journal, and ISAKOS was a truly global society — its 3000 members may cluster in North America and Europe and Asia, but really they are scattered around the world — and there has never been a truly global journal on this topic. But now there is, and it is called *JISAKOS*.

Then the second question: what could *JISAKOS* do that the others hadn't already accomplished? And how could we distinguish ourselves from all the other journals? After all, there were only so many good articles, and all the journals were competing for them, with an eye for their "impact-factors".

### Getting Started

We had some novel ideas, which helped us find our feet. We published a series of what we called *State-of-the-Art* articles, which together gives a broad survey of where we are now: our present state of diagnosis and treatment, the 'pros and cons' of various alternatives, and of future possibilities. From this we hope to predict how the field shall develop and, more importantly, where it might need to develop. We believe that *JISAKOS* can perform this task, because we alone have the global-reach. Each *State-of-the-Art* has three authors from around the world, to ensure a real breadth. By comparison, all other journals are parochial. They only reflect their particular part of the world, and their own experience or bias.

Our aim is to spread knowledge and research globally, and thereby improve our patients' quality of life (our ultimate task). Obviously we are there to guide our readers, but we also like to entertain them, and give them a deeper perspective. That is the idea behind our *Classic* articles, each of which is a "time capsule", and captures a moment in time, the moment when something important had been published. The idea is to put our present praxis into a historical perspective. To give a sense of how we have reached where we are, and just how far we have come. And perhaps, to teach us humility, because a *Classic* can also describe something that subsequently has become obsolete, however "cutting-edge" at the time.

One of our vanities of science is that we view the past with a sense of superiority. We tend to believe that we finally solved the big problems thanks to our own brilliance, and that the future will only need to tweak things here and there.

The ancient Romans cured this arrogance, by having slaves behind them in their triumphal chariots, whispering in their ears “remember, remember, you are also mortal!” And for us, *JISAKOS* would serve the same purpose, through its *Classic* articles.

### Something Different

Being the “new kid on the block” did give us some advantages. We were the first “digitally-born” orthopaedic sports medicine journal, designed for a faster moving world, where immediate access was becoming the norm. Other journals have had to adapt themselves to this new world, often with reluctance. But we were born into it. We were mobile-friendly. Our articles were published online, as soon as they were finalized. Our Journal had all the sophistication of the media-savvy younger generation. Of course we still provided bi-monthly paper-copies, which *ISAKOS* members can bind in rich leather, and gaze at lovingly during their retirement. But we had started fast-moving, and we aim to keep up the pace.

This idea of *pace* is important, because clinical developments in orthopaedic sports-medicine have accelerated in recent years. *JISAKOS* has to keep its readers abreast of the latest research and evidence-based guidelines. It also has to explore the different approaches to diagnosis and treatment, to rehabilitation and prevention, to follow-up and the sequelae of injuries. We have to explain how patients respond to treatments, and how findings can translate into practical applications. In all this, our members should be able to identify themselves with their journal: “this is what my society has selected, as important for me to study, in my scarce and valuable time”.

Healthcare is rapidly changing. As healthcare providers we have to face that challenge, and change with it. Better than that, we ought to take the lead. We should encourage prevention, and endorse patient-power. “Why do it?” is becoming as important as “How to do it”. Patient selection in surgery decision-making is one of the themes in our *State-of-the-Art* articles. Clarity of indication might enable us to ‘do the right thing’, and avoid unnecessary surgery. But then there is ‘doing the right thing right’. Can we ensure quality-of-care just by following guidelines? If so, who gets to decide what counts as “quality”, and who should be setting those guidelines? Should it be governments, or insurance companies, or healthcare providers like us, or the patients themselves, through PROMS (Patient Reported Outcome Measures)?

And then there is *Patient Safety*. Is the ultimate solution a black-box in every Operating Room? Or is volume the decisive factor? But then, how many procedures create a good surgeon?

One of our global problems is the inexorable rise of healthcare costs. Growing populations and new technologies play their part, but also a widening of indications. The regional differences are otherwise difficult to explain. In the last 10 years, for example, the total health expenditure has more than doubled in all European countries. If we don’t make these choices ourselves, the choices will be made for us.

### Human All Too Human

We surgeons work with our hands, but we also pride ourselves on being “scientific”, and following something called the “scientific method”. We firmly believe that this is how “good” science and good technology is achieved (and “bad” science is thwarted). What this boils down to is that articles must be peer-reviewed, before they can be published. That is, everything has to be passed – as well-researched and well-argued, hence probably correct – by influential and experienced people. These peer-reviewers have an important task, so they need to be neutral.

But what if they are subtly influenced by other motives? What if they are really thinking: “I don’t agree with this, because it is unfashionable”, or even “it goes against my own ideas, and it will threaten my own reputation, if it turns out to be correct”, or “there is simply no money in this approach, the funding is all for the other side”.

We may not know much about the philosophy-of-science, but we do know that people are always people (*“Human, all too human”*, as Nietzsche puts it). And that the system we employ might actually be delaying good ideas, unorthodox ideas – even suppressing them completely – and simply because they are unfashionable.

We can observe the power of orthodoxy and money, when it comes to Climate Science. Whatever your personal opinion about Anthropogenic Global Warming (AGW), you would have to admit that, when scientists start fiddling the figures, and trying to suppress the unorthodox by bullying, there is likely to be something wrong.

That’s why our systematic reviews followed PRISMA guidelines, and why we chose our *JISAKOS* reviewers with such care. We deliberately chose them to welcome the unorthodox (you can find their names on the journal website). I am sure you will agree that a journal that deliberately dares to be unorthodox – and dares to give youngsters their chance that this journal might just have the advantage...

### Our Compass

On the cover of *JISAKOS* there is a dial, which suggests our global reach. But to me it also suggested a compass. I was born a Dutchman, a mariner from a maritime nation, and my ancestors had sailed around the world. I know the importance of a compass, as a guide through uncertainty, as a guide to safe anchorage.

## From Rookie to Pro: JISAKOS Now Publishes Original Research!

That is how I think of ISAKOS, as a voyage into the unknown, with *JISAKOS* as its compass, and also its record.

And I was fortunate with my excellent crew; an editorial board of field-leaders, Leendert Blankevoort as managing editor, and BMJ as diligent publisher.

When we launched, we had more questions than answers. I was hoping that *JISAKOS* would gradually come to guide the discussion, and come up with some solutions. And apart from our scientific content, that we could also become a platform for ethics and the credibility of research. Everything was before us.

### And so, to the Present...

After two years, it is worth considering how *JISAKOS* has fared. So far, in 2017 alone we published authors from 17 countries and we had more than 100 citations from other scholarly journals; our users have increased by 32% (from 33,745 in 2016 to 44,418 in 2017); and our page-views by 20% (from 104,414/annum to 123,876); whilst Twitter and Facebook demonstrate our global presence, with followers in more than 45 countries, and more than 2,000 impressions a day. That's quite impressive, for the new kid on the block!

But now we are soliciting original research, and we expect a rapid increase in submissions. To cope with this, we expanded the editorial board. All this is exciting, and just a little bit daunting...

So, I would ask you all to submit manuscripts. Help us make *JISAKOS* a great journal, something that is regarded as essential reading for orthopaedic surgeons, not just in the US or Europe or Asia, but around the world.

Now wouldn't that be fine!

## ISAKOS Young Investigator's Scholarship and Research Mentoring Program

The Young Investigator's Program was developed by the ISAKOS Scientific Committee as a mentor-mentee program for young investigators from developing countries with limited access to research resources.

The program seeks to assist young surgeons advance research by awarding a Fellowship at an ISAKOS recognized research facility and funding high-impact projects in the applicants' countries.



### The ISAKOS Young Investigator's Program is a two part program:

**Part I:** Twenty scholarship recipients will receive a \$1,500US stipend to support travel and participation at the ISAKOS Congress in Cancun, Mexico. Registration fees for the Congress will also be waived. Awardees will attend a research symposium where four finalists will present their research.

**Part II:** The four finalists will be interviewed by the ISAKOS Scientific Committee—two winners will be selected. Each winner will receive a \$10,000US stipend to complete a research project along with the guidance of a research mentor (determined by the researcher and ISAKOS Scientific Committee). Research must be completed within the assigned term, and regular reports will be required as research progresses.

Application Deadline: **September 1, 2018**

For application requirements, visit [isakos.com/Awards/YoungInvestigator](http://isakos.com/Awards/YoungInvestigator)

# AOSSM

## Surgical Skills Courses

OLC, Rosemont, IL

## AOSSM & ISAKOS Hip Arthroscopy Course

### The Hip in the Athlete – An International Perspective

April 13–14, 2018  
OLC, Rosemont, IL

Gain an international perspective on hip injury treatment and management in a small course setting with faculty from both AOSSM and ISAKOS! Attendees engage in a mix of classroom and hands-on surgical skills lab learning that will highlight best practices and useful tips to get your hip patients of all ages back in the game.

#### Who Should Attend?

- Practicing orthopaedic surgeons with a desire to learn or reinforce their knowledge in surgical skills pertaining to the athlete's hip
- Individuals with basic to intermediate hip arthroscopic skills
- Orthopaedic surgeons with an interest in expanding their practice into the field of athletic hip management and surgical intervention

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Early bird prices end March 13, 2018



The American Orthopaedic  
Society for Sports Medicine®





## Special Thanks & Recognition to Shiyi Chen, MD, PhD and the Chinese Organizing Committee

The 11<sup>TH</sup> ISAKOS Biennial Congress was successfully held at the Shanghai Convention & Exhibition Center of International Sourcing in China on June 4–8, 2017. It was ISAKOS’ most successful Congress to date, and couldn’t have been pulled off without the help of the local Chinese Organizing Committee. Professor Shiyi Chen, and his team, deserve a special thank you for their help in making the 11<sup>TH</sup> Biennial Congress come to life!

### Shiyi Chen, MD, PhD

Co-Chair of the 14th IFOSMA & CAOS Summit Forum on Bone Joint & Sports Injury

Chinese Organizing Committee, 2017 ISAKOS Congress in Shanghai



01



02

During the opening ceremony on June 4, the 2015–2017 ISAKOS President, Dr. Philippe Neyret, gave recognition to the local host, Professor Shiyi Chen and his extraordinary team—for their collaboration, partnership and the achievements of Chinese sports medicine. The local Chinese Organizing Committee assisted with numerous Congress specifications, from facilities and hotels to transportation. Professor Shiyi Chen then gave a lecture titled “Chinese Sports Medicine: Past, Present and Future”, in which the history, development and progress of Chinese sports medicine were described in detail.



03



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Professor Chen was also Co-Chair of the 14th International Forum of Orthopaedic Sports Medicine and Arthroscopy Surgery (IFOSMA) and Chinese Association of Orthopaedic Surgeons (CAOS) Summit Forum on Bone Joint and Sports Injury. The Forum was held successfully on June 3–6, 2017, as a satellite conference to the ISAKOS Congress. The 2017 Forum was sponsored collaboratively by ISAKOS, COA, CAOS and CSSM. More than 1,600 Chinese orthopaedic sports medicine surgeons took part in the Forum, and 134 abstracts were accepted as papers. IFOSMA has been recognized as an ISAKOS Approved Course for almost ten years. For the past 14 years, it has been serving as a window for the international exchange of Chinese sports medicine knowledge. IFOSMA has become a very important event for Chinese sports medicine surgeons and is a significant platform for doctors and scholars in China—to help them pursue a more advanced and international exchange of knowledge.



06

To help welcome guests from all over the world, and to showcase the rich and vibrant Chinese culture, Professor Shiyi Chen organized the “11<sup>th</sup> ISAKOS Biennial Congress—Chinese Friends’ Night” at the Guoman hotel on June 4. The event also celebrated the 110<sup>th</sup> Anniversary of Huashan Hospital, Fudan University. There were approximately 150 international leaders, and more than 100 local experts in attendance at the banquet. Professor Shiyi Chen gave a warm welcome and sincerely thanked everyone for their support.



05



06



07

- 01 ISAKOS President, Dr. Philippe Neyret, presenting the welcome speech in the opening ceremony
- 02 Professor Shiyi Chen, giving his lecture “Chinese Sports Medicine: Past, Present and Future” during the opening ceremony.
- 03 11<sup>th</sup> Biennial Congress Opening Ceremony
- 04 Professor Jiwu Chen performing a live surgical demonstration
- 05 Dr. Philippe Neyret recognized Professor Shiyi Chen for his collaboration and partnership with ISAKOS
- 06 Outstanding Contribution Award, Exceptional Contribution Award and Magnolia Award recipients
- 07 Performances rich with local Chinese customs and culture



08

An award ceremony was held for those who have greatly contributed to the development of Chinese Sports Medicine. The “Outstanding Contribution Award” and “Exceptional Contribution Award” were awarded to Freddie Fu and KM Chan. The “Chinese Sports Medicine Magnolia Award” was presented to; Bruce Reider, Gary Poehling, John Bergfeld, Ned Amendola, Savio L-Y Woo, Philippe Neyret, Masahiro Kurosaka, Patrick SH Yung, Robert Smigielski, and ISAKOS Executive Director, Michele Johnson. To cap off the evening, a grand celebration ensued—performances rich with local customs and culture—giving the international guests a taste of Shanghai, China.

The ISAKOS Family would sincerely like to thank Professor Shiyi Chen, the local Chinese Organizing Committee, and all the participants, faculty, exhibitors and guests who attended the 2017 ISAKOS Congress. The ISAKOS Congress provided a unique opportunity for attendees to share, discuss and learn the latest advancements in arthroscopy, knee surgery and orthopaedic sports medicine—and because of everyone’s support and collaboration, it was truly a success!



09



09

## THANK YOU TO THE LOCAL ORGANIZING COMMITTEE!

### CSSM

Gouping LI, MD  
Yingfang Ao, MD  
Shiyi Chen, MD, PhD  
Manyi Wang, MD

### COA

Guixing Qiu, MD  
Yingze Zhang, MD  
Wei Tian, MD  
Kunzhen Wang, MD  
Peifu Tang, MD

### CAOS

Yan Wang, MD

### SMA

Jianguang Xu, MD  
Fudan University:  
Chouwen Zu, MD  
Xiaohui Liu, MS  
Huashan Hospital:  
Qian Ding, MD  
Ying Mao, MD  
Jianhua Shao, MD  
Dekun Guan, MD

### FUSM

Jiwu Chen, MD  
Hongyun Li, MD  
Jiarui Chen, MD

### Shanghai Government for Tourism Administration

Ping Chen

### Others

KM Chan, MD (HK)  
Patrick Yung, MD (HK)  
Yi-Sheng Chan, MD  
(Taiwan)  
Waisean Chan, MD  
(Macao)

12<sup>TH</sup> Biennial

# ISAKOS CONGRESS 2019

Cancun, Mexico • May 12–16, 2019

## 6 MEETING DAYS

- Pre-Courses on Saturday, May 11, 2019
- Sports Rehabilitation Concurrent Course
- 300+ Scientific Papers
- Panel Discussions and Debates
- Symposia
- Lunch Time Lectures and Workshops
- Surgical Demonstrations
- Instructional Course Lectures
- ePoster Presentations
- Technical Exhibits
- CME Certification
- Spouse and Guest Program
- Welcome Reception

## CME CERTIFICATION

The 12<sup>TH</sup> Biennial ISAKOS Congress will be planned and implemented in accordance with the essential areas and policies of the Accreditation Council for Continuing Medical Education (ACCME) through joint sponsorship.

## AWARDS AND FELLOWSHIPS

- John J. Joyce Award
- Richard B. Caspari Award
- Jan I. Gillquist Scientific Research Award
- Albert Trillat Young Investigator's Award
- **New!** Paolo Aglietti Award
- Achilles Orthopaedic Sports Medicine Research Award
- Patellofemoral Research Excellence Award
- Gary G. Poehling Award
- The Patellofemoral Traveling Fellowship
- **New!** The ISAKOS Global Traveling Fellowship
- Young Investigator's Scholarship & Research Mentoring Program

## CALL FOR ABSTRACTS

ISAKOS is pleased to announce the Call for Abstracts for the 2019 Congress  
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## ABSTRACT SUBMISSION DEADLINE

September 1, 2018

APPLY ONLINE  
FOR AWARDS  
& FELLOWSHIPS



#ISAKOS2019





## ¡BIENVENIDO!

We cordially invite you to the 12<sup>TH</sup> Biennial ISAKOS Congress in Cancun, Mexico. The ISAKOS Congress continues to be considered the premier international meeting, providing a unique opportunity for attendees to share, discuss and learn the latest advancements in arthroscopy, knee surgery and sports medicine.

The five-day ISAKOS Congress includes a myriad of educational opportunities. The meeting provides a variety of new and cutting edge surgical techniques and approaches to clinical management, combined with overviews of current controversies in orthopaedic practice.

We hope you will plan to participate in the international experience that is the ISAKOS Congress!



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**ABSTRACT SUBMISSION DEADLINE  
 SEPTEMBER 1, 2018**

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# APPLY FOR AWARDS AND FELLOWSHIPS!

## AWARDS

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- John J. Joyce Award
- Richard B. Caspari Award
- Jan I. Gillquist Scientific Research Award
- Gary G. Poehling Award
- Albert Trillat Young Investigator's Award
- Achilles Orthopaedic Sports Medicine Research Award
- Paolo Aglietti Award – **New!**
- Patellofemoral Research Excellence Award

## AWARDS



### John J. Joyce Award

In 1981, Dr. John J. Joyce, III, offered a monetary prize for the best arthroscopy paper read by an orthopaedic surgery resident or fellow during the Scientific Program of the 4th Congress of the International Arthroscopy Association in Rio de Janeiro. With characteristic generosity, he endowed a prize to be awarded at every IAA Congress thereafter. John Joyce created the award with the intention to stimulate and reward younger members who contribute high-quality data and presentations.



### Richard B. Caspari Award

Beginning at the 2003 ISAKOS Congress in Auckland, New Zealand, a monetary prize in honor of Richard B. Caspari was awarded to the best upper extremity paper read at the scientific program of the Congress. The Richard B. Caspari award was established with the intention of stimulating and rewarding upper extremity focused abstracts and presentations.

## FELLOWSHIPS

[isakos.com/fellowships](http://isakos.com/fellowships)

- Patellofemoral Traveling Fellowship
- ISAKOS Global Traveling Fellowship – **New!**
- Young Investigator's Scholarship & Research Mentoring Program



### Jan I. Gillquist Scientific Research Award

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Beginning at the 2007 ISAKOS Congress in Florence, Italy, a monetary prize was awarded to the best scientific paper presented during the scientific program of the Congress. ISAKOS will remember Jan Gillquist with a Research Award, created with the intention to stimulate and reward abstracts and presentations in the subject of Scientific Research.



### Gary G. Poehling Award

Former ISAKOS President, Gary G. Poehling, is an innovator, teacher and leader in the field of Arthroscopy-specializing in the elbow, wrist and hand. Beginning at the 2017 ISAKOS Congress in Shanghai, China, a monetary prize in honor of Dr. Poehling is to be awarded to the best Elbow, Wrist and Hand paper read during the scientific program of the ISAKOS Congress.



### **Albert Trillat Young Investigator's Award**

In 1989, The International Society of the Knee established a Young Investigator's Research Award in memory of Professor Albert Trillat. Past President and founder of the International Society of the Knee, this award provides recognition for a young researcher who has done outstanding clinical laboratory research contributing to the understanding, care or prevention of injuries to the knee.

### **Achilles Orthopaedic Sports Medicine Research Award**

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The Achilles Orthopaedic Sports Medicine Research Award was created in 1995 to recognize researchers who have done outstanding clinical or laboratory research in the field of sports medicine, such as the care and prevention of injuries. A panel composed of members of the ISAKOS Orthopaedic Sports Medicine Committee reviews the award applications and the winning manuscript is presented at the ISAKOS Biennial Congress.



### **New! Paolo Aglietti Award**

The Aglietti Award provides recognition for outstanding research contributing to the understanding of Knee Arthroplasty. This award is in recognition of Professor Aglietti's numerous contributions to knee surgery as a prolific researcher, teacher and surgeon. Professor Aglietti served as Chairman of the ISAKOS Knee Committee and was ISAKOS President from 2007 – 2009. The 12<sup>TH</sup> Biennial ISAKOS Congress will be the first time the Aglietti Award will be presented.

### **Patellofemoral Research Excellence Award**

*SPONSORED BY THE PATELLOFEMORAL FOUNDATION & ISAKOS*

The Patellofemoral Research Excellence Award was established in 2005 to encourage outstanding research leading to improved understanding, prevention and treatment of patellofemoral pain or instability. A panel composed of representatives from the ISAKOS Knee and Scientific Committees, The International PF Study Group and The Patellofemoral Foundation review the award applications and the winning manuscript is presented at the ISAKOS Biennial Congress.

## **FELLOWSHIPS**

### **Patellofemoral Traveling Fellowships**

*SPONSORED BY THE PATELLOFEMORAL FOUNDATION & ISAKOS*

This travel award was developed to promote better understanding and communication regarding patellofemoral pain. This opportunity is awarded on a competitive basis to an orthopaedic surgeon interested in the study and advancement of understanding of the patellofemoral joint. Preference is given to those who have established an academic record of accomplishment. The Patellofemoral Foundation and ISAKOS will provide a stipend to permit visits to several centers, worldwide, that offer opportunities to learn about the complexities of patellofemoral pain. The fellows will write a report of the experience, which will be published in a future ISAKOS Newsletter.

### **New! ISAKOS Global Traveling Fellowship**

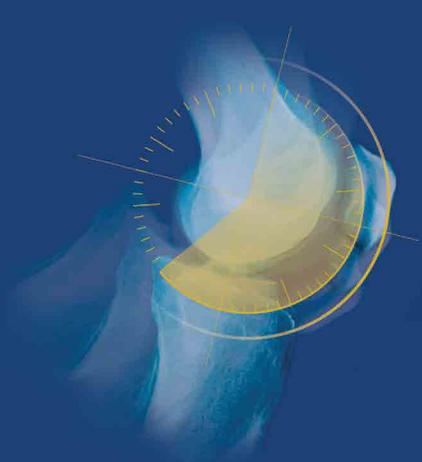
The ISAKOS Global Traveling Fellowship is a new initiative from ISAKOS to foster the international exchange of knowledge and skills in the field of sports orthopaedic surgery. The Fellowship is coordinated by the Traveling Fellowship Committee and the ISAKOS office. It will provide the opportunity for four orthopaedic surgeons under the age of 45 to travel with a godfather to the godfather's geographic region. They will visit up to six medical centers over 14 to 16 days, before attending the ISAKOS Biennial Congress.

### **ISAKOS Young Investigator's Scholarship and Research Mentoring Program**

The ISAKOS Young Investigator's Scholarship and Research Mentoring Program was developed by the ISAKOS Scientific Committee as a mentor-mentee program for young investigators from developing countries with limited access to research resources. The Young Investigator Program seeks to assist young surgeons advance research by awarding a Fellowship at an ISAKOS recognized research facility and funding high-impact projects in the applicants' countries.

# JOURNAL OF ISAKOS

Joint Disorders & Orthopaedic Sports Medicine



An Official Publication of the  
International Society of Arthroscopy,  
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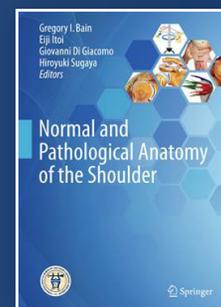
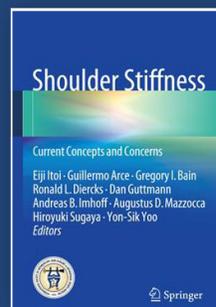
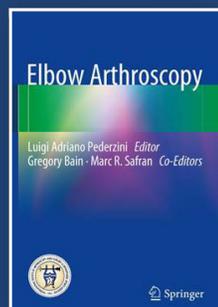
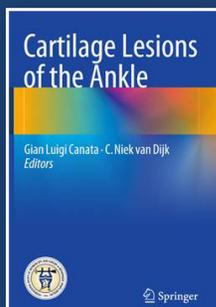
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**Allen F. Anderson, MD**  
Tennessee, UNITED STATES  
1949–2017

Born on November 16, 1949, Allen Anderson was a graduate of the University of Tennessee College of Medicine. He completed a residency in orthopaedics at Vanderbilt University and was board certified by the American Board of Orthopaedic Surgery in general orthopaedics with a certificate of added qualification for Sports Medicine. He was a sports medicine specialist with an interest in knee injury and ligament reconstruction. He published more than 100 scientific manuscripts in peer review journals and 26 book chapters. Anderson received a patent for the invention of a pediatric ACL reconstruction system. He received numerous awards and was recognized as: America's Top Physicians 2004–2012 from Consumer's Research Council, Elected to Best Doctors in America by peers 2007–2008, Nashville Business Journal Top Doctor 2016–2017.

Anderson was an active ISAKOS Member since 1994 and served on many ISAKOS Committees since 1999. At the time of his passing, he was a Member at Large for the ISAKOS Board of Directors. He also previously served as President of the American Orthopaedic Society for Sports Medicine (AOSSM) and as the Associate Editor of the Orthopaedic Journal of Sports Medicine and The American Journal of Sports Medicine.

His greatest joy was spending time with his beloved wife, Candy, and their three sons; Brian, David and Chris. He leaves behind 5 grandchildren: Evie, Ben, Eleanor, Caroline, and Francis Allen.

Allen Anderson will be greatly missed by all. Our thoughts and prayers are with Candy and the entire Anderson family.

## NEW FOR 2019!

### ISAKOS IS PLEASED TO ANNOUNCE **TWO NEW AWARDS** FOR THE **12<sup>TH</sup> BIENNIAL** ISAKOS CONGRESS



#### **Paolo Aglietti Award**

ISAKOS is pleased to announce the Paolo Aglietti Award for Knee Arthroplasty. This award is in recognition of Professor Aglietti's numerous contributions to knee surgery as a prolific researcher, teacher and surgeon. Professor Aglietti served as Chairman of the ISAKOS Knee Committee and was ISAKOS President from 2007–2009.



#### **ISAKOS Global Traveling Fellowship**

The ISAKOS Global traveling Fellowship is a new initiative from ISAKOS to foster the international exchange of knowledge and skills in the field of sports orthopaedic surgery. Fellows will have the opportunity to observe sports orthopaedic surgeries performed by highly respected surgeons, to discuss not only the surgical procedures but all aspects of patient management, and to discuss and share research experience.

## Radiocapitellar Arthritis



Kilian Wegmann, MD, PhD  
Cologne, GERMANY



Lars Peter Müller, Prof.  
GERMANY



Gregory Ian Bain, MBBS,  
FRACS, PhD  
AUSTRALIA

### Introduction

Arthritis of the elbow can be a debilitating pathology. This condition can present idiopathically or as secondary degenerative changes. Secondary arthritis often develops after trauma—for example, when fractures or other injuries result in incongruity or regional defects in the articular surfaces. The most common type of fracture around the elbow, with an annual incidence of as high as 2.8 per 10,000, is a fracture of the radial head. Hence, secondary arthritis of the radial head and the capitellum are common sequelae. Radiohumeral arthritis is also found in individuals who perform strenuous manual labor. Patients often complain about painful crepitus during rotation of the forearm, night pain, and pain after rest. Radial-sided pain can be induced by forceful muscle contraction of the forearm, which compresses the radiocapitellar joint. Often, these patients are young, active males with manual occupations.

### Assessment

Clinical investigation will show pain on compression of the radiocapitellar joint space. The osteochondral shear test, also known as the active radiocapitellar compression test, will be positive. This test is performed by applying compression while pronating and supinating the extended forearm. Radiographs and CT scans will show fraying of the joint surfaces. Depending on the level of progression, subchondral cysts and osteophytes may be seen.

MRI might reveal subchondral edema and/or intra-articular effusion. In all cases, the examiner has to pay attention not to overlook signs of joint laxity or instability, which may be present as well.

### Treatment

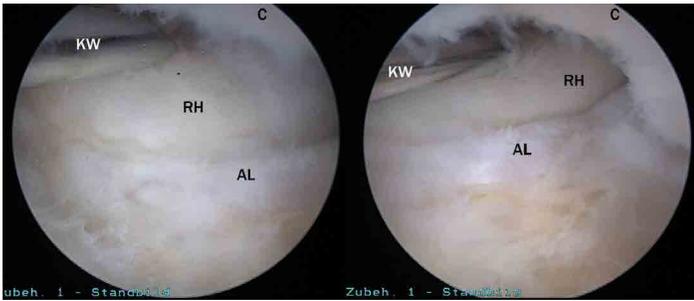
Therapeutic options are limited in cases of symptomatic radiohumeral arthritis. Frequently, rest and pain-relief measures provide only a temporary effect. The use of NSAIDs has a long-standing tradition in the treatment of arthritic pain. Possible adverse events such as interactions with aspirin, upper GI bleeding, and nephrotoxicity are well known, somewhat limiting their potential for long-term pain reduction. Cortisone injections do not result in substantial long-term improvement for arthritic joints. Platelet-rich plasma (PRP) has been demonstrated to not provide a reproducible benefit when used for the treatment of joint abnormalities. Physiotherapy may enable the patient to maintain motion and strength.

### Arthroscopy

As the least-invasive operative treatment available, arthroscopy is often performed to debride chondral flaps, osteophytes, loose bodies, and synovitis. Moreover, arthroscopy can be used to perform microfracture surgery. We commonly use the 4.0-mm scope in the high posterolateral portal, looking down on the radial head and into the radiocapitellar joint to visualize the pathology. Instruments are brought into the joint through the soft spot portal, slightly above the radial head. From there, the debridement can be performed and the state of degeneration of the joint can be determined. Stability testing also can be performed by investigating the congruency of the radiocapitellar, radioulnar, and humeroulnar joints. Microfracture of the radial head and capitellum is done either via the soft spot or through additional percutaneous portals. Bringing in the camera through the anteromedial portal and using the anterolateral portal for instrumentation allows a thorough investigation of the ventral aspect of the radiocapitellar joint. Chondral flaps and osteophytes can be debrided from there.

If localized, significant chondral defects are present, microfracture is an established means of treatment. The goal of microfracture is to open the subchondral bone in order to allow mesenchymal stem cells to reach the chondral surface, fill the void, and generate new chondral tissue (fibrocartilage) that can assist in taking part of the articular load. To create the holes in the subchondral bone, we use 1.4 to 1.6-mm K-wires, which are introduced in an oscillating mode. A major task is to reach the articular surface with the drilling device in the correct angle. A flat angle can result in sliding of the K-wire, leading to “keying” of the surface (Fig. 1).

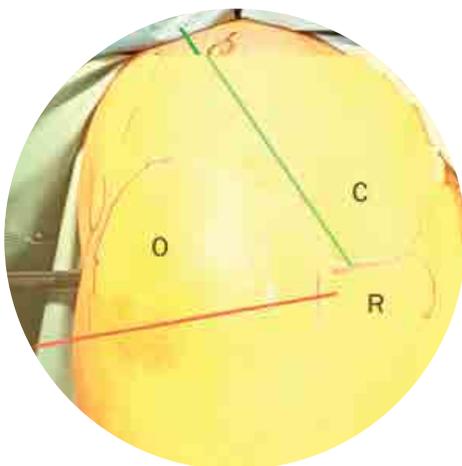
**Radiocapitellar Arthritis**



01

We therefore do not recommend using the low posterolateral portal for the introduction of the perforating device; instead, we recommend using a higher and more laterally placed percutaneous portal (Figs. 2 and 3). To find the correct portal position, we use a needle and aim for the steepest angle to the target articular surface. We recommend using the oscillating drill mode as it produces less heat compared with standard drilling.

After the drill has perforated the subchondral bone, the wire is withdrawn. To document extrusion of bone marrow fat into joint cavity, it is helpful to reduce pump pressure or to apply suction (Fig. 4). We make the holes 4 to 5 mm apart. Any loose debris will be removed with a shaver. This usually creates a clot over the defect, which evolves into fibrocartilage over a period of 1–2 months. During aftercare, free range of motion is allowed to prevent stiffness, but loading should be avoided for 6–8 weeks.



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An alternative method is to use an angled arthroscopic pick, which was designed for ankle arthroscopy (Arthrex). As it is angled, it can be positioned with greater precision, and, as it does not require power, it avoids the concerns regarding heat generation.

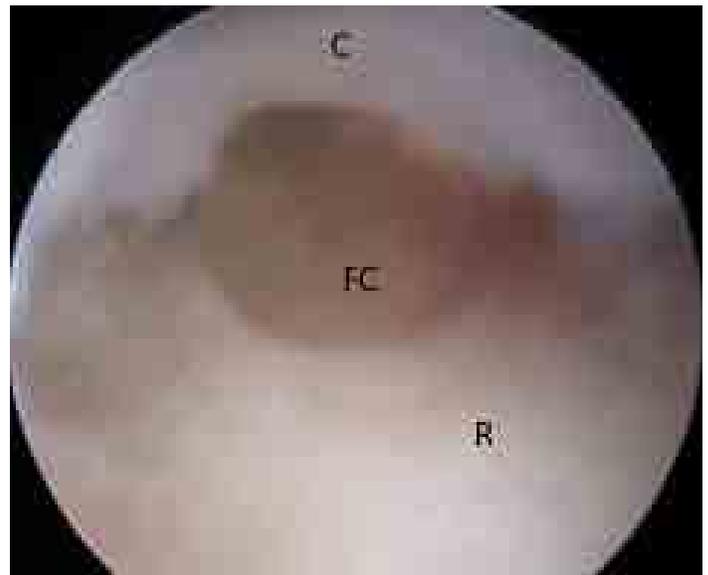


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**Open Debridement**

Open debridement procedures can also be performed, but at the cost of more intensive soft-tissue dissection. If radiohumeral arthritis continues to be symptomatic, radial head resection may be required. However, resection of the radial head removes a critical stabilizer against valgus and longitudinal forces and should be avoided in the athlete, other than as a last resort. Potential complications of resection include medial instability with valgus deformity and changes to the radioulnar variance with proximalization of the radius.

As an alternative, resection interposition arthroplasty has been advocated, but that procedure is based on strict patient selection as instability is a contraindication. If there is associated elbow instability, then prosthetic arthroplasty should be performed. However, prosthetic replacement is associated with specific problems.



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For example, the bone-cement-implant interfaces can become loose during functional activities. Moreover, there is concern regarding the loading of the articular cartilage of the capitellum by the prosthetic components. Also, the fitting accuracy of radial head prostheses has not yet achieved a high level. These considerations render radial head replacement as a backup treatment option, especially in the scenario of arthritic changes. If erosion of the capitellum is present, implantation of a radial head replacement often leads to a painful joint. In such cases, radiocapitellar joint replacement has been advocated. Given the anatomical conditions at the capitellum, stable fixation of a prosthesis is difficult, and early loosening with unfavorable outcome has been reported.

An alternative surgical option for radiohumeral arthritis is a shortening osteotomy of the proximal part of the radius. Biomechanical testing has shown reduction of the contact pressure at the radiohumeral joint, without loss of valgus stability, following shortening of the proximal radius by 2.5 mm<sup>5</sup>. In addition, we observed promising results in a small unpublished series of 5 strictly selected patients with ongoing pain due to arthritis of the radiohumeral joint. However, these results need to be verified in a larger series.

As symptomatic radiohumeral arthritis is a demanding condition to treat, especially in young, active patients, other treatment alternatives that avoid the need for resection and arthroplasty need to be identified.

### Conclusion

Radiohumeral arthritis is a common and challenging entity. The surgeon is confronted with high-demand patients and a limited armamentarium of treatment options. Long-term results of prosthetic replacement at the elbow are limited by the bone stock and the complex anatomy. Hence, preserving the joint should be the goal of treatment. Shortening osteotomy of the radius may be an option to gain time for the patient.

- 01 Arthroscopic views showing the introduction of a K-wire (KW) at a flat angle (left), leading to sliding and keying of the articular surface (right). RH = radial head, AL = annular ligament, C = capitellum
- 02 Photograph showing potential portals for microfracture of the dorsal segment of the radial head. Bringing the K-wire in through the low posterolateral portal (red line) creates a flatter angle, compared with a higher and more laterally placed portal (green line). R = radial head, C = capitellum, O = olecranon.
- 03 Arthroscopic view showing the correct entry of the K-wire into the radial head at the defect without sliding. KW = K-wire, RH = radial head, AL = annular ligament, C = capitellum.
- 04 Arthroscopic view showing extrusion of a large bubble of fat cells (FC) from the bone marrow. R = radial head, C = capitellum.

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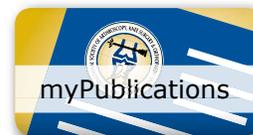
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## Patellofemoral Replacement



Spike Erasmus, MD  
Kneeclinic Stellenbosch  
SOUTH AFRICA



Daniel C. Wascher, MD  
Professor of Orthopedic Surgery  
University of New Mexico  
UNITED STATES

### Introduction

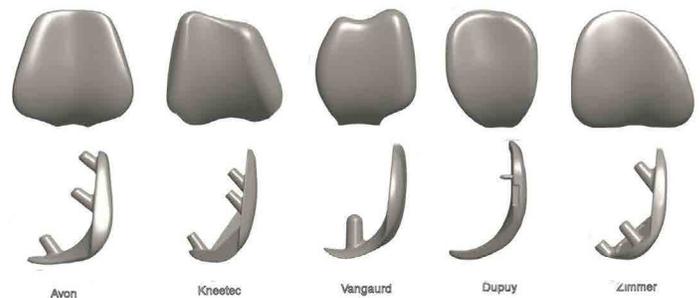
Isolated patellofemoral degeneration is a common problem in patients over 55 years of age and has been reported to affect 2% – 11% of males and 8% – 24% of females. The cause of isolated patellofemoral degeneration is multifactorial. The most common cause is degeneration secondary to abnormal patellofemoral biomechanics caused by factors such as trochlear dysplasia, patella alta, increased tibial tuberosity-trochlear groove (TT-TG) distance, and rotational abnormalities. This condition results in chronic overload of the articular cartilage and eventual degeneration. Other causes include post-traumatic arthritis (resulting from patellar fractures or articular cartilage injuries) or chronic repetitive overload (resulting from non-physiological exercises such as squats, box jumps, etc.). When treating this condition, it is important to identify the cause as this factor has an effect on the preferred treatment options.

### Treatment

Treatment of patellofemoral degeneration can be divided into non-surgical and surgical treatments. Non-surgical treatment consists of quadriceps and gluteal muscle strengthening, activity modification (avoiding stairs, squats, etc.), and symptomatic treatment with non-steroidal anti-inflammatory medications. Surgical treatment involves either a joint-preserving procedure or an arthroplasty.

When joint preservation is an option, symptoms can be relieved by improving patellar tracking with use of procedures such as tibial tubercle transfer, medial patellofemoral ligament (MPFL) reconstruction, and lateral retinacular release. The tibial tubercle can be moved medially, distally, and anteriorly, depending on the area of degeneration in the patellofemoral joint. Anteriorization of the tibial tubercle can decrease joint-reaction forces on the patella. A lateral patellar facetectomy can remove the area of the patella that is frequently most affected.

Arthroplasty options include total knee replacement (TKR) and patellofemoral replacement (PFR). Several authors have reported excellent results following TKR for the treatment of isolated patellofemoral degeneration. However, TKR needlessly removes the normal tibiofemoral articulation, which may impair proprioception and functional activities. Additionally, the recovery period is longer and the morbidity rate is higher in association with TKR. Finally, if needed, revision TKR presents greater challenges, especially in terms of bone loss. Therefore, in our opinion, PFR is preferable to TKR for the treatment of a knee with advanced patellofemoral degeneration and a well-preserved tibiofemoral articulation when non-surgical treatment has failed.



01

### Implant Design

In a study of normal knees, we found wide variation in the position and orientation of the trochlear groove. In the coronal plane, the orientation of the groove, measured from the distal condylar line, varied from 12.5° of varus to 13.3° of valgus. Other investigators have noted similar findings. It is important to be aware of the design differences between commercially available PFR devices (Fig. 1). PFR implants can be classified as either an inlay or an onlay type. With first-generation designs, there was a clear distinction between the 2 types. With the inlay type, the damaged articular surface is replaced but the original trochlear shape is maintained. With the onlay type, the anterior part of the trochlea is removed and is replaced by with prosthetic trochlea. The advantage of the onlay type is that a dysplastic trochlea can be replaced with a normally shaped trochlea. With second-generation designs, the differences between the inlay and onlay types are less pronounced, with some of the newer inlay designs also reshaping the trochlea but to a lesser extent than is the case with the onlay type. There is a marked difference between prostheses in terms of trochlear design and groove orientation. With onlay designs, the trochlear groove angle has been found to vary from 0° to 13° of valgus.

In a personal study, we found that the amount of external femoral rotation of an onlay prosthesis, as dictated by the axial orientation of anterior femoral cut, has an effect on the coronal orientation of the trochlear groove. Specifically, an increase in external rotation increased the valgus orientation of the groove, whereas an increase in internal rotation decreased the valgus orientation. The inlay type of implant can be used for the treatment of degenerative patellofemoral joints with normal or moderate trochlear dysplasia. The onlay type is more versatile and can be used for any knee, irrespective of the degree of trochlear dysplasia.

### Technique

There are several important points to consider when performing a PFR. First, the surgeon must take care not to overstuff the patellofemoral compartment. This can be avoided by measuring the original thickness of the patella and resecting an amount of bone similar to the thickness of the selected patellar component. If there is severe patellar wear, the surgeon may need to resect less patellar bone than is being replaced. After resection, the thickness of the remaining patella should be at least 12 mm. Additionally, the anterior femoral cut should be flush with the anterior cortex of the femur, without notching.

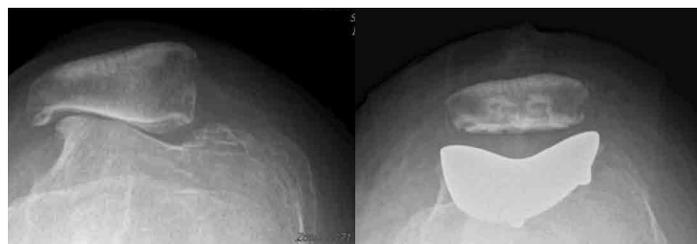
The position of the trochlear component is also critical. With the onlay type of prosthesis, the orientation of the anterior femoral cut will influence both the prosthesis-articular cartilage transition and the coronal direction of the trochlea. There should be a smooth transition between the trochlear component and the remaining articular cartilage. If this is not possible, the prosthesis can be placed slightly lower than the surrounding articular cartilage, but never higher. Internal-external rotation of the anterior femoral cut will influence the coronal trochlear angle. More external rotation is necessary when a prosthesis with a 0° trochlear angle is used than is the case when a prosthesis with a built-in 7° valgus trochlear orientation is used. We prefer to use instrumentation that can predict the prosthesis-articular transition and the trochlear orientation before the anterior femoral cut is made. The size of the femoral component is important. Distal overhang might impinge on the anterior cruciate ligament (ACL), while a too-short proximal trochlea might result in the patella running on the articular cartilage and off the prosthesis in full extension. Medial and lateral overhang should be avoided.

If there is a choice between sizes, the smaller trochlear component should be selected. The patellar button should be placed medially, and lateral overhanging patellar bone should be removed as it can impinge on the femoral component (Fig. 2).



02

Finally, the surgeon must ensure that the patella tracks centrally (Fig. 3). Often, additional procedures are required, such as lateral facetectomy or lateral retinacular release. Occasionally, a tibial tubercle osteotomy is necessary. Dy et al., in a meta-analysis of PFRs, found that the most common additional procedure was lateral retinacular release, followed by tibial tubercle osteotomy.



03

### Results

The intermediate-term results of PFR generally have been very good. In a recent systematic review of both first and second-generation designs, good to excellent knee function was reported in 87.3% of patients and the mean Knee Society Score was 87.5. Better outcomes have been seen in patients with trochlear dysplasia, whereas inferior outcomes have been associated with obesity and with low mental-health scores. These findings highlight the importance of patient selection when deciding on the optimal treatment for patients with patellofemoral degeneration.

There is a difference between the results associated with older (first-generation) designs and modern (second-generation) designs. Average annual revision rates of 2.14% have been reported. Revision rates have been reported to be higher with first-generation designs, mostly because of mechanical reasons. In most series, the primary cause for revision has been progression of tibiofemoral arthritis. Complications are more common with first-generation designs; however, there is no difference between designs with regard to the rates of persistent pain or progression of tibiofemoral osteoarthritis.

- 01 Different onlay designs.
- 02 PFR with smooth prosthesis-articular cartilage transition, no overhang, and no sharp edges.
- 03 Preoperative and postoperative radiographs.

## Patellofemoral Replacement

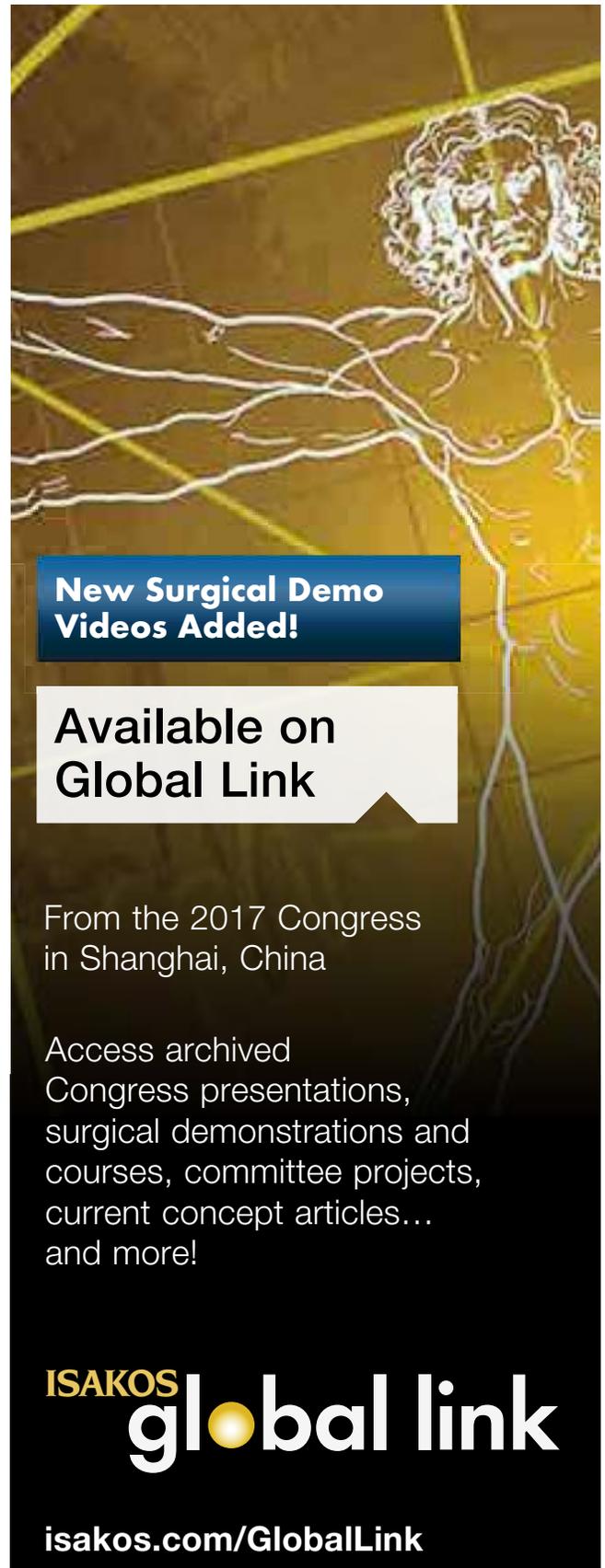
A meta-analysis comparing PFR with TKR for the treatment of isolated patellofemoral arthritis showed higher complication rates in association with PFR. In the PFR group, the most common reason for reoperation was mechanical problems, followed by persistent pain. Long-term survivorship was also lower for PFR than for TKR, with most common reason being the progression of tibiofemoral degeneration.

However, second-generation PFR was compared with TKR, the authors found no statistical differences in terms of the rates of reoperation, revision, persistent pain, or mechanical complications.

When necessary, revision of a PFR to a TKR can be easily performed and usually is done with a standard implant. Revision of a PFR was found to be comparable to a primary TKR and superior to a revision TKR in terms of surgical characteristics and postoperative clinical outcomes. However, both studies demonstrated higher complication rates in association with revision PFR that were similar to those associated with revision TKR.

### Conclusion

Patellofemoral replacement is an attractive option for the treatment of advanced patellofemoral degeneration in that it is associated with less morbidity, improved function, and less bone loss than TKR. With careful patient selection and attention to surgical detail, good to excellent outcomes are seen in most patients. The primary cause of revision is progression of tibiofemoral arthritis. Revision of a PFR to a TKR has similar outcomes to primary TKR.



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## Talar Osteoperiosteal Grafting From the Iliac Crest (TOPIC): A Novel Surgical Technique for Large Primary and Secondary Osteochondral Defects of the Talus



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### Pearls & Pitfalls—Surgical Technique

Talar Osteoperiosteal Grafting From the Iliac Crest (TOPIC): A Novel Surgical Technique for Large Primary and Secondary Osteochondral Defects of the Talus

#### The Concept

Osteochondral defects of the talus are characterized by damage to the talar articular cartilage and subchondral bone. Such defects may be due to an ankle fracture or sprain, an avascular episode, and, possibly, a genetic predisposition. These injuries have a severe impact on the quality of life of active patients as a result of deep ankle pain during weight-bearing and sporting activities.

The initial treatment of these defects typically consists of conservative measures, after which—in cases of persistent symptoms—surgical therapy can be considered. First-line surgical treatment options that are frequently applied include arthroscopic debridement of the defect, bone marrow stimulation, fixation, and retrograde drilling when cystic lesions are present.

In patients with large defects and those who have had a failure of first-line surgical treatment, more extensive and invasive surgery may be necessary.

For those specific clinical indications, treatment strategies that are frequently employed include osteochondral allograft procedures, osteochondral autograft transfer system (OATS) procedures (involving either a single plug or mosaicplasty), and classic and matrix-associated chondrocyte implantation (ACI, MACI). Each of these options has clinical advantages and disadvantages. Allografts, for instance, have a high failure rate: in a number of studies, graft rejection was observed as a result of immunological reactions.

Although the OATS procedure is also regarded as an effective surgical option, with a 90% success rate reported in the literature, donor-site morbidity rates have been reported to range from 11% to 35% when the graft was harvested from the ipsilateral femoral condyle. Furthermore, the graft that is harvested from the femoral condyle frequently does not properly restore the surface of the talar dome, resulting in incomplete incorporation of the implanted graft as well as bone cyst formation. Previously, a new technique involving the use of autologous osteoperiosteal cylinder grafts was described by Hu et al. and Chen et al. The surgical treatment yielded promising results; however, the downside of that method is that the size of the cylinder autograft is static and is determined preoperatively, thereby compromising optimal individualized treatment for large talar osteochondral defects.

In order to address these disadvantages, we developed a new surgical technique for the treatment of large talar osteochondral defects or secondary lesions: the Talar Osteoperiosteal Grafting from the Iliac Crest (TOPIC) procedure. With this press-fit technique, the autograft is harvested from the ipsilateral iliac crest, a site that has been shown to have chondrogenic potential because the cambium layer of periosteum contains chondrocyte precursor cells<sup>4</sup>. A bone-periosteal transplant for bone-cartilage repair meets the 3 requirements for tissue engineering: a source of cells, a scaffold, and local growth factors. In addition, the curvature of the iliac crest is highly similar to the curvature of the talar bone. In this Pearls & Pitfalls section, we will describe the surgical technique for the newly developed TOPIC procedure.

#### Surgical Technique

##### Step 1: Medial Malleolar Osteotomy

The TOPIC procedure is carried out with the patient under general or spinal anesthesia following the administration of antibiotic prophylaxis. The patient is placed in the supine position with a tourniquet applied around the proximal aspect of the leg. The team prepares for surgery and carries out a time-out procedure, after which the entire ipsilateral lower leg is prepared and draped.

## Talar Osteoperiosteal Grafting From the Iliac Crest (TOPIC): A Novel Surgical Technique for Large Primary and Secondary Osteochondral Defects of the Talus



01A

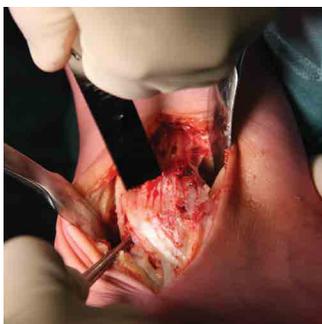
Next, a medial malleolar osteotomy is performed through a curved incision (approximately 7 cm) over the medial malleolus (Fig. 1-A).

Once the large saphenous vein has been identified and protected, the anteromedial joint capsule is opened and the surgeon makes a dorsal incision of the posterior tibial tendon retinaculum, after which the tendon is inspected and retracted.

In order to allow the medial malleolar osteotomy site to be closed with 3.5-mm stainless steel cortical screws, two 2.5-mm holes are drilled and tapped in the medial malleolus. An osteotomy is then performed perpendicular to the cortex with use of an oscillating saw (Fig. 1-B). Then, the medial malleolus is held plantarly by means of a K-wire, thereby exposing the talar surface and talar osteochondral defect.

### Step 2: Excision of the Diseased Osteochondral Talar Fragment

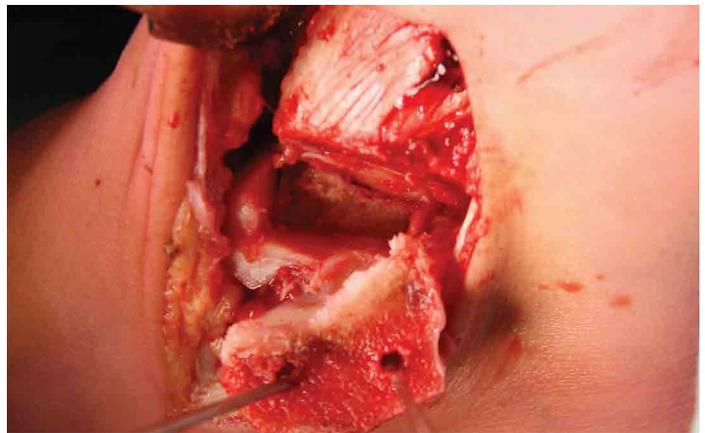
The talar osteochondral lesion is exposed to facilitate the incision. The cartilage is incised in a rectangular fashion in order to preserve as much healthy cartilage as possible. All necrotic and cystic bone is excised in toto with use of an oscillating saw and a chisel/osteotome with thin blades (Fig. 1-C). The end result should be a cube-shaped hole in the talus, deep enough so healthy bone can be seen (Fig. 1-D).



01B



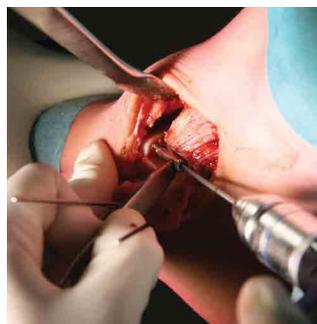
01C



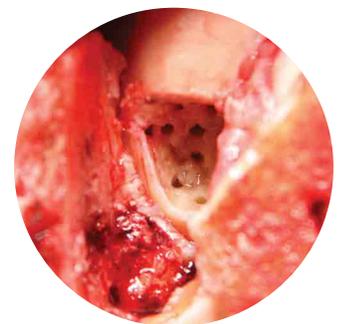
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### Step 3: Microdrilling the Subchondral Bone

The host site can be prepared with a 2-mm drill so that a bone-marrow-stimulation process will take place. This particular step of the procedure subsequently results in the disruption of intraosseous vessels, which introduces bone marrow cells into the empty defect (Figs. 2-A and 2-B).



02A



02B

### Step 4: Harvesting the Graft from the Iliac Crest

Once Step 3 has been finalized, harvesting of the graft can be initiated. After microdrilling, and just before the actual harvesting, the surgeon measures the size of the excised block with use of a ruler so that a precise excision of an autograft of the correct size can be performed.

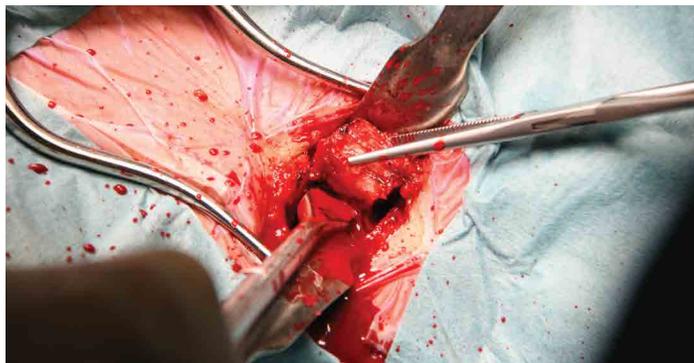
Along the palpable iliac crest, a horizontal incision of approximately 5 cm is made, after which the bone is exposed with use of 2 retractors. The surgeon then uses an oscillating saw to harvest a cortical osteoperiosteal autograft from the iliac crest. The graft is then excised and transported to a sterile table in the operating room for further adjustments in size and shape (Fig. 3-A).

### Step 5: Adjusting the Size and Shape of the Harvested Graft to the Diseased Fragment

Adjusting the size and shape of the harvested graft is an important step that can impact the clinical success of the TOPIC procedure. First, the harvested graft is compared with the excised talar osteochondral fragment (Fig. 3-B).

The surgeon manually adjusts the harvested graft so that it resembles the curvature, size, and depth of the excised defect as closely as possible (Figure 3-C). It is important to ensure that the graft is not sitting proud. The periosteal layer is thinner than the talar cartilage layer. Therefore, 1 to 2 mm of the cartilage thickness should be subtracted on the lateral and inferior sides. The surgeon should bear in mind that the graft will be placed into the talus in a press-fit manner.

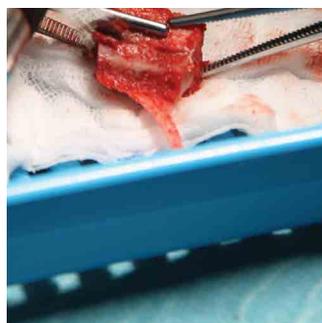
The surgeon should add approximately 0.5 mm on both the ventral and dorsal cuts in order to correct for the blade thickness of the oscillating saw. This entire step should be executed in a highly precise and focused manner because it will contribute to the clinical success of the press-fit insertion technique.



03A



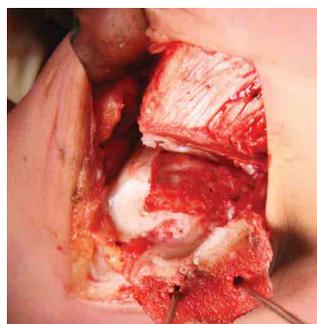
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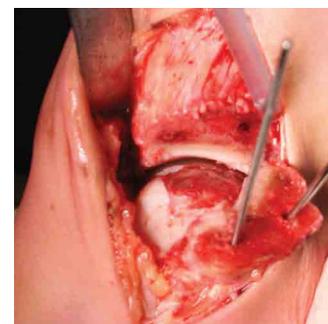
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### Step 6: Implanting the Graft by Means of a Press-Fit Technique

Optimal shaping of the harvested autograft in Step 5 ensures that the graft can be safely placed into site of the excised talar defect. The surgeon uses a surgical punch to gently press the harvested graft into the excised lesion with use of a press-fit technique, with sufficient precision and care to ensure that the inserted autograft is fitted exactly underneath the level of the talar cartilage. No additional screws are necessary to fixate the autograft (Figs. 4-A and 4-B).



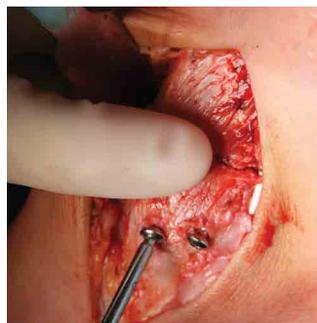
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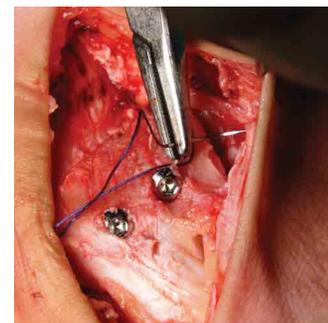
04B

### Step 7: Closure of the Medial Malleolar Osteotomy and Incision Sites

The osteotomy site that was created during the first step is then closed and fixated with use of two 3.5-mm screws. Rinsing and closure in layers are then performed (Figs. 5-A and 5-B).



05A



05B

- 01 Incision, medial malleolar osteotomy, exploration and excision of the defect.
- 01A Curved incision over the medial malleolus.
- 01B Medial malleolar osteotomy.
- 01C The diseased osteochondral talar fragment is being excised.
- 01D Post-excision
- 02A Microdrilling of the subchondral bone by means of a 2mm drill
- 02B End result.
- 03A Harvesting the osteochondral autograft from the ipsilateral iliac crest
- 03B Adjusting the harvested autograft from the ipsilateral iliac crest in such a manner that it resembles the diseased excised talar osteochondral fragment.
- 03C After adjusting the autograft, the graft is compared to the diseased and excised talar osteochondral defect in order to assure for optimal sizing and fitting.
- 04A End result of the inserted autograft from the ipsilateral iliac crest.
- 04B End result of the inserted autograft from the ipsilateral iliac crest.
- 05A Closing the medial malleolar osteotomy by means of two 3.5mm lag screws, after which the retinaculum of the post. tib. tendon is closed, as well as the skin layers and the wound.
- 05B Closing the medial malleolar osteotomy by means of two 3.5mm lag screws, after which the retinaculum of the post. tib. tendon is closed, as well as the skin layers and the wound.

## Talar Osteoperiosteal Grafting From the Iliac Crest (TOPIC): A Novel Surgical Technique for Large Primary and Secondary Osteochondral Defects of the Talus

### Postoperative Management and Rehabilitation

The patient wears a below-the-knee cast for 6 weeks postoperatively. At 6 weeks, radiographs of the ankle are made at our outpatient clinic to assess consolidation of the medial malleolar osteotomy site.

At this visit, the cast is changed to a walking boot, which is worn for another 6 weeks. At 12 weeks postoperatively, the inserted graft is radiologically assessed by an experienced musculoskeletal radiologist and the orthopaedic surgeon on a computed tomography (CT) scan.

The scan is checked to confirm consolidation and bone growth into the inserted autograft as well as to assess whether remodeling of the talus has taken place. At 6 months and 1 year postoperatively, the patient is seen in our outpatient clinic again in order to closely assess progress, including with regard to return to sporting activities. The patient is referred to a physiotherapist to guide and stimulate clinical progress and to aid in the rehabilitation and return-to-sports process. At all follow-up visits, the patient is checked for potential complications (e.g., infections, neurovascular injury, synovitis, allergic reactions, donor-site morbidity, etc.).

### Discussion

Current surgical methods to treat primary and secondary talar osteochondral defects may have limited clinical efficacy because of high reported rates of donor-site morbidity, inherent complications, the complexity of the surgery, the non-matching curvature of the harvesting site, and the immunological reaction to an allograft. In this article, we describe a newly developed OATS technique (the TOPIC technique) that can overcome these clinical disadvantages and provide patients with pain relief and return to sporting and working activities.

The advantages of this novel surgical procedure include the simplicity of the technique; the limited operative time required; and the relatively low costs of the procedure in comparison with allograft procedures, chondrogenesis-inducing therapies, autologous chondrocyte implantation techniques, and others.

An additional clinical advantage is that the iliac crest (the site from which the autograft is harvested) matches the surface geometry of the talar body with regard to curvature. Moreover, research has shown that the periosteum of the iliac crest possesses the potential to regenerate articular cartilage-like tissue because the cambium layer contains chondrocyte precursor cells. Prospective clinical and radiological studies are underway to evaluate the clinical efficacy of this new surgical technique. Short- and intermediate-term results appear promising and will be published in the future.



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## Perspectives on Instrumented Pivot-Shift Testing



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### Introduction

There is still considerable variability in the knee-laxity evaluations performed in research studies on the anterior cruciate ligament (ACL). Quantitative evaluation of anterior laxity is conducted almost exclusively with use of KT-1000 measurements, whereas rotational laxity is assessed only with use of the manually performed pivot-shift test<sup>1</sup>. It is well known that the manual pivot-shift test is very subjective and provides only 4 levels of grading. Therefore, subtle differences in rotational laxity cannot be consistently detected with the manual pivot-shift test.

The current problem is that residual rotational laxity following ACL reconstruction is not always detectable with the manual test and does not consistently produce sizable improvement of rotational laxity. Quantitative evaluation of the pivot-shift test is therefore necessary in order to improve the ability to assess the results of ACL reconstruction.

Several instrumented measurement systems have been developed in an attempt to achieve comparable and meticulous measurements with use of the pivot-shift test. Some of these systems can be used in a non-invasive manner and thus are clinically applicable. Three major examples of instrumented pivot-shift test systems are described below.

### Electromagnetic Measurement System

In vivo knee kinematics during the pivot-shift test were first evaluated with use of an electromagnetic system by Bull et al. in 2002, with the electromagnetic sensors being fixed to the bones with pins. The disadvantage of that method was that it could only be used intraoperatively. We then developed a noninvasive method for the application of a similar electromagnetic system (Liberty, Polhemus, Colchester, VT, USA) in order to allow for wider clinical use. With that method, electromagnetic sensors are attached over the femur and tibia with use of plastic straps and a third sensor is used to input the 3D positions of anatomic osseous landmarks for both bones (Fig. 1).

An anatomical coordinate system for the knee is configured in a virtual space on the basis of the 3D positional relationship of the two bones, and knee kinematics are recorded in 6 degrees of freedom during the pivot-shift test (Fig. 2). Anterior tibial translation and tibial acceleration are calculated from the data, and these parameters are used when determining the clinical grading of the results of the pivot-shift test.



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This electromagnetic system is now commercially available with a user-friendly console that includes original software to automatically calculate measurement parameters (Joint Instability Measurement Interface JIMI Kobe, Arthrex Japan, Tokyo, JAPAN) (Fig. 3), although its sales area is currently limited to Japan.

01 The 3D position of the anatomic landmark is digitized with use of a stylus equipped with an electromagnetic receiver. Seven anatomic landmarks are registered to configure the knee coordinate system.

02 The pivot-shift test is performed while evaluating 6-degrees-of-freedom knee kinematics with use of the electromagnetic system. Tibial anterior translation and acceleration are calculated for further analysis.

## Perspectives on Instrumented Pivot-Shift Testing



03

### Simple Image Analysis with Use of an iPad

The pivot-shift phenomenon was first reported as the anterior subluxation of the lateral tibial plateau and its spontaneous reduction. However, as some ACL-deficient patients show visible abnormal tibial translation on the lateral side of the knee joint during the test, it was hypothesized that lateral compartment translation may have an effect on the grading of the test results. Therefore, a trial was performed to capture the surface movement during the pivot-shift with use of a digital camera and subsequent image analysis with a computer. Three round stickers, 0.75 inch in diameter (Color Coding Labels; Avery Dennison, Pasadena, CA, USA), were attached to the skin over specific osseous landmarks (the lateral epicondyle, Gerdy's tubercle, and the fibular head) to allow for image analysis. A video capturing the lateral aspect of the knee joint was made during the pivot-shift test with the digital camera. The video was then processed in the computer to evaluate the anteroposterior movement of the tibial points (Gerdy's tubercle and the fibular head) relative to the femoral point (the lateral epicondyle). The anteroposterior tibial translation on the lateral side of the knee joint was successfully captured and was found to be related to the clinical grading of the results of the test.

The iPad (Apple, Cupertino, CA, USA) has the capacity to capture video and to perform image analysis at the same time. Therefore, we designed a specially programmed iPad application for pivot-shift image analysis (PIVOT, Impellia, Pittsburgh, PA, USA) (Fig. 4).

The iPad application will be able to be purchased and downloaded anywhere in the world, once it arrives in the online store. The PIVOT application is currently under preparation for sale.

### Triaxial Accelerometer System

As noted in our experimental study on the electromagnetic system, an acceleration surge is observed during the pivot-shift test. Direct measurement of this tibial acceleration has been shown to be feasible with use of the KiRA system (Kinematic Rapid Assessment; Orthokey LLC, Lewes, DE, USA).



04

With that system, an accelerometer is attached over the lateral aspect of the shank between the tibial tuberosity and Gerdy's tubercle with use of a wrapping band and is wirelessly connected to a computer equipped with Bluetooth, and the acceleration of knee movement is recorded with the original software. KiRA is also commercially available worldwide now, but an official broker is commonly required to import such a high-technology device in most countries outside of the EU.

### Clinical Usability of Noninvasive Quantitative Measurement Devices

These 3 instrumented systems for the pivot-shift test seem to be feasible in our clinical practice, but their diagnostic accuracy has not been compared. Therefore, we conducted a study to compare these 3 systems in terms of the clinical detection of ACL deficiency. The pivot-shift test was performed for 30 patients with unilateral ACL injuries who were under general anesthesia. Three instruments (the accelerometer system [KiRA], the image-analysis system involving the using iPad [iPad], and the electromagnetic measurement system [EMS]) were used simultaneously to evaluate 2 parameters: tibial acceleration (as monitored with the KiRA and EMS systems) and tibial anteroposterior translation (as recorded with the iPad and EMS systems).

Although all 3 systems could detect ACL deficiency, receiver operator characteristic (ROC) curve analysis demonstrated that the EMS method was more accurate than the KiRA and iPad methods for the detection of ACL insufficiency.

We concluded that the EMS method has an advantage over the KiRA and iPad methods because it provides a more comprehensive and accurate evaluation both tibial acceleration and translation.

### Investigating the Effect of the Concomitant Meniscal Tear on the Pivot-Shift

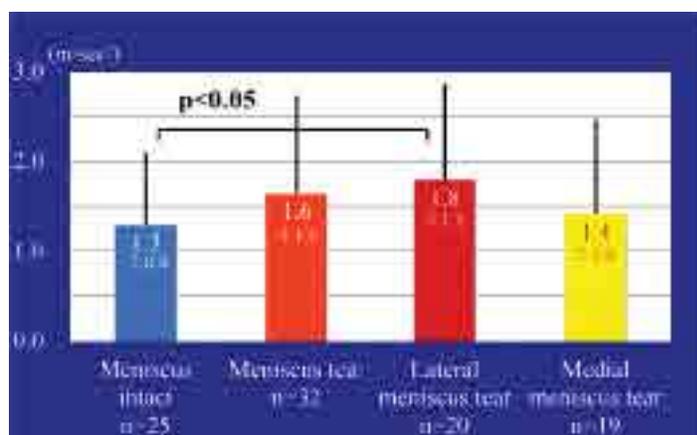
Although meniscal injury commonly occurs in association with ACL injury, the impact of meniscal injury on knee rotational laxity has not been fully examined, especially in vivo, mainly because of the lack of instrumented measurement systems. Musahl et al., in an in vivo study involving the iPad measurement system, demonstrated increased lateral translation during the pivot-shift test when knees that had ACL injury combined with meniscal and anterolateral capsule injuries were compared with knees that had an isolated ACL injury. We also tested the effect of the concomitant meniscal tear on the pivot-shift test in a clinical study of 57 knees with an ACL injury. A concomitant meniscal tear was confirmed in 32 knees. Clinical grading was different between the knees with and without a meniscal tear ( $p < 0.05$ ), whereas tibial acceleration was not significantly different between these groups ( $1.6 \pm 1.1$  m/sec for knees with a meniscal tear, compared with  $1.3 \pm 0.8$  m/sec for knees without a meniscal tear;  $p = 0.09$ ). Subgroup analysis showed that the ACL-deficient knees with lateral meniscus tear had larger tibial acceleration ( $1.8 \pm 1.1$  m/sec,  $n = 19$ ) than those without a meniscal tear ( $p < 0.05$ ), whereas the knees with a medial meniscus tear ( $1.4 \pm 1.0$  m/sec,  $n = 20$ ) did not show aggravated rotational laxity ( $p = 0.33$ ) (Fig. 5). This investigation was reported in 2017 at the 11<sup>TH</sup> ISAKOS Congress in Shanghai and received the Jan I. Gillquist Scientific Research Award.

Both the iPad and electromagnetic measurement systems could detect the effect of a concomitant meniscus tear on the pivot shift in ACL-injured knees. It is difficult to achieve similar results with use of manual examination during the pivot-shift test. Significant but subtle influences of such secondary restraint injuries should be further tested with use of instrumented measurements.

### Conclusion

Several non-invasive instrument systems are currently available for use in clinical practice, although their accessibilities are geographically different to some extent. The electromagnetic system might provide higher diagnostic accuracy and comprehensive evaluation of the pivot shift than the other instruments, whereas the iPad or accelerometer system might be more user-friendly tools with acceptable diagnostic accuracy.

The use of instrumented measurement systems during the pivot-shift test is required in order to detect subtle but significant differences between various injury patterns and treatments of the ACL-injured knees. As a result, further advancements in ACL treatment will likely depend on the use of such systems when performing the pivot-shift test.



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- 03 The commercially available electromagnetic knee kinematics measurement instrument (Joint Instability Measurement Interface JIMI Kobe; Arthrex Japan, Tokyo, JAPAN). This device is an all-in-one unit that contains an electromagnetic tracking system and a processing computer.
- 04 iPad image analysis. The markers on the lateral side of the knee joint are captured by the iPad during the pivot-shift test.
- 05 The tibial acceleration during the pivot-shift test in the ACL-deficient knees with and without concomitant meniscus tear. There was a significant difference between the ACL-injured knees with an intact meniscus and those with torn lateral meniscus.

# Chronic Exertional Compartment Syndrome



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## Diagnosis

History, physical examination and provocative tests are the cornerstones. Patients typically complain of five cardinal symptoms: pain, tightness, cramps, weakness, and diminished sensibility limiting their sports performance or forcing them to stop; pain with passive stretch of the compartment may be present after exercising. Fascial defects may also be detected on palpation in 39% to 46% of affected patients.

*Intracompartmental pressure (ICP) values:* in lower extremity resting and timed post-exercise ICP values obtained after a provocative test (running, hopping, tip-toeing, heel walking) are considered the gold standard for CECS. No specific numerical values have been demonstrated as fully reliable, being the most important to detect a rise in pressure numbers from resting to 1 and 5 min post-exercise accompanied by delayed normalization.

Resting (pre-exercise)	> 15 mmHg
Post-exercise Immediate at 1'	> 30 mmHg
Post-exercise at 5'	> 20mmHg
Post-exercise at 15'	> 15 mmHg

*MRI:* pre- and post-exercise MRIs have demonstrated increased diffuse intracompartmental signal on T2 sequences when compared with baseline; MRI is also useful in excluding fascial defects, medial tibial stress syndrome, stress fracture or other structural lesions.

*Near-infrared spectroscopy (NIRS):* it has recently been studied in Europe as a measure of oxygen saturation in muscle which is reduced when CECS is present. It is a noninvasive test and has been demonstrated to be as efficacious as MRI or ICP monitoring patients with known CECS.

In upper extremity there is also no consensus on the ICPs reference values. Currently, handgrip stress tests eliciting classic CECS symptoms provides the best clinical information for diagnosis.

## Introduction

Chronic exertional compartment syndrome (CECS) is defined as a condition presenting transient increases in pressures of muscle compartments during exercise or intense activities that typically resolves with rest; the intramuscular volume expand by up to 20% increasing pressure within the compartments that leads to transient ischemia.

Typically, CECS is seen in the young adult athlete; the leg, accounts for more than 95% of all cases with variable involvement of the forearm, hand, thigh and foot in narrow high-risk cohorts. CECS of the leg, has been described in multiple sports as soccer, volleyball, basketball, lacrosse, skiing and others involving intense running, jumping or pivoting maneuvers, but it has been characteristically described in endurance runners, which accounts for up to 2/3 of cases. CECS may also be present in activities as dancing, military duty, labor activities and occasionally in less-active population, which makes the diagnosis even more challenging.

Upper extremity presentations appears typically in the forearm and can result of either manual labor, rowing, motocross riding or motor racing, gymnastics, weight lifting, climbing, kayaking and/or piano players.

## Chronic Exertional Compartment Syndrome

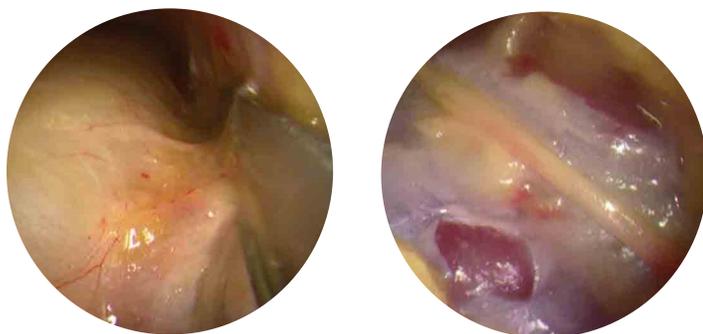
*Lower extremity differential diagnosis:* medial tibial stress syndrome (MTSS) (shin splints) and tibial stress fractures are the most common etiologies to differentiate from CECS in lower extremity. The differential diagnosis should also include evaluations for nerve entrapment (SPN, DPN, Sural N), deep vein thrombosis, popliteal artery entrapment and rarely some other clinical entities affecting bone or soft tissues.

*Upper extremity differential diagnosis:* a broad differential diagnoses includes peripheral nerve entrapment, peripheral neuropathy, motor neuron pathologies, and muscular disorders.

### Treatment

*Conservative:* the reported results of non-operative management are modest and conservative interventions have generally been unsuccessful in restoring active patients to pain-free physical activity.

*Surgery:* when conservative measures are ineffective, or patients are unwilling to accept permanent activity or duty restrictions, operative management may be considered, with decompression of all symptomatic compartments. Fasciotomy is the elective treatment of CECS although selective use of partial fasciectomy for primary or revision cases may also be considered.



As popularized by Mubarak and Owen, four-compartment fasciotomy of the leg can be performed through a dual-incision technique; the medial incision lies 2 cm medial to the tibia and the lateral incision is midway between the tibial crest and fibula. In recent years, several techniques for endoscopic fasciotomy, using smaller distal and proximal incisions, have also been described with encouraging results; specific long retractors, scissors and extended endoscope, as the ones used in vascular/general surgery are especially useful in this case.

When releasing the anterior/lateral compartments distally care must be taken to avoid injury of the superficial peroneal nerve (SPN) that exists the crural fascia at this level.

During the posterior compartment release, the saphenous vein and nerve must be identified and protected; the superficial fascia is easily identified, whilst the deep posterior compartment must be incised through the periosteum of the posterior medial border of the tibia. Hemostasis should be monitored carefully without tourniquet at the end of the procedure.

In the forearm, unlike the fascial compartments in the leg, pressure transfer from one compartment to the other appears to be substantial, thus, although the most affected muscles are probably the flexor digitorum profundus and flexor pollicis longus (deep volar compartment), superficial fasciotomy is adequate to release the entire forearm using a 4 to 8 cm longitudinal incision over the flexor compartment in the mid-forearm; if preferred, blunt splitting of the flexor digitorum muscle can be performed to allow access to the deep flexor muscles surrounding the ulna.

*The affected compartment dilemma:* in the lower leg, CECS is bilateral in 75–90% of the patients therefore, isolated release of one extremity may lead to subsequent contralateral surgery. The anterior compartment is most frequently affected (42%–60%) followed by the lateral (35%–36%), deep posterior (19%–60%), and the superficial posterior (3%–21%). Ideally, only the affected compartments should be released but there is a risk of failure and recurrence as untreated compartments occasionally become symptomatic once the most affected ones were released.

### Complications

Perioperative complications often manifest early as local surgical site infections, wound healing difficulties, hematoma or seroma development and/or iatrogenic neurovascular injury, most commonly, the SPN and saphenous nerve.

Recurrences oscillates around 15–20% and typically occur after an initial symptom-free interval; it may result from inadequate release, failure to decompress a symptomatic compartment, postsurgical fibrosis or nerve compression. Entrapment of the SPN has been found in 44% of subjects presenting with recurrent CECS. Deep posterior compartment release success is lower (around 60%); the “fifth compartment” consisting of the tibialis posterior muscle which has its own fascia, when left intact can contribute to the inferior outcome observed in patients with deep posterior CECS.

### Athletes performance

Postoperatively, activities are permitted as tolerated, expecting complete recovery in between 8 to 12 weeks. The best outcome is reported 14 months postop on average, most commonly in patients undergoing isolated anterior and lateral release. Recurrence rate is slightly higher for young patients, around 20%, while in adults is close to 11%.

## Leg, Ankle & Foot Committee Report

Pieter D'Hooghe, MD, MSc, MBA  
*Committee Chair, Doha, QATAR*

Kenneth J. Hunt, MD  
*Committee Deputy Chair  
 Aurora, CO UNITED STATES*

### **The International Consensus Meeting on Cartilage Repair of the Ankle**

*17–18 November, 2017  
 Pittsburgh PA, UNITED STATES*

The International Consensus Meeting on Cartilage Repair of the Ankle was held during the International Congress of Cartilage Repair of the Ankle (ICCRA) on November 17–18, 2017 at Pittsburgh UPMC, USA. This event enrolled global experts from six continents and 27 countries and aimed at providing a consensus on 137 remaining questions on cartilage and osteochondral defects in the ankle. More than 100 expert practitioners and researchers collaborated over one year to gather all available literature and current expert opinions treatments of osteochondral defects. This generated a focus on specific areas currently missing evidence and consensus.

Cartilage injuries and osteochondral defects around the ankle (OCD) are common conditions that frequently require surgery for full recovery. However, there is an internationally recognized lack of consensus and evidence-based guideline in the management of these conditions. The objective of this ICCRA consensus meeting was to address this remaining controversy vacuum and create and disseminate a useful clinical message on ‘best practice’ for both clinical treatment and research on osteochondral injuries.

A significant amount of time has been invested in this joint venture and we expect the upcoming Pittsburgh Consensus Statement to improve our clinical practice and guide future research.



Instigated by Dr. C. Niek van Dijk, the Delphi Technique was used as the tool to reach the final statements at the consensus meeting.

The ISAKOS Leg, Ankle & Foot Committee was present with eight members and actively participated in the preparation, discussion and moderation.

We express our deepest gratitude to the diligent work ethic of all participants. We managed to reach consensus for all 137 questions and statements within the proposed timelines, even on controversial topics such as revision strategies and novel treatment strategies. The University of Pittsburgh Medical Center (UPMC), Pittsburgh’s Department of Orthopaedic Surgery, ISAKOS’ Leg, Ankle & Foot Committee, and ESSKA were well represented and scientifically contributed.

The ISAKOS Leg, Ankle & Foot Committee acknowledges and congratulates Dr. John Kennedy (Hospital of Special Surgery, NY, USA), Dr. Richard Ferkel and Dr. James Stone for being the inspirational fathers and engines of this consensus meeting.

Special thanks to Dr. Freddie Fu, who was once more, an outstanding host in his home city during the two days—by opening doors to us that otherwise remain closed to public.

Two of our colleagues deserve a special word of thanks: Dr. MacCalus Hogan and Dr. Christopher Murawski. Without you, the consensus would have simply not been possible. Your team spirit, leadership skills and academic vision have been inspirational. The Leg, Ankle & Foot Committee is proud to team up with you, represent and participate at the highest level, and share your invigorating enthusiasm to define the standard of practice benefit and improve outcomes for ankle patients all over the world.

With an event like this, we are confident that the next generation of Leg, Ankle & Foot surgeons is in good hands!

**INTERNATIONAL CONSENSUS MEETING ON CARTILAGE REPAIR OF THE ANKLE**  
SAVE THE DATE



November 17 and 18, 2017  
Pittsburgh, PA, USA



*This meeting represents the culmination of an intense, year-long collaboration among global leaders in cartilage repair of the ankle to develop consensus on key focus areas within the field. This first-of-its-kind effort has assembled orthopaedic surgeons, physical therapists, radiologists, and basic scientists to provide evidence-based and/or expert recommendations on the diagnosis, treatment, rehabilitation, and follow-up for a common and difficult clinical problem.*

*You're invited to attend the International Consensus Meeting on Cartilage Repair of the Ankle. You will have the opportunity to witness the consensus discussion and rigorous scientific debate, as well as to network with national and international leaders in the field in an informal setting.*

**ORGANIZING TEAM**

James D. E. Calder, MD – London, UK	Jin Woo Lee, MD, PhD – Seoul, Korea
Pieter D'Hooghe, MD – Doha, Qatar	Helder Pereira, MD – Vila do Conde, Portugal
Richard D. Ferrel, MD – Los Angeles, USA	James W. Stone, MD – Milwaukee, USA
John G. Kennedy, MD – New York, USA	Masato Takao, MD, PhD – Tokyo, Japan

**PITTSBURGH HOSTS**

MacCalus V. Hogan, MD      Christopher D. Murawski

**WHERE:**

University Club • 123 University Place • Pittsburgh, PA 15260

For questions, or additional information, please visit [UPMCPHYSICIANRESOURCES.COM/ICMCR](http://UPMCPHYSICIANRESOURCES.COM/ICMCR). To register, please contact [cdmurawski@gmail.com](mailto:cdmurawski@gmail.com).



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## 26th SEVERANCE ARTHROSCOPY SYMPOSIUM : Shoulder & Elbow

26 November, 2017  
Seoul, REPUBLIC OF KOREA

The 26<sup>th</sup> Severance Arthroscopy Symposium, which is ISAKOS and Asia Arthroscopy Congress (AAC) approved, was successfully held on the November 26, 2017.

The Symposium is a traditional arthroscopy symposium that has been held at Yonsei University Health System in Seoul, Korea 26 times since 1995, and has been ISAKOS Approved since the 13<sup>th</sup> Symposium in 2004.

On behalf of the entire Symposium Program Committee, Prof. Sung-Jae Kim would like to thank all the attendees and members of the Severance Arthroscopy Society for their great contributions.

The 26<sup>th</sup> Severance Arthroscopy Symposium had about 200 participants and 38 distinguished speakers from all around the country who delivered lectures in their areas of expertise.

The program was unique in that topics concerning shoulder and elbow arthroscopy were dealt with within a single symposium to help time-constrained surgeons quickly grasp the recent advances in the rapidly evolving field of arthroscopy.

In the shoulder and elbow sessions, various topics ranging from rotator cuff tears, instability and dislocation injuries were covered with sufficient depth in order to help the audience practice with more confidence.

After the symposium, the members of the Severance Arthroscopy Society and the speakers networked and mingled at the Symposium banquet. The Severance Arthroscopy Symposium will continue to strive to enhance the exchange and dissemination of knowledge that the Severance Arthroscopy Society is famous for.



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From the history of the International Society of the Knee (ISK) and International Arthroscopy Association (IAA), to the creation and future of ISAKOS—learn more about us through our ISAKOS Archives online! Brought to you by the ISAKOS Archives Committee. Have something you would like to contribute to the archives?

- Photos
- Videos
- Programs
- Publications
- Antiques (instruments, etc.)

Please send to the ISAKOS Office along with your contact information and submission description.

[isakos@isakos.com](mailto:isakos@isakos.com)

2410 Camino Ramon Suite 215  
San Ramon, CA 94583 USA



## Evolution and Innovation in Knee Surgery

18 November, 2017

Athens, GREECE

The 2<sup>nd</sup> scientific meeting, Evolution and Innovation in Knee Surgery, organized by the Orthopaedics and Sports Orthopaedics Clinic of the Metropolitan Hospital in Athens, was successfully held on November 18, 2017.

This ISAKOS Approved meeting was also under the patronage of the Greek Arthroscopic Association. The scientific program was comprised of interesting lectures from distinguished Greek and international orthopaedic surgeons. During the meeting, two live surgical cadaveric demonstrations were performed by Professor Andreas Imhoff and his associate Knut Beitzel from Munich. The other demonstration was performed by Jurgen Barthofer and Andreas Schneiderbauer from Linz, Austria. The hospital's amphitheater was full of Greek and international participants, who often expressed their professional opinions and interacted with the speakers. Also present were Pericles Papadopoulos, President of the Greek Arthroscopic Association; Panagiotis Papagelopoulos and Spyros Pneumatikos, Professors of Orthopaedic Surgery of the University of Athens; as well as Associate Professor Michalis Iosifidis representing ISAKOS. The main topics of the meeting were new techniques in meniscal repair and osteotomies around the knee. Sixty-five top orthopaedic surgeons participated, including Professor Anastasios Georgoulis, Christos Giannakopoulos, Vassileios Chouliaras, Dimitris Mastrokalos. All participants were provided with certificates of attendance.

The growing interest of the Greek orthopaedic community suggests that focused meetings on specific knee surgery topics have their own importance. Despite ease of access to the abundance of available resources regarding surgical techniques, discussion with experts and live surgical demonstrations remain of great value to the average orthopaedic surgeon. In this context, we feel that the next meeting will be of even greater acceptance and success.

Saturday, November 18<sup>th</sup> 2017 09:00-14:30  
Metropolitan Hospital Athens  
Orthopaedics and Sports Orthopaedics Clinic  
Director P. Kouloumentas MD

**PROGRAM**  
SCIENTIFIC MEETING

**Evolution and Innovation in knee surgery**

- Osteotomies around the knee
- Save the Meniscus
- ACL reconstruction with single tendon short graft -the All inside technique-
- ACL repair without graft. The role of internal brace

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## Gijón Knee Sports Meeting 2017

19–20 October, 2017

Gijón, SPAIN

Once again this year, the Gijón Knee Sports Meeting 2017 was held on October 19–20, 2017, which is an event of Traumatology and Sports Medicine. The above mentioned event is a classic two-year celebration event headed by Dr. Antonio Maestro and included in the Smith & Nephew Educational Program Master Class.

On this occasion, a total of nine countries were involved (Belgium, Chile, Spain, France, The Netherlands, Mexico, Portugal, United Kingdom and USA), and brought together a total of 250 participants, 35 lectures and 15 live surgeries in the operating room-lab installed for such purpose.

In attendance, there were outstanding international professors and members of ISAKOS, such as Dr. David Dejour, Dr. Joao Esgregueira-Mendes, Dr. Bert Mandelbaum, and Dr. Jack Bert. Prestigious sports doctors from important International and National Societies such as Dr. José María Busto, Dr. Koen Lagae, Dr. Peter Thompson, Dr. Barton-Hanson, Dr. Ramón Cugat, Dr. Juan Carles Monllau, Dr. Jordi Puigdelivoll, Dr. Paco Biosca, Dr. Juan Ayala, Dr. Mikel Sánchez, Dr. Juan Leal and many others, interacted with the attendees and created an amicable and professional atmosphere that was apparent throughout the meeting.

During the event, updates were discussed in different sections divided into: meniscus, cartilage, anterior and posterior cruciate ligaments and peripheral ligaments. The following topics were highlighted during the meeting:

- The need of meniscal preservation and meniscal repair techniques, with special emphasis on hidden injury or on meniscus ramp and root, especially when these are associated with ligament injuries



- The new technologies applied to chondral pathology in the athlete, with the support or help of biology, the applications of viscosupplementation and PRPs, and the treatment of subchondral edema were the knowledge needs regarding the cartilage section
- The anatomical reconstruction of the ACL, with the preservation of remains as the best reference, together with the use of the crests and required good knowledge of the anatomy, as well as the knowledge of the bone age to avoid physical injuries especially in children under 12 years or the tibial inclination as morphology associated with the same injury and prevention methods among which highlights FIFA 11
- Femoro-patellar repair through the management of soft or bony parts by means of trochloplasty which remains the challenge
- The correct isometry and the use of one or two bands depending on the impact on the POL and the need of fixating in the proximity of the extension in the pathology of the medial aspect section



- The repair techniques of both cruciate ligaments and also those of anterolateral ligament repair, and the use of extraarticular plasties, both medial and lateral and the technical difficulty of the appropriate management of the portals, especially the posterolateral one, highlighted in the PCL repair
- The concept of knee global instability, with the need of biology and medical evidence knowledge allow the development of algorithms for the return to competition



Future meetings will be based on the need to discuss posterolateral reconstruction techniques, cost savings in the operating room, the management of multiligamentary injuries in one or two stages (one acute and one delayed), with the help of allografts and also with the potential indication of osteotomies and the need to objectify and measure the instability degrees.

Socially, the well-known "Espicha Asturiana" dinner was a meeting highlight and the perfect closure to the meeting. The atmosphere of involvement and interaction among the attendees, along with the brilliant display of the surgical techniques by the participating surgeons, all contributed to the success of the 2017 Gijón Knee Sports Meeting.



## UPCOMING ISAKOS APPROVED COURSES

7<sup>th</sup> Advanced Course on Knee Surgery  
Centre Henri Oreiller  
Val d'Isere, FRANCE

**January 14–18, 2018**

Chair(s): Francois Kelberine, Sebastien Lustig,  
Philippe Landreau, Nicolas Gravelleau

**For further information, please contact:**

Tel: +33 676598915  
Fax: +33 442375005  
[www.kneecourse.com](http://www.kneecourse.com)

18<sup>th</sup> International Sports Medicine Fellows  
Conference

Sheraton Carlsbad Resort & Spa  
Carlsbad, CA, UNITED STATES

**January 26–28, 2018**

Chair(s): Bert Mandelbaum, MD

**For further information, please contact:**

Tel: +1 925 8071190  
Fax: +1 925 8071199  
[www.ismf-conference.com](http://www.ismf-conference.com)

Athens Shoulder Course  
Conference Center "N. Louros" Mitera Hospital &  
Laboratory Of Anatomy Of The Medical School Of  
The University Of Athens  
Athens, GREECE

**February 1–3, 2018**

Chair(s): Antonogiannakis Emmanouel

**For further information, please contact:**

Tel: +30 2109609400  
Fax: +30 2104190905  
[www.athens-shoulder-course.com](http://www.athens-shoulder-course.com)

Paris Shoulder Symposium  
Hôtel Le Méridien Etoile  
Paris, FRANCE

**February 1–March 2, 2018**

Chair(s): Philippe Valenti, Laurent Lafosse

**For further information, please contact:**

Tel: +33 776815708  
Fax: +33 491943033  
[www.paris-shoulder-symposium.com](http://www.paris-shoulder-symposium.com)

2018 5<sup>th</sup> ACL Symposium  
Daejeon Eulji Medical Center, Eulji University  
Daejeon, REPUBLIC OF KOREA

**February 3, 2018**

Chair(s): Eui-Sung Choi

**For further information, please contact:**

Tel: +82 1088133166  
Fax: +82 422527098  
[acl.urimed.co.kr](http://acl.urimed.co.kr)

5<sup>th</sup> Biennial International Congress of Iranian  
Society of Knee Surgery, Arthroscopy and Sports  
Traumatology

International Conventional Center of Kish Island  
Kish Island, ISLAMIC REPUBLIC OF IRAN

**February 14–17, 2018**

Chair(s): Hamidreza Yazdi, MD

**For further information, please contact:**

Tel: +98 (21) 88084218  
Fax: +98 (21) 88084218  
[www.iskast.com](http://www.iskast.com)

Arthroscopy & Arthroplasty Workshop  
MLN, Medical College  
Allahabad, INDIA

**February 16, 2018**

Chair(s): Dr. K. D. Tripathi

**For further information, please contact:**

Tel: +91 9415235183  
Fax: +91 5322616582  
[www.uporthocon2018.com](http://www.uporthocon2018.com)

Rome Shoulder Course– Revision Arthroplasty  
University Campus Bio-Medico  
Rome, ITALY

**February 23, 2018**

Chair(s): F. Franceschi, Chief of the Upper and Lower  
Limb Surgery Department

**For further information, please contact:**

Tel: +39 3381307625 or  
+39 3358007236

SRATS Congress 2018  
National Theatre Bucharest  
Bucharest, ROMANIA

**March 21–23, 2018**

Chair(s): Prof. Cristian-Ioan Stoica, MD, PhD

**For further information, please contact:**

Tel: +40 721254618 or +40 757212878  
Fax: +40 212521387  
[www.congres-srats.ro](http://www.congres-srats.ro)

Masters Knee Symposium on Ligaments, Cartilage  
and Meniscal Injury

Yonsei University Hospital, Eunmyung Auditorium  
Seodaemun-gu, REPUBLIC OF KOREA

**March 25, 2018**

Chair(s): Sung-Jae Kim

**For further information, please contact:**

Tel: +82 1075646175  
Fax: +82 25733540

Madrid Foot and Ankle Course  
CEU University Madrid  
Madrid, SPAIN

**April 5–6, 2018**

Chair(s): Prof. C.N.Van Dijk, M. de Prado, P.L. Ripoll  
and Prof. F. Forriol

**For further information, please contact:**

Tel: +34 963734690  
Fax: +34 963337930  
[madridfootandankle.com](http://madridfootandankle.com)

6<sup>th</sup> Arthroscopic Technique Symposium (Advanced  
Course)

Asan Medical Center  
Seoul, REPUBLIC OF KOREA

**May 27, 2018**

Chair(s): Kyung-Ho Yoon, MD

**For further information, please contact:**

Tel: +82 226263296  
Fax: +82 226261164  
[www.korarthro.com](http://www.korarthro.com)

Foot and Ankle Arthroscopy Sports Traumatology  
Course

AMC Amsterdam  
Amsterdam, NETHERLANDS

**May 31– June 1, 2018**

Chair(s): Prof. G.M.M.J. Kerkhoffs

**For further information, please contact:**

Tel: +31 (0)205662474  
Fax: +31 (0)205669117  
[www.acesamsterdam.nl](http://www.acesamsterdam.nl)

Football Medicine Outcomes: Are We Winning?  
Camp Nou Stadium

Barcelona, SPAIN

**June 2–4, 2018**

Chair(s): Stefano Della Villa

**For further information, please contact:**

Tel: +39 0512986814  
Fax: +39 05119902200  
[www.footballmedicinestrategies.com](http://www.footballmedicinestrategies.com)

35<sup>th</sup> Annual SDSA Shoulder Course: Arthroscopy  
Arthroplasty & Fractures

Hilton Bayfront  
San Diego, CA, UNITED STATES

**June 20–23, 2018**

Chair(s): James C. Esch, Felix "Buddy" Savoie,  
Jon "J.P." Warner

**For further information, please contact:**

Tel: +1 760 9402066 or +1 951 6956800  
Fax: +1 951 6956801  
[sdsi-shoulder.com](http://sdsi-shoulder.com)

The 15<sup>th</sup> International Forum on Sports Medicine and  
Arthroscopy (the 15th IFOSMA)

Intercontinental Hotel

Qingdao, CHINA

**June 29–July 1, 2018**

Chair(s): Shiyi Chen

**For further information, please contact:**

Tel: +86 021 52888255  
Fax: +86 021 64150355  
[www.ifosma2018.com](http://www.ifosma2018.com)

XV Congreso Internacional de la Asociación  
Argentina de Artroscopia–III Congreso Conjunto con  
la AOSSM

Hilton Buenos Aires Hotel

Buenos Aires, ARGENTINA

**September 4–7, 2018**

Chair(s): Rodrigo Maestu, J. Batista,  
JP Previgliano, D. Slullitel

**For further information, please contact:**

Tel: +54 1148112089  
Fax: +54 1148112389  
[www.artroscopia.com.ar](http://www.artroscopia.com.ar)

18<sup>èmes</sup> Journées Lyonnaises de Chirurgie du  
Genou –Advanced Course: Revision Knee

Arthroplasty

Convention Centre

Lyon, FRANCE

**September 20–22, 2018**

Chair(s): Roger Badet & Sebastien Lustig

**For further information, please contact:**

Tel: +33 472076222  
[www.lyon-knee-congress.com](http://www.lyon-knee-congress.com)

XIV Turkish Sports Traumatology, Arthroscopy and  
Knee Surgery Congress

Gloria Convention Center

Antalya, TURKEY

**October 2–6, 2018**

Chair(s): Prof. A. Merter Ozenci

**For further information, please contact:**

Tel: +90 2123814637  
Fax: +90 2122586078  
[tusyad2018.org/en.html](http://tusyad2018.org/en.html)

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