



ISAKOS

newsletter

ISAKOS Newsletter 2013 • Volume I

Come and Renew your Friendships from Around the World at the 2013 ISAKOS Congress!

The International Society of Arthroscopy, Knee Surgery and Orthopaedic Sports Medicine look forward to welcoming both members and future members to the 9th Biennial ISAKOS Congress in Toronto, Canada. Bringing together the worlds' leading experts in arthroscopy, knee surgery and orthopaedic sports medicine, the ISAKOS Congress is an event not to be missed.

With more than 1,800 different educational events, the ISAKOS Congress presents attendees with a variety of options for their continuing medical education. Four simultaneous pre-courses will be offered on Saturday, May 11, on topics ranging from *Advances in Knee: Patellofemoral Instability, ACL Reconstruction and Meniscal Repair*, to *Clinical Research Methods: From Idea to Publication*, to *International Update on Surgical Controversies of the Shoulder and Elbow*, and *ISAKOS & FIFA: Key Issues and Challenges in Safety and Health in Soccer 2013*.

ISAKOS is also pleased to offer a concurrent course focusing on topics related to Sports Rehabilitation. This course, entitled *Sports Rehabilitation: Global Perspectives for the Physical Therapist and Athletic Trainer* will be held from Sunday, May 12 to Tuesday, May 14, 2013, and involves a diverse faculty of internationally renowned orthopaedic surgeons, as well as physical therapists.

The ISAKOS Congress will be held from Sunday, May 12 to Thursday, May 16, and will include more than 250 speakers. Participants will have access to Instructional Course Lectures, debates, symposia, lectures, scientific paper presentations, live surgical demonstrations on cadavers, and electronic posters. The faculty of the ISAKOS Congress welcome your comments and questions, and look forward to interacting with course participants.

Toronto is an international and beautiful city, looking forward to welcoming all ISAKOS Congress participants and their guests. Make sure you book your hotel reservations at an ISAKOS Congress designated hotel to ensure you can maximize your networking time!

The family of ISAKOS looks forward to welcoming all to the city of Toronto for another educational ISAKOS Congress!

9TH BIENNIAL
ISAKOS 2013
CONGRESS
MAY 12-16, 2013 • TORONTO, CANADA

www.isakos.com



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Miqësi	barátság
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For more on the
**ISAKOS
CONGRESS,**
please see page 16



EDITOR'S NOTE



The reason my bags are packed and I'm ready to go to the ISAKOS Biennial Congress in Toronto

Is because I'm committed to learning as well as interaction with my peers; I prioritize arthroscopy and sports medicine education; and in my final editorial I honor ISAKOS President Moises Cohen from Sao Paulo, Brazil.

ISAKOS has a long line of leaders including respected Past Presidents, and Moises has nobly continued the tradition.

Dr. Cohen is a notable scholar. Among his many classic presentations and publications, one which I find memorable is his description of long term outcome after ACL surgery (published in the *Arthroscopy: The Journal of Arthroscopic and Related Surgery*), to highlight a single example of his clinically relevant academic contributions. As a result of this and substantial other research, as well as a commitment to exemplary teaching, and tireless patient care, Moises has in 2012 been promoted to the highest and admired designation of "Titular Professor," a full professor at his esteemed university. Ever humble, Dr. Cohen shares the credit for this recognition and accomplishment with his friends at ISAKOS, whom he calls mentors, although we feel as mentees to our society President.

Socially, Moises is a host with a few equals. At the last Biennial Congress in Rio de Janeiro Brazil, Moises served as local host, and any who attended appreciated the warmth of his cultured nation. We are delighted that he is bringing us north to Toronto, Canada this spring. For those who have yet to register, please do so, in order to join us for the upcoming Congress.

The ultimate expression of leadership, in the case of Dr. Cohen, could include the inspiration he has provided for his entire family, as both of his daughters have pursued orthopedic knee, or shoulder fellowship training, respectively, and in addition remaining affiliated with the Instituto Cohen.

I'd like to thank all of my mentors, peers, friends and colleagues for the opportunity to serve as your Newsletter Editor for three consecutive, two-year terms, and assure you that the incoming Editors will continue to improve the Newsletter and continue its development in my stead.

In addition to thanking Dr. Cohen, I once again acknowledge my predecessor as Editor, Ron Selby, MD, as well as ISAKOS Executive Director, Michele Johnson and her team, including my special thanks to Katie Anderson for her leadership of the Newsletter Editorial Board and Committee, and her expertise in print and electronic publication, which has resulted in the substantial quality manifested in the newsletter as it exists today.

James H. Lubowitz, MD
ISAKOS Newsletter Editor, 2011 – 2013



Cohen Family



Dear Family of ISAKOS,

As we begin 2013, I would like to take a moment to reflect on the year of 2012. 2012 was a very strong year for our society. As you can see from the pages of this Newsletter, ISAKOS was busy in 2012, with cooperative courses in India and China, as well as our ISAKOS Approved Courses. We continue to appreciate the opportunity to work with regional leaders to bring the educational opportunities of ISAKOS to your local area. I encourage you to review the ISAKOS Approved Course reports and see the great work being done around the world!

ISAKOS also has improved our society website with the introduction of the MyISAKOS menu, which contains all of your ISAKOS Member Benefits in one convenient menu. More information on this can be found on page 13 of this Newsletter.

We also continue to grow and develop the ISAKOS Global Link website, including the introduction of Surgical Skills courses, including pre- and post-course questions. The ISAKOS Education Committee strongly encourages you to participate in these online courses. We are already hard at work on advanced development of courses based on the 2013 Congress Surgical Skills Demonstrations.

Looking forward to 2013, the international community of ISAKOS will come together in Toronto from May 11–16, 2013 for the 9th Biennial ISAKOS Congress. This will be the largest ISAKOS Congress to date, with nearly 2,000 unique presentations held over the Pre-Course day of Saturday, May 11, and the Congress days of Sunday, May 12–Thursday, May 16. I would like to take a moment to thank everyone who submitted abstracts for the ISAKOS Congress—more than 1800 were received! ISAKOS also would like to thank the ISAKOS Committee Members who ensured that each abstract was reviewed three times to ensure the best scientific content for the meeting.

The ISAKOS Congress will include four concurrent pre-courses, include two with Surgical Skills demonstrations! ISAKOS is thrilled to be partnering with the Fédération Internationale de Football Association for the first ISAKOS & FIFA Collaborative Pre-Course on **Key Issues and Challenges in Safety and Health in Soccer 2013**. Other pre-course offerings will include **Advances in Knee: Patellofemoral Instability, ACL Reconstruction and Meniscal Repair**, which includes surgical demonstrations from five leading international experts; **Clinical Research Methods: From Idea to Publication**, appropriate for anyone interested in research or publication, not just orthopaedics; and **International Update on Surgical Controversies of the Shoulder and Elbow**, a dense half day course with eight different surgical demonstrations! More information on the ISAKOS Congress Pre-Courses can be found on page 19 of this Newsletter.

We hope to see all of our ISAKOS Family in Toronto. Have ideas of projects ISAKOS should consider for 2013? Thoughts on ways to improve member services? Please do not hesitate to contact ISAKOS—we love to hear from our members. Please email all questions, suggestions or comments to isakos@isakos.com.

Moises Cohen, MD, PhD
ISAKOS President 2011–2013



Visit ISAKOS at Booth #766 at the AAOS Annual Meeting in Chicago

ISAKOS will be exhibiting at the AAOS Annual Meeting in Chicago on March 19–23. Don't forget to visit and bring your colleagues to booth #766. Become their Sponsor if they wish to apply for ISAKOS Membership.

ISAKOS Committee Meetings will also be held during the AAOS Annual Meeting. View the ISAKOS Committee Meeting Schedule.

See you in Chicago!

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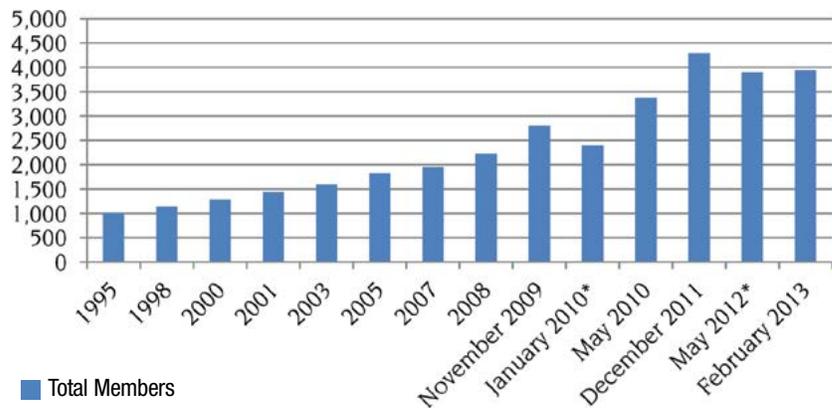
We depend on our members to make the society what it is today and to embrace the potential it has in the future. It is the responsibility of members to recruit NEW MEMBERS to join ISAKOS and its goal to reach across the world.

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ISAKOS MEMBERSHIP BY CATEGORY

# of Members	Category
1,840	Active
16	Affiliate
96	Applicant
794	Associate
973	Corresponding
202	Emeritus
17	Honorary
6	Fellow
3,945	- Total Count -

TOTAL MEMBERS

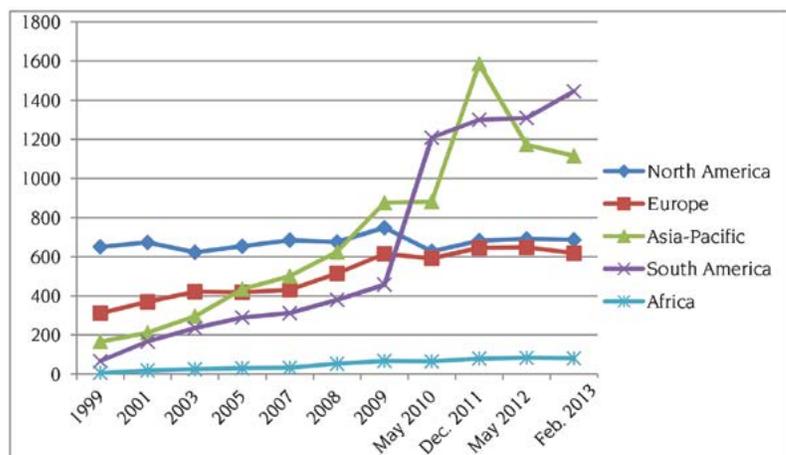


ISAKOS MEMBERSHIP BY GROWTH

Year	Total Members
1995	1,005
1998	1,141
2000	1,282
2001	1,437
2003	1,598
2005	1,828
2007	1,958
2008	2,231
November 2009	2,809
January 2010	2,396
May 2010	3,374
December 2011	4,291
May 2012	3,902
February 2013	3,945

ISAKOS MEMBERSHIP GROWTH BY REGION 1999 TO FEBRUARY 2013

Growth by Region	1999	2001	2003	2005	2007	2008	2009	May 2010	Dec. 2011	May 2012	February 2013
North America	650	673	622	653	684	675	748	627	682	691	686
Europe	311	369	421	418	430	514	615	592	645	647	618
Asia-Pacific	165	211	295	433	500	624	876	881	1585	1172	1115
South America	66	166	235	289	312	379	457	1209	1300	1309	1446
Africa	6	18	25	30	32	53	67	65	79	83	81
TOTAL	1,198	1,437	1,598	1,828	1,958	2,245	2,763	3,374	4,291	3,902	3,945





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All-Inside ACL Reconstruction with Dr. James Lubowitz, MD



Arthroscopic Double-Row Rotator Cuff Repair with Dr. Stephen Burkhart, MD



Advanced Arthroscopy of the Ankle with Annunziato "Ned" Amendola, MD

YOUR COMMITTEES AT WORK

ARTHROSCOPY COMMITTEE

The Arthroscopy Committee has been focusing on two related projects. The first has been to develop an online picture and video library of normal and pathologic arthroscopic anatomy of the knee, shoulder, hip, elbow, wrist and ankle in order to provide teaching and reference tools for ISAKOS members. The second, and closely related project, is to develop standard methods and tools for evaluating, classifying, and reporting injuries and conditions of these joints. *It is the Committee's belief that we can harness ISAKOS' power of international collaboration for researching disease and reporting treatment outcomes if we use one standard method to classify each of the conditions that we are treating, and one standard method to document outcomes for each of these treatments. If we all used the same tools, data could be pooled from many research projects and then multi-center, international studies could start with a goal of better understanding the outcomes of our patient treatments.*

The first project was the development of a series of videos showing normal arthroscopic anatomy of each of the aforementioned joints. In essence, we needed to define what normal anatomy was, before undertaking the task of classifying abnormal anatomy. These videos can be found in the ISAKOS Global Link so that members can now have a visual library of normal findings in each joint. These videos can then be used for teaching and for reference.

The next project is the development of Standard Terminology used to describe and classify each of the pathologic conditions that we may see during arthroscopic surgery. The conclusions of that project, headed by Neik van Dijk, can be found in the myCommittees section of myISAKOS. It is an excellent classification of disease and injury.

The Arthroscopy Committee is now working on further defining the classification of injuries. Mark Clatworthy led a group of surgeons who have made recommendations on how we should classify knee ligament injuries, articular cartilage injuries, and knee arthritis radiographically, and developed the ISAKOS Classification of Meniscal Tears. This was published in a previous ISAKOS Newsletter and in *The American Journal of Sports Medicine*. Work on the ankle, hip, wrist and elbow are near completion as well.

As part of this work, a combined Committee was formed with the Upper Extremity Committee to discuss and come to consensus on a single Classification for injuries to the AC Joint, Rotator Cuff Tears, and Shoulder Instability that we could recommend to be used by ISAKOS members.

Next for the Arthroscopy Committee is to gather and publish arthroscopic photographs of each pathologic finding from the terminology projects online. It is the Committee's intention to provide all ISAKOS members with a library of pathologic anatomy for each of the conditions that we treat.

The library will be very useful for teaching new physicians about the injuries that we treat, and refining how we report our future research studies. As the Committee develops the web-based library, we will invite every ISAKOS member to send in intra-operative photographs of the various lesions for inclusion in the library.

Finally, the Arthroscopy Committee is beginning to work with the other clinical committees to use our classifications to develop multicenter studies within the ISAKOS Membership community.

The Arthroscopy Committee thanks all of its members for their hard work on these endeavors and looks forward to seeing all of you in Toronto!

Fredrik Almqvist, Kevin P. Shea

EDUCATION COMMITTEE



The Education Committee has been working on its mission: "Develop a multi-facet and multi-dimensional education program meeting the scientific, clinical and practice-related needs for members" – *Be the World*

Umbrella on Arthroscopy, Knee Surgery and Orthopaedic Sports Medicine.

The Committee developed and established a few new rules for becoming an ISAKOS Teaching Center. On the ISAKOS website, one can view the increasingly high-quality Teaching Centers that have become ISAKOS Approved. We encourage members to use this resource because it is a valuable asset for everyone.

The Education Committee refined the ISAKOS Approved Course requirements as well, to ensure the scientific quality of the Courses.

Currently, the Education Committee is working on six booklets that will be available at a later date:

- "Elbow Arthroscopy"
Luigi Pederzini, Marc Safran and Greg Bain
- "Surgery of Shoulder Instability"
Mark Miller and 2 co-editors
- "Meniscal Reconstruction"
João Espregueira-Mendes, Rene Verdonk and Joan Carlos Monllau
- "Surgical Treatment of Patella Malalignment"
Alberto Gobbi, Harrison Coerver and Mehran Mehregany
- "Rotator Cuff"
Upper Extremity Committee –
Guillermo Arce, Felix Savoie and Ben Kibler
- "Safe Return to Sports"
François Kelberine and others

YOUR COMMITTEES AT WORK

EDUCATION COMMITTEE (cont.)

The long-term Education strategy was planned, and it was decided that special focus should be given to organizing courses for surgeons from developing countries. This is why the Education Committee launched the online platform, Global Link. The website will be a forum for discussion and data collection for multi-centric studies. It was also decided to hold educational meetings in the year between congresses, in various developing countries, as part of the effort to make quality training available to surgeons in those areas.

Another new program developed by the Committee is the sponsored Travelling Fellowship program. This program awards a scholarship of up to \$2,000 USD to young deserving surgeons. Local expenses should be supported by the Centers being visited.

The Education Committee also hopes that ISAKOS can work towards becoming the primary resource for international surgical skills education in our specialties of Arthroscopy, Knee Surgery and Orthopaedic Sports Medicine.

The ISAKOS Education Committee would like to thank all the involved Committee members for their acceptance and commitment to fulfill ISAKOS' education goals. It is an amazing team! Congratulations to all and keep up the good work!

The next Education Committee meeting will be at AAOS in Chicago in March 2013.

The Education Committee will also support and contribute to the 9th Biennial ISAKOS Congress Program in Toronto, chaired by Marc Safran. Do not miss this extraordinary meeting!

João Espregueira-Mendes, Alberto Gobbi

KNEE COMMITTEE

The primary focus of the Knee Committee has been planning and recruiting speakers for the Congress Pre-Course *Advances in the Knee: Patellofemoral Instability, ACL Reconstruction and Meniscal Repair*. This Pre-Course will be held on Saturday, May 11th at the 2013 ISAKOS Congress in Toronto. The Chairs, Allen Anderson, David Parker and Willem Van De Merwe, put together a program with exceptional speakers on the topics of Treatment of Pediatric ACL Tears, Revision ACL Reconstruction, ACL and Osteoarthritis, Patellofemoral Instability, and Treatment of Meniscal Pathology. The patellofemoral topics include Biomechanics of Patellofemoral Instability, Management of Acute Dislocation and Surgical Treatment including Tibial Tubercle Osteotomy, MPFL Reconstruction and Trochleoplasty. The topics of the Meniscal Repair section will include Current Concepts of Meniscal Repair and Meniscal Transplantation. The afternoon session will feature surgical demonstrations and case presentations on Double Bundle ACL Reconstruction, Extra-articular Reconstruction and Repair of Meniscal Root Tears. This will be an exceptional course and well worth arriving in Toronto a day early!

In addition to the Pre-Course, the Knee Committee is continuing to work on criteria for awarding one of the ISAKOS & OREF, \$100,000, multicenter research grants. The mechanism for selecting and coordinating awards will be developed in conjunction with the Scientific Committee and the ISAKOS Board of Directors. The Committee also helped the Program Committee grade the abstracts for the ISAKOS Congress and will be involved in grading applications for various knee-related awards at the Congress as well.

Members of the Knee Committee have represented ISAKOS at international meetings this year. Allen Anderson and Willem van De Merwe made presentations during the ISAKOS Symposium at the SLARD meeting in Cartagena, Columbia. Willem van De Merwe was the Chair and David Parker presented lectures at the ISAKOS Course on Sports Rehabilitation at the Congress of Arthroscopy and Sports Medicine Meeting in Jaipur, India.

The next Knee Committee meeting will be held on March 19, 2013 at the AAOS Annual Meeting in Chicago.

Allen F. Anderson, Willem Van De Merwe, David Parker

For more on the ISAKOS CONGRESS, please see page 16



YOUR COMMITTEES AT WORK

ORTHOPAEDIC SPORTS MEDICINE COMMITTEE



The first project of the Orthopaedic Sports Medicine Committee was a current concept on the “Art and Science of Muscular Injuries”. After our closed meeting held in Aspetar (Qatar), it took some time to complete the work. However, thanks to Myles Coolican (Australia) for finalizing and reporting on the concept in a previous e-newsletter. The current concept can be found on the ISAKOS website and has been presented on behalf of ISAKOS during the combined European Federation of Sport Traumatology and World Sport Trauma Meeting in London last October with Myles Coolican, Lucio Ernlund (Brazil), Joe Lowe (Israel), Jacques Menetrey (Switzerland) Ricardo Denari (Argentina) and François Kelberine (France).

The second project, which is still in progress, is a current concept on a safe return to sports after four frequent sport injuries: ankle injury, patellar dislocation, shoulder dislocation and ACL reconstruction. This concept is chaired by Nicola Maffulli (UK), Myles Coolican, Daniel Slulittel (Argentina) and François Kelberine (France). Each chapter includes 5-6 experts from all over the world and collaboration from the Upper Extremity and the Knee Committees. A 2-day closed meeting was held in London at the EFOST congress. The final article is presently under review. According to the Education Committee, an educational booklet will be distributed and posted online at a later date. For both these current concepts, a publishable version will be written by Robert Laprade, (USA), Nicola Maffulli and Myles Coolican to be submitted to Arthroscopy.



The OSMC is strongly involved in the Toronto Congress program with exciting sessions:

- **2 Instructional Courses:** PRP chaired by Rosero Silva (Brazil) and *Safe Return To Sport* which will partially report the OSMC current concept.
- **4 Symposia:** *Pediatrics Sport Medicine* (case based) chaired by Francois Kelberine, *Combat Sport Injuries* chaired by John Bergfeld (USA), *Tendinopathy* chaired by Nic Maffulli and *Running Injuries* chaired by Mike Carmont (UK).
- **A Team Physician Special Interest Session** within the meeting—with lectures about Concussion by Albert Pearsall (USA), Women in Sport Medicine by Jo A. Hannafin (USA) and use of allografts.
- **The Achilles award** for the best manuscript related to research in orthopaedic sports medicine.

The future projects of the Orthopaedic Sports Medicine Committee concern two online surveys for ISAKOS members:

- **Return to Play after Closed Head Injury** - as the guidelines are different from one country to another. Albert Pearsall (USA) and Ron Dierk (The Netherlands) will propose a suitable questionnaire for this survey.
- The **Shoulder at Risk for Dislocation** in collaboration with the Upper Extremity Committee. Daniel Slullittel (ARGENTINA) will complete a literature review and methodology and a draft of the form.

The Orthopaedic Sports Medicine Committee would like to express gratefulness to the OSMC members for their dedication. See you in Toronto!

François Kelberine

What are
all these codes
about?

ISAKOS has included OR Codes throughout this Newsletter to link you to the latest information on our website! Simply scan the code with the bar code reader app on your smartphone and get connected to up-to-date ISAKOS content!

YOUR COMMITTEES AT WORK

SCIENTIFIC COMMITTEE



The Scientific Committee is preparing an exciting Pre-Course on Clinical Research Methods for the 2013 ISAKOS Congress in Toronto. The course will be co-chaired by Stephen Lyman from Hospital for Special Surgery and Robert Marx. The Pre-Course will cover all aspects of clinical research methodology, from study design to research execution and even tips to assist with publication. There will be leading experts from across the world who will be lecturing, including non-ISAKOS members who are able to bring in additional areas of expertise. This course is ideal for any clinician involved in clinical research who wishes to improve the quality of their research. It will also encourage academic members to pursue new areas of research by using new methodologies. The ISAKOS Scientific Pre-Course will also be valuable to those who may not be involved in research but might consider future involvement or want to better understand research to aid with their practice.

On another exciting front, the Scientific Committee recently awarded the first ISAKOS & OREF research grant. The title of the research study is "Clinical Application of Quantitative Assessment of the Pivot Shift—A Multi-center Study," with Volker Musahl, from the University of Pittsburgh, as the principal investigator and Yuichi Hoshino, from Kobe University in Japan, as the co-principal investigator. Other investigators include James Irrgang, Yan Lu, Nicola Lopomo, Giulio Muccioli, Cecilia Signorelli, Mattias Ahlden, Kristian Samuelsson, Kouki Nagamune, and Ryosuke Kuroda. Congratulations to Dr. Musahl and his team, and we look forward to their research findings.

Nori Nakamura and Rocky Tuan organized an ICRS and ISAKOS combined symposium on joint preservation which was held at the 2012 ICRS Meeting in Montreal. Speakers included Phillipe Neyret, Freddie Fu, Susan Chubinskaya, and Daniel Saris. Manuscripts based on the symposium presentations will be published in a supplement to the journal, *Cartilage*. Dr. Nakamura and Dr. Tuan will hold another ICRS/ISAKOS combined symposium at the 2013 ISAKOS Congress in Toronto with Connie Chu, Anthony Hollander and Bert Mandelbaum

Robert G. Marx

UPPER EXTREMITY COMMITTEE



The Upper Extremity Committee has been very busy during the latter half of 2012. The two main Committee projects were accomplished with great success.

The Classifications and Scores Consensus Project, a combined task force of the Arthroscopy and Upper Extremity Committees, is currently at its final stage. After hard work, the lack of a pre-determined patient or injury classification and well-designed preoperative and postoperative evaluation scores, may lead to a futile report. Undoubtedly, the appropriate selection of a score for a given research is essential for success. Kevin Shea, project leader, is presenting a Preliminary Report of this work in this Newsletter. We hope this summary will be a helpful guide for members and investigators to launch future studies based on precise classification and follow-up assessment scores. The final draft of this work will be published as an UEC Booklet and will be available at a later date.

The second UEC project is the Rotator Cuff Consensus. Recent publications regarding clinical practice guidelines for rotator cuff diseases have been deemed controversial and somewhat confusing. Therefore, the ISAKOS-UEC assembled an expert panel of surgeons and researchers to develop an international consensus, based on the available evidence and panel opinion on the most appropriate management of disorders of the rotator cuff. The ISAKOS-UEC members met in Buenos Aires, in April 2012, for a Closed Consensus Meeting about Rotator Cuff Diseases. The original lectures, with audio, were organized and uploaded to ISAKOS Global Link by Vicente Gutierrez from the Education Committee. They are currently available to members. A brief report written by Dr. Felix Savoie will be submitted for publication to the *Arthroscopy: The Journal of Arthroscopic and Related Surgery*. The Closed Consensus Meeting about Rotator Cuff Diseases wrap-up with clinical recommendations will also be published as an ISAKOS Booklet.

The ISAKOS UEC will also publish a booklet on the Acromio-Clavicular Joint Consensus and Conclusions, led by Klaus Bak. This booklet will offer ISAKOS members valuable clinical information—the product of four years of devoted commitment to UEC educational projects.

The Upper Extremity Committee has successfully overcome many challenges and is always moving forward.

Guillermo Arce, Eiji Itoi



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ISAKOS UPDATE

New Year Brings New Ventures for ISAKOS

ISAKOS has a few exciting things to unveil this year. The Society constantly strives to develop programs to better serve its membership as well as to reinforce involvement and partnership. Because of this, two new web portals have been created to streamline your interaction with ISAKOS; myISAKOS and myCongress. Both programs house the most important ISAKOS or Congress information in one convenient location. In addition to these two portals, the 2013 ISAKOS Congress Mobile App is underway. This smart phone application will give users access to Congress information while on the go and during the meeting.



As a replacement to the Members Only section of the ISAKOS website, the **myISAKOS** dashboard reshapes the way ISAKOS members and non-members access their ISAKOS accounts. ISAKOS Members can now conveniently manage their profile information, subscriptions and access their member benefits. Non-members can use myISAKOS to browse public ISAKOS resources and benefits, manage their account information as well as apply for membership. We hope that our online users find myISAKOS convenient and simple for all their ISAKOS needs.



myCongress was developed as a gateway to the ISAKOS Congress for its attendees and participants. With myCongress, users are able to register, manage program participation, review or edit submitted abstracts and more. Through this dashboard, one can also request a Visa letter or CME certificate, download important Congress documents as well as find links to book accommodations and tours. With this single portal, meeting attendees and participants can easily access everything needed to participate in the ISAKOS Biennial Congress.

Congress participants and attendees will also have Congress information at their fingertips by using the 2013 ISAKOS Congress Mobile App. The app will allow users to view exhibitor and attendee directories, venue maps and program schedules at the touch of a button. The app will also feature live ISAKOS Twitter feed as well as a photo scavenger hunt game that encourages networking and friendly competition between participants. Digitally interact with meeting attendees through this mobile network as well as use it to customize and enhance your Congress experience.

ISAKOS encourages you to explore these new tools and hopes that they make your interaction with ISAKOS much more convenient and efficient. Thank you for your continued support of our endeavors and we look forward to seeing you in Toronto!

Michele Johnson
ISAKOS Executive Director



UPPER EXTREMITY COMMITTEE PROJECT UPDATE

REPORT FROM THE SHOULDER TERMINOLOGY GROUP

ISAKOS is an international organization established to facilitate the world-wide exchange of research, education, and clinical care for our patients. As such, it is critical that we all speak the same language when we discuss and report the results of our research and treatment outcomes with each other.

In 2012, a group was formed by members of the Arthroscopy Committee and the Upper Extremity Committee to standardize terminology for shoulder instability, rotator cuff tears, and acromioclavicular joint injuries. These topics were chosen because over 90% of the shoulder presentations at the ISAKOS Congresses in Florence, Osaka, and Rio de Janeiro concerned injuries in one of these three areas. The group has been led by Guillermo Arce and Kevin Shea. Other members include Klaus Bak, Mark Ferguson, Eiji Itoi, Emilio Calvo, Benno Ejnisman, Raffy Mirzayan, Ben Kibler, Jaap Willems, Gus Mazzocca, Matthew Provencher, Buddy Savoie, and Philippe Hardy. The group felt strongly that we should have a single system to classify each type of injury and a standard outcome measures for each condition in order to improve our ability to compare results and ultimately, to collaborate in multicenter studies. The classification system should already be in use, if possible, validated for reliability, and easily used by physicians and researchers. Similarly, the outcome scores should be validated, already in use and should include both patient-completed measures and objective data.

Many classification systems have been used to describe rotator cuff tears in world-wide orthopaedic literature. However, there is no classification system that is universally utilized. When these studies were analyzed, several factors were identified that researchers felt were important in classifying tear patterns. These factors include: location of the tear, extent of the tear, pattern of the tear, degree of tendon retraction and degree of fatty infiltration as measured by either CT scan or MRI. Based on this preliminary review, a small group led by Emilio Calvo proposed a new system of rotator cuff tear classification by combining the factors felt to be most important in classifying rotator cuff tears (see Table I). This new classification combined the important factors from those classifications in current use into one unified evaluation system. The group is currently validating the system for reliability and hopes to have more information soon.

Similarly, shoulder instability is classified in a number of ways including direction of instability, traumatic vs. atraumatic, subluxation vs. dislocation, and frequency of occurrence. John Kuhn (1) has developed the FEDS classification system in an attempt to unify these classifications.

The group felt that the system should be modified to include instability in the overhead athlete, differentiate between voluntary and involuntary instability, and include details of the anatomic tissues involved, i.e. capsular stretch, labral tear, bone lesion, etc. Kevin Shea has proposed a modification of the FEDS system of Shoulder Instability Classification that includes these factors (Table II). The group is continuing to discuss this classification method and invites comments from ISAKOS members.

The outcome scoring systems used for rotator cuff injuries and shoulder instability in ISAKOS presentations and publications for the previous 3 Congresses were reviewed. No consistent system was utilized. The group felt strongly that we are now in an era of evidence-based medicine and should use patient-completed outcome measures as part of our studies. Consensus was reached that we recommend use of the Western Ontario Rotator Cuff Index (WORC) (2) as the primary outcome measure for rotator cuff treatment and the Western Ontario Shoulder Instability Index (WOSI) (3) as the primary outcome measures for reporting our results of treatment. These systems are patient completed and validated for many languages. Many members felt that we would also like to have traditional objective measurements such as range of motion, strength, etc. included in the reported outcomes. We again reached consensus to recommend that the Constant score (4) be used as a secondary outcome measure for rotator cuff disease and the American Shoulder and Elbow Surgeons (5) score be used secondarily for shoulder instability.

A more thorough explanation will be provided in an ISAKOS Booklet on Shoulder Classification and Outcome Scoring that will be available at a later date.

The group is not able to make any recommendations on either AC Joint classification or AC Joint outcomes at this time. A group led by Eiji Itoi, Ben Kibler, and Gus Mazzocca is refining a classification system based on the original Rockwood classification and hopes to come to a consensus in the near future. The outcome evaluation has proven to be more challenging. Most researchers have used the Constant Murley Classification system to report their results of AC Joint treatment. However, this system is not specific for AC Joint symptoms, nor is it validated for that use. It is likely that they will bring forward a new outcome scale in the future.

Finally, the purpose of the project is to create a single classification and outcome scoring system that anyone can use for their research. This way, studies from every part of the world can be comparable. The group is open to any comments and suggestions as we finalize our recommendations. Please feel free to send your comments to either Kevin Shea (shea@uchc.edu) or Guillermo Arce (guillermorace@ciudad.com.ar).

Kevin P. Shea and Guillermo Arce

Table I
ISAKOS Rotator cuff tear classification system

LOCATION (L)	EXTENSION (E) ¹	PATTERN (P) ²	FATTY ATROPHY (A) ³	RETRACTION (R) ⁴
Partial thickness	>50% thickness <50% thickness	A (Articular) B (Bursal) I (Interstitial)	0 1 2 3 4	1 2 3
Full thickness posterosuperior	C1 C2 C3 C4 (Massive)	C U L rL (reverse L)		
Full thickness anterior	1 2 3 4 5			

- (1) Extension in partial thickness tears is based on the percentage of foot print coverage. Extension in posterosuperior full-thickness cuff-tears refers to the size of the tear as measured medial to lateral (C1 = < 1cm, C2 = 1 to 2 cm, C3 = 3 to 4 cm, C4 = > 4 cm). Extension in anterior (subscapularis) full thickness tears is based on Lafosse et al classification system: 1 = Partial lesion of superior one-third, 2 = Complete lesion of superior one-third, 3 = Complete lesion of superior two-thirds, 4 = Complete lesion of tendon but head centred and fatty degeneration classified as less than or equal to Goutallier stage III, 5 = Complete lesion of tendon but eccentric head with coracoid impingement and fatty degeneration classified as more than or equal to Goutallier stage III (Lafosse L et al, JBJS Am 2007).
- (2) Full-thickness posterosuperior rotator cuff tear pattern is described as Ellman and Garstman (Ellman H, Garstman G, 1993).
- (3) Fatty atrophy is defined using CT or MRI based on the systems by Goutallier et al (CT) (Goutallier et al, Clin Orthop 1994) or Fuchs et al (MRI) (Fuchs B et al, JSES 1999): 0 = Normal muscle, 1 = Some fatty streaks, 2 = Less than 50% fatty muscle atrophy (more muscle than fat), 3 = 50% fatty muscle atrophy (equal muscle and fat), 4 = More than 50% muscle atrophy (more fat than muscle).
- (4) Retraction is assessed following the Patte et al classification system (1 = Proximal stump close to bony insertion, 2 = Proximal stump at level of humeral head, 3 = Proximal stump at glenoid level) (Patte D, Clin Orthop 1990).

Table II
Modified FEDS Classification of Shoulder Instability

Direction	Etiology	Severity	Frequency	Anatomic Lesion
Anterior Posterior	Traumatic -required reduction -never required	Pain* Subluxations	single episode 2-5 times	Capsule Labrum
Inferior	reduction Atraumatic -involuntary -positional -habitual Repetitive Microtrauma*	Dislocations Locked	> 5 times Locked	Bone

*Only applicable to shoulder instability in the overhead and throwing athlete

°As determined by either pre-operative imaging studies (CT arthrogram, MRI, etc.) or intra-operative findings. A Capsular lesion is diagnosed only if there are no labral avulsions or glenoid bone defects associated with the instability.

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- **Pre-Course:** *Clinical Research Methods: From Idea to Publication*
- **Pre-Course:** *International Update on Surgical Controversies of the Shoulder and Elbow*
- **Pre-Course:** *ISAKOS & FIFA: Key Issues and Challenges in Safety and Health in Soccer 2013*

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Marc R. Safran, MD

Message from the Program Chair

The 9th Biennial ISAKOS Congress is just around the corner. The ISAKOS Program Committee has been hard at work with the ISAKOS Office putting together an excellent educational program bringing together leaders in knee surgery, orthopaedic sports medicine and arthroscopy from around the world. The scientific program will be of the highest standard, as the top 250 abstracts of over 1800 submissions will be presented as scientific papers. An additional 500 abstracts will be presented as Electronic Posters. E-Posters will be available online and at viewing stations during the 2013 ISAKOS Congress.

Awards will be given for the **John Joyce Award** for the best arthroscopy paper read by an orthopaedic surgery resident or fellow during the Scientific Program; the **Caspari Award** for the best upper extremity paper read; and the **Scientific Research Award** for the best scientific paper presented. Manuscript based awards will include the **Albert Trillat Award** presented to the young researcher who has done outstanding clinical laboratory research contributing to the understanding, care or prevention of injuries to the knee; the **Achilles Award** for the most outstanding clinical or laboratory research in the field of sports medicine, such as the care and prevention of injuries; and the **Patellofemoral Research Award**, presented for outstanding research leading to improved understanding, prevention and treatment of patellofemoral pain or instability.

Additionally, there are thirty two **Instructional Course Lectures**, held in the morning from 7:00-8:30am Monday, May 13 through Thursday, May 16. Topics for these Instructional Course Lectures range from *Arthritis in the Athlete*, to *Shoulder Instability*, to *Cartilage Repair Options* to the *treatment of the Stiff Knee*. Instructional Course lectures offer the opportunity to expand your knowledge in a friendly setting with some of the leading faculty in the world!

ISAKOS is also pleased to offer thirty five **Symposia**, and nine **Speciality Lectures**. Personally, I am looking forward to our three sure to be hotly contested debates on *Use of Synthetic Ligaments*, *Chondral Defect in Young Athletes: ACI vs. Mosaicplasty vs. Microfracture*, and *Autologous Chondrocyte Implantation*.

ISAKOS looks forward to presentations by our Partner Societies as part of the daily opening sessions. **AANA**, **AOSSM**, **APKASS** (Formerly APOSSM), **ESSKA**, and **SLARD** will each present a thirty minute presentation from their unique regional perspective.

For those looking to extend their stay in Toronto, the four concurrent **Pre-Courses** offered by the ISAKOS Congress are a great option to increase your learning. More information on the Pre-Courses can be found on Page 19 of this Newsletter. The Program Committee would like to thank the Pre-Course Chairs for their diligence in developing highly diverse and educational programs for these courses.

Combined with the wonderful venue of Toronto, we expect a record attendance. We look forward to seeing you in Toronto.



Marc R. Safran, MD
2013 ISAKOS Program Chair
and the Program Committee

The ISAKOS Biennial Meeting in Toronto is Imminent!

Nobuo Adachi, MD

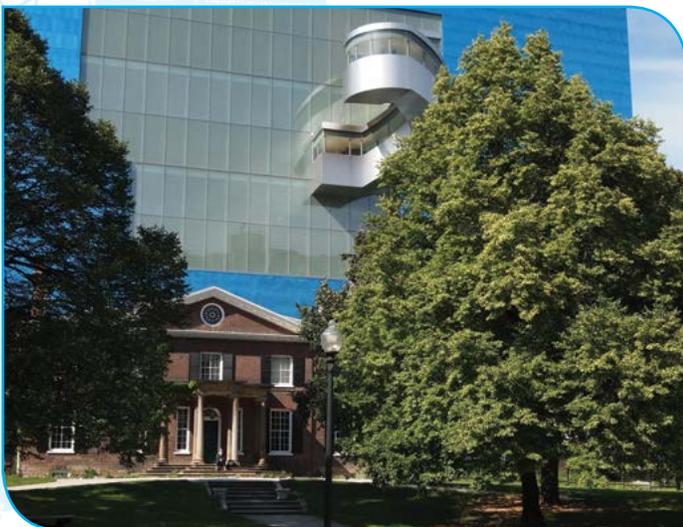
*ISAKOS Members At Large
Department of Orthopaedic Surgery,
Hiroshima University, Japan*



First of all, let me introduce myself to the readers of this newsletter. I am Nobuo Adachi MD from Hiroshima University, Japan. I have been working as a sports-related knee surgeon for over 18 years under

the guidance of Professor Mitsuo Ochi who is also Chairman of the Department of Orthopaedic Surgery at Hiroshima University. Just last year, I became a Member at Large of ISAKOS.

It was a great honor to be the recipient of the John Joyce Award at the 5th ISAKOS Congress which was held in Hollywood, Florida in 2005. The title of my presentation for the award was "Single versus Double-Bundle Anterior Cruciate Ligament Reconstruction Using Multi-stranded Hamstring Tendons." Recently, double-bundle ACL reconstruction has become a very popular surgical technique. Some surgeons even perform triple-bundle reconstruction! Many basic and clinical research studies on double-bundle reconstruction have been published. However, it is also true that these findings have been accompanied by almost as much debate on the efficacy of this complicated procedure. Indeed, the next ISAKOS meeting will bear witness to this, providing an invaluable forum for fruitful discussions on this issue. Another interesting topic of ACL surgery is the proprioceptive function of ACL.



This is one of the sub-topics of ACL injury/ ACL reconstruction and recently has comprised my main research interest. As everybody recognizes, ACL has a very important role as a proprioceptive receptor. In order to preserve or facilitate the proprioceptive function after ACL reconstruction, ACL reconstruction with ACL remnant preservation has been the focus of much attention.



I am very much looking forward to participating in the ACL sessions at this ISAKOS meeting in Toronto and specifically to recognizing the current status of ACL reconstruction.

Beside the congress, I would like to experience this international city, Toronto. Toronto is the largest city in Canada, the provincial capital of Ontario and also the center of culture and economy of Canada. I am surprised to hear that Toronto is also one of the world's most diverse cities in terms of the percentage of non-native-born residents, with about 49% of the population born outside Canada. Toronto is blessed with an abundance of sightseeing opportunities, such as the **CN Tower**, the **Royal Ontario Museum**, the **Eaton Center**, the **Hockey Hall of Fame**, and a variety of international cuisine to enjoy. Watching professional sports is of course another attraction, since Toronto is the only Canadian city with representation in seven major league sports, with teams in the *National Hockey League*, *Major League Baseball*, *National Basketball Association*, *Canadian Football League*, *Major League Soccer*, *Canadian Women's Hockey League* and *W-League*. The National Football League's *Buffalo Bills* team also plays select home games in the city. Most famously, Toronto is home to the *Toronto Maple Leafs*, one of the *National Hockey League's* Original Six clubs, and has also served as home to the *Hockey Hall of Fame* since 1958. The city has had a rich history of hockey championships. I can only hope that an NHL game will coincide with the ISAKOS meeting!



See you all in Toronto!

ISAKOS to Host Four Congress Pre-Courses on May 11, 2013

ISAKOS is pleased to announce it will be hosting four pre-courses on Saturday, May 11th including *Advances in Knee: Patellofemoral Instability, ACL Reconstruction and Meniscal Repair, Clinical Research Methods: From Idea to Publication, Upper Extremity Live Surgical Demonstrations and ISAKOS & FIFA - Key Issues and Challenges in Safety and Health in Soccer 2013*. The cost of an ISAKOS Pre-Course is USD \$175 before March 31, 2013 and USD \$200 after April 1, 2013. Participation in multiple Pre-Courses is allowed, however, full registration fees must be paid for each course. ISAKOS welcomes attendees to begin their Congress experience early with one or more of our educational Pre-Courses.

Advances in Knee: Patellofemoral Instability, ACL Reconstruction and Meniscal Repair

Pre-Course Chairs: Allen Anderson, MD, USA; Willem van der Merwe, MBChB, FCS, SA Ortho, SOUTH AFRICA; David Parker, FRACS, AUSTRALIA

The *Advances in Knee* pre-course aims to improve the understanding and treatment of the knee through a unique combination of didactic sessions and live surgical demonstrations. Focusing on the diverse topics of Patellofemoral Instability, ACL Reconstruction and Meniscal Repair, the *Advances in the Knee* pre-course will encourage presentations with a high level of evidence, debates on controversial subjects, and increased audience participation.

Clinical Research Methods: From Idea to Publication

Pre-Course Chairs: Stephen Lyman, PhD, USA; Robert Marx, MD, MSc, FRCSC, USA

ISAKOS is proud to present the first *Clinical Research Methods* pre-course, emphasizing evidence based research methods and analytic techniques. The goal of this pre-course is to provide attendees with the skills necessary to undertake their own high quality research projects. This didactic course will instruct attendees on the process of conceiving a research question, designing a study, analyzing data, and presenting results. This course will not be limited to topics related to orthopaedics and sports medicine - all clinicians interested in research are encouraged to attend.

International Update on Surgical Controversies of the Shoulder and Elbow

Pre-Course Chairs: Guillermo Arce, MD, ARGENTINA; Felix Savoie III, MD, USA

ISAKOS is pleased to offer a surgical skills oriented pre-course on Upper Extremity procedures. The goal of the *International Update on Surgical Controversies of the Shoulder and Elbow* pre-course is to evaluate the optimal use of diverse techniques for a variety of upper extremity surgical procedures. This half-day pre-course will also help participants to formulate surgical protocols for upper extremity procedures that integrate strategies to avoid potential complications.

ISAKOS & FIFA: Key Issues and Challenges in Safety and Health in Soccer 2013

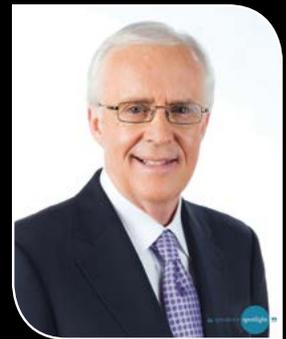
Pre-Course Chairs: Bert Mandelbaum, MD DHL (hon) USA; Moises Cohen, MD, PhD BRAZIL

This pre-course is designed for anyone involved in the treatment or management of soccer players. As the most popular sport in the world, there is a unique need for specific information on the treatment of soccer athletes. Co-sponsored with the *Fédération Internationale de Football Association (FIFA)*, this course is a great opportunity for athletes, team physicians, athletic trainers and coaches to learn more about the treatment of soccer players.

To register for Congress Pre-Courses, visit www.isakos.com/2013congress.

ISAKOS INTRODUCES PRESIDENTIAL GUEST LECTURER

With more than 25 years of broadcast experience, Brian Williams is considered the "dean of Canadian sports commentators." He has covered virtually every national and international professional-sports event, as well as major amateur tournaments. Williams looks forward to sharing the lessons he's learned from the world's greatest athletes with ISAKOS Congress attendees.



Williams was the recipient of Sports Media Canada's Outstanding Sports Broadcasting Award, and he was inducted into the Canadian Football Hall of Fame for his contributions to the CFL. Most notably, he was named to the Order of Canada in 2011, for both his distinguished broadcasting career and his extensive community and volunteer work.

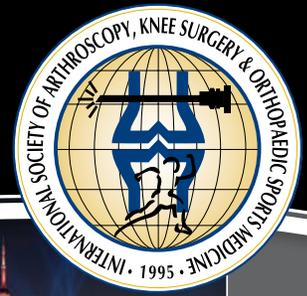
Don't miss Brian Williams' lecture as the ISAKOS Presidential Guest Lecturer on **Tuesday, May 14 at 10:00am**, part of the ISAKOS Congress Opening Session.

9TH BIENNIAL

ISAKOS 2013 CONGRESS

MAY 12-16, 2013 • TORONTO, CANADA

Sports Rehabilitation Concurrent Course: Global Perspectives for the Physical Therapist and Athletic Trainer



ISAKOS is pleased to present the 2013 ISAKOS Congress *Sports Rehabilitation Concurrent Course: Global Perspectives for the Physical Therapist and Athletic Trainer*. This course will include an internationally renowned faculty of orthopedic surgeons, athletic trainers and physiotherapists.

Course Objectives

Upon completion of this course, participants should be able to:

- Describe current developments in the management of knee, shoulder and elbow, hip, foot and ankle and muscle injuries in athletes
- Better evaluate and manage sideline or onsite issues in sports medicine
- Describe controversial issues concerning return to play in athletic events
- Understand different modalities and treatment strategies utilized in other nations when dealing with similar injuries
- Improve technical knowledge of the athlete's sports return
- Discuss the use and misuse of performance enhancement substances and techniques

9TH BIENNIAL

ISAKOS 2013 CONGRESS

MAY 12-16, 2013 • TORONTO, CANADA

For more Congress Registration information, please visit www.isakos.com/2013congress.

Target Audience:

This course is intended for physicians, athletic trainers, physiotherapists, and coaches concerned with the management or prevention of injuries to the team athlete.

Registration:

Registration for the ISAKOS Congress Sports Rehabilitation Concurrent Course is \$400 if registered before March 31, 2013 and \$450 if registered after April 1, 2013. Please note, registration for the Sports Rehabilitation Course does not include access to the ISAKOS Congress Scientific Sessions. Register at www.isakos.com/2013congress.

For more information on the Sports Rehabilitation Concurrent Course, including a list of faculty and presentation topics, please visit www.isakos.com/2013congress.

Register Today 



ISAKOS thanks DJO Global, Inc. for their support of the Global Perspectives for the Physical Therapist and Athletic Trainer Course.

LUNCHTIME LECTURES AS PART OF THE SPORTS REHABILITATION CONCURRENT COURSE

Sunday, May 12, 2013

A New and More Effective Way to do Functional Rehab - The Role of Wireless Active Muscle Stim

Tuesday, May 14, 2013

Role of Radial Shockwave Therapy in the PT Practice - Practical Use in Evidence-based Indications

Subject to change. Faculty to be determined at a later date.

Faculty: Freddy Romano, MSc Physical Therapy and Biomedical Physics

2013 ISAKOS Congress Registration Hours

Registration will be open every day at the Metro Toronto Convention Centre during the following hours:

Friday, May 10	14:00 - 18:00	Sunday, May 12	6:30 - 17:00
Saturday, May 11	6:00 - 10:00	Monday, May 13	6:30 - 17:00
	Pre-Course Registration Only	Tuesday, May 14	6:30 - 17:00
	10:00 - 16:00	Wednesday, May 15	6:30 - 17:00
	Congress Registration Opens	Thursday, May 16	6:30 - 12:00

Explore. Dream. Discover.

My Five Favorite Spots in Toronto



Kivanc Atesok MD, MSc, Toronto, Canada

ISAKOS Newsletter Editorial Board

The largest city in Canada, Toronto, has so many wonderful places to offer. Although narrowing it down is not an easy task, five top tourist attractions in the city could be presented to ISAKOS Members to visit in May.

The **CN Tower** is considered the signature icon of the city, attracting more than two million international visitors annually. It is one of the world's tallest freestanding structures on land, standing 553.33 meters tall and has the world's second highest public observation deck at 446.5 m. Toronto's most spectacular views—day or night, can be experienced from the tower. The 360 is a revolving restaurant at the CN Tower that completes a full rotation once every 72 minutes at 351 metres and features unforgettable food combined with magnificent views of the city and The Lake Ontario.

Casa Loma is the second most popular tourist destination in Toronto after the CN Tower. It is a grand mansion built in the early 1900's and famed for its extravagance and size. Casa Loma means "Hill House" in Spanish, a name that fits the astounding location of this 'medieval' castle like structure on the brow of a hill overlooking Toronto. The estate took three years to complete, and is well-known for its impressive architecture with decorated suites, secret passages, an 800-foot tunnel, towers, stables, and beautiful 5-acre estate gardens.

The **Royal Ontario Museum (ROM)** is Canada's largest museum of world culture and natural history. It was founded in 1912 and is recognized as one of the largest museums in North America. The museum is located at the very heart of the city and attracts over one million visitors every year. With more than six million items and forty galleries, the museum's diverse collections of world culture and natural history are part of the reason for its international reputation. The museum contains notable collections of dinosaurs, minerals and meteorites, Near Eastern and African art, East Asian art, European history, and Canadian history. It also houses the world's largest collection of fossils from the Burgess Shale with more than 150,000 specimens. The museum even contains an extensive collection of design and fine arts.

Toronto **Eaton Centre** is Canada's premier shopping destination and is an experience that defines elevated living, offering international retailers unrivalled by any other shopping in downtown Toronto. It is truly a unique destination that offers an urban vibrancy and exciting possibilities with every visit. Its spectacular glass Galleria soars above a fascinating selection of more than 230 retailers and restaurants. Services within the Centre are available to assist visitors at any time.

Centre Island is Toronto's island getaway, a reprieve from the hustle and bustle of the city without having to drive for hours; just a short ferry ride of 10 to 15 minutes from downtown. Visitors can rent bikes by the hour near the Pier to ride the many bike trails throughout the island. For a more romantic activity, couples can rent a canoe and navigate the lagoons or watch the city coast and lights from the Island after sundown.

We extend our sincere thanks to ISAKOS for the opportunity to experience a fascinating scientific event in the special city of Toronto.

"Twenty years from now you will be more disappointed by the things you didn't do than by the ones you did do. So throw off the bowlines, sail away from the safe harbor. Catch the trade winds in your sails.

Explore. Dream. Discover."—Mark Twain.



CN Tower, Toronto



Casa Loma, Toronto



The Royal Ontario
Museum, Toronto



Toronto Eaton Centre



Centre Island, Toronto



ISAKOS GLOBAL CONNECTION

A Campaign for Education, Research and Collaboration

Become an ISAKOS Godfather Today!

The ISAKOS Godfather Initiative was created in order to provide meaningful benefits to individuals who donate to the Global Connection Campaign, as well as to individuals interested in ISAKOS membership, but who may not currently have the resources to become members.

If an individual donates \$5,000 or more to the Global Connection Campaign and designates this money to the Godfather Initiative, a portion of that donation will be allocated toward an ISAKOS membership scholarship program.

The membership scholarship program would offer those in need of funding for membership the opportunity to submit an application and statement of need. Applications are reviewed by the ISAKOS Membership Committee, and accepted applicants will receive free membership for four years, and one waived registration fee for an ISAKOS Congress during those four years.

Godfathers will receive special, distinct recognition during the ISAKOS Biennial Congress in Toronto, Canada, and are recognized on the ISAKOS Global Connection Campaign website, in the Newsletter, and at the ISAKOS Campaign Donor Reception in Toronto.

Individuals who donate at the Godfather level prior to the 2013 Congress will be designated as ISAKOS Founding Godfathers. To become a Godfather, click here, and to view the list of ISAKOS Founding Godfathers to date, go to www.isakos.com/campaign.

**LAST CHANCE to Become an
ISAKOS Founding Godfather!**

HOW TO DONATE

Donations may be made through
the ISAKOS office, or via the
Campaign website:

www.isakos.com/campaign.



The WORST-CASE SCENARIO

– Daniel Slullitel, MD, Prof.

There is a saying in Argentina that bad things usually come all together and, of course, at the worst possible time. One of these scenarios is surgical complication near the time of a family vacation or important meeting. Even if you have a well-organized surgical group, or are putting off surgical procedures until the very last second, it is a matter of faith. Because when complication arise, at least in my country, it is very difficult to leave happy and worry-free, even with the patient's blessing.

It was two weeks before Christmas, and my wife, two daughters and I were preparing to go to Boston to visit a friend. We had plans to see the Nutcracker, tickets had already been purchased. I was at work when a 55 year old woman came in complaining of shoulder pain due to a typical idiopathic frozen shoulder.

She had been suffering for eight months and only recently was diagnosed with shoulder tendinopathy. First she was counseled immobilization and a cortisone subacromial injection, which helped her, but physiotherapy was of no benefit due to the pain. The patient started with progressive ROM restriction. NSAids were taken once or twice a day (diclofenac 75 mg each) to try and mitigate the pain. A clinical examination revealed 45 degrees of abduction, no internal rotation and 30 degrees of external rotation. Motion was very painful for her. A new MRI was taken which confirmed slight tendinopathy. The patient had no diabetic relatives and a blood test cleared her from rheumatoid diseases. Her renal function was okay, but at the upper limit. I advised the patient that we should proceed with conservative treatment and that if it fails, an arthroscopic capsular release may be necessary. She asked me for an immediate surgical release because of the long-lasting pain. I told her about my upcoming vacation, but felt a little bit uncomfortable since I knew a careful arthroscopic capsular release is a simple operation and that she would be okay to start immediate rehab with my associates or fellows taking care of her. She wanted me to personally perform her surgery since I was the first to diagnose her with a frozen shoulder. So, I made room in my schedule for the surgery, one week before my departure.

With the patient in the lateral decubitus position and on general and plexual anesthesia, we were ready for surgery. It was difficult to enter the glenohumeral joint, but with smooth manipulation, I was able to gain access and perform a circumferential capsular release. Another gentle manipulation would permit full range of motion.



After which, I performed a subacromial bursectomy. After twenty-five minutes, the surgery was complete. An infusion pump and approximately twelve liters of irrigation fluid were used.

Her awakening was uneventful and she immediately began assisted ROM. Her family was in the general hospital since we intended to keep her hospitalized for pain management and rehabilitation eight hours after the surgery. The patient did not urinate and no bladder sensations were felt. At twelve hours, blood samples were taken. Hyponatremia and signs of renal failure were found. Nausea, vomiting and pain started. After suspecting acute renal failure, the appropriate measures were taken. Slight signs of hemolysis were found.

At first we thought that continuous ingestion of non-steroid anti-inflammatories, which can jeopardize renal function, was the cause of the renal failure. But the next day, as I was scrubbing my hands for my last scheduled surgeries, I realized a strange irrigation fluid—different from the usual one outside of my surgery room. It was labeled “irrigation fluid for surgical procedures,” but it did not mention isotonic behavior. I quickly asked if this was the fluid used for the patient's procedure. They informed me it was and then soon realized that the fluid was mistakenly taken from the urological store. The fluid used was hypotonic fluid, which may have been the reason for the early hyponatremia and hemolysis.

Thus, the acute renal failure may have stemmed from a combination of NSAID and hypotonic fluid. There is little literature about this in our field, although there is plenty in the urological field, which I studied thereafter. The patient started dialysis on the second post-op day and I was scheduled to leave for vacation on the 6th post-op day. Fortunately, signs of proper kidney function were seen the day before my scheduled departure and the patient was able to cease dialysis shortly after. Of course, at the time, I contemplated whether or not leaving was a good idea. Looking back now, it is so incredible to see how small details can quickly turn life into a nightmare. We know the saying “a chain is only as strong as its weakest link,” but the trouble is that we are responsible for it. Surgery is surgery. No matter which type you are performing, unexpected things may happen. If you are lucky enough to say that nothing like this has happened to you, take precaution—as statistics prove that it is only a matter of time.

REPORT ON THE

ISAKOS

Patellofemoral Traveling Fellowship

June and September 2012

Hosts:

*John Fulkerson, Hartford, Connecticut
Elizabeth Arendt, Minneapolis, Minnesota
Ronald Grelsamer, New York, New York
Scott Dye, San Francisco, California
Philippe Neyret, Lyon, France
David Dejour, Lyon, France
Simon Donell, Norwich, UK
Andrew Amis, London, UK*

Fellow: Dr. Ashraf Abdelkafy, Ismailia, Egypt



First of all, I would like to express my deep gratitude to the Patellofemoral Foundation and ISAKOS for selecting me to participate in this highly valuable fellowship. Also, I would like to thank my hosts; Profs John Fulkerson, Elizabeth Arendt, Ronald Grelsamer, Scott Dye, Philippe Neyret, David Dejour, Simon Donell and Andrew Amis for their great efforts to teach me about the secrets of patellofemoral joint.

Fellowship Planning:

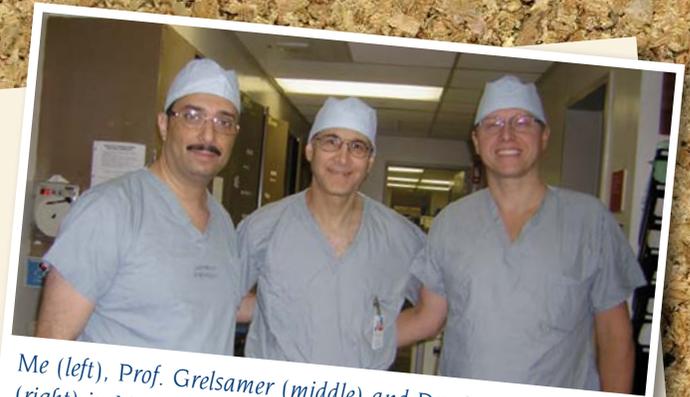
Planning started early after receiving the good news regarding my selection to participate in this fellowship. Dr. Geraldo Schuck (the other winner of the ISAKOS PF Fellowship from Brazil) and I started long discussions regarding whom we should visit in the USA and Europe to get the most beneficial experience. We also asked Prof. Fulkerson to give us some advices. Finally, we decided to divide our visit into two halves USA in June Europe in September, and we made up our minds to visit the previously mentioned professors. Afterwards, we started contacting them and asking about their suitable dates in June and September. At that point I would like to thank Prof. Fulkerson because he helped us a lot in making the contacts. Successfully, we managed to finalize the itinerary and we informed every one with it. Then we booked plane tickets and hotels.

FELLOWSHIP PROGRAM

Fellowship Program:

1ST
STOP

The visit started by meeting **Prof. Grelsamer** in **New York**. Dr. Schuck and I arrived in NY on June 3rd and we spent 2 days there. Prof. Grelsamer picked us up on the 1st day and we went to Mount Sinai Hospital and he took us for a tour to visit the hospital and the medical school, library.... etc. Then we directly went to the operation room where we had the chance to observe a case of MPFL reconstruction, tibial tub. osteotomy and ACI done by Prof. Gladstone and Prof. Grelsamer. At that night we enjoyed a very nice dinner in an Italian restaurant near my place where we had the chance to discuss many things regarding patellofemoral joint. Dr. Gladstone was there also. Next day we watched a case of ACL reconstruction done by Prof. Grelsamer.



Me (left), Prof. Grelsamer (middle) and Dr. Geraldo Schuck (right) in Mount Sinai Hospital New York, New York

2ND
STOP

Second stop was **Hartford, Connecticut** where we traveled by train from New York. The train from NY to Hartford was very convenient. It took us about 3 hours. In Hartford, we met **Prof. Fulkerson** and we were very excited about that. Prof. Fulkerson is considered a true legend in patellofemoral surgery. But after meeting him and talking to him we found him to be a very kind and modest person and this encouraged us to have long talks and discussions with him. Prof. Fulkerson prepared 6 cases of patellofemoral surgery to us to observe and this was really very beneficial. The cases were variable as Tibial tub osteotomies, MPFL reconstructions, lateral retinacular reconstruction...etc. We had a nice dinner with long conversations with Prof. Fulkerson in an Italian restaurant. Next day we attended out-patient clinic with him.



With Prof. Fulkerson Hartford, Connecticut.

FELLOWSHIP PROGRAM



With Prof. Arendt Minneapolis, Minnesota.



3RD STOP

Third stop was **Minneapolis, Minnesota** where we had a great opportunity to meet things to see. First we had dinner at her house where her husband cooked a very nice local meal to us. Next day Dr. Schuck and I gave 2 presentations in front of the whole orthopedic department and then we attended 3 MPFL reconstruction surgeries with her. We were invited to watch a baseball match and this was our first one and we loved it very much and the Minnesota team won (we brought them luck). We had the opportunity to visit the MRI research center which is a huge MRI center linked to the university of Minnesota and we saw the 7-tesla great images. We also attended a cadaver lab where I had the opportunity to make an MPFL reconstruction by my self and Prof. Arendt checked it and made her comments. We also had a demonstration by Prof. Arendt performing patellofemoral arthroplasty on a model. We enjoyed many dinner invitations from Prof. Arendt.



With Prof. Arendt Minneapolis, Minnesota.

FELLOWSHIP PROGRAM

4TH STOP

Fourth stop was **San Francisco, California** where we met **Prof. Scott Dye**. He was so kind that he invited us to stay at his house during our stay in San Francisco. We enjoyed very much listening to his lectures about the knee evolution, joint homeostasis and the envelope of function. I read before meeting him about these concepts but listening to it from the master differs a lot. He also told us about his special study when he had an arthroscopy of his knee without anesthesia to personally test different areas causing pain in the knee. Prof. Dye and his wife cared a lot about us. He gave us the opportunity to visit the Sports Medicine Center of San Francisco University. Prof. Dye and his wife took us for sight seeing in many parts of San Francisco. We enjoyed a lot of dinner invitations from him.



With Prof. Dye, San Francisco, California.



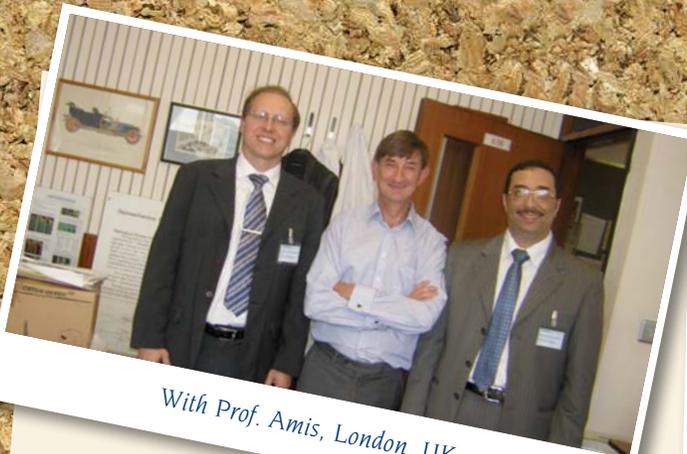
5TH STOP

Fifth stop was **Lyon, France** where it started by attending the **Lyon Patella meeting** from 20-22 September 2012 and to my knowledge this was the first big congress having the theme "Patella". Then for a whole week we attended surgeries with **Prof. Philippe Neyret** and **Prof. David Dejour** and what was new for us, was watching 2 cases of trochleoplasty. We observed also different types of patellofemoral surgeries as MPFL reconstruction, tibial tuberosity osteotomies...etc. Prof. Neyret invited us with many other guests who attended the Patella Lyon meeting for lunch at his very nice house



With Profs. Neyret and Dejours, Lyon, France.

FELLOWSHIP PROGRAM



With Prof. Amis, London, UK.



6TH STOP

Sixth stop was **London, UK** where we visited **Prof. Andrew Amis** in the Imperial College of London and we had a nice opportunity to see his labs. Where many biomechanical patellofemoral studies are going on. Also, we listened to several presentations from his research fellows who are conducting researches about patellofemoral problems.



7TH STOP

Seventh stop was **Norwich, UK** where **Prof. Simon Donell** invited us to stay at his house in the very beautiful British countryside for two days and we attended several patellofemoral surgeries as trochleoplasty and MPFL reconstruction. We attended outpatient clinic and in-patient rounds. Prof. Donell and his wife invited us for dinner in a very nice restaurant where we tried a typical British food.



With Prof. Donell, Norwich, UK.



Specific Gains from this Fellowship:

Gains are numerous; first, as everyone knows that the patellofemoral joint is called the black spot even among knee surgeons and after this fellowship, the black color turned pearly white. I figured out how to accurately assess a case of patellofemoral problem, the different protocols for management; surgical vs. conservative, the surgical techniques preferred by the experts and the results they get. Second, after meeting the experts and watching them operating, I discovered that there is nearly a consensus regarding some topics and debates regarding others and I encourage them especially through the patellofemoral study group to conduct a flow chart or algorithm for treatment of patellar problems to help others in decision making. Third, I made new precious friends. Forth, I had the opportunity to visit new extremely nice places. This fellowship will greatly affect my overall performance as a knee surgeon and will have a positive influence on my future career and I'll be able to teach my colleagues more about patellofemoral joint and attract more patients with patellofemoral problems to my institute.

Finally, I would like to say that this Fellowship was more than great as I had the opportunity to meet the American and European experts in patellofemoral surgery.

Again many many thanks for the Patellofemoral Foundation, ISAKOS and the hosts for giving me such opportunity.

Dr. Ashraf Abdelkafy, MD

Consultant and Lecturer of Orthopaedic Surgery and Traumatology,
Faculty of Medicine, Suez Canal University, Circular Road 41522,
Ismailia, Egypt.
Email: ashrafkafy@hotmail.com



Rotator Cuff Tears: Cell Based Approach



Dr. Francisco Vergara
Medical Director
Sport Medicine Center MEDS
Santiago, Chile

Introduction

The tendinous tear repairs continue being the target of numerous studies, the objective is to obtain a regeneration and not a fibrous scar. The Rotator Cuff Tear is one of the most typical cases, as a result of degenerative changes with age and its high re-tear rates after the surgical repair. The Biologic Factors may be the solution, but many doubts exist about them.

The use of Growth Factors, Platelet Concentrates (PRP), Stem Cells, Biologic Patches and Biogenetic are different alternatives to improve the tendon repair, but the evidence is not clear yet, and more studies about it are necessary.

Platelet Concentrates (PRP)

The Platelet Concentrates have many years of clinical use. Studies have shown that they have better results in muscle tears and epicondylitis, and controversial results in patellar and Achilles tendinopathies. In Rotator Cuff tears the results are different, many studies have demonstrated that imagenologic assessment is better, but the clinical results are not clearly better.

One of the most important factors which can influence the diversity of results demonstrated in the literature is the concentration variability of different components of blood in PRP. The causes of this can be divided in intrinsic and extrinsic factors. The first of them is the patient's venous blood status, which can be influenced by hydration status, lipemia level, inflammatory process and circadian rhythm amongst others, like the use of aspirins, a not well described situation in clot formation. The extrinsic factors are the processing system determined by commercial industries or the numerous research laboratories, the physical structure of PRP (Clot, Gel, Liquid) and lastly, number of doses administered. These factors influence the final platelet quantities and obviously the total amount of Growth Factors used in a specific injury.

Some consensus exists nowadays which can standardize and make comparable the PRP use. The ideal platelet concentrate is 2,0 to 2,5 times more than basal concentration, without red nor white cells (the latter have catabolic effects in repair), no thrombin activation because the growth factors release is too fast and tissue effect is minimal, the clot structure is better for slower growth factors release and the use more than one dose improves tenocytes growth, being the recommended dose interval between 7 to 14 days.

If we analyze three different studies which used PRP in Fibrin Matrix form sutured inside the tendon-bone interface, all of the systems are low in WBC. Two used Cascade System and the other a Plateletpheresis system. These studies are from Barber, Castricini and Jo; the first of them shows a significant lower re-tear rate, but no differences in clinical outcome. In table 1 we can see that re-tear rates for PRP group are favourable but not significant, but the patients distribution and tear sizes are different between the groups.



Figure 1

Our experience with PRP utilization begins in 2003, its benefits are evident in muscle tears, epicondylitis, patellar tendinopathies with intrasubstance tears, but not in partial tears of supraspinatus, where infiltration was ultrasound guided. For Rotator Cuff surgery, reviewing our experience, in 128 Rotator Cuff repairs, we used PRP in 51 of them (39,8%), being the results similar to Randelli's publication in Arthroscopy 2011, with an improvement in pain in the first month and a better mobility, no conclusive results in re-tear rate and in clinical recovery. We used two Systems, both with high concentration of WBC and used only one application and they were activated with thrombin, all of which clearly decreased efficacy of PRP. Today we use a PRP which meets the above mentioned requirements and we will compare both groups in a near future.



Figure 2

Stem Cells

The supraspinatus tendon has a special biologic behavior, with genetic conditions which can influence its degeneration, as the lack of vascularity specially proximal to its insertion in the humeral head. These elements can influence the repairing effect of PRP, so it is necessary to find another biologic element which can help us, one of the most important possibilities are the Mesenchymal Stem Cells. Various forms to obtain them exist. We believe that in clinical practice there are two most important ways: Bone Marrow Aspirate Concentrate (from iliac crest or humeral head, amongst others), and from stimulated peripheral blood. The first one has the advantage of being technically easier and can be used at the moment of surgery, but this advantage is the small amount of stem cells obtained. The stem cells harvested and separated from peripheral blood after a 3 days induction with filgrastim (Neupogen©) are a larger amount (up to 20.000.000), without need of culture nor inductors which could modify the genetic activity of these cells. They can be criopreserved and used several times. The stem cells harvested from other sources, like adipose and dermal tissues, require a differentiation process which increases the risks of genetic changes.

Since Smith et al paper in 2003 in equines, numerous animal studies have been performed which show an improvement in tendon healing. Connell and Clark, in 2009 and 2011 respectively, used Skin-derived Tendon-like stem cells (SDTLCs) injections for epicondylitis and patellar tendon repair, with improvement in time recovery. Ellera Gomes et al in 2012 used Bone Marrow Mononucleated Cells (BMMCs) in Rotator Cuff surgical repair and showed a decrease in retear rate.

Our larger experience has been with condral knee lesions where an improvement in repair with microfractures when using PRP clot with mesenchymal stem cells has been observed.

	Castrova, AJSM	Al-AJSM	Balke, Arthroscopy
Published	2010 December	2011 July	2011 August
Study Period	2007 Jan-2008 April	2009 Jan- 2009 July	2006 June-2009 Jan
Level of Evidence	I (Randomized Controlled Trial)	II (Cohort)	III (Case-Control)
Number of Patients	88 (43 PRP/45)	42 (19 PRP/23)	40 (20 PRP/20)
Age	37 – 72 y	50-70 y (Not precise)	44-69 y
Follow-Up	16 m	19,7 ± 1,9 m (Min 16) Longer Control	31 m (24-44)
PRP System	Cascade	Platelet-rich plasma	Cascade
PRFM	1	1	2
Size Tear	< 30 mm	17 > 30 mm (11 PRP) 25 < 30 mm (8 PRP) >30 mm 37.0% PRP and 28.1% Control	10-50 mm
Suture Configuration	Double Row Suture Bridge	Double Row	Single Row
Retear Rate	PRP 2.5% vs 10.5% C 1/40 vs 4/38	PRP 26,7% vs 41.2% Control	PRP30% vs 60% Control *
Healed Fully in Preop <30mm	NI	PRP 87,5% vs 84.3% Control	PRP 86% vs 50% Control *
Functional Scores	Constant	ASES, SST, Constant, UCLA, DASH, SPADI	Row's*, ASES, SANE, SST, Constant
MRI Evaluation	Retear, Thickening, Size of Footprint, Signal Intensity Alterations.*	Retear: (I-V's Sugaya)	Retear

Clinical Experience

A special Rotator Cuff retear pattern which appears after the double row repair is the medial retear, which occurs proximal to the repaired area. This retear is difficult to repair, for in spite of the tendon release it is impossible to reattach the tendon to the humeral footprint. The use of biologic patches is argued, due to the high rates of failure and complications, we believe it can not replace the tendon, it just serves as a reinforcement. The publications on the use of autograft like Fascia Lata are very few, McAdams in 2007 published about the use of fascia lata to cover a tendonless supraspinatus defect, with and without concomitant use of deltoid flap in rabbits, obtaining better repair results with the use of the flap. We have stated a solution for one case of medial Rotator Cuff retear, with the use of a fascia lata graft with stem cells clots and PRP during surgery, and repeating a second and third ultrasound guided dose of Stem Cells at 14 and 28 days, achieving good tendon coverage and continuity at six months. This case will have a one year follow before publication.

In summary, the use of biologic factors is still in its beginnings. There are many factors which we must study and correct so as to optimize its repairing function. We consider that biologic factors are a key tool for surgical result improvements.

Full article and references also available online at www.isakos.com.

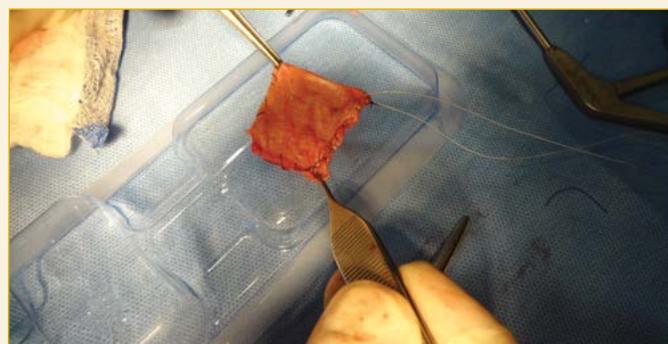


Figure 3

Prevention of AC Joint Disease in Weightlifter

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ISAKOS OSTC Member

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Thiago Bonilha

Fellow

Introduction

The involvement of the acromioclavicular (AC) joint in athletes who practice weightlifting is a relatively rare and unique pathology. One of the earliest reports in the literature was made by Dupas, in 1936, but until now there have not been enough scientific articles studying the issue.

The AC joint is classified as diarthrodial, and its main stabilizing structures are the coracoclavicular ligaments and the acromioclavicular ligaments and capsule.

Pathology, signs and symptoms

Currently, the most accepted theory involves repetitive micro trauma leading to multiple subcondral stress fractures, intense active repair process, synovial proliferation and articular degeneration. The patient usually complains of insidious pain in the AC region, which is exacerbated by weight training. This pain may radiate to the deltoid or trapezium, and is relieved by prolonged rest. In some cases, the athlete might have difficulty sleeping on the affected side. Physical examination is of extreme importance to locate the exact place of the pain, well localized as a point tenderness over the AC joint. A cross-body adduction maneuver (Figure 1) may also elicit exacerbation of the symptoms. Injection of anesthetics into the AC joint and consequent improvement of the pain can be both a diagnostic tool and a treatment option.

Imaging

AP and Zanca views are the main X-ray images needed (Figure 2). Magnetic resonance is also of great value, as it may show the most common manifestation of the disease—bone marrow edema (Figure 3). CT scan can also be used, and will evidence bone and joint degeneration, and cysts.

Treatment

The main treatment and prophylaxis line revolves around the avoidance of provocative maneuvers, as well as the modification of weight training techniques. Ice massage, nonsteroidal anti-inflammatory drugs and steroid injections can be utilized as adjuvants.

Some of the modifications of training techniques include: a narrower grip on the bar, where the distance between both hands should be 1.5 times the biacromial width; a shorter range of motion, especially on the bench press, trying to keep the bar at least 10 cm away from the chest (Figure 4); substituting or adapting the exercises with more risk of causing stress in the AC joint region is also advisable—cable crossover (Figure 5) instead of bench press, dumbbell decline press (Figure 6) instead of dip, incline press with straight bar (Figure 7) instead of push-ups, and high pulls instead of power cleans, the former lacking the “racking” phase of the latter, which puts heavy strain over the AC joint.

Surgery

A patient whose condition does not respond to the above mentioned conservative management or who is unwilling to alter his or her training may require a surgical approach. Most studies report good results with arthroscopic resection of 0.5 to 1cm of the distal clavicle, either through the subacromial (indirect) or through the superior (direct) approaches. Rehabilitation should start as early as possible, even at day one.

Summary

The affliction of the AC joint in weightlifting athletes is a unique disease, and most likely occurs due to an overuse phenomenon. The first option for treatment is always conservative, consisting mainly of modification of weight training techniques. When surgery is needed, overall good results are achieved, with return to training possible within the first week, and return to preoperative training levels by the second post operative week.

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Fig. 1



Fig. 2

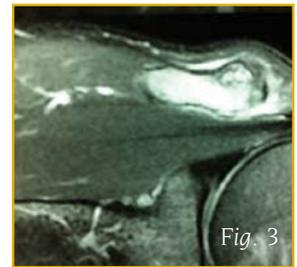


Fig. 3



Fig. 4



Fig. 5



Fig. 6



Fig. 7

Extracorporeal Shock Wave Therapy for Sports Medicine

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Extracorporeal shock wave therapy (ESWT) has been used clinically for the treatment of urinary stones. Valchanou et al. performed high-energy shock wave application with a lithotripter for delayed and non-union fractures for the first time in the orthopedic field. After this clinical breakthrough, ESWT was increasingly used for pseudarthrosis. Since 1993, it has been reported that ESWT is effective therapy for patients suffering from soft tissue pain of bone or tendinopathies. Numerous studies have evaluated the efficacy of ESWT as a method of managing tendinopathies after the latter 1990s.

Shock Wave Generator and Application

Shock waves have high peak pressure amplitudes with rise times of a few nanoseconds. It is possible to apply high energy shock waves safely because the heat energy of the shock wave is transmitted by blood flow soon after, so that the accumulation of local heat is prevented. (Figure 1) Furthermore, it is effective therapy for orthopedic disorders because a large amount of

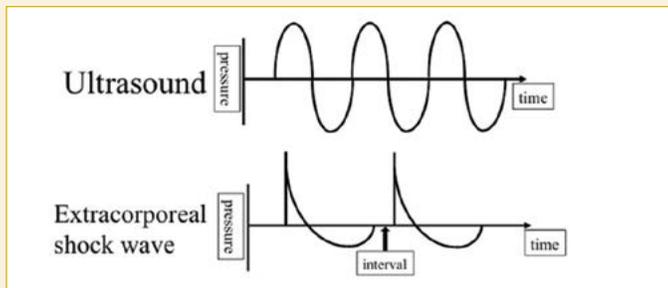


Fig. 1: Difference between Ultrasound and Extracorporeal shock wave.

energy is radiated after collision with hard tissue such as bone. Focused extracorporeal shock waves used in medicine are created as a result of electrohydraulic (Spark Gap), electromagnetic (EMSE), or piezoelectric (Piezo) generation.

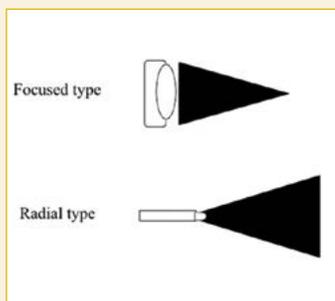


Fig. 2: Type of ESWT

Recently, nonfocused shock wave (radial shock wave) applicators have also been commonly used. Radial shock waves are produced pneumatically and provide a larger diameter shock wave field and, therefore, cover a larger treatment area. (Figure 2)

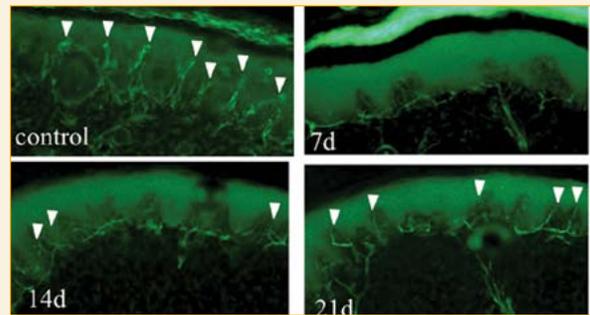


Fig.3-a: PGP 9.5 positive free nerve endings after ESWT.

ESWT has various parameters during treatment, such as energy flux densities (EFD), frequency, numbers of shots, and use of local anesthesia. EFD has been classified into lower-energy shock waves (<0.10 to 0.12 mJ/mm²) and high-energy shock waves (>0.12 mJ/mm²). The total amount of energy per session is determined by multiplying the total flux density by the number of shots. These differences affect the clinical results. Localization during ESWT is another factor that influences the outcome of ESWT. There are three commonly used methods of localization. The first is anatomic focusing, in which the wave is directed at the anatomical region that is considered the source of pain. The second method of localization is image-guided focusing, using ultrasound, fluoroscopy, or computed tomography. The third method is clinical focusing, in which the shock waves are applied to the most painful area of tenderness with biological feedback. This method is the most reliable at directing the shock waves to the painful region, but it is impossible to use local anesthesia because of the necessity to have the patient's biological feedback.

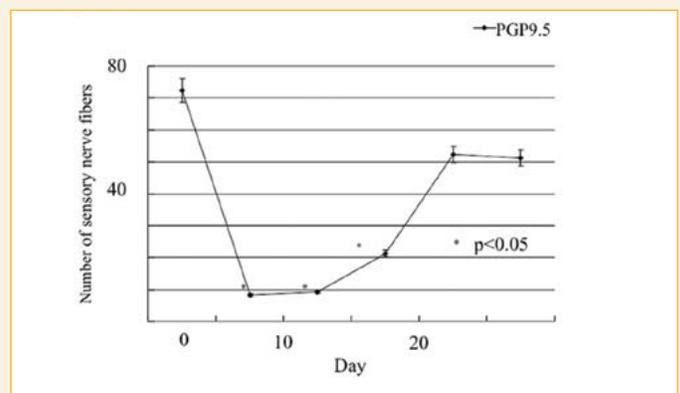


Fig.3-b: Numbers of PGP9.5 free nerve endings. PGP9.5 positive free nerve endings significantly decreased until 3 weeks after ESWT.

Extracorporeal Shock Wave Therapy for Sports Medicine (cont.)

The pathomechanism of the effectiveness of ESWT is not fully understood. Shock wave applications to bone cause not only fragmentation and decortications, but also periosteal separation with subperiosteal hemorrhage and trabecular fractures, which induce cortical thickening and endosteal osteogenesis. Furthermore, gene expression patterns of shock wave-induced osteogenesis are similar to those of periosteal hard callus formation during fracture healing using in situ hybridization. These reports indicate that shock waves can induce osteogenesis in various bony tissues. ESWT also has an analgesic property. Ohtori et al. reported that nearly complete degeneration of epidermal nerve fibers in the shock wave-treated skin and re-innervation of the epidermis occurred 2 weeks after treatment. These data indicate that the degeneration of the painful free nerve endings results in pain relief. (Figure 3-a,b) Furthermore, the regeneration of the tendon would be one of the mechanisms of pain relief. TGF-beta and insulin-like growth factor are up-regulated after ESWT, which leads to cell proliferation and up-regulation of collagen synthesis. Endothelial nitric oxide synthase (eNOS), vessel endothelial growth factor (VEGF), and proliferating cell nuclear antigen (PCNA) are up-regulated simultaneously, resulting in angiogenesis. These data suggest that these cytokines regenerate the degenerated tendon, leading to long-term pain relief. On the other hand, Väterlein et al. reported that ESWT does not damage the joint cartilage of growing rabbits. Based on these reports, the adverse effects of ESWT appear to be few.

Clinical use of ESWT

The International Society for Medical Shockwave Treatment (ISMST) has listed the indications in the orthopedic field. Approved standard indications are chronic tendinopathies (plantar fasciitis with or without heel spur, Achilles tendon, radial epicondylopathy (tennis elbow), Rotator Cuff with or without calcification, patellar tendinopathy, greater trochanteric pain syndrome) and impaired bone healing function (delayed bone healing, stress fractures, early avascular bone necrosis (native X-ray without pathology), early osteochondritis dissecans (OD) post-skeletal maturity).

A common empirically-tested clinical use is for chronic tendinopathy (ulnar epicondylopathy, adductor syndrome, pes anserinus syndrome, peroneal tendon syndrome). Exceptional indications or expert indications are spasticity, early stage osteochondritis dissecans pre-skeletal maturity, apophysitis (Osgood Schlatter disease), and Peyronie's disease. Various parameters, such as energy flux densities (EFD), frequency, numbers of shots, localizer, and use of local anesthesia, can be used for ESWT during treatment. These factors can affect the clinical results, and it is necessary to ascertain the effectiveness of ESWT using different parameters.

Lateral Epicondylitis

Lateral epicondylitis is a painful condition originating from the common extensor origin, mainly involving the extensor carpi radialis brevis muscle of the elbow. The histological pathogenesis of lateral epicondylitis is thought to involve microtears and angiofibroblastic hyperplasia. ESWT has been recommended for recalcitrant lateral epicondylitis before considering surgery. Several nonrandomized studies and case series have been published from the 1990s, generally with improved symptoms and grip strength as a result of ESWT. After these series, prospective, randomized, controlled studies were published. Recent papers were skeptical of the effectiveness of ESWT. Staples et al. reported that significant improvements in both groups and no difference between the groups, whether receiving ESWT (a total of 6000 shock waves, energy level set at the maximum level tolerated, frequency of pulses set at 240/min) or a subtherapeutic dose (a maximum total of 300 shock waves, energy did not exceed 0.03 mJ/mm²). Crowther et al. published clinical results comparing corticosteroid injection and ESWT. The clinical results of the steroid injection group were superior to those of the ESWT group in the medium term. On the other hand, several studies have reported the superiority of ESWT in prospective, randomized, controlled studies. Pettrone et al. reported that low-dose ESWT without anesthetic is a safe and effective treatment when compared to placebo. Rompe et al. also reported the effectiveness of repeated ESWT. Regarding the comparison between ESWT and surgery, Radwan et al. reported the clinical results of 56 patients who received high-energy extracorporeal shock wave treatment (ESWT; 1,500 shocks, 0.22 mJ/mm²) without local anesthesia or underwent percutaneous tenotomy of the common extensor origin. They reported that ESWT appeared to be a useful noninvasive treatment method that reduced the necessity for surgical procedures. From these results, the effectiveness of ESWT for the treatment of lateral epicondylitis is not clear; further study will be needed to clarify its effectiveness.

Plantar Fasciitis

Plantar fasciitis is characterized by pain localized at the origin of the plantar fascia on the calcaneus and pain that is worse in the morning. The pathogenesis is unclear, but the condition may be a result of repetitive overloading causing microtears and degeneration in the plantar fascia. Several authors have reported ESWT for the management of plantar fasciitis. Prospective, randomized, placebo-controlled trials of ESWT for treating plantar fasciitis have shown both improvement and no change compared with placebo. Buchbinder et al. reported that there was no evidence to support a beneficial effect using ESWT in their double-blind, randomized, placebo-controlled trial.

On the other hand, Rompe et al. using focus ESWT and Gerdesmeyer et al. using radial ESWT conducted prospective, randomized, placebo-controlled trials of patients with chronic plantar fasciitis. The treatment group showed significant improvement in both series. For the most part, the majority of the studies showed favorable results using ESWT for plantar fasciitis. With respect to the methods of ESWT, there were several randomized studies, which showed that: 1) ESWT should be done without local anesthesia (Rompe et al.); 2) focused ESWT is superior to radial ESWT (Lohrer et al.); 3) the tangential technique is better than the perpendicular technique with respect to treatment-induced pain and allows higher energy dosages to be used (Tornese et al.) (Figure 4); and 4) ESWT to both the location of the heel spur and the maximal point of tenderness is effective (Dorotka et al.) Based on these well-designed, randomized, placebo-controlled trials studies showing favorable results, it seems that ESWT is an effective treatment for chronic plantar fasciitis in patients who have failed conservative treatment.

Other Indications for ESWT in Sports Medicine

There have been only a few studies regarding the treatment of Achilles tendinopathy. Saxena et al. reported the effectiveness of radial ESWT for paratendinosis, proximal tendinosis, and insertional tendinosis of the Achilles tendon. Although the effectiveness of ESWT was reported in all series so far, further prospective, randomized, controlled studies are needed.

Patellar tendinopathy is similar to Achilles tendinopathy, since only a few studies have been reported. Zwerver et al. reported effectiveness using the patient-guided piezo-electric ESWT without local anesthesia, which should be considered as a treatment before proceeding to surgery. Although the effectiveness of ESWT was reported in all series so far, further prospective, randomized, controlled studies are needed.

ESWT has been proven to be effective for fracture healing and management of non-union. Moretti et al. and Taki et al. reported its effectiveness for stress fracture. Although improvement of pain and consolidation were achieved in all 15 cases they reported, additional basic science and clinical studies are necessary to determine the effectiveness of ESWT.

Future Directions

The adverse effects of ESWT are thought to be so few that the indications for ESWT are likely to be expanded for various kinds of injuries in sports medicine. Basic research has provided useful information for the future direction of ESWT. Murata et al. reported that radial shock waves significantly augmented reporter gene transfection over 140-fold in rabbit chondrocytes in vitro. Radial shock waves may potentially contribute to the treatment of cartilage morbidities by enhancing the potency

of tissue healing and gene transfection of growth factors. Although the viral method is the gold standard of gene transfer, viral methods have some disadvantages, including the need for specific cell culture conditions and immune or inflammatory responses that adversely affect the cellular phenotype. On the other hand, gene transfer using ESWT is safer than viral methods. Gene transfer using ESWT would be indicated for various kinds of injuries in sports medicine, such as cartilage injury, ligament injury, and so on. Furthermore, radial shock waves could enhance the introduction of nuclear factor-kappa B (NF-kappaB) decoy oligodeoxynucleotides into Achilles tendon cells, which has been reported to markedly inhibit NF-kappaB activation and suppress pro-inflammatory cytokine gene expression. Another study showed the effectiveness of ESWT for inflammatory pain suppression using proopiomelanocortin (POMC), which is an endogenous opioid (endogenous opioids are safe, but they are not used for clinical treatment because their metabolism is very fast), gene transfer. Both transfer of NF-kappaB decoy and POMC would bring long and strong pain relief for chronic tendinopathy, and it could be a new therapeutic strategy for chronic tendinopathy.

ESWT has a wide variety of potential applications, and further study is needed to develop the use of ESWT in sports medicine.



Fig. 4.: ESWT technique for plantar fasciitis.

Full article and references also available online at www.isakos.com.

Issues Which Complicate the Uncomplicated Total Knee Arthroplasty

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Total knee arthroplasty (TKA) has become a routine and reliable surgical procedure with good and predictable outcomes. It has become one of the most beneficial surgical procedures for improvement in quality of life. Surgeons are educated in the technical aspects of TKA and manufacturers are constantly attempting to improve the durability of the implants and also the ease and accuracy of implantation.

There are some cases which pose difficulties from a surgical and technical perspective and generally these are well recognized beforehand with time to allow preparations to be made for eventualities which may occur during the course of the surgery. Fortunately such cases are uncommon and include revision cases and those with deficient or poor quality bone, tumour and major deformity among others.

The purpose of this article is to review some issues which may arise during the course of an otherwise uncomplicated TKA which requires specific additional surgical treatment in order to obtain an optimal outcome. The data comes from a symposium held at the ISAKOS Congress in Rio de Janeiro in May 2011. The papers presented at that symposium have been collated and the case scenarios detailed.

Fractures Occurring during Total Knee Arthroplasty

Patients with weaker bone are at increased risk of suffering an intraoperative fracture. Thus predisposing factors include osteoporosis which is more common in females, chronic steroid usage, the elderly, or those with a neurologic disorder. An extensive discussion on this topic by Alden et al identified 67 intra-operative fractures in 17,380 primary TKAs with a prevalence of 0.39%. Of these there were 49 femoral and 18 tibial fractures with 80% occurring in females. Forty percent of fractures occurred at the time of bone exposure and preparation and 33% at the time of implant trialing. A further 19% occurred at the time of implantation.

Most (73.1%) fractures were of the femur, with 47% being of the condyles and 13% being fractures of the epicondyles and a further 13% being central metaphyseal fractures. Only 16% of all fractures were managed with observation or modified weight bearing whereas 45% had fixation of the fracture done during the course of the operation. Twenty four percent had a stemmed implant used as part of the fixation. There was an increased risk of femoral fracture with posterior stabilized implants with a risk ratio of 4.74 compared with using cruciate retaining implants. The remaining 26.9% were tibial fractures of the plateau or of cortical margins. No patellar fractures were reported in this series but have been reported in revision cases.

Whilst fractures are uncommon during TKA they can occur and must be recognized and treated appropriately during the procedure. Failure to do so risks collapse in the postoperative period which is invariably more difficult to deal with. There is also an increased risk with posterior stabilized femoral components and during exposure. Care should be taken with implantation of trials and definitive components in elderly or osteoporotic individuals. If a fracture does occur then appropriate fixation should be undertaken immediately and during the course of the arthroplasty procedure. The implant may need to be changed, for example to a stemmed prosthesis.

Fractures of the tibia account for 27% of per-operative fractures and generally can be managed at the time of surgery. If the fracture configuration is stable then bracing and protected weight bearing will be required. If the fracture is potentially unstable then it should be treated:—those involving only the tibial plateau with screw fixation and possibly the use of a stemmed prosthesis; those involving the prosthesis with appropriate fixation, bone grafting and a stem bypass; those distal to the prosthesis with separate fixation and possibly bone grafting along with cast-bracing.

Scenario: During a routine TKA, the femoral trial is tight and on removal a large portion of the postero-lateral femoral condyle comes away with the trial implant. Revision implants are not readily available.

Recommended Management: The bone piece should be carefully removed from the trial implant and repositioned onto the femur. This can then be fixed into position using appropriate cancellous screw fixation with or without a washer. The cutting guides should be repositioned to check that no change in cut position has occurred. The definitive implant should then be placed, usually in a cemented fashion.

Avulsion of the Patellar Tendon

Patellar Tendon (PT) avulsion is a complication best avoided rather than struggling to treat it. Apart from unrecognized vascular injury, PT tear or avulsion has the potential to be the most devastating intraoperative complication which can leave the patient with significant ongoing disability.

Fortunately this is rare and is almost impossible to not recognize at the time of surgery. Indeed it is not uncommon for a minor partial avulsion to occur which heralds the risk of complete avulsion to the surgeon thus allowing protective measures to be implemented. The incidence has been quoted by Rand as occurring in 18 out of 8288 TKA cases (0.22%).

The tibial attachment of the PT is always at risk of avulsion from over-zealous retraction of the patellar tendon laterally but is particularly jeopardized in the following situations.

- In cases where the knee is very tight for whatever reason and there is limited flexion. Exposure is difficult and there is a temptation to retract the patellar further laterally.
- In elderly patients who may have poor quality bone or PT tissue there is a risk of avulsion or disruption.
- At the time of the tibial proximal cut, exposure needs to be clear so that the PT is not cut or the tuberosity detached.

Lateral exposure is often difficult and needs to be done carefully so as not to risk avulsion. External rotation of the tibia can be helpful as can release of synovial bands or scarring in the lateral gutter. If there is mild tension on the PT then gentle retraction, soft tissue releasing and going ahead with the femoral bone cuts may often allow relaxation of the lateral structures over time and adequate exposure can usually be achieved. Sometimes the placement of a pin in the medial one third of the tibial tuberosity can act as an indicator to the surgeon and offer some protection against complete avulsion. (Figure 2)



Figure 2. Placing a smooth pin at the attachment of the patellar tendon to the tibial tuberosity.

If the soft tissues are too tight and it becomes clear that further exposure is needed then the surgeon must elect to undertake either a quadriceps snip proximally or a tibial tuberosity osteotomy distally.

In the event that PT avulsion or disruption occurs, it must be recognized and treated. Partial avulsion can be simply treated by reattachment with sutures or anchors and post-operative rehabilitation altered accordingly. Complete avulsion or disruption needs to be treated by reattachment or repair along with reinforcement of the PT to allow rehabilitation and movement to progress without risk of further damage. Reinforcement should be done through bone tunnels in the tibial tuberosity and the patella and along the line of the PT. Autogenous tissue such as the hamstring tendons can be used or synthetic material such as wires, nylon tape or synthetic graft. In older patients, synthetic material is preferred and the author's preference is to use 2 separate 18 gauge cerclage wires.

Scenario: During a routine TKA, your assistant enthusiastically but too strongly retracts and completely avulses the patellar tendon from the tibial tuberosity.

Recommended Management: At the completion of the arthroplasty a 3.2mm drill hole is placed transversely across the tibial tuberosity and across the lower half of the patella. The PT is carefully reattached to the tuberosity using sutures and either 2 anchors or a non-crushing staple. Two 18 gauge wires are passed in a cerclage fashion through the bone tunnels, tensioned and locked so that the wire twist knots are on either side of the PT. The fascia and skin are then closed routinely and the patient is placed in a knee splint in extension. Active flexion is allowed and terminal range active extension is commenced progressing to full active extension over 6 weeks.

Medial Ligament Disruption during Knee Arthroplasty

Disruption of the Medial Collateral Ligament (MCL) during the course of a TKA is a serious complication which may cause ongoing instability issues, early failure of the implant and the need for early revision surgery. (Figure 3) However if the complication is recognized at the time of surgery and the ligament is appropriately repaired, there may be few if any consequences.



Figure 3. Medial collateral ligament laxity persisting after Knee Arthroplasty.

The incidence of this complication is low, reported in 16 of 600 TKAs (2.7%) by

Leopold et al although the incidence has been as high as 8% in morbidly obese patients. The mechanism of injury to the MCL is most commonly by cutting it with the saw blade at the time of resection of the femoral posterior condyle or the proximal tibia. It is also possible to tear the MCL during exposure with hyperflexion of the knee. Surgeons must take care at the time of flexing the knee when there has been long standing stiffness as the MCL may peel off the medial tibia. It should be obvious to the operating surgeon at the time that the MCL has been damaged. Certainly when assessing for flexion and extension gap balancing and when trialing for range and stability, MCL laxity should become apparent. When detected at this stage it is a fairly simple matter to repair the ligament primarily. The knee should be protected in a hinged range of motion brace for 4–6 weeks postoperatively.

Issues Which Complicate the Uncomplicated Total Knee Arthroplasty (cont.)

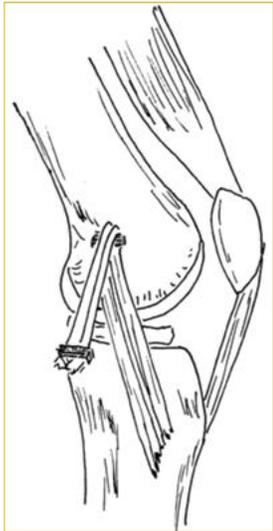


Figure 4. Semitendinosus and Gracilis tendons used for reconstruction of the medial collateral ligament.

It may happen that the ligament is damaged so badly that suture repair is not possible. In that case, it will be necessary to reconstruct the ligament and, if possible, to convert to a more constrained implant. The tissues available for use as a graft of the MCL include the semitendinosus and gracilis (Figure 4), the quadriceps tendon and the iliotibial band. Synthetic material can also be used if available. Intraoperative disruption of the Lateral Collateral Ligament during TKA has not been reported but should it occur, the principles of treatment would be the same.

Prevention of such an injury primarily involves being aware that the MCL is at risk and placing appropriate retraction at the time

of resection of the posterior femoral condyles. The size of the saw blade may also be a factor.

Scenario: During a routine TKA, you become aware that the medial collateral ligament has been badly damaged. It is not suitable for resuturing. This could also apply to the lateral side.

Recommended Management: Following completion of the TKA and being careful not to ‘overstuff’ the joint, the semitendinosus and gracilis tendons are harvested and left attached distally to the tibia. The medial area of the distal femur is exposed and the area of attachment of the MCL to the medial epicondyle is identified and a small trough is made proximal to this. The hamstrings graft is passed deep to the retinaculum and through the remaining stump of the MCL and fixed in the trough with a staple with the knee at 30° flexion. The remaining hamstring is then brought down posteriorly and attached to a bony trough just proximal to the attachment of the semimembranosus tendon. This is to reproduce the posterior oblique limb of the MCL. The required length of this segment is determined in extension but needs to be fixed with the knee in flexion for access (Figure 5). A hinged brace is applied following surgery and a graded increase in range of motion progressed with physical therapy supervision over 6 weeks.

Incorrect Cuts Compromising Ligament Balancing during TKA

Each bone cut in TKA is important as the ultimate end result for the patient depends to a large degree on accurate positioning of the implant. Initial bone cuts are particularly important as further cuts are usually derived or based on the initial cut position. Outcomes can be assessed both clinically and radiographically with the latter being primarily determined by the spread of outliers in varus–valgus alignment. There is however no proven correlation between outcome and outliers.

There are essentially 3 different techniques for the initial cut for TKA; Femoral anterior, Femoral distal and Tibial. Each has its own advantages and disadvantages. The anterior femoral cut sets the rotational position of the femoral component, the distal cut first sets the varus–valgus alignment and the tibial cut sets varus - valgus and tilt alignment as well as being the major cut for flexion and extension gap stability.

Methods for determining alignment and positioning for the blocks used for cutting the bone have classically relied on extra-medullary or intra-medullary alignment jigs. More recently there has been progression to computer navigation, both image based and non-image based, and patient specific cutting or alignment blocks. Neither of these has been shown to improve clinical outcomes although improvements in alignment have been claimed.

If an incorrect cut is made at the time of TKA, it must be recognized immediately and adjusted for appropriately. This can take various forms depending on which cut and the angle of and extent of error. Correction of the error can range from simply recutting the area through to using a revision component. However the best treatment is avoidance of the error and importantly recognizing the error during the case while the possibility for correction is available. To recognize such an error on a postoperative radiograph is not only embarrassing but a significant problem for the patient.

To avoid making such an error requires an awareness of alignment and of the possibility for errors at all stages of the operation. It is very important that this awareness is taught to surgeons in training rather than simply going through the motions of the steps of the operation. The supposed advantage of the newer technologies (computer navigation and patient specific technology) is that they force the surgeon to be aware of the alignment anatomy and hopefully ensure fewer errors. Unfortunately this has not been borne out in clinical outcomes.

Scenario: You are called to a routine TKA, a junior surgeon has made the distal femoral cut using the wrong side cutting block. To do the correct cuts now would compromise balancing. You do not have revision equipment readily available. It can be provided in 1–2 hours.

Recommended Management: Firstly arrangements should be made for the revision equipment to be expeditiously made available and appropriately sterilized. These components and instrumentation may be needed and a delay with the request will only delay their arrival.

If the distal femoral cut has been made with the cutting block against the distal femur and without any proximal adjustment (Figure 5, A & B) then it will most likely be able to be corrected simply by using the correct cutting block. This may require raising the joint line a small amount (2–3 mm) and maybe using a smaller femoral component and a thicker insert. The junior surgeon may well have recognized the error by the fact that very little, if any, bone had been cut from the lateral femoral condyle. If no further cuts have been made then revision instrumentation may not be required.



Figure 5,A. Correct position of a 6° valgus distal femoral cut.



Figure 5,B. Position of a 6° cut made with the incorrect side cutting block.



Figure 5,C. Position of the incorrect 6° valgus cut if made to cut bone from the lateral femoral condyle.



Figure 5,D. Correction of the incorrect cut (white line) by recutting (black line) will significantly raise the joint line and is unacceptable in a primary knee arthroplasty.

However if the error was not recognized and the cutting block had been shifted proximally in order to cut an appropriate thickness centrally and/or laterally then this is a more difficult situation to retrieve from (Figure 5, C & D). Ultimately the best outcome for the patient will be if the joint line can be restored and the joint balanced. If the bone offcut is large enough then it may be possible to reattach it with appropriate fixation and recut the restored distal femur. Alternatively revision instrumentation should be used to make up for the lost bone with appropriate blocks and/or wedges. The delay in waiting for the instrumentation will benefit the patient with a better outcome.

Vascular Injury During TKA

Vascular injury during TKA is, fortunately, a rare complication but one which if missed could have serious consequences including amputation of the limb. However if such a problem occurs and is immediately recognized and appropriately treated then there will usually be no ongoing or long term problem. The incidence of vascular injury during TKA is variously quoted as occurring between 0.01% and 0.23%.

Of patients undergoing joint arthroplasty, Parvizi et al reports on 16 patients with vascular injury with an overall incidence of 0.1%, 11 of these occurred following TKA (incidence not stated). The concerning issue was that none of the vascular injuries were recognized at the time of surgery. Two were caused by direct laceration of the artery and the others by popliteal artery thrombosis. One patient required above knee amputation (AKA) and 50% of patients initiated legal action. Pal et al reported on 9 cases of vascular injury at a rate of 0.23% with only 3 being recognized at the time of surgery. Four patients suffered significant morbidity including 2 AKA's.

The main artery at risk is the popliteal artery which lies centrally or just lateral to the midline and posterior to the popliteus muscle. At its closest point it is less than a centimeter from the posterior tibia and this does not change with knee flexion. The artery is at risk with any sharp instrument passing posteriorly including scalpels, pins, saw blades, osteotomes and retractors. It is imperative that the surgeon be aware of any instrument which passes or is directed posteriorly.

Some conditions, notably arterial disease, may predispose to popliteal artery thrombosis or injury. This can result from the use of a tourniquet or from awkward positioning of the limb such as into hyperextension or with over-enthusiastic dislocation of the joint. The use of a tourniquet is controversial. Certainly if the tourniquet is not inflated then an arterial injury should be recognized immediately.

Issues Which Complicate the Uncomplicated Total Knee Arthroplasty (cont.)

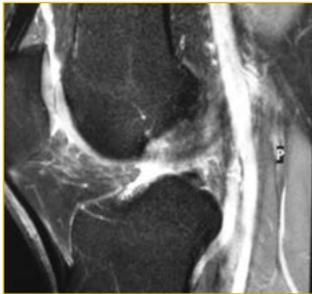


Figure 6. Aberrant Anterior Tibial Artery (arrow).

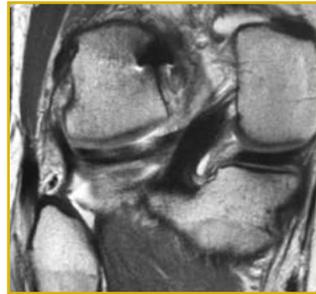


Figure 7. Position of the lateral inferior geniculate artery.

Two other arteries are at risk during TKA, an anatomical variant of the popliteal artery and the inferior lateral geniculate artery. There is an anatomical variant of the popliteal artery where the branch which normally passes between the tibia and fibula to become the anterior tibial artery passes anterior to the popliteus muscle and is directly against the posterior tibial surface. This occurs in 2.1% of the population and is readily seen on MRI scan (Figure 6). Damage to this artery could cause significant posterior compartment bleeding.

The inferior lateral geniculate artery passes against the tibia and below the level of the lateral meniscus (Figure 7). It is at risk at the time of the tibial cut. If the tourniquet is released after implantation then damage to this vessel is difficult to see and to control. This may be a cause of a significant post-operative haemarthrosis.

In order to minimize risk of arterial injury during TKA the single most important measure is surgeon awareness. Awareness of the potential for arterial injury and not performing such surgery in remote areas, awareness of the potential for arterial thrombosis in patients with atherosclerosis and other cardiac and vascular conditions, awareness of the risk of arterial damage if any instrument is directed or penetrates posteriorly, awareness of the possibility of abnormal anatomy in revision or other compromised situations and awareness of the anatomical variations that may be present all contribute to the minimization of risk of arterial injury. Limited use of a tourniquet may also aid in detection of excessive or abnormal haemorrhage thus allowing diagnosis of arterial injury during the course of the surgery.

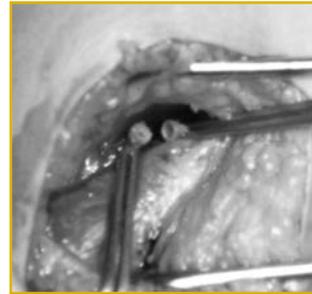


Figure 8. The popliteal artery approached from a medial incision and clamped proximally and distally.

Scenario: During a routine TKA, you become aware that a sharp instrument has penetrated posteriorly. A vascular surgeon is 40 minutes away.

Recommended

Management: Remove the sharp instrument and inform the operating theatre of the potential problem.

If the tourniquet is inflated then ask that it be deflated then slowly extend the knee to relax the artery and observe for bleeding. If active bleeding occurs then reinflate the tourniquet and note the original time. Call the vascular surgeon and request immediate assistance and meanwhile proceed with the TKA, finish and close the skin.

In an ideal scenario, the vascular surgeon will take over under the same anaesthetic and undertake a primary repair through a separate posteromedial incision. However if a vascular surgeon is not available then immediate transfer to a tertiary centre must be arranged. In general terms the tourniquet should not be left on for more than 3 hours. If the process of transfer or vascular care is going to take longer than 3 hours then a decision must be made as to whether to apply a compression bandage and leave definitive treatment to be done at the tertiary centre or to undertake clamping of the artery.

The penetrating injury will be at the level of the joint line or just below this and so the area of the injured artery is easily accessed by a posteromedial incision reflecting the pes anserinus muscles inferiorly and releasing the medial head of gastrocnemius from the femur and reflecting it posteriorly. If the injury is more distal then semimembranosus may also need to be released. The proximal end of the artery must be clamped and if possible the distal end to prevent backflow. (Figure 8). The patient should be heparinized and the area packed and covered in a sterile fashion in preparation for transfer to the tertiary centre.

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Summary

Each of these issues taken separately are uncommon events in the course of TKA. However when considered in combination comprise a significant level of risk. If one combines the incidence of intraoperative fracture (0.39%), patellar tendon avulsion (0.22%), ligament disruptions (2.7%), incorrect cuts estimated at 0.5% and vascular injuries approximated to 1.5%, there is overall a 5.31% risk of a major issue occurring during each TKA.

Fractures	0.39%
PT Avulsions	0.22%
Ligament disruptions	2.7%
Incorrect cuts—(est)	0.5%
Vascular injuries—(est)	1.5%
Total	5.31%

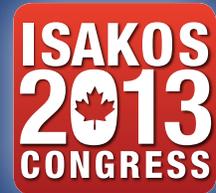
The most reliable preventative technique that any surgeon can employ is to be meticulous and acutely mindful of the potential for such complications during each stage of the operation. Senior surgeons must teach this awareness to their trainees and Fellows. In the event that an issue does occur, if the surgeon is alert, then it will be recognized during the course of the operation and appropriate steps can be taken to correctly manage the problem.

Dealing with any of these issues post-operatively is not only detrimental to the patient and their overall outcome but it is embarrassing for the surgical team, more costly to remedy, entails further risk to the patient and frequently results in litigation.

Full article and references also available online at www.isakos.com.



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18th Severance Arthroscopy Symposium

OCTOBER 14, 2012

The 2012 18th Severance Arthroscopy Symposium, which is approved by ISAKOS and the Asian Arthroscopy Congress (AAC), was successfully held on October 14, 2012. Professor Sung-Jae Kim, founder and first president of the AAC, was the chairman for the Symposium.

On behalf of the entire Symposium Program Committee, we would like to thank all the attendees and members of the Severance Arthroscopy Society for their contributions.

The Symposium had 305 participants and 39 distinguished speakers from all around the country who delivered lectures in their areas of expertise. The program was unique in that topics concerning knee and shoulder arthroscopy were dealt with within a single symposium. This helped time-constrained surgeons grasp the recent advances in the rapidly evolving field of Arthroscopy.

In the Knee sessions, various topics ranging from ligament injuries to meniscus and cartilage lesions were discussed in sufficient depth to help the audience practice with confidence. In the special lecture session, an exceptional presentation titled "Anatomic Double-Bundle ACL Reconstruction: Where are We Now and Where Should We Go Hereafter" was given by Professor Kazunori Yasuda of Hokkaido University in Japan.

In the Shoulder sessions, topics concerning instability/stiffness and rotator cuff lesions were explored. The audience paid a great deal of attention, reflecting the continuous enthusiasm for shoulder arthroscopy.

There were also three Sawbones workshops covering current techniques in shoulder arthroscopy during the lunch session.

After the symposium, the members of the Severance Arthroscopy Society and the speakers enjoyed networking and seeing colleagues at the Symposium banquet. The Severance Arthroscopy Symposium will continue to strive to enhance the opportunity to engage in the exchange and dissemination of knowledge that the Severance Arthroscopy Society is famous for.





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ISAKOS APPROVED COURSES IN REVIEW

Combined Arthroscopy and Sports Medicine Meeting

NOVEMBER 2012 • JAIPUR, INDIA

Combined Arthroscopy and Sports Medicine–CASM 2012 was a combined meeting of Indian Arthroscopy Society (IAS), Asian Arthroscopy Congress (AAC) and Asia Pacific Orthopedic Society for Sports Medicine, (APOSSM). This combined meeting of the IAS, AAC and APOSSM which was held in Jaipur, India. CASM 2012 was attended by more than 800 delegates and 49 International faculty from more than 32 countries including Japan, China, Hong Kong, Korea, Taiwan, Malaysia Singapore, Iran, UAE Indonesia, New Zealand and Australia amongst others.

CASM 2012 was supported by ISAKOS. As a part of this conference, ISAKOS organized a certified Team Physician's course on 8 November 2012. The ISAKOS Team Physician course was a highlight of this meeting. The purpose of the workshop was to discuss sports medicine topics like tendinopathy, musculoskeletal imaging, pre-hab and re-hab. Specialists shared their experience and provided insights into newer developments in this specialty. The Chair for the Workshop was Willem van der Merwe from South Africa and Indian Co-Chairs were Mandeep Dhillon and Parag Sancheti. The International faculty included Surgeons, Radiologists and Physiotherapists who shared their views and discussed regarding the various aspects patient care with a sports perspective.

Willem van der Merwe welcomed the participants for this course and spoke about his experience in sports injury management with an African viewpoint. His session was followed by eminent speakers from all over the world who specifically talked on ACL injuries, Shoulder and Ankle Injuries. The surgeons' perspective and the physiotherapists' point of view was discussed for these injuries along with importance of injury prevention, predisposing factors, treatment protocols and post-surgery rehab. Separate sessions demonstrations on Kinesiology Taping, Core Stability, Eccentric Neuromuscular exercise; Plasma Rich Protein (PRP) and Radiological Imaging of Sports Injuries were also included the workshop.



The program was unique as each specialty was given its own value by conducting them in separate large halls where attendees could focus on the topics they were most interested in (special program calendar was given and also a mobile application was accessed). Sessions not only included knee and shoulder arthroscopy but stress were given to other joints such as wrist, ankle and the most undiscovered Hip joint. This helped many surgeons to grasp their knowledge in the recent advances evolving in the field of Arthroscopy.

During this 3 day meeting, lectures, symposiums, ICL's and debates were held on various aspects of arthroscopy and sports medicine. In addition, 25 live surgeries were demonstrated which showed innovative techniques to make arthroscopic surgeries simplified which was in line with the theme of the meeting. The entire 3 day proceedings of CASM 2012 was highly appreciated by the all the participants and faculty and has put Indian Arthroscopy on a pedestal. The entire organizing committee worked hard to make this meeting a success. Dr. Anant Joshi was the organizing chairman, Dr. Parag Sancheti, the organizing secretary, Dr. Dinshaw Pardiwala was the scientific chair and Dr. Nicholas Antao was the treasurer for the meeting. This committee was ably supported by Dr. Kanchan Bhattacharya, President and Dr. Debasis Chatterjee, Secretary of Indian Arthroscopy Society.

CASM 2012–HIGHLIGHTS:

- 8 Concurrent preconference workshops (including ISAKOS certified course)
- 25 Live surgical demonstrations. Beamed from 2 hospital (6 ORs) in Jaipur city
- 49 International faculty
- 103 Indian faculty
- 810 Delegates (including those from the ISAKOS pre-course)
- 320 scientific presentations



The 4th Annual JOSKAS Congress 2012

Hiroshi Mizuta MD, PhD

President, the 4th Annual JOSKAS Congress
 Professor and Chairman, Department of Orthopaedic Surgery,
 Faculty of Life Sciences, Kumamoto University



President Mizuta and his colleagues

On behalf of JOSKAS (Japanese Orthopaedic Society of Knee, Arthroscopy and Sports Medicine), I would like to report on the 4th Annual JOSKAS Congress. JOSKAS was formed in 2009 by the merger of the Japanese Knee Society and the Japanese Arthroscopy Association. It has been growing rapidly since then, with currently more than 2700 members.

The 4th Annual JOSKAS Congress was held at the Okinawa Convention Center and the Ginowan Municipal Gymnasium in Okinawa, Japan on July 19-21, 2012. The Congress Program included six Special Lectures, 13 Educational Lectures, four Symposia, ten Panel Discussions, 399 Podium Presentations, and 513 Poster Presentations. Wonderful lectures were given by our international guests: Stephen Lyman, PhD; Michael Kjaer, MD; Felix H. Savoie III, MD; Jean-Noel Argenson, MD; Andrew Unwin, MD; Scott A. Banks, PhD; Allston J. Stubbs, MD; Clarence L. Shields Jr., MD. Their participation added a great deal of value to the Congress.

Symposia included: "Strategy of Rotator Cuff Injuries in Overhead Athletes," "Diagnosis and Treatment of Elbow Injuries in Overhead Athletes," "Return to Sports After ACL Reconstruction: Now and Future", and "Early Functional Recovery After TKA." Panel Discussions included; "Arthroscopic Hip Surgery: Now and Future", "Strategy of Low Back Pain in Athletes", "Treatment of Osteochondritis of the Knee: Up to Date", "New Treatment for Sports Injuries," "Revision ACL Reconstruction: Technique and Outcome," "Arthroscopic Surgery for Recurrent Anterior Dislocation of the Shoulder Joint: Technique and Outcome,"

"Arthroscopic Ankle Surgery: Up to Date," "High Tibial Osteotomy: Technique and Indication," "SLAP Lesion in Athletes: Diagnosis and Treatment," and "Mid- and Long-term Results of Meniscal Repair." The JOSKAS Congress was followed by educational, hands-on seminars on arthroscopy of the knee and shoulder joint and arthroplasty of the knee joint for young orthopaedic surgeons on July 21–22.

Two social events that were held emphasized the local Okinawa culture. First was an official banquet held on July 18 at the Okinawa Harbor-View Hotel. 120 executive members and international guests were greeted by traditional Ryukyuan Island Dance performances. After poster presentations on July 19, the welcome party was held at the Ginowan Municipal Gymnasium. Participants enjoyed the JOSKAS CUP, a tug-of-war competition held among various Japanese universities, and an "Eisa", an Okinawan folk dance that marks the end of Bon summer festival.

The Congress was a great success, with approximately 2000 attendees. They enjoyed presentations and lectures on the latest research and had the opportunity for animated discussions. Attendees also enjoyed the social events and visiting the many places of exquisite natural beauty in Okinawa. We deeply appreciate the efforts and support from the JOSKAS members and international guests. The success of this meeting was built on everyone's contributions. JOSKAS will continue to make the best efforts towards the development of both JOSKAS and ISAKOS. The 5th JOSKAS Congress will be conducted by President Akira Dezawa, professor of Teikyo University, in Sapporo on July 20–22, 2013.



Symposium

ISAKOS APPROVED COURSES IN REVIEW

The 27th Korean Arthroscopy Society Annual Meeting

HOSPITAL, KOREA • OCTOBER 13, 2012



Traditional Ryukyuan Dance at the Official Banquet

This year has had significant meaning to the Korean Arthroscopy Society since it is the 50th anniversary of the Korean Orthopedic Association and is the year when the Congress of Korean Arthroscopy Society became an ISAKOS Approved Course. This Congress provided participants with the chance to exchange up-to-date knowledge and information regarding arthroscopic surgery. Professor Yong-Girl Rhee, the president of Korean Arthroscopy Society, organized this year's Annual Meeting. It was the first time the Annual Meeting of Korean Arthroscopy Society was held internationally. Professor Yong-Girl Rhee hopes to expand this kind of international meeting in order to increase the rapid exchange of information as well as to strengthen relations within and with Asia.



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ISAKOS NEWSLETTER 2013: Volume 1 • 45

San Diego Shoulder Institute's (SDSI) Annual Course



Not many orthopaedic seminars continue to advance in caliber, excellence, and educational value. San Diego Shoulder Institute's (SDSI) Annual Course: Arthroscopy, Arthroplasty, and Fractures is the exception. Celebrating its 29th year, this year's course was second to none. Held in scenic Southern California, this course offers an exceptional climate for learning.

James C. Esch, M.D. serves as SDSI's President and Course Chair. His international influence and reputation serves as a catalyst to drawing the most dynamic and prominent faculty from across the globe. Held in scenic Southern California, the course affords an incomparable venue and climate for learning. Approximately 380 surgeons, representing 27 countries, attended the June 2012 event. Many registrants indicated this was the first time attending the course, and several stated they attend every year. Overwhelming, attendees indicated the SDSI course is "the best shoulder course in the world" and well worth attending.

The intense four-day course is structured for attendees to customize the learning experience based on individualized learning goals. The course begins with arthroscopic model laboratories.



These sessions provide individualized instruction allowing participants to practice and perfect skills on realistic shoulder models. SDSI also partnered with the University of California, San Diego, Center for the Future of Surgery. This newly opened state of the art facility allowed SDSI to offer small-group cadaveric sessions focusing on arthroscopy and arthroplasty techniques. Initial didactic sessions were followed by small group practice sessions and concluded with a question and answer period. Many participants commented that the opportunity to practice surgical techniques in partnership with a world-class expert was invaluable.

Skills laboratories are augmented by comprehensive lectures focusing on Instability, Cuff Repair, Arthroscopy, Arthroplasty, Fracture Management, and Advanced Practice Topics. One special break out session allows participants to present challenging cases to SDSI's expert panel for treatment recommendations. This session receives resounding accolades.



This year's course made history by being broadcast live via internet coverage. Viewers from over 71 countries logged on to the lecture sessions broadcasted at the time of delivery. Those viewing were not only afforded the benefit of accessing lectures at no charge, but could also provide direct comments and questions to the world-renowned faculty during the lecture experiences. Individuals who missed the opportunity may still view the course by logging onto www.G9MD.net.

Next year, San Diego Shoulder Institute celebrates its 30th anniversary. Due to increased demand, SDSI is expanding to a larger facility in San Diego. Plan to join the exceptional event at the Hilton Bayfront San Diego June 12-15, 2013. Look for specific details in early 2013 on the SDSI website www.shoulder.com.

ISAKOS APPROVED COURSES IN REVIEW

SIGASCOT-ISAKOS Symposium

NAPLES, ITALY • OCTOBER 12, 2012



The SIGASCOT 4th National Congress held in Naples, Italy on October 10-12, 2012.

Claudio Zorzi was the President and Paolo Adravanti the Vice-President. It was a successful meeting with more than 600 participants. On Friday, October 12, a special three-hour SIGASCOT-ISAKOS symposium was held.

Eleven presentations focused on surgical treatment Anterior Cruciate Ligament and helped expand the knowledge of the audience. ISAKOS Faculty were represented by Professor Fu (ISAKOS Past President), Professor Kurosaka and Professor Neyret (respectively 1st and 2nd ISAKOS Vice-President). Philippe Colombet, President of the SFA (Société Française d'Arthroscopie) and Matteo Denti, 1st Vice-President of ESSKA, were also involved.

The symposium allowed for many excellent discussions and relations within a positive atmosphere and ambiance. Each participant was able to enjoy not only science, but Italian food and sights as well. Some of the attendees got the opportunity to visit Vesuvio, Pompei and Capri.

The SIGASCOT National Congress was also a great opportunity to announce the 2013 ISAKOS Congress in Toronto as well as to promote ISAKOS membership.

Thanks to SIGASCOT for inviting ISAKOS Faculty.



5th Annual SLARD Congress

From October 10-12, 2012, the Fifth Annual Congress of the Latin American Society of Arthroscopy, Knee Surgery and Sports Medicine (SLARD) was held in Cartagena, Colombia. This enchanting city set the stage for an event that received more than 600 attendees. Doctors Mauricio Gutierrez (SLARD President), Rodrigo Lopez (Secretary) and Carlos Leal (Program Chairman) collaborated to create a robust scientific program.

The scientific level was outstanding and the SLARD members updated their knowledge with the help of renowned experts. ISAKOS remained an integral part of the Congress, offering three symposia and two guest lectures. The ISAKOS booth was located strategically and was visited by hundreds of participants interested in SLARD and ISAKOS membership's advantages and events.

The ISAKOS-SLARD collaboration is deeply appreciated and leads to an enrichment in orthopaedic knowledge throughout Latin America.



The 11th Turkish Sports Traumatology, Arthroscopy and Knee Surgery Congress

ANKARA, TURKEY • OCTOBER 2-6, 2012

The congress was also an opportunity to meet old friends and make new acquaintances, laying the groundwork for future scientific collaboration. We have had tremendously positive feedback from Congress participants on the quality of the scientific presentations and the organization of the meeting. For those interested, photographs taken during the scientific sessions and the social program are available on the Congress web site, www.tusyad2012.org.



The 11th Turkish Sports Traumatology, Arthroscopy and Knee Surgery Congress was held in Ankara on October 2-6, 2012. The Congress was a great success with 520 registered participants, 3 live surgery sessions, 20 panels, 54 lectures, 8 instructional course lectures, 11 industry workshops, 42 poster and 61 oral presentations.

This ISAKOS Approved Course was held under the presidency of Prof. Reha Tandogan and the honorary presidencies of Prof. Rene Verdonk and Prof. Mahmut Doral. The biannual Turkish Arthroscopy Congresses have always had strong international participation. This tradition continued with the scientific support of ESSKA and EFOST, with 14 invited speakers from all over the world. Program Chairmen Prof. Sinan Karaoglu and Alberto Gobbi prepared a wonderful scientific program featuring experts and leaders in diverse fields. Robert LaPrade, Mark Miller, Alessandro Castagna, Micheal Dienst, Joao Espregueira-Mendes (represented by Helder Pereria), Elizaveta Kon, Charles Brown, Luigi Pederzini, Romain Seil, Erhan Basad and Michael Hantes, among others, presented their expertise on knee, shoulder, hip, elbow and ankle surgery.

The Congress also hosted the 3rd Balkan Arthroscopy Meeting, a full-day proprioception workshop and a FORTE (Federation of Orthopedic Trainees in Europe) session. Live surgery sessions attracted a significant interest with an anatomic double bundle ACL reconstruction, a Bankart repair with capsular shift and a meniscal implantation. Advances in cartilage repair, hip arthroscopy, meniscal implants and allografts and multi-ligament injuries were also discussed in detail. Controversies in primary and revision knee arthroplasty, shoulder instability, partial rotator cuff injuries, Achilles tendon tears and patellar instability were debated.

The Turkish Society of Sports Traumatology, Arthroscopy and Knee Surgery gratefully acknowledges the scientific support of ISAKOS in making the Congress a success. The Society hopes that this event will be another opportunity to cement ties and improve relations between Turkey and the international arthroscopy and knee surgery community.



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ISAKOS APPROVED COURSES IN REVIEW

6th World Sports Trauma Congress

LONDON, ENGLAND • OCTOBER 17-20, 2012

The 6th World Sports Trauma Congress (WSTC) and 7th EFOST Congress 2012 were held at the Queen Elisabeth Conference Centre in London on October 17–20, 2012.

With more than 600 participants, the congress was a great success.

The Congress also provided the opportunity for the ISAKOS Orthopaedic Sports Medicine committee to meet in order to prepare for what will be presented at the 2013 ISAKOS Congress in Toronto.

2nd ISAKOS Vice President elected, Philippe Neyret, gave the Invited Guest Lecture.

Francois Kelberine became the EFOST Past-President and the current President is now Nicola Maffuli.



Francois Kelberine and Philippe Neyret

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sundarbone70@hotmail.com
Tel: 91-422-2485000
Fax: 91-422-2451444
www.iasm2013.com

Arthroscopic Aspects of Hip and Ankle Surgery

1931 S Hertogenbosch, NETHERLANDS
March 29, 2013

For further information, please contact:

Maaik van den Borne
maaikevdborne@gmail.com
Tel: 0031-6-30385387
Fax: 0031-13-5443010
www.scopie.org

5TH Congress of the Greek Association of Arthroscopy Knee Surgery and Sports Injuries

University Hospital of Larisa Greece
Larisa, GREECE
April 3-6, 2013

For further information, please contact:

Michael Hantes
hantesmi@otenet.gr
Tel: 30-2413-501199
Fax: 30-2413-670107
www.eae-net.gr

The 10TH International Forum on Sports Medicine & Arthroscopic Surgery

Sheraton Hangzhou Wetland Park Resort
Hangzhou, CHINA
April 4-6, 2013

For further information, please contact:

Shiyi Chen, MD
cshiyi@163.com
Tel: 86-21-52888255
Fax: 86-21-62496020
www.isakos-shanghai.com/

53RD Knee Severance Arthroscopy Fresh Cadaver Workshops

Yonsei University Anatomy Department
Seoul, KOREA
April 6, 2013

For further information, please contact:

Min Jung
jmin1103@naver.com
Tel: 82-2-2228-5679
Fax: 82-2-63-6248
www.severanscopy.com

XIV Annual Meeting of the Argentinian Association of Sports Traumatology (AATD)

Sheraton Hotel & Conventions Center
CABA, ARGENTINA
April 17-19, 2013

For further information, please contact:

Miguel A. Khoury
congreso.aatd@gmail.com
Tel: 54-911-44221797
Fax: 54-11-48042975
www.aatd.org.ar

54TH Shoulder Severance Arthroscopy Fresh Cadaver Workshops

Yonsei University Anatomy Department
Seoul, KOREA
April 20, 2013

For further information, please contact:

Min Jung
jmin1103@naver.com
Tel: 82-2-2228-5679
Fax: 82-2-363-6248
www.severanscopy.com

Congress of Ukrainian Association of Sport Trauma, Knee Surgery and Arthroscopy

Aquamarine Hotel, Parkova str. 11
Sebastopol, UKRAINE
April 29-30, 2013

For further information, please contact:

Igor Zazirnyi
zazirnyi@ukr.net
Tel: -852054
Fax: -2596432
www.uastka.org

San Diego Shoulder Institute 30TH Annual Course: Arthroscopy, Arthroplasty, and Fractures

Hilton Bayfront
San Diego, CA USA
June 12-15, 2013

For further information, please contact:

Larky Blunck, RN
eblunck@aol.com
Tel: 1-760-445-2874
Fax: 1-760-940-6110
www.shoulder.com

13TH Amsterdam Foot and Ankle Course

Amsterdam Medical Center
Amsterdam, NETHERLANDS
June 13-14, 2013

For further information, please contact:

Inge van Eekeren
i.c.vaneekeren@amc.uva.nl
Tel: 0031-020-5662474
Fax: 0031-020-5669117
www.ankleplatform.com

5TH Annual Meeting of Japanese Orthopaedic Society of Knee, Arthroscopy and Sports Medicine

Sapporo Convention Centre
Sapporo, JAPAN
June 20-22, 2013

For further information, please contact:

Japan Convention Services, Inc
joskas2013@convention.co.jp
Tel: 81-3-3508 1214
Fax: 81-3-3508 1302
www2.convention.co.jp/joskas2013/english/index.html

Advanced Instructional Course on Arthroplasty and Arthroscopy

University Medical Centre Utrecht
Utrecht, NETHERLANDS
July 1-4, 2013

For further information, please contact:

Arthroscopy & Arthroplasty 2013
info@shoulder-elbow-knee.nl
Tel: +31-30 2769174
Fax: +31-30 276 9251
www.shoulder-elbow-knee.nl

2013 The Ligament Reconstruction Seminar & Live Surgery in Sapporo

Faculty House "Trillium (Enreiso)" in Hokkaido University
Sapporo, JAPAN
August 1, 2013

For further information, please contact:

Eiji Kondo
eijik@med.hokudai.ac.jp
Tel: 81-11-706-7211
Fax: 81-11-706-7822
hokudai-med-sports.org/index.html

International Symposium on Cartilage Repair of the Ankle - Asia 2013

Roppongi Hills
Tokyo, JAPAN
August 2, 2013

For further information, please contact:

Christopher D. Murawski
MurawskiC@HSS.EDU
Tel: 1-646-7978880
Fax: 1-646-7978966
www.toptour.co.jp/conv/3947/israasia2013/index.html

3RD INDO-US Shoulder Course

Hotel Aloft
Coimbatore, INDIA
August 9-11, 2013

For further information, please contact:

Dr. Santosh Sahanand
indousshoulder@gmail.com
Tel: -2645743
Fax: -2321619
www.ortho-one.in/news/e-flyer-3rd-indo-us.jpg

International Congress of Indian Arthroscopy Society (IIAS) 2013

Grant Hyatt Hotel, and K E M Hospital
Mumbai, INDIA
September 19-22, 2013

For further information, please contact:

Dr Roshan Wade
roshanwade@gmail.com
Tel: -9.1982005063e+011
Fax: 91 - 022 - 24136051

5TH International Hip Arthroscopy Meeting

Alte Kongresshalle
Munich, GERMANY
October 10-12, 2013

For further information, please contact:

michael.dienst@ocm-muenchen.de
Tel: 49-89-206082-0
Fax: 49-89-206082-333
www.ishacongress.com

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