



# ISAKOS

newsletter

## SUMMER 2006

Volume 10, Issue 2

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Ronald M. Selby, MD, USA

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## Viva Italia...

with the ISAKOS 6<sup>th</sup> Biennial Congress in Florence!



Experience, once again, the extraordinary international exchange that takes place at an ISAKOS Biennial Congress. We welcome you to the 2007 ISAKOS Congress, to be held at the Fortezza da Basso in Florence, Italy. Florence's Fortezza da Basso is an enormous fortress designed by architect Antonio da Sangallo the Young. The exterior wall of the Fortezza da Basso still remains intact and the building is of great historical military importance. Built in a striking pentagonal style, the Fortezza da Basso is around 500 years old. Over the years the Fortezza da Basso has been used as a prison, arsenal, and army barracks.

Florence lies on the Arno River and is considered a center of medieval European trade and finance. The city is often thought to be the birthplace of the Italian Renaissance and was long ruled by the Medici family. Florence is also famous for its fine art and architecture. It is said that, of the 1,000 most important European artists of the second millennium, 350 lived or worked in Florence.

ISAKOS Members who have not attended a recent congress should make plans to attend in 2007. This congress is unique due to the diversity and vibrancy of delegates from over 70 countries.

### Congress Highlights

- Evidence Based Medicine
- Arthroscopic Surgery in 2020
- Double Bundle ACL & PCL
- Minimally Invasive Joint Arthroplasty
- Meniscal Transplant
- Cartilage Technology
- Arthroscopic Rotator Cuff Repair & Instabilities
- Hip Arthroscopy
- Injury Prevention
- Rehabilitation Based on Science
- Sports with Joint Replacement

### Featured Sessions

- Live Surgical Demonstrations
- Hands-On Workshops
- Poster Exhibits
- Scientific Paper Presentations
- Instructional Course Lectures
- Technical Exhibits



## Editor's Note

**Ronald M. Selby, MD (USA)**

*E un Mundo Piccolo! (It's a small world!)*

We are all very fortunate, blessed really, to be engaged in a line of work that is interesting, enjoyable, and helpful to our fellow man. It is no secret that in quite a few countries the health care delivery system has gotten worse in the past few decades and years. For many of us reimbursement is down and the hassle factor is up: more paperwork, more bureaucratic loopholes to jump through, decreased reimbursement, and more difficulty in securing treatment for our patients. Still, the intrinsic satisfaction derived from the doctor-patient relationship and the often miraculous improvement that we can help impart through surgical intervention is rewarding indeed! It has been quoted that 97% of the world's working force is unhappy with their jobs. We are certainly fortunate. A big factor that can add to our professional and personal lives is the interaction with our colleagues. Belonging to a professional association keeps us in touch with the educational process and helps keep us up-to-date with our practice and with our profession.

ISAKOS is the world leader in promoting research, advancing and disseminating education and thereby improving patient care worldwide in arthroscopy, knee surgery and orthopaedic sports medicine. The advantages to membership in ISAKOS are both tangible and intangible. You receive the newsletter biannually; have access to the "members only" portion of the ISAKOS website; an annual subscription to *Arthroscopy: The Journal of Arthroscopy and Related Surgery* is included in membership; discounted ISAKOS Congress registration; AND you can participate in "ISAKOS-approved" courses and teaching centers and "ISAKOS-sponsored" meetings; meet and network with world leaders in your field; and enhance your critical thinking through exposure to new and international perspectives of the very problems that you encounter in your own practice!

There is no better showcase for ISAKOS than the Congresses. Thought leaders of national and regional societies meet at these international gatherings to share information in clinical research, basic sciences, and pertinent issues to the regional societies. Collaborations and friendships are born and enhanced at these meetings. ISAKOS works with regional and local societies that have similar goals and allows them to combine their knowledge and strength in international forums. ISAKOS is a rapidly growing organization with nearly 2000 members from 70 countries.

*(continued on page 21)*



## President's Message

**John A. Bergfeld, MD (USA)**

*Dear Friends of ISAKOS,*

*Communication and relationships have been key to the success of our society.* Our goals to work with other societies and support their efforts in education have been a focus for ISAKOS. We met with the Presidents of ESSKA, APOSSM, SLARD and AANA at the recent AAOS Annual Meeting in Chicago and discussed future objectives and strategy for our common goals.

Our ISAKOS committees are thriving and functioning productively. Their work is shared with you in the committee reports within this newsletter. They have been actively working on current concept meetings in Brazil (Minimally Invasive Knee Surgery) and South Africa (Patellofemoral Joint). Future ISAKOS workshops are scheduled in Beijing, China (October 2006) and Mexico City, Mexico (November 2006).

The Membership Survey, developed by the ISAKOS **Communications Committee**, is complete. The results will help to determine specific wants and needs of the ISAKOS Membership. At this point we are in the process of filtering the information and will implement these findings in conjunction with our strategic planning committee.

I would like to give a special thanks to all committee chairs and members for their active role and support of the ISAKOS Mission during the year. The results of their work will come to fruition in time for the Sixth Biennial Congress in Firenze.

Working closely with ESSKA, we will now be able to provide a discounted subscription rate to the *Knee Surgery Sports Traumatology Arthroscopy Journal* (KSSTA), the official ESSKA Journal, as an added member benefit beginning in 2007. This will be in addition to our already powerful official journal, *Arthroscopy: The Journal of Arthroscopic and Related Surgery*. We have also Co-Sponsored two post graduate courses with ESSKA. The first in St. Petersburg, Russia and upcoming in Ukraine.

*(continued on page 21)*

REGISTER ONLINE FOR

# 6<sup>th</sup> BIENNIAL ISAKOS CONGRESS

MAY 27-31, 2007



[www.isakos.com/register](http://www.isakos.com/register)

You can register online beginning September 1, 2006 for the 2007 ISAKOS Congress. Visit the ISAKOS Web site at [www.isakos.com/register](http://www.isakos.com/register), enter your registration information and provide a credit card number for payment. Your payment will be processed immediately and you will receive a confirmation of your registration via e-mail. Registration discounts will be honored until March 1, 2007.

The deadline to pre-register for the 2007 ISAKOS Congress is April 15, 2007. After April 15, you will be required to register on-site at the meeting in Florence, Italy.

If you prefer to submit your registration via fax or mail, you may download the registration form after September 1, 2006 from the ISAKOS Web site at [www.isakos.com](http://www.isakos.com).

## ISAKOS WELCOMES NEW MEMBERS

### ACTIVE MEMBERS

Grzegorz Adamczyk, MD, PhD, *Poland*  
Luca Antonelli, MD, *Italy*  
Ümit Selçuk Aykut, MD, *Turkey*  
Alessandro Beccarini, MD, *Italy*  
James P. Bidwell, FRCSEd (Tr.&Orth),  
*United Kingdom*  
Arnoldo Enrique Briceño, MD, *Chile*  
Allen Lawrence Chong, MBBS, FRACS (ORTH),  
*Australia*  
Franco Cincotti, MD, *Venezuela*  
Luis Coronel, MD, *Peru*  
Jack Farr, MD, *USA*  
Jose David Bernal Gonzalez, MD, *Mexico*  
Gerhard Jacobus Greeff, MD, *South Africa*  
Hideya Ishigooka, MD, PhD, *Japan*  
Kenichi Kajitani, MD, *Japan*  
Akihiro Kanamori, MD, *Japan*  
Elisaveta Kon, MD, *Italy*  
Tomasz Koziel, MD, *Poland*  
Sanghak Lee, MD, *Korea*  
Claudio Lepera, MD, *Brazil*  
Walter Fabian Martinez, MD, *Argentina*  
COL. R. Dr. Vejayan Rajoo, MS(Ortho), *Malaysia*  
Kandiah Raveendran, MB BS FRCS MCh(Orth),  
*Malaysia*  
Rodney Ian Walter Richardson, MB BS, FRACS,  
*Australia*  
Jinhyup Shin, MD, *Korea*  
J. Richard Steadman, MD, *USA*  
Pavitar Singh Sunner, MD, *Australia*  
Bruce L. White, FRACS, *Australia*  
Stefano Zaffagnini, MD, *Italy*

### ASSOCIATE MEMBERS

Nobuo Adachi, MD, PhD, *Japan*  
Abdulrahman Ahmed Alkrad, MD, *Saudi Arabia*  
Ibrahim Sinny Assiri, MBBS, FRCSC, *Canada*  
Michael J.A. Banz, MD, *Switzerland*  
Ignacio Luis Sanz Barga, MD, *Argentina*  
Cris D. Barnthouse, MD, *USA*  
Wael Kamal Barsoum, MD, *USA*  
Larry S. Bowman, MD, *USA*  
Joel L. Boyd, MD, *USA*  
Marcio Oliveira Carneiro, MD, *Brazil*  
Roberto Rodrigues Cisneros, MD, *Brazil*  
Nurzat Elmali, MD, *Turkey*  
Peter H. Ess, MD, *Finland*  
John Anthony Gallagher, FRACS, *Australia*  
Jonathan Austin Herald, FRACS, MSp Med,  
*Australia*  
Elliott B. Hershman, MD, *USA*  
Omer Aslam Ilahi, MD, *USA*  
Yusuke Iwahori, MD, *Japan*  
Jae-Hoon Jeong, MD, *Korea*  
Mustafa Karahan, MD, *Turkey*  
Otoshi Kenichi, MD, *Japan*  
Keith Kenter, MD, *USA*  
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Martin Lind, MD, PhD, *Denmark*  
Karen Louise Luscombe, FRCS (Tr. Orth),  
*United Kingdom*  
Samuel John Maccessi, MBBS, FRACS, *Australia*  
Mahir Mahirogullari, MD, *USA*  
Konrad Malinowski, MD, *Poland*  
Jacobus Johannes Marais, MD, *South Africa*  
Evandro Marcelino, MD, *Brazil*  
Leonardo Fossati Metsavaht, MD, MS, *Brazil*  
Arif Sukimin Mohammad Shukri, MBBS, MS  
*Ortho, Malaysia*  
Khalid David Mohammed, FRACS, *New Zealand*  
Athanasios Papachristos, MD, *Greece*  
Kwang Yeol Park, MD, *Korea*  
Kyong-Jin Park, MD, *Korea*  
Carmelo Francesco Pascali, MD, *Italy*  
Paul Alexander Rowe, MD, *South Africa*  
Alvaro Sanchez, MD, *Chile*  
Gabriel Sanchez Mazariegos, MD, *Spain*  
Troy Earl Skidmore, DO, *USA*  
Robert Paul Sotta, MD, *USA*  
Jai Thilak, MD, *India*  
Ilya Voloshin, MD, *USA*  
Ethan R. Wiesler, MD, *USA*  
Ichiro Yoshimura, MD, PhD, *Japan*  
John Zimmer, MD, *USA*

# ISAKOS

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# YOUR COMMITTEES AT WORK

## ARTHROSCOPY COMMITTEE



The **Arthroscopy Committee** is currently undertaking two major projects. The first is to develop a CD-ROM on Normal Arthroscopic Anatomy of all Major Joints. The second is a Standard Terminology Project.

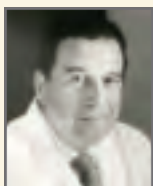
The objective of the CD-ROM project is to provide information on normal anatomy as seen by standard portals of the knee, shoulder, ankle, elbow, hip and wrist joint. The format for each joint consists of a section on superficial anatomy, routine portals, portal placement and the normal arthroscopic anatomy as seen from the involved portal. An intra-articular schematic drawing shows the routine travel through the joint and the position of the picture in the joint. For the beginning arthroscopist it is important to understand the normal arthroscopic anatomy in order to be able to distinguish it from pathology. Each section is finished by a summary and questionnaire in order to highlight the major points.

The second project is the Standard Terminology Project. The aim is to provide standard terminology, definitions and classifications in the field of arthroscopy of knee, shoulder and ankle joints. Each chapter will provide a guideline for the assessment of normal and pathological aspects of these joints during arthroscopy. In each chapter the main clinical diagnosis in relation to these joints are described. Of each clinical diagnosis a definition is given followed by a brief description of symptoms and signs as well as the underlying pathological process. Of the arthroscopic findings a definition is given, followed by a classification system concerning this abnormality. This project is a combined ISAKOS/ESSKA project. It is the intention of the committee to produce a basis for such a document at the Current Concepts meeting in September 2006 in Amsterdam.

Apart from these projects the committee has developed symposia and international courses for the upcoming ISAKOS Congress and manuscripts for the ISAKOS newsletter.

**C. Niek van Dijk, MD** (*The Netherlands*)

## BYLAWS COMMITTEE



The **Bylaws Committee** of ISAKOS recommends the following amendments to the ISAKOS bylaws. Please review these changes as they will be voted upon at the 2007 ISAKOS Congress in Florence, Italy.

### **a. Article VI, 6.03 (a)**

**Change from** "Medical doctors qualified as orthopaedists, musculoskeletal surgeons, rheumatologists or the equivalent, from all countries who are in good standing in their national/ regional society as determined by a membership committee of the Society may join the Society as active members." **to** "Those individuals at the doctoral level who demonstrate an interest or ability in the fields of medicine or science and who have demonstrated interest in arthroscopy, knee surgery and orthopaedic sports medicine."

### **b. Article VI, 6.03 (b)**

**Change from** "Those individuals who demonstrate an interest or ability in the fields of medicine or science and who have demonstrated an interest in arthroscopy, knee surgery and orthopaedics sports medicine shall be eligible for membership as associate members of the Society." **to** "Those members who qualify for full active membership shall be eligible for membership as associate members of the Society."

### **c. Article VI, 6.07 (c)**

Membership of an individual may be terminated or suspended by the Board in a manner described in Section 6.07 (a) for revocation of license to practice medicine; (b) failure to pay dues assessed within "six (6) months" **change to** "one (1) year" after the Treasurer shall have sent by "electronic mail or mail" **change to** "written copy" a notice of delinquency; or (c) a conviction of a felony.

### **d. Article VIII, 8.03**

If said dues are not paid within "one hundred eighty (180) days" **change to** "one (1) year", all privileges of membership shall be suspended until all arrears are paid in full.

### **e. Article X, 10.02**

The Board of Directors shall also appoint an archivist to the Board who shall be a member of the Board of Directors but who shall serve without vote. **Remove** as the archivist will not be a member of the Board of Directors.

### **f. Article XIII, 13.01 (d)**

3. The Membership Committee shall review all requests received. Candidate names shall be forwarded to the Board of Directors. Remove "to present to the full membership for a vote."

### **g. Article XVII, 17.01**

Whenever written notice is required to be given to any person under the provisions of the Articles, these Bylaws, or the Nonprofit Corporation Law, it may be given to such person, either personally or by sending a copy thereof by "first class mail, postage prepaid, or by telegram charges prepaid" **change to** "written copy", to his address appearing on the books of the Society, or the case of directors, supplied by him to the Society for the purpose of notice. "If the notice is sent by mail or by telegraph, it shall be deemed to have been given to the person entitled thereto when deposited in the United States mail or with a telegraph office for transmission to such person." **change to** "When the notice is sent by written copy, it shall be deemed to have been given to the person entitled thereto." A notice of meeting shall specify the place, day and hour of the meetings and any other information required by law or these Bylaws.

**Paolo Aglietti, MD** (*Italy*)

# YOUR COMMITTEES AT WORK

## COMMUNICATIONS COMMITTEE



Dr. Selby expressed many thanks to the Communications Committee and to the ISAKOS Office for assisting in the coordination of the membership survey. The committee has diligently worked on the implementation of the Guidelines for the Distribution of Digital Publications. They were unanimously approved and will be submitted to the Executive Committee for final approval. There will be an attempt to make these guidelines universally applicable. The guidelines should be sent to the committees which are responsible for production of digital publications at the congress.

The Newsletter Editorial Board has been charged with translation of an online newsletter in other languages. If members from other regions would like to offer to translate the newsletter, please notify the ISAKOS office.

**Ronald M. Selby, MD (USA)**

## EDUCATION COMMITTEE



The Education Committee continues to expand international learning opportunities. The committee has received multiple ISAKOS sponsored workshop applications for 2006/2007 and is in the process of reviewing these. In addition,

the committee has identified target regions of the world for future ISAKOS sponsored workshops including but not limited to Thailand, South America, South Africa, Prague, Sydney, India, Russia and East-Central Europe.

Renewal request letters were sent to all ISAKOS Approved Teaching Centers and the office has received over 65 renewal applications. In order to be re-approved as a teaching center, it is necessary to complete the renewal application and return to the ISAKOS office. In addition, attendees to teaching centers are being asked to evaluate their experience. If you have not completed this renewal application please complete and return to the ISAKOS office no later than August 1, 2006.

Currently, the committee is looking at various ways to expand teaching opportunities worldwide. These include partnering with regional societies and industry.

**Don Johnson, MD (USA)**

**David McAllister, MD (USA)**

## KNEE COMMITTEE



The current concepts meeting on MIS Arthroplasty is close to being completed. The meeting will take place in August 2006 in Brazil prior to the SLARD congress.

The committee is organizing the current concepts meeting on Biomechanics of the Patellofemoral Joint and its Clinical Relevance in South Africa on October 6–8, 2006.

An Educational Grant is being provided by ISAKOS to support the meeting and CD publication to be distributed at the 2007 ISAKOS Congress in Florence, Italy.

During the committee meetings in Chicago, IL, USA in March 2007, **Allen Anderson, MD (USA)** began development of the validation process of a meniscal documentation form with the agreement of the continental spot medicine societies and ISAKOS. It is the committees hope that this will be presented during the ISAKOS Congress in 2007.

The application deadline for the Patellofemoral Traveling Fellowship is November 1, 2006. Following the close of the application process the committee will select a candidate. For more information on this award, see page 7 of this issue of the ISAKOS Newsletter.

**Philippe Neyret, MD (France)**

**Rene Verdonk, MD, PhD (Belgium)**

## ORTHOPAEDIC SPORTS MEDICINE COMMITTEE



The Orthopaedic Sports Medicine Committee has been working on a number of projects since meeting in Chicago in March 2006.

A Team Physician's Course has been approved by the Program Committee and Board of Directors to be held during the Congress in Florence on May 27.

More information will be available in the Preliminary Program in September 2006. **José Huylebroek, MD (Belgium)** is the course Chair.

In addition, the committee is reviewing and considering the following as Future Projects and plans to submit these to the ISAKOS Executive Committee and Board of Directors for approval and funding:

- A Current Concepts Meeting to consider various issues relating to Sports and Activities in the Older Population. Interested members who wish to be involved in this should contact **Peter Myers, MD (Australia)** or **Rick Parker, MD (USA)**.
- A Survey for distribution to ISAKOS members to determine the International approaches to the management of the isolated knee MCL injury. **Francois Kelberine, MD (France)** is in charge of this.
- A Tips and Pearls CD based on the Team Physicians Pre-Course held at the ISAKOS Congress in Hollywood, Florida, USA in April 2005 is being reviewed by **Dean Taylor, MD (USA)**.

The Orthopaedic Sports Medicine Committee would welcome suggestions from ISAKOS Members regarding educational opportunities in the field of Sports Medicine. Please contact the Committee through the ISAKOS Office.

**Peter Myers, MD (Australia)**

## SCIENTIFIC COMMITTEE



The "Evidence Based Sports Traumatology Project" will begin with the development of in-depth analysis of five topics: dislocation of the shoulder, double bundle ACL reconstruction, patellar dislocation, cell-based therapy in cartilage repair, and stress fractures. The goal is to have these five projects completed within one year. It is planned that new subjects will be added to this list on a regular basis in the future.

A current concepts conference on the "Future of Sports Medicine" is also being developed for late 2007 or early 2008. A document to be used in assuring the scientific quality of future current concepts conferences, workshops and other major related activities is in the process of final development.

The committee is currently exploring the idea for a four-hour symposium on how to plan science during the ISAKOS Congress in May 2007. In addition, during the committee meeting in Chicago, Illinois in March 2006, the committee initiated a project to develop a manuscript entitled, "How to Evaluate the Sports Medicine Literature." Further information will follow.

**Robert Johnson, MD (USA)**

## STRATEGIC PLANNING COMMITTEE



During the Strategic Planning Committee meeting in Chicago, Illinois, the committee reviewed the current ISAKOS Mission and Vision Statements and felt that no changes were necessary.

The committee also assessed the progress of the Strategic

Plan, developed at the Hollywood Congress in April 2005, to gauge the movement in four areas:

1. How to increase the incorporation of open knee surgery in ISAKOS
2. Financial Future of ISAKOS; How to ensure the financial viability beyond the campaign
3. Committees and How They Function; How to enhance the productivity and effectiveness in a cost effective way; overlap areas, reduce the duplication of efforts; communication; charges and timeline
4. Education; What is the Future?; Subject matter with new technology; Delivery mechanism with new technology

The committee was impressed with how well the Strategic Plan is being implemented by the Executive Committee and the ISAKOS staff.

The committee also met with Lynn Dowling to initiate collaboration with the AAOS on educational material and marketing. This will be an additional resource for ISAKOS. The next Strategic Planning Forum will be in Florence just prior to the 2007 ISAKOS Congress.

**Kenneth DeHaven, MD (USA)**

**Gary Poehling, MD (USA)**

## UPPER EXTREMITY COMMITTEE



The Upper Extremity committee is pleased to announce the first recipients of the 2006–2007 Upper Extremity traveling fellowship, **Dr. Sigitas Ryliskis** from Vilnius, Lithuania and **Dr. Nandkumar Kondiba Katakdhond** from Mumbai, India. We congratulate them and expect that this opportunity will allow them to improve their expertise in the treatment of

upper extremity problems, and that they will be able to become leaders in their fields. They will be observing upper extremity treatment at several centers of their choosing and will prepare reports to be given at the ISAKOS Congress in Florence. The committee encourages other interested individuals to apply for the next traveling fellowships to be awarded for 2008–2009.

We are grateful to those ISAKOS Members that participated in the online survey, "Current Practice in Post Operative Shoulder Rehabilitation." The survey is complete and the data is being analyzed. The results will be presented at the ISAKOS Congress in Florence, Italy in May 2007. We hope this study will provide a basis for understanding the methods by which rehabilitation is being provided, will serve as a point of reference for comparing rehabilitation programs, and that the information will be used to improve the outcomes from the rehabilitation survey.

A current concepts meeting of the **Upper Extremity Committee** will be held in Dallas, Texas, USA on October 5–7, 2006, on the subject of the "Biceps Tendon, From Origin to Insertion." This topic will be evaluated through a series of papers and discussions, with a statement of current knowledge and directions for future research to be formulated.

**W. Ben Kibler, MD (USA)**

## ISAKOS Mission Statement

**ISAKOS advances the worldwide exchange and dissemination of education, research and patient care in arthroscopy, knee surgery and orthopaedic sports medicine.**

# 2007 CONGRESS AWARDS & FELLOWSHIPS

## CONGRESS AWARD PROGRAMS

### JOHN JOYCE AWARD

A cash prize will be awarded for the best arthroscopy paper presentation during the scientific program in Florence. All arthroscopy papers presented will automatically be considered for this award. Second and third place prizes will also be granted.

### SCIENTIFIC AWARD

A cash prize will be awarded for the best paper presentation during the scientific program in Florence. All papers submitted will automatically be considered for this award.

### ACHILLES ORTHOPAEDIC SPORTS MEDICINE RESEARCH AWARD

An honorarium will be awarded to a researcher who has performed the most outstanding clinical or laboratory research in the field of orthopaedic sports medicine. Complete manuscripts must be mailed to the ISAKOS office by November 1, 2006. Download an application and review detailed instructions at [www.isakos.com/awards](http://www.isakos.com/awards). Faxed and e-mailed submissions will not be considered.

**Deadline: November 1, 2006**

### ALBERT TRILLAT YOUNG INVESTIGATOR'S AWARD

An honorarium will be awarded to a young investigator who has done outstanding clinical or laboratory research contributing to the understanding, care or prevention of injuries to the knee. All applicants must be under 40 years of age at the time of the 2007 Congress. Complete manuscripts must be mailed to the ISAKOS Office for consideration no later than November 1, 2006. Download an application and review detailed instructions at [www.isakos.com/awards](http://www.isakos.com/awards). Faxed and e-mailed submissions will not be considered.

**Deadline: November 1, 2006**

### RICHARD B. CASPARI AWARD

The Richard B. Caspari Award was established in 2003 at the 4<sup>th</sup> Biennial ISAKOS Congress in Auckland, New Zealand to reward the best upper extremity paper read during the scientific program of the Congress. A panel comprised of members of the ISAKOS Upper Extremity Committee will select two prize-winning papers in 2007. The winners will be announced in Florence, Italy at the awards ceremony and an honorarium will be awarded.

### PATELLOFEMORAL RESEARCH EXCELLENCE AWARD

Sponsored by The Patellofemoral Foundation, Inc.

The Patellofemoral Research Excellence Award was established in 2003 to encourage outstanding research leading to improved understanding, prevention and treatment of patellofemoral pain or instability. Complete manuscripts must be mailed to the ISAKOS Office no later than November 1, 2006. Download an application and review instructions at [www.isakos.com/awards](http://www.isakos.com/awards). The winner will be awarded an honorarium at the 2007 Congress in Florence, Italy.

**Deadline: November 1, 2006**

### THE PATELLOFEMORAL TRAVELING FELLOWSHIP

This travel award is to promote better understanding and communication regarding patellofemoral pain. This opportunity will be available on a competitive basis to an orthopaedic surgeon interested in the study and advancement of understanding of the patellofemoral joint.

Preference will be given to those who have established an academic track record. Applicants should submit the application, two (2) letters of recommendation and your curriculum vitae to the ISAKOS office at [isakos@isakos.com](mailto:isakos@isakos.com) by November 1, 2006.

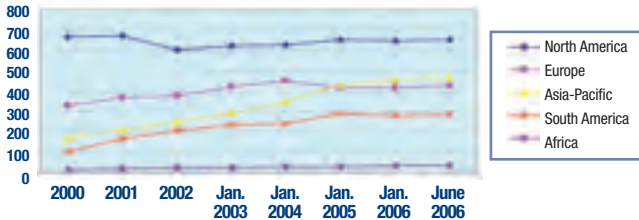
The Patellofemoral Foundation will provide a stipend to permit visits to several centers worldwide, that offer opportunities to learn about the complexities of patellofemoral pain. The fellow will write a report of the experience which will be considered for publication in *Arthroscopy: The Journal of Arthroscopic and Related Surgery*.

**Deadline: November 1, 2006**

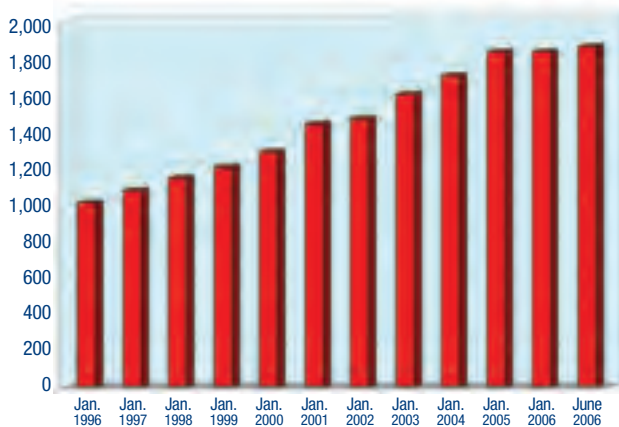


# MEMBERS

## ISAKOS GROWTH BY REGION



## ISAKOS MEMBERSHIP GROWTH



## COMMUNICATIONS COMMITTEE & NEWSLETTER EDITORIAL BOARD

### Encourage Participation

This is your newsletter...and ISAKOS is your society! The editorial board welcomes submissions from all members. E-mail the editorial board about your projects, meetings and interests at [isakos@isakos.com](mailto:isakos@isakos.com).

#### Communicate with the Committees

E-mail addresses for all committee members are available on the ISAKOS Web site in the Members Only section.

Direct e-mail communication with every board member, committee chair and deputy chair will foster a pipeline of information between members and the leadership. Stay in touch, and keep the entire organization abreast of your projects and initiatives!

#### Submit Articles for Print

The newsletter welcomes scientific and other submissions from all members. Scientific submissions should only be submitted if their publication in the newsletter will not compromise their ability to be published in a journal. Previous publication may make articles unacceptable for journal publication.

Opinions, reviews, overviews, and commentaries are welcome. Photographs or artwork, where appropriate, will be considered for publication as space permits.

All submissions can be sent to [isakos@isakos.com](mailto:isakos@isakos.com).

## NEW MEMBERS

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.

Download an application online at [www.isakos.com](http://www.isakos.com) or contact the ISAKOS office at +1 (925) 807-1197 for a **NEW MEMBER** Recruit Packet.

## MEMBERSHIP DUES

*The Board of Directors has approved an increase in the membership dues beginning in 2007. The increase will be as follows:*

### THE 2007 MEMBERSHIP DUES\*

Non-AANA Members	\$275
AANA Members	\$200
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# WHAT ARE NEW Members Saying?

## QUESTION 1:

What role does ISAKOS play in your practice, community, region or nation? As ISAKOS grows, what future role would you like to see it play? How could ISAKOS be a better asset to you?

## ANSWER:

### The Role of ISAKOS in my Community

I see ISAKOS as a major force in the distribution of information in my field of practice, which is arthroscopy and knee surgery. By actively taking part in ISAKOS activities I can ensure a continuous update in the standard of care for my patients.

### The Future Role of ISAKOS



By supporting continuous medical educational activities in the African region ISAKOS can help to improve standards of orthopaedic care.

On an international level ISAKOS can help to standardize various aspects of orthopaedic care, eg. Terminology. Apart from the positive effect on patient care, it will improve communication and exchange of ideas between different countries and orthopaedic associations.

### ISAKOS as an Asset

ISAKOS could be a better asset to me by involving more Orthopaedic Surgeons from my region in instructional courses and other committee activities.

### Jacobus Johannes Marais, MD

Durbanville, Cape Town, South Africa  
Member Since April 2006

## QUESTION 2:

What do you see as being the greatest challenge(s) that ISAKOS faces? What is/are its greatest strength(s)?

## ANSWER:



The first decade of the 21<sup>st</sup> century, named "The Bone and Joint Decade", is dedicated to the procurement of the means for improved and versatile therapeutic solutions in the field of Orthopaedics.

To my opinion, this is the greatest challenge that ISAKOS faces due to its multi-nationality interface. Orthopaedic Surgeons in the field of Arthroscopy and Knee Surgery from all over the world should make a common effort in order to develop new surgical techniques that will be beneficial for the patients. During the past fifty years, a great evolution of medical science has been achieved through the continuous interchange of ideas and sometimes within controversies that occur between different scientists. This fact, combined also with the internationality of ISAKOS, transforms it to a powerful tool capable of producing further scientific evolution. As a new member, I have the feeling that ISAKOS will play a basic role in my scientific career by means of optimizing my theoretical knowledge and expanding the field of my surgical experience.

### Athanasios A. Papachristos, MD

Lamia, Fthiotida, Greece  
Member Since March 2006

## QUESTION 3:

Which past ISAKOS congress did you attend? What impressed you most about it? When you came home and told peers about it, what did you emphasize? What would you improve?

## ANSWER:

I was fortunate to attend the Hollywood, Florida Congress in 2005. Obviously there are international attendees at AAOS, AANA and AOSSM, but to have all the internationally recognized experts in one forum was very rewarding.



I related to my peers on return home that the international community adds even a wider palate of approaches to Orthopaedics; and, in many areas this added insight is a glimpse into the future as many of the techniques may only be available in the United States in coming years. The only area to improve might be even more complete recording and archiving of all presentations with easy web based access, so that even those not in attendance could receive timely information.

### Jack Farr, MD

Indianapolis, Indiana, USA  
Member Since February 2006

# TEACHING CENTER SPOTLIGHT

## ONZE LIEVE VROUWE GASTHUIS



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### COURSES AT THE ONZE LIEVE VROUWE GASTHUIS HOSPITAL

- Weekly training sessions at our skill's lab
- 3 monthly sessions at the Anatomy Department, Utrecht University Hospital
- Annual International Arthroscopy Course, at the Anatomy Department, Utrecht with hands on sessions on fresh cadavers
- Fellows can scrub in and perform operations themselves (under guidance of our staff members)

The orthopaedic department in the OLVG Hospital is one of the largest training centres for Dutch residents in the Netherlands. The staff includes 6 orthopaedic surgeons: **W.J. Willems, MD, PhD**, Chair (*The Netherlands*), C.P. van der Hart, MD, S. John Ham, MD, PhD, Arthur E.B. Kleipool, MD, Frank R. A. J. de Meulemeester, MD and Frank de Nies, MD.

Its main areas of orthopaedic services include:

- Arthroscopic Surgery of all joints
- Main interest in Arthroscopic Knee Surgery (C.P. van der Hart) and Arthroscopic Shoulder Surgery (**W.J. Willems, MD, PhD** (*The Netherlands*))
- Sports Medicine (a.o. taking care of AJAX soccer club, Dutch Gymnastic League, Dutch National Dance Academy, Concertgebouw Orchestra, etc.)
- Total Joint Arthroplasty (hips, knees, shoulders)
- Spine Surgery
- Pediatric Orthopaedic Surgery
- Ankle and Foot Surgery
- Traumatology

The residents spend 3 years of their training in our institute and 1 year in the orthopaedic department of Utrecht University. The residents of that department spend 1 year in our department. We cooperate with that department, where in our institute the residents get their main practical training, and have time for research in the University department.

Fellows (including traveling fellows from abroad) have ample time for practical training. They can scrub in the theatre and, depending on their experience, are able under the present Dutch law to perform operations under guidance of one of our staff.

In the hospital, a skills lab was opened in 2004. We have 2 fully equipped arthroscopy towers where residents can train the basic and advanced procedures on saw bones, silicone models, Alex models etc.



We have anatomy sessions at the Anatomy department of Utrecht University on a regular basis, where residents and fellows can train anatomy as well perform anatomic research.

The fellow program is adjusted to the time available: if the fellow can stay for some time (e.g. 2 months), procedures like a Bankart repair can be learned.

# ISAKOS-APPROVED TEACHING CENTERS

## Approved Teaching Centers

CENTER NAME	COUNTRY
Addenbrooke's Hospital Cambridge	UNITED KINGDOM
Alpha Klinik	GERMANY
Ambroise Pare Hospital	FRANCE
American Sports Medicine Institute	USA
Arlington Orthopedic Associates/ Joint Preservation Center	USA
Arthroscopic Training Center	FRANCE
Arthroscopy and Sports Medicine Institute	INDIA
Baskent University	TURKEY
Baylor College of Medicine	USA
Boston University Sports Medicine	USA
Brisbane Orthopaedic and Sports Medicine Centre	AUSTRALIA
Buenos Aires Sports Medicine and Arthroscopic Center	ARGENTINA
Casa Di Cura San Giuseppe– ISpeO (Istituto Specialistico Ortopedico)	ITALY
Center for Orthopedics and Rehabilitation in Sports	BRAZIL
Centre for Sports Medicine & Orthopaedics	SOUTH AFRICA
Centre Hospitalier de Montbeliard	FRANCE
Centro De Ortopedia e Fraturas de Joinville	BRAZIL
Centro de Ortopedia y Traumatologia Centenario SA	ARGENTINA
Centro de Traumatologia y Ortopedia San Isidro	ARGENTINA
Chester Knee Clinic at the Grosvenor Nuffield Hospital	UNITED KINGDOM
The Cleveland Clinic Foundation	USA
Clinica Alemana	CHILE
Clinica del Deporte	ARGENTINA
Clinica Ortopedica	ITALY
Concordia Hospital	ITALY
Department of Orthopaedic Surgery, Graduate School of Medicine, Chiba University	JAPAN
District Hospital of Traumatology; Regional Center of Knee Surgery, Arthroscopy & Sports Traumatology	POLAND
Dokul Eylul University School of Medicine, Department of Orthopaedics and Traumatology	TURKEY
Droitwich Knee Clinic	UNITED KINGDOM
Gabinete C.O.T., Clinica Del Pilar	SPAIN
Gyeong-Sang National University Hospital, Department of Orthopaedic Surgery	KOREA
Hace Hepe University, Department of Orthopaedic Surgery and Traumatology	TURKEY
Hadassah University Hospital: Sport Injury and Joint Arthroplasty Units	ISRAEL

CENTER NAME	COUNTRY
Hospital for Orthopedic Surgery	GERMANY
Hospital USP – Santa Teresa, Arriaza and Associates	SPAIN
Istituti Ortopedici Rizzoli	ITALY
The Knee Foundation	UNITED KINGDOM
Mehilainen Hospital and Sports Clinic	FINLAND
Mississippi Sports Medicine and Orthopaedic Center	USA
New Sassuolo Hospital	ITALY
Nicholas Institute of Sports Medicine and Athletic Trauma	USA
Onze Lieve Vrouwe Gasthuis	THE NETHERLANDS
Orthopaedic Center Kassel	GERMANY
Orthopaedic Foundation for Active Lifestyles	USA
The Orthopaedic Learning Centre	HONG KONG
Orthopaedic Research Foundation of Southern Illinois	USA
Orthopaedic Research of Virginia	USA
Orthopaedics and Traumatology Department, Let People Move Biomechanical Laboratory	ITALY
Orthopedic Healthcare Northwest	USA
Orthopedic Hospital Speising Department I	AUSTRIA
QEII Health Sciences Centre; Alumni Library and Arthroscopy Teaching Centre	CANADA
Queen's Medical Center Nottingham	UNITED KINGDOM
San Diego Arthroscopy & Sports Medicine Fellowship	USA
SMOC – CMSO Kliniek Park Leopold	BELGIUM
Southern California Knee & Shoulder Center	USA
Southern Orthopaedic Sports Medicine	USA
Southwest Sporttraumatologie Center	GERMANY
Sports Injury and Arthroscopy GKNM Hospital	INDIA
Sports Traumatology Center Koelliker	ITALY
Sportsmed SA	AUSTRALIA
Stellenbosch Medi-Clinic	SOUTH AFRICA
Suleyman Demirel University	TURKEY
University of Alberta Glen Sather Sports Medicine Clinic	CANADA
University of Kentucky Sports Medicine Center	USA
University of Missouri-Columbia, Department of Orthopaedic Surgery	USA
Wakefield Orthopaedic Clinic	AUSTRALIA
The Wellington Knee Surgery Unit	UNITED KINGDOM
West Coast Center for Orthopedic Surgery & Sports Medicine	USA

## Future Trends

### IN CARTILAGE REPAIR



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#### INTRODUCTION

For more than two millennia a nihilistic view on the treatment of articular cartilage injuries has dominated among treating physicians. In spite of the over all great development within medicine and related technology, the improvement in treatment of cartilage

injuries has been very slow and not successful.

The intrinsic repair capacity of traumatic or micro traumatic articular cartilage injuries is minimal and will leave no repair, no regeneration of significance without treatment.

The key to establishing a successful treatment option is an increased and deepened interdisciplinary research. The understanding of cartilage physiology and pathophysiology is the basic necessary background to further progress and improvement of new therapies in cartilage diseases and traumatic injuries.

By the publications of some new or modified techniques in the middle of the 1990 with later on published encouraging medium to long term results, new hope for the young and middle-aged patients and for the treating, orthopaedic surgeon arose. The aim with the present and future treatments is to restore the synovial joint function with repair or regeneration of cartilage in the damaged surface.

#### PRESENT STATUS

Microfracturing introduced by Steadman, is a modification of drilling by Pridie, and abrasion arthroplasty by Johnson are based on perforation of the subchondral boneplate allowing bleeding and migration of mesenchymal stem cells and fibroblasts into the damaged area to produce repair tissue in the debrided lesion. Good and excellent results have been reported in about 70% of the cases with up to 11 years follow up with microfracturing. The repair tissue however, is mainly consisting of fibro cartilage.

Autologous osteochondral graft transplantation is a new technique to transfer osteochondral cylinders taken from minor weight bearing areas of the injured knee (Hangody, Bobic). Donor site morbidity and the limitation of cylinders available have limited the areas to be treated to 3 to 4 cm<sup>2</sup>. The defects around the cylinders are filled with fibrous tissue however, with weak integration to the surrounding cartilage and to the cylinders. 90% good and excellent results have been reported on defects, located on the femur articular surfaces on the knee.

The third technique, published in 1994, was autologous chondrocyte transplantation (ACT) using autologous chondrocytes, isolated from cartilage biopsies from minor weight bearing areas of the knee of the patient, cultivated in laboratory for 2 weeks and then implanted into a debrided cartilage lesion under the cover of a periosteal flap, harvested from proximal tibia.

Good and excellent results, in about 90% of cartilage lesions of the femoral condyle and of osteochondritis dissecans with 5 to 11 years follow-up were reported. This was the first time in orthopaedics that cells isolated and cultivated in laboratory were transplanted into a cartilage defect to stimulate healing. 80% of biopsies, taken after ACT was graded hyaline like cartilage by unbiased scientists.

Since then, the basic and clinical research and development has

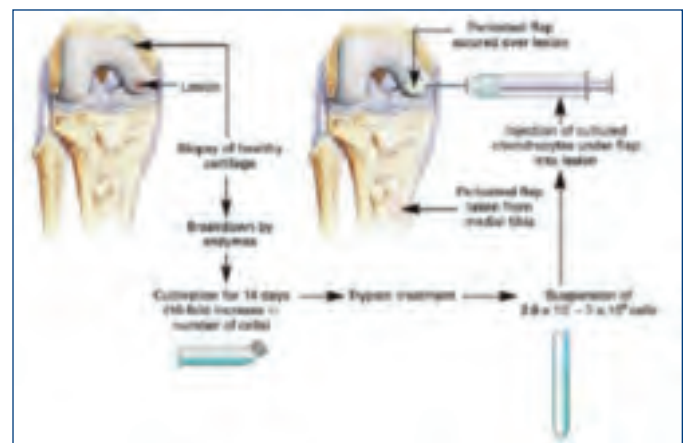


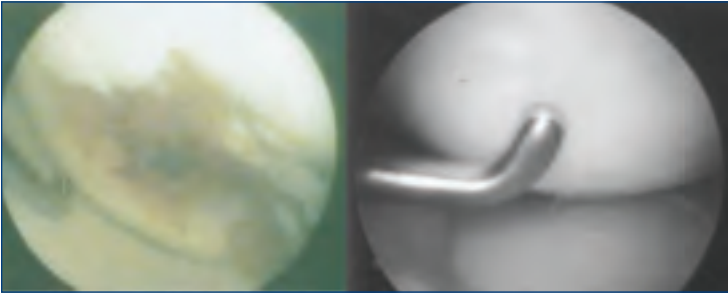
Figure 1: Schematic drawing of autologous chondrocyte transplantation.

been activated tremendously and created new hope for improved treatment and establishing of a gold standard for the treatment of articular cartilage lesions.

Several authors have proposed algorithms for the selection of the optimal treatment in different patient situations.

#### FUTURE TRENDS IN THE TREATMENT

With greater experience of an increased number of patients treated with cartilage repair procedures, the limitations of the different techniques have been explored. For autologous chondrocyte transplantation, larger defects up to over 20 cm<sup>2</sup>, multiple defects (from 2 up to 4–5 defects in one knee) have been treated. Uncontained defects with no support in some part of the periphery of the defect have been addressed with specific techniques in fixation. Bipolar lesions with a bone-to-bone situation in tibiofemoral and patellofemoral compartments have also been tried in young patients. With the ACT procedure, this has been very successful with good results in defects over 10cm<sup>2</sup> or more, with 84% good and excellent results in multiple defects and uncontained defects and with 75% good and excellent results in bipolar defects.



*Figure 2: 17-year-old girl with OCD before ACT (left) and arthroscopy performed by independent orthopaedic surgeon one year after treatment with ACT (right). Excellent clinical result 6 years after treatment.*

## OPTIMAL ENVIRONMENT

The widening of the indications for cartilage repair has focused on the importance of creating optimal environmental conditions for the short and long term survival of the repair tissue.

This includes taking into account the complexity of the defects and background factors that may be the cause of the injury or the cause of the progress of the injury into secondary osteoarthritis. Background factors, such as instability, for example, anterior or posterior cruciate ligament insufficiency, collateral ligament insufficiency, or patellar instability have to be treated in a staged procedure or at the same time as the transplantation is performed.

Unloading procedures, like high tibial osteotomy or distal femoral osteotomy in varus or valgus deformities of the knee in large or bipolar compartmental lesions in the tibial femoral joint has to be addressed in a stage procedure or as a concomitant procedure to the ACT.

Bipolar, large or uncontained lesions in the patellofemoral joint without malalignment may need unloading by ventralization of the tibial tuberosity. Meniscus deficiency after total or subtotal meniscectomy may have to be addressed in a staged procedure to restore the biomechanical anatomy of the compartment.

Bony defects may have to be treated with autologous bone grafting, prior to or concomitant to the ACT as in the “sandwich procedure”.

The establishing of an optimal environmental condition is of outmost importance for the short and long term survival of the repair tissue, irrespective of what cartilage repair technique has been used.

## FUTURE TRENDS IN BASIC RESEARCH

Basic research and tissue engineering are two important areas, necessary for the development of new techniques.

Cell physiology and pathophysiology have to be studied to understand the mechanism for brake down or catabolic activities and repair or anabolic activities in the damaged cartilage.

This will provide a basis for drug development to block catabolic activities and stimulate anabolic activities in early cases of posttraumatic articular cartilage lesions and in early cases of osteoarthritis.

The turnover of articular cartilage is important to understand and the need for supplement like hyaluronic acid, glucosamine, creatinsulphate and pre collagen and others has to be evaluated both for maintaining homeostasis but also for improving the repair or regeneration of cartilage.

## TISSUE ENGINEERING

Tissue engineering, using resorbable biocompatible materials in scaffolds, membranes and gels to facilitate the surgical procedure and to support the matrix production in the repair area by mechanical support and facilitating fixation techniques in arthroscopic surgical technique is an important part in the progress. The collaboration between tissue engineering and orthopaedic surgery has already resulted in ongoing investigational studies, using hyaluronic acid as a carrier as well as collagen type 1 and 3 membranes of a porcine or a bovine origin as well as gels in cartilage repair techniques. Short-term follow-ups show promising results from investigational studies of these new techniques.

## OBJECTIVE EVALUATION OF CARTILAGE REPAIR

As the aim of treatment is to restore synovial joint function the result seems to be dependent on the quality of the repair tissue produced by different techniques and the long-term survival of the repair tissue. Repair tissue could be non-identical to the original tissue or regenerative tissue—identical to the original tissue. Biopsies showing hyaline-like cartilage seem to correlate well with clinical outcomes and long-term survival of the repair.

Indentation tests comparing normal articular cartilage stiffness with stiffness of repair tissue of hyaline-like appearance show no significant difference. Fibrocartilage however is significantly softer than normal articular cartilage.

Arthroscopic ultrasound has also been used to evaluate repair tissue by comparing its properties with normal articular cartilage.

The optimal tools for evaluating the repair tissue should be non-invasive and reliable.

MRI with gadolinium seems to be a promising tool to evaluate the degree of filling, anchoring and integration to bone and surrounding cartilage and qualitative and quantitative content of the repair tissue. Repeated MRI used over time can be used to follow the normalization of matrix and the maturation of the repair tissue.

Protein markers, analyzed from synovial fluid after trauma could be used after different repair techniques, like matrix metalloproteinases, cartilage oligometric matrix protein, etc, may be useful but have to be further investigated.

## FUTURE TRENDS IN CELL TRANSPLANTATION

Future developments in cell transplantation calls for further research in the use of autologous articular chondrocyte progenitor cells, mesenchymal stemcells and embryonic stemcells. Allogenic type of cells from articular cartilage progenitor cells, mesenchymal stemcells and embryonic stemcells and xenogenic cells from porcine or bovine or other animal sources have to be researched in the usability in repair of human articular cartilage injuries.

# CURRENT CONCEPTS

## GROWTH FACTORS

The use of growth factors is an interesting area where a lot of research has been done but still further research is necessary to introduce growth hormone therapy into cartilage repair in clinical work. Interesting aspects of using bio engineered carriers capable of delivering growth factors of different types along with cells will be a reality in the future. The use of growth factors and mesenchymal stemcells and embryonic stemcells may have long time before being established as safe treatment techniques.

## GENE THERAPY

Treatment may be possible by the insertion of genes that direct the synthesis of therapeutic proteins like growth factors in patients with localized joint disease. Toward the development of gene-based methods for effective delivery of stimulatory proteins several studies have shown that viral vectors including lentivirus, retrovirus and adenovirus can be used to express various transgene products.

## SUMMARY

The fast development in cartilage repair with establishing of different types of treatment techniques, specially focusing on cell therapy brings new opportunities into the treatment of articular cartilage injuries in the young patients with post traumatic injury or maybe in the early osteoarthritic period of middle aged patients. The degradation of articular cartilage and synovial joint function after traumatic or micro traumatic articular cartilage damage in a young patient is an entity by itself and could not be compared to degeneration in osteoarthritis. The earlier you can treat a young patient with post traumatic articular cartilage injuries, the better the result and the possibility to prevent further degradation into posttraumatic osteoarthritis over time.

We are facing an exciting time in clinical work in cartilage repair and the inter disciplinary

Collaboration between basic scientists, tissue engineers and orthopaedic surgeons will be very fruitful in the coming decades. The new steps taken in the last two decades have created hope for the patients and for the treating surgeon in the present and in the future.

Even middle-aged patients with early osteoarthritis may be possible to treat with resurfacing techniques using a combination of matrix stabilizing artificial resorbable scaffolds and optimal cell implantation. Whether the cells are of autologous articular mesenchymal or embryonic cell types or allogenic or xenogenic origin the future will tell.

*Full article and references also available online at [www.isakos.com](http://www.isakos.com)*

## STRESS FRACTURES



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## INTRODUCTION

Fatigue microdamage is an essential element of bone mechanics and biology. The process develops following various types of stress, enhances movement of calcium in and out of the skeleton and brings on remodeling, which adapts the bone internal structure to specific kinds of activity and demands, removes the fatigue damage and keeps the skeleton as light as possible.

Stress fractures comprise the inability of bone to withstand the repeated stress which athletic activity, military service or even normal daily life exerts on a prior strong, normal or weakened bone. Griffiths et al showed in 1971 that 10,000 repeated stress cycles would cause a femur to show signs of breakage when forces of 12% body weight were applied in the 20–50 age group, while only 5% body weight was needed in the over 70 age group.

Over the years a number of fine texts have been presented in the literature. Among these, two excellent monographs have been published: The classic work of Devas published in 1975 and the work of Hulkko published by the OULU University in 1988. An excellent review by Z. Dudelzak in Hebrew has been produced as a book by the Army Center of Physical Education in Israel in 1991. Two interesting and comprehensive books have been published in recent years, one by Bruckner, Bennell and Matheson and the second edited by Burr and Milgrom.

## INCIDENCE

Stress fractures exist in racing horses, racing hounds and humans. This is for the reason that motivation or encouragement for high performance is a pre-requirement to get a stress fracture.

Incidence of stress fractures is based on military reports and ranges from 5 to 30 percent depending on the unit and year. Prospective studies show an approximately double incidence than retrospective studies. The fractures appear after 2 weeks of training reaching their peak at 6 to 8 weeks. In the Israel infantry a tendency has been identified as noted in 1994 for later occurrence of the fractures which were noted previously in the 2–4 week and in the late 80's occurred toward the 13–16 week probably because of the strict introduction of gradual building up training. The incidence in the civilian population has been summarized by Shaffer in 2001: Johnson et al and Bennel et al in track and field sports showed, respectively, an incidence of 10% and 20% in men and 31% and 22% in women over a 12 months observation period, the highest incidence being in distance running. These were prospective studies.

Most fractures were seen in the tibia, but 20.6% were reported in the femur. In dancers, retrospective studies disclosed that 22.2% and 31.5% of dancers reported at least one stress fracture, the most common location being the metatarsals (63%). In figure skaters, 21.5% of skaters reported a stress fracture during their career, mainly in the lumbo sacral spine (33% males, 45% females). Gymnasts observed for three years (men) or two years (women) showed an incidence of 16% stress fractures for men and 24% stress fractures for women. In road runners the incidence of injury has been reported to be 35% to 50% over a 12-month period, while 4.6% of runners will sustain stress fractures over a 12-month period.

The incidence of stress fractures is higher in females and lower in Blacks which is also the present experience in the Israeli Army and Border police since the Ethiopian (east African) immigration started entering the military forces some years ago and girls were allowed to take part in the combat border police training. The relative risk for women soldiers in the US military has been shown to be similarly high; 3.5 fold (Fort Leonard Wood, 1995), 5.1 fold (Fort Jackson, 1984), while others showed figures even higher ranging from a relative risk of 1 to a relative risk of 5 in athletics and from a relative risk of 1 to a relative risk of almost 10 in military service. This may be strongly enhanced by late menarche (RR 2.6 for each year), by menstrual disturbances (RR-6) or by eating disorders (R.R-8).

## RISK FACTORS

The etiology of stress fractures is multifactorial, and thus difficult to control. Race and gender are strongly involved, along side with age, flexibility, leg length discrepancy, foot arch structure, bone morphology and geometry, natural and acquired physical fitness, training errors and eating disorders. We shall elaborate on only a few of these:

Low physical fitness has been repeatedly shown as a cause of stress fractures. Cline (in 1998) showed a strong reverse effect of previous physical activity on stress fractures in female soldiers and Shaffer (in 1999) showed the same in male soldiers with a three fold fracture rate in the least fit. Scully in 1987 demonstrated the occurrence of only 5 stress fractures in a trained unit of soldiers requested to perform a 300 mile march as opposed to 86 fractures in an untrained unit. Mann et al (in 2001 and 2003) showed a preventive effect of starting physical activity at a younger age as compared to "last minute" pre-army preparation.

Leg length discrepancy may have a strong effect even in moderate length discrepancy. A difference in length of 10–14 cm has been shown to cause a raise in stress fracture incidence, especially in the longer leg, by a factor of 3.

Bone geometry, with a narrow width of the bone relative to its length has a relation to stress fractures because of relative structural weakness. BMC and BMD have only a border line effect, somewhat more important in females.

A younger age is a possible risk factor in males with a 28% reduction in stress fractures for each year of age after 17. The reverse was demonstrated for females, with a younger age shown as a protective factor.

## DISTRIBUTION

Since Breithaupt described stress fractures of the metatarsal bones in the Prussian army in 1855 (Fig. 1 a, b), Pirker in the femoral shaft of an athlete in 1934 (Fig. 2 a, b), and Burrows described the so called Runner's Fracture of the distal fibula in 1940 (Fig. 3 a, b), stress fractures have been described in almost every bone of the body. Distribution of stress fractures in the body changes from report to report and differs from the athletic series to the military series.

### METATARSAL STRESS FRACTURES:



1a) Stress fracture of the 2nd Metatarsal bone on x-ray.



1b) Stress fracture of the 2nd Metatarsal bone on bone-scan.

### STRESS FRACTURE OF THE FEMUR ON BONE SCAN IN AN 18 YEAR OLD SOLDIER.

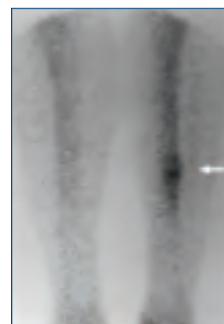
*There is a fracture of the neck of the Femur on the contra-lateral side. The femoral neck fracture is of major importance as it tends to displace. The signs being obscure it was probably unsuspected prior to performing the bone scan.*



2a) On bone-scan.



2b) On x-ray.



3a) Stress fracture of the Fibula on bone scan.



3b) Stress fracture of the Fibula on x-ray.

(continued on page 16)

# CURRENT CONCEPTS

## STRESS FRACTURES

(continued from page 15)

McKeag & Dolan in 1989 summarized 4 studies concerning the incidence of stress fractures in athletes. The average percentages were as follows:

Tibia	Fibula	Femur	Tarsus	Metatarsus	Other
44	16	8	9	16	7

The figures given by Orava & Hulkko in 1987 are rather similar:

Tibia	Fibula	Femur	Tarsus	Metatarsus	Other
50	12	6	7	20	5

The incidence of fractures in the Finnish army were reported by Sahi in 1987 and by Friberg & Sahi in 1987:

Tibia	Fibula	Femur	Tarsus & Calcaneus	Metatarsus	Other
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### Sahi et al

49	2	7	8-21	13-24	8
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### Friberg&Sahi

66	7	9	4	8	6
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The dominance of metatarsal fractures in the tank brigade (68%) is rather outstanding. Other differences between the two Finnish studies are not marked.

The incidence in the Israeli Army has been reported by Halel, Dudeszak, Giladi and Volpin et al:

Tibia	Fibula	Femur	Tarsus	Metatarsus	Other
-------	--------	-------	--------	------------	-------

### Halel

1976

32	3	46	0	18	1
----	---	----	---	----	---

### Dudeszak

1983

71	1	26	0	2	0
----	---	----	---	---	---

### Giladi

1984

56	0	30	0	8	6
----	---	----	---	---	---

### Volpin

1987

68	0	15	1	13	3
----	---	----	---	----	---

It should be mentioned that all three later studies utilize scintigraphy for diagnosis. The outstanding feature in these studies is the dominance of tibial fractures in army and civilian practice and the relatively high incidence of femoral fractures in the Israel army when compared to other studies quoted here and quoted by Giladi and by Dudeszak. It is interesting to note the very low incidence of calcaneal and a low incidence of metatarsal stress fracture in the Israel and Finnish army compared to previous reports in the military showing an incidence of 13 to 83%. The relatively low incidence of fibular fractures in almost all military reports when compared to athletes should also be emphasized.

## DIAGNOSIS

We shall deal with this important issue only in brief. Obviously, clinical suspicion is the first diagnostic tool, followed by clinical examination ("clinical stress fracture" is an accepted term), roentgenography, scintigraphy with its classical grading of the fractures developed by Zevas in 1987, computed tomography, magnetic resonance, ultrasound and thermography. A Position Statement prepared by Smith & Schlezinger for the FIMS (International Federation of Sports Medicine) concluded that MRI should be considered the method of choice for stress fracture diagnosis as it is accurate, sensitive, shows changes in bone structure when still unnoticeable on other imaging methods, and is free of ionizing radiation.

## PREVENTION

Much has been said on prevention, using graduated training, reducing sleep deprivation, pre-recruitment physical training, dietary instructions, shoe modifications and insoles, all seem to have a certain preventive effect. Modification of combat equipment had a major preventive effect in preliminary results in female fighters of the Israel Border Police (Heiman, Mann & Constantini, preliminary results presented to the Israel Border Police Command, May 2006). Conclusion of the accumulating data seems to show that knowledgeable interventions may well have place in reducing the incidence of stress fracture in risk populations.

## TREATMENT

Once diagnosis has been established the great majority of fractures would be treated conservatively by modifying activity. Specific cases as the neck of the femur especially of the traction type or with a negative bone scan may require bed rest or occasionally surgical intervention. Most stress fractures when diagnosed by scintigraphy and none displaced will grossly need about half the time a full fracture of the same bone would need to heal; This would include not rest but only reduced activity. The approximate time would be 4 to 6 weeks in the tibia, 6 to 8 weeks in the femur and 3 to 4 weeks in the metatarsals. In general pain and x-ray control are good predictors for a safe return to activity. In the military it is convenient to use a flow chart which makes the decisions easier to control.

Occasionally a fracture will displace or progress to non-union. In these cases surgical intervention may be required. This may be needed in the femoral neck, in transverse fracture of the anterior tibial cortex, in the ankle, the tarsal navicular, the fifth metatarsal or the great toe sesamoids. Orava and Hulkko in 1987 reviewed 37 delayed and non unions which comprised 10% of their total series of stress fractures. 6% of the total series eventually needed surgical intervention. Similar figures were shown by Hulkko in 1988 and by Ha et al in 1991.



## SUMMARY AND CONCLUSIONS

### General

A stress fracture is caused by repeated stress acting on a bone which is not sufficiently strong to withstand the stress. The first cases were published in the Prussian army in 1855 by Breithaupt and large series have since been published both from the military and from the civilian set ups.

### Incidence of stress fractures

As opposed to previous reports showing a dominance of metatarsal and calaneal fractures most series today show a dominance of 30 to 70% tibial fractures, followed by femoral fractures. This tendency is stronger in military reports where the fracture of the fibula, so called "runner's fracture" is less dominant than in civilian series. Occurrence in the military is usually reported from 5 to 30%. The occurrence in athletes ranges from 10% to 50% with no good explanation for this wide range of reported inconsistency.

### Etiology and Predisposing Factors

Factors predisposing to stress fractures are hereditary, with blacks injured less and, women injured more, personal body characters as leg length discrepancy, alignment, body type, bone width, hip mobility, the arch of the foot, and faulty walking and running biomechanics. Other factors are lack of physical fitness, building an over ambitious training program or training with bad footwear or hard surfaces. Good shoes and orthotics seem to have a potential to reduce stress fractures as has modification of combat equipment in the military. Bone mass and menstrual disorders, along side with eating disorders are additional factors in causing the fractures. Starting physical activity at an early age has probably a protective factor as is an older age in boys and possibly a younger age in girls.

### Diagnosis

Diagnosis is based on the clinical history and examination. This is assisted by x-ray, scintigraphy, computed tomography, magnetic resonance and ultrasound. X-ray and scintigraphy should probably be done in most patients, while computerized tomography and magnetic resonance should probably be reserved for special cases. This approach, though, may well change in the near future as computed tomography is today accurate, fast and available and experience is accumulating in Magnetic Resonance diagnosis of stress fractures appreciated for its accuracy and safety.

### Differential Diagnosis

Differential diagnosis would include tumors, infectious, other trauma to the bone and soft tissues, normal bone reaction to stress, myositis ossificans and soft tissue calcifications. Over diagnosis by scintigraphy should be remembered, and also the rare but hazardous possibility that a fracture would occur with a negative bone scan. The possible overlap of the tibial stress syndrome progressing from a benign condition to a tibial stress fracture should also be kept in mind. A true "Asymptomatic" stress fracture probably does not exist.

### Prevention

Gradual build up of Physical fitness probably best started at very early adolescence should be advised. In the military and in athletic activity, training should be conducted in a cyclic manner and in stepwise increase of stress on the musculo-skeletal system. It seems that there is sufficient evidence to advise well constructed shoes and to require a shock absorbing insole for most athletes and the majority of infantry recruits. Modification of combat equipment, especially in female military personnel, should probably be considered.

### Treatment

Treatment would basically be to reduce activity to the limit of pain, and in general enable relative rest for approximately half the time as a full fracture of the same location would take to heal. Rest enforcement would be considered in the military environment and usually only in potential hazardous conditions such as femoral neck fractures. Certain cases, 5–6% of total fractures, may eventually not unite, displace and require surgical intervention.

*Full article and references also available online at [www.isakos.com](http://www.isakos.com)*

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Thank you for your participation in the Online ISAKOS Member Assessment Study. As an ISAKOS Member, it was a critical element in the growth of our Society. Your thoughts and ideas on areas such as education, communication and technological issues are extremely helpful as we continue to enhance ISAKOS programs and services on your behalf.

## ANATOMIC ACL RECONSTRUCTION

### *The Double-Bundle Concept*



**PASCAL CHRISTEL, MD, PHD**

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#### **INTRODUCTION**

As a result of better understanding of its anatomy and biomechanical function, reconstruction of the anterior cruciate ligament (ACL) has been increasingly successful over the past 15 years. However, a critical review of the literature, including meta analysis, reveals that the success rates of single-bundle reconstruction vary between 69 % and 95 %. Persistence of the pivot shift in more than 15% of cases (B classification in the IKDC system) raises doubts about this operation's ability to prevent long term arthritis.

One-bundle techniques do not completely reproduce the anatomy and function of the ACL. They address only the anteromedial (AM) bundle which even does not fully control the anteroposterior stability of a knee near extension, and it has been shown one-bundle reconstruction techniques do not fully restore a normal rotatory stability.

Since 1987, a number of authors have suggested to improve the control of rotatory instability, by reconstructing not only the AM bundle, but also the posterolateral (PL) bundle of the ACL. In this field, one must pay homage to our Japanese colleagues for their pioneering work, followed by the Europeans.

#### **ACL FOOTPRINT MORPHOMETRY**

On the average, the anteroposterior length of the tibial ACL insertion is 17 to 18 mm and its mediolateral width 12 to 14 mm. The distance between the centers of the two bundles is nearly 10 mm. On the femur, the length of the ACL insertion is 18 to 19 mm and its width 10 to 12mm. The most distal point of the femoral insertion, corresponding to the shallow edge of the PL bundle, is 3 mm from the cartilaginous limit of the lateral condyle. The distance between the centers of the two bundles is 8 to 9 mm.

Taking into account these dimensions, it is always possible drilling two tunnels through both sites, while maintaining a bony bridge of at least 2 mm between them.

#### **BIOMECHANICAL EVALUATION**

Numerous articles have reported the distinct role of the two ACL bundles: their variation in length is different, the PL bundle bears the greatest load at about 15° flexion, while the AM bundle bears maximum strain between 60° and 90° flexion, its load and length showing little variation. Compared to the classical one-bundle technique, the two-

bundle reconstruction provides a statistically significant improvement in control of anterior tibial translation at 20 degrees of flexion, and knee rotational stability is clearly improved.

#### **GRAFT CHOICE**

Most authors have been using double-stranded hamstring tendons autografts. In general, semitendinosus is used to reconstruct the AM bundle and gracilis for the PL bundle ending up to 7 mm and 6 mm graft diameters respectively (Fig 1). The use of triple- or quadruple- stranded grafts allows increasing the bundle diameters by 1 or 2 mm. Double-stranded tibialis anterior and posterior tendon allografts allow obtaining large bundle diameters.



Figure 1

#### **SURGICAL PROCEDURE**

Currently, the basic principles for anatomic ACL reconstruction consist in reconstructing both ACL bundles with two independent grafts lying in four separate tunnels, two femoral and two tibial, drilled in the centers of the bundle attachment sites.

Femoral tunnels may be drilled from inside-out or from outside-in. As femoral anatomical insertion site of the ACL cannot be reached through the tibial tunnel most of authors using single incision technique drill the femoral tunnels through the anteromedial portal.

On the tibia the AM tunnel starts close to the medial edge of the tibial tubercle while the PL tunnel opens just at the anterior edge of the medial collateral ligament. Specific aimers may be used to maintain the appropriate distance and position between the intra-articular openings of both tunnels.

Most authors fix the grafts with EndoButtons CL™ on the femoral side and two interference screws in the tibia (Fig 2). Other fixations systems may be used.

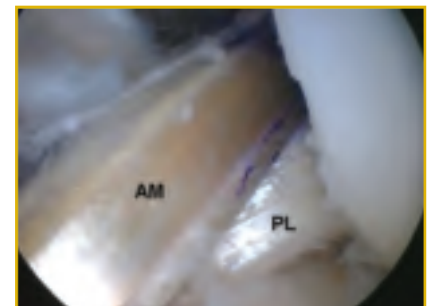


Figure 2

An important step is the degree of knee flexion during fixation of each bundle. Drawn from the results of biomechanical studies and in vivo measurements it is recommended to fix the AM bundle between 45 and 60 degrees of flexion whereas the PL should be fixed at 15 or less degrees of flexion.

## CLINICAL RESULTS

In terms of anterior tibial translation control, most of the published clinical studies have reported results at least identical to one-bundle reconstruction techniques. Due to less favorable outcomes than the 4-tunnel techniques, the techniques based on the use of 3 tunnels, either 2 in the femur side and one on the tibia or the opposite have been given up. It seems increasing the bundles diameters lead to more favorable results.

Zhao et al using quadruple stranded hamstring grafts have reported 95.3 % grade A Lachman, 95 % grade A pivot shift, and 97.7 % IKDC knee examination normal or nearly normal.

## DISCUSSION

Many technical questions remain to be solved: what is the amount of tension to be applied to each bundle during fixation? Do we have to apply the same amount? Should we fix the AM bundle first? What degree of external tibial rotation do we have to maintain during fixation?

There is no consensus on the methods of fixation to be used. However, as others we have observed no or very few tunnel enlargements compared to the one bundle hamstring techniques. Several hypotheses can be raised: increased bone-tendon interface area, more physiological loading of the grafts compared to one-bundle?

The potential superiority of double-bundle reconstruction over the one-bundle techniques will be demonstrated through the evaluation of rotational stability. The only clinical test currently available to evaluate rotational stability is the pivot shift, which combines translation and rotation, and the sensitivity of which depends on examiner experience and subjectivity. Thus there is a need for the development of simple devices which could be routinely used to quantify the tibial rotation during clinical examination.

## CONCLUSION

Considering the complex anatomy of the ACL and the common deficiencies of rotatory control with single bundle reconstructions, a more physiologic reconstruction that controls both the anteroposterior and the rotatory instability is proposed.

Reconstruction of both the PL bundle, which is mostly responsible for the internal rotation of the lateral tibial plateau, and the AM bundle, responsible for controlling the straight anteroposterior instability of the knee, should allow for a more complete reconstruction than the traditional single bundle procedure.

*Full article and references also available online at [www.isakos.com](http://www.isakos.com)*

## CONTRALATERAL MENISCUS MRI

**Better Predicts Needed Meniscal Allograft Size than Recipient Tibial X-ray**



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### INTRODUCTION:

Currently the needed size of a meniscus for meniscal-allograft-transplantation (MAT) is estimated from recipient tibial plateau radiographs. We have found this method to be frequently inaccurate, often overestimating the needed size, with low inter-observer reliability. In arthritic knees transplanted menisci usually fail by extrusion: as if oversized. MRI measurement of a patient's contralateral intact meniscus offers a potentially more accurate method to determine ipsilateral meniscal size. This has not been adopted as a sizing method because 1) menisci have been assumed to be bilaterally asymmetric and 2) MRI has been reported to be inaccurate. We hypothesized that 1) menisci are bilaterally symmetric, 2) MRI is accurate; 3) the radiographic method is not consistently accurate; 4) MRI measurement of the contralateral intact meniscus should be a more consistently accurate method.

### METHODS

Part I. Symmetry: we obtained meniscal size data for 500 left/right pairs of cadaveric knees from Allosource Tissue Bank and calculated the size difference between menisci for each pair.

Part II. Sizing: menisci in 10 intact cadaveric knees were measured directly and with MRI. Tibial plateau radiographs were measured to predict the meniscal size.

### RESULTS

Part I: 97% of the menisci had sagittal and frontal dimensions that were within 3mm of the contralateral meniscus.

Part II: MRI predicted actual meniscal size within 5%, versus 14.5% for radiographs (p=0.019).

### CONCLUSIONS

MRI measurement of the contralateral meniscus, if intact, better predicts needed meniscal size than radiographs of the recipient tibial plateau. Better sizing may improve MAT results in arthritic knees.

*Full article and references also available online at [www.isakos.com](http://www.isakos.com)*

# ISAKOS APPROVED COURSES IN REVIEW

## 25<sup>TH</sup> & 26<sup>TH</sup> KNEE AND SHOULDER ARTHROSCOPY WORKSHOP

Severance arthroscopy fresh cadaver workshops were held on April 1<sup>st</sup> (knee) & 8<sup>th</sup> (shoulder), 2006.

The workshops have been held at Yonsei University College of Medicine in Korea 26 times and have had ISAKOS approval since the 11th workshop on November 1st, 2003. These are the only fresh cadaver workshops in Korea with ISAKOS approval.

**Professor Sung-Jae Kim** (Korea), course chairman of the workshop and director of Severance arthroscopy unit, has been working as arthroscopy committee member of ISAKOS and editorial board member of Arthroscopy journal.



During the workshop, participants observed demonstrations by **Professor Sung-Jae Kim** (Korea) and then went into training by themselves under the guidance of the professor and table instructors. Participants were able to train themselves for various operative techniques and had opportunities to discuss with the instructors. After this exercise, they dissected the cadavers to get more information about the surgical anatomy of the joint.

It was useful time spent for the participants who attended the workshop. **Professor Sung-Jae Kim** (Korea), added a demonstration of ankle and elbow arthroscopy in this time.



**Course chairman:** **Prof. Sung-Jae Kim, MD, PhD** (Korea)

**Table instructors:** **Chang-Hyuk Choi, MD** (Korea), **Kwang-Am Jung, MD** (Korea), Sang-Jin Sin, MD, Jong-Min Kim, MD (Korea), Young-Min Chun, MD, Dae-Heup Song, MD, **Kwang-Yeol Park, MD** (Korea), Doo-Hyung Lee, MD and Tae-Eun Kim, MD

**Participants:** 16 persons for knee workshop and 16 persons for shoulder workshop

## INTERNATIONAL SOCIETIES & PRESIDENTS

ISAKOS maintains an extensive list of all international societies and presidents on the ISAKOS Web site.

Please visit [www.isakos.com](http://www.isakos.com)

and follow the links to the International Societies.

If your information is incorrect or you are not listed please contact the ISAKOS office at [isakos@isakos.com](mailto:isakos@isakos.com).

## Editor's Note

ISAKOS has witnessed a 20% membership growth for each of the past two years. I predict exponential growth in the future! Why? Simple. It is a win-win for members when they join. The benefit to the society is in the increased aggregate resources that it gains from each and every one of its members. Members gain from the talents brought by other members. I further predict that the upcoming ISAKOS Congress in Florence will be the best ever. How can I say that? The Congresses keep getting better and better. The program committee under the direction of **Chairman Lars Engebretsen** (Norway) and the guidance of **ISAKOS President John Bergfeld** (USA) is busy organizing outstanding submissions including scientific papers, debates, symposia, live surgical demonstrations, electronic posters, technical exhibits, instructional course lectures, and hands on workshops. If my informal survey of colleagues that I've run into is any indication the interest in this meeting is extremely high. Do yourself a favor and mark your calendar right now for May 27-31, 2007 and don't miss out on an exceptional experience in Florence, Italy! **Ciao!**

**Ronald M. Selby, MD**

## President's Note

The **Executive Committee** has continued to meet monthly via teleconference. These meetings combined with good communication with the executive office have ensured that the administration of ISAKOS has been efficient, progressive and straightforward.

On October 26 and 27, we will be hosting the second ISAKOS Global Leadership Retreat. At this forum, ISAKOS leaders and industry will exchange information and explore common opportunities, challenges and solutions. The outcome of this forum will enhance the continued development of our plan to achieve the ISAKOS Mission and Vision. Topics to be discussed at this meeting include the Future of ISAKOS Education, Common Research Goals, Code of Ethics, Emerging Markets and Ongoing Challenges. We also will use this opportunity to increase the effectiveness of our relationship with industry to accomplish our common goals.

Join us in Firenze, Italy, the site of the ISAKOS 6th Biennial Congress! **Lars Engebretsen, MD** (Norway), the ISAKOS **Program Committee** and ISAKOS Clinical Committees, are formulating an extraordinarily academic and practical meeting.

It is a privilege and honor to serve ISAKOS.

**John A. Bergfeld, MD**

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# UPCOMING ISAKOS APPROVED COURSES



## BASIC ARTHROSCOPY SHOULDER WORKSHOP

Changi General Hospital Singapore,  
Republic of Singapore  
September 1–2, 2006

### For Further Information, Please Contact:

Angela Teh  
Tel: +65 627 00552  
Fax: +65 627 26698  
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## UPDATE IN KNEE SURGERY

German Cancer Research Center  
Heidelberg, Germany  
September 8–9, 2006

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Tel: +49 611 977 1635  
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www.kneupdate.org

## ADVANCES IN LOWER LIMB SURGERY

Radisson Tree Tops Resort  
Port Douglas, Queensland, Australia  
September 10–13, 2006

### For Further Information, Please Contact:

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www.device.com.au

## I CONGRESSO NAZIONALE SIGASCOT

Palazzo Congressi Bologna  
Bologna, Italy  
October 4–6, 2006

### For Further Information, Please Contact:

Anna Lisa Cusin  
Tel: +39 051 6233 199  
Fax: +39 051 623 3269  
E-mail: biotechslr@biotechcongressi.it

## 8<sup>TH</sup> CONGRESS OF THE TURKISH SOCIETY OF SPORTS TRAUMATOLOGY, ARTHROSCOPY AND KNEE SURGERY

Efes Sürmeli Hotel  
Kuşadası, İzmir, Turkey  
October 10–14, 2006

### For Further Information, Please Contact:

E-mail: valor@valor.com.tr  
www.turkartroskopi2006.org

## SHOULDER SURGERY CONTROVERSIES 2006/ INTERNATIONAL LIVE SHOULDER SURGERY SYMPOSIUM

The Fairmont Hotel  
Newport Beach, CA, USA  
October 19–21, 2006

### For Further Information, Please Contact:

Wesley M. Nottage  
Tel: +1 949 581 7001  
Fax: +1 949 581 6687  
E-mail: tscwmn@aol.com  
www.shouldersurgerycontroversies.com

## ICRS SURGICAL SKILLS COURSE: NEW TECHNIQUES FOR JOINT PRESERVATION IN YOUNG PATIENTS

Westin Diplomat Resort & Spa  
Hollywood, FL, USA  
October 20–21, 2006

### For Further Information, Please Contact:

Stephan Seiler ICRS Course Office  
Tel: +41 44 390 18 40  
Fax: +41 44 390 18 41  
E-mail: sseiler@cartilage.org  
www.cartilage.org

## 2006 KOREAN ARTHROSCOPY SOCIETY ANNUAL MEETING WITH ARTHROSCOPY MASTERS OF ASIA

Severance Hospital, Yonsei University  
Seoul, Korea  
November 3, 2006

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www.severnscopy.com

## V BASIC ANKLE ARTHROSCOPY COURSE

Sheraton Hotel  
Antalya, Turkey  
November 3–4, 2006

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Fax: +90 242 227 4329  
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www.artroskopi.org

## 2<sup>ND</sup> HIP ARTHROSCOPY MEETING

Kulturzentrum Saalbau  
Homburg/Saar, Germany  
November 17–18, 2006

### For Further Information, Please Contact:

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Fax: +49 6841 1621209  
E-mail: michael\_dienst@yahoo.de  
www.orthopaedic-homburg.de

## 27<sup>TH</sup> FRESH CADAVER KNEE ARTHROSCOPY WORKSHOP

Yonsei University Hospital  
Seoul, Korea  
December 2, 2006

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www.severnscopy.com

## 28<sup>TH</sup> FRESH CADAVER SHOULDER ARTHROSCOPY WORKSHOP

Yonsei University Hospital  
Seoul, Korea  
December 9, 2006

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Fax: +82 2 363 6248  
E-mail: sungjaekim@yumc.yonsei.ac.kr  
www.severnscopy.com

## 6<sup>TH</sup> ADVANCED COURSE ON SHOULDER ARTHROSCOPY

Val D'Iserre France  
January 21–27, 2007

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Fax: +33 383 85 7551  
E-mail: d.mole@wanadoo.fr  
www.valdisereshoulder.com

## A KNEE SUMMIT: FROM BIRTH TO DEATH

Intercontinental Hotel  
Cleveland, OH, USA  
April 11–14, 2007

### For Further Information, Please Contact:

John A. Bergfeld, MD  
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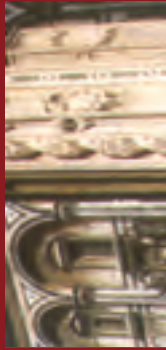
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