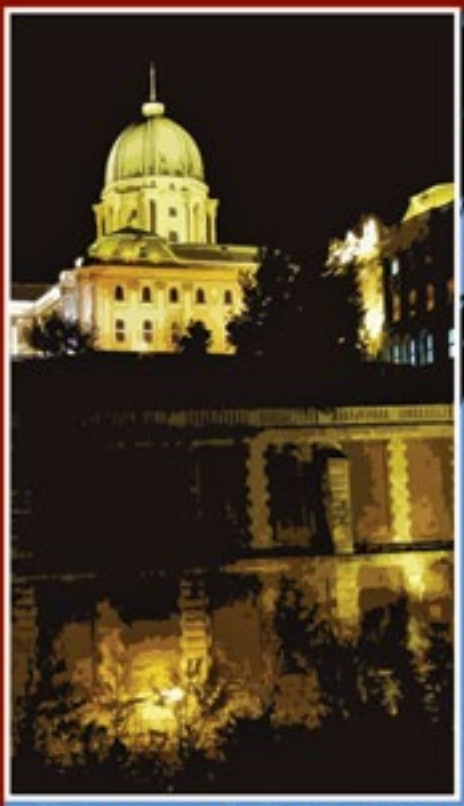
Program Book and Syllabus



# The 18th Annual Advanced Pain Conference

and **Practical Workshop**

Budapest, Hungary, August 26-28, 2013

www.congressline.hu/pain2013

## The 24th FIPP Examination

Budapest, Hungary
August 29, 2013

# Content

# GREETINGS

## Dear Colleagues and Friends,

We are proud to announce the 18th Annual Budapest Advanced Interventional Conference-Workshop and invite you to return to Budapest for what we consider our finest yet with distinguished faculty from around the world working with our sponsors to bring the latest in advancements in our specialty. We invite you to Budapest, an arena that annually leads to friendship, participation and improved patient care as a result of our belonging in this beautiful and expanding field.

Looking back on these past 17 years, we have made great progress in pain management. We have made lots of friends; we have become safer, better and have had more impact on higher quality patient care. We have more evidence in effectiveness and learned many of the issues that we must avoid in order to prevent undesirable and bad outcomes in our patients. It is interesting that on one hand we have refinement, but at the same time now we have new and improved procedures that we did not know about. Also, the field has expanded because the training and knowledge of the pain practitioners have significantly improved. Our doctors today can appreciate and learn pain procedures and understand the need for increased safety. We have witnessed the birth of the Fellow of Interventional Pain Practice Examination, which began with the World Institute of Pain and mostly significantly in Budapest. We now have 770 FIPPs from 42 countries and you will see the 2012 Budapest and 2013 Maastricht FIPPs honored at the August 27 Awards Ceremony. In Budapest you have also seen the disappearance of remnants of communism and right in front of our eyes the improvement from the work of the people. Improvements are worldwide but the evolution that comes from hard work is unmistakably present when you look at it from a distance. Budapest has grown, and we have grown with it. It is such a pleasure to have old friends come back together, and you will notice that the Examination site has after many years changed dramatically with all the other changes that you see around.

The 2013 Budapest Conference will present a high-quality program. It is remarkable to see the multi-specialty involvement in interventional pain treatment and seeing that the field involves more and more spine surgeons, because they see and realize on one hand, they can treat more patients as well as help patients that suffer complications from surgical procedures. They see also that interventional procedures prevent spine surgery in many patients. It is amazing to see the impact of our friends such as Sam Hassenbusch. Now we have the Hassenbusch Prize for the highest achieving candidate in the FIPP Examination. We also see that it was Sam Hassenbusch who went to the American Medical Association's code committee to advocate the approval for the lysis of adhesions procedure on behalf of neurosurgery. This year we see the upcoming publication by Ludger Gerdesmeyer, orthopedic surgeon in Germany, who is bringing out the 12-months follow up of a prospective randomized double blind multi center study where the participants in the study were mainly spine surgeons. Interventional pain for the most part, is minimally invasive surgery and essential component of it is neuromodulation. Highly trained physicians regardless of the primary specialty designation practice Neuromodulation procedures.

We are very much looking forward to new improved, better service to our patients through working closely together with industry that provides more and more sophisticated and cost-effective equipment. You will have a chance to meet and share with these representatives from the leading companies that also share in support of this conference.

Dr. James Heavner is organizing the Budapest Conference Scientific Program with some 40 international

speakers. The local arrangements chairman, Dr. Edit Racz of Budapest, is serving her 17th year as the motor behind the success of the Budapest Conference.

The Budapest Conference allows for the incredible Hungarian experiences we have traditionally provided. You will enjoy the sights, flavors and sounds of Budapest at the opening reception on Monday evening, August 26 and the Awards Ceremony on Tuesday, August 27.

The Budapest Conference website is http://www.congressline.hu/pain2013. Sandra Vámos and staff from CongressLine are looking forward to working with you again for registration, hotel information for Sofitel Hotel, the 2013 Conference site, and help with any of your needs, including visa information and assistance. The workshop will again be in the beautiful Semmelweis University Pathology Lab.

We look forward to sharing the Hungarian experience with each of you. We can recall memories during this 20th anniversary year of the World Institute of Pain and ask you to share your experiences and memories from the past as well as your expectations for this 18th annual Budapest Conference.

With best personal regards,

**Gabor B. Racz**, MD, FIPP, DABIPP
Director - Budapest Conference
Grover E. Murray Professor,
Professor and Chairman Emeritus at TTUHSC
Founder and Past President WIP
Member of WIP Executive Board

**James E. Heavner,** DVM, PhD, FIPP (Hon)
Co-Program Director and
Workshop Coordinator
FIPP Examination Board and Registrar

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**José R. Rodríguez Hernández**, MD, FIPP – Puerto Rico
**Arman Taheri**, MD, FIPP - Iran
**Athina Vadalouca**, MD, PhD, FIPP – Mediterranean
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**Alex Sow Nam Yeo**, MD, PhD, FIPP – SE Asia

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## Conference Organizers

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**Kris C. P. Vissers**, MD, FIPP (The Netherlands)
**Jan Peter Warnke**, MD (Germany)
**Chris Wells**, MD, FIPP (UK)

# General Information

## Conference Dates

The 18th Annual Advanced Pain Conference & Practical Workshop
**26-28 August, 2013**

## Conference Site

**Sofitel Budapest Chain Bridge – Ballroom**
H-1051 Budapest, Széchenyi István tér 2.

## Practical Workshop Venue

**Semmelweis University Labs**
H-1091 Budapest, Üllői út 93.
Daily bus transfers are provided within the venues.

## The 24th FIPP Exam

**29 August, 2013**
**Venue: Semmelweis University Labs,** H-1091 Budapest, Üllői út 93.

## Conference Website

www.congressline.hu/pain2013

## Language

The official language of the Conference is English.

## CME Accreditation and Designation

This activity has been planned and implemented in accordance with the Essential Areas and policies of the Accreditation Council for Continuing Medical Education through the joint sponsorship of Texas Tech University Health Sciences Center and The World Institute of Pain. Texas Tech University Health Sciences Center is accredited by the ACCME to provide continuing medical education for physicians.

Texas Tech University Health Sciences Center designates this live activity for a maximum of 20 **AMA PRA Category 1 Credit(s)™**. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

## International CME Credit

Continuing medical education credits designated by the American Medical Association are generally accepted by licensing and specialty boards throughout the world. To confirm acceptance of **AMA PRA Category 1 Credit(s)™**, check with your licensure or medical specialty certification board.

## Opening Hours of the Registration Desk at Sofitel Budapest Chain Bridge

| | |
|---|---|
| **Sunday, 25 August** | 14.00 – 19.30 |
| **Monday, 26 August** | 07.00 – 13.30 |
| **Tuesday, 27 August** | 07.30 – 13.30 |
| **Wednesday, 28 August** | 07.30 – 13.30 |

## FIPP Exam Registration at Sofitel Budapest Chain Bridge

| | |
|---|---|
| **Wednesday, 28 August** | 16.00 –19.00 |

## Registration Fee (Regular Fees after 15 July, 2013)

| | |
|---|---|
| **Pain Conference & Practical Workshop** | 1600 Euro |
| **Pain Conference** | 1150 Euro |
| **Accompanying person fee** | 350 Euro |
| **FIPP Exam registration fee** | 2500 USD |

## Meals

Coffee breaks, lunches, welcome cocktail and award ceremony dinner are included in the registration fee.

## Internet

Free of charge Wi-Fi service available at the venue.

## Commercial Exhibition

The exhibition will be opened from Monday, 26 August until 28 August at the Sofitel Hotel Ballroom foyer. Delegates will have the opportunity to meet representatives of pharmaceutical and diagnostic equipment companies at their stands to discuss new developments and receive up-to-date product information.

## Hotels

**Sofitel Budapest Chain Bridge*******
(Conference venue)
H-1051 Budapest, Széchenyi István tér 2.

**Hotel Central Basilica*****
H-1051 Budapest, Hercegprímás u. 8.

# Official Social Events

## Faculty Dinner (only for Faculty Members)

**Sunday, 25 August, 2013**, 20.00-22.00
**Spoon Cafe & Lounge** (H-1052 Budapest, Vigadó tér 3. dock)
**Dress Code:** business casual
**Meeting point**: Sofitel Budapest lobby at 18.30

## Welcome Cocktail (for all registered guests)

**Monday, 26 August, 2013,** 20.00-22.00
**Sofitel Budapest Chain Bridge,** Roof Terrace
**Programme:** Csillagszemű Dance Ensemble, Sara Hoffer Trio
**Dress Code:** Business casual

## Award Ceremony Dinner (for all registered guests)

**Tuesday, 27 August, 2013,** 20.00-23.00
**Wenckheim Palace, Metropolitan Ervin Szabo Library** (H-1088 Budapest, Szabó Ervin tér 1.)
**Programme:** Award Ceremony and Monarchia String Quartet
**Dress Code:** formal
**Meeting point:** Sofitel Budapest lobby at 19.30 (Bus transportation is provided.)

## Sightseeing Tour in Budapest

**Monday, 26 August, 2013,** 09.30-13.00
**Price:** 30 Euro/person (Min. number of participants: 15) Including in the accompanying person fee.
An approximately 4-hour long sightseeing tour, which shows the most attractive features of the capital. Transportation by bus, with English speaking guide, refreshment and all entrance fees are included.
**Meeting point:** Sofitel Budapest lobby at 09.15

# Useful Information

## How to get to the Conference Venue?

To reach the Conference Venue there are several means of transport:
**Metro station** "Deák Ferenc tér" junction (M1 – yellow line, M2 – red line, M3 – blue line)
The Sofitel Budapest is in 6-7 minutes walking distance from this junction, or take bus no. 105 to "Széchenyi tér" stop.
**From the airport** to the conference venue use the Airport Minibus Service, fixed rates for passengers.
(Fixed rate: 2990 HUF / cca 11 EUR one-way from the airport to the Hotel Sofitel or to inner city hotels), Tel: +36 1 296 8555; www.airportshuttle.hu
or use the PAIN2013 Official Taxi Company: City Taxi +36 1 211 1111
(Rate: 5300 HUF = cca 20 Euro).

## Climate

The climate of Budapest is continental. In August usually nice warm weather can be expected with a max. temperature of 28-30°C, while the lowest temperature during the night ranging between 12-15 °C. Nevertheless some rainy days can be expected.

## Insurance

The registration fees do not include provision for the insurance of participants against personal accidents, illness, cancellation, theft, property loss or damage. Participants are advised to take adequate personal travel insurance.

## Currency

The Forint (HUF), the official national currency, is convertible. The exchange rates applied in Budapest banks, official exchange offices and hotels may vary. All the major credit cards are accepted in Hungary in places displaying the emblem at the entrance.
**Exchange rate:** 1 Euro = 299 HUF in July, 2013

## Credit Cards

In general, VISA, EC/MC and American Express credit cards are accepted in most restaurants, cafés, shops and petrol stations.

## Stores and Shopping

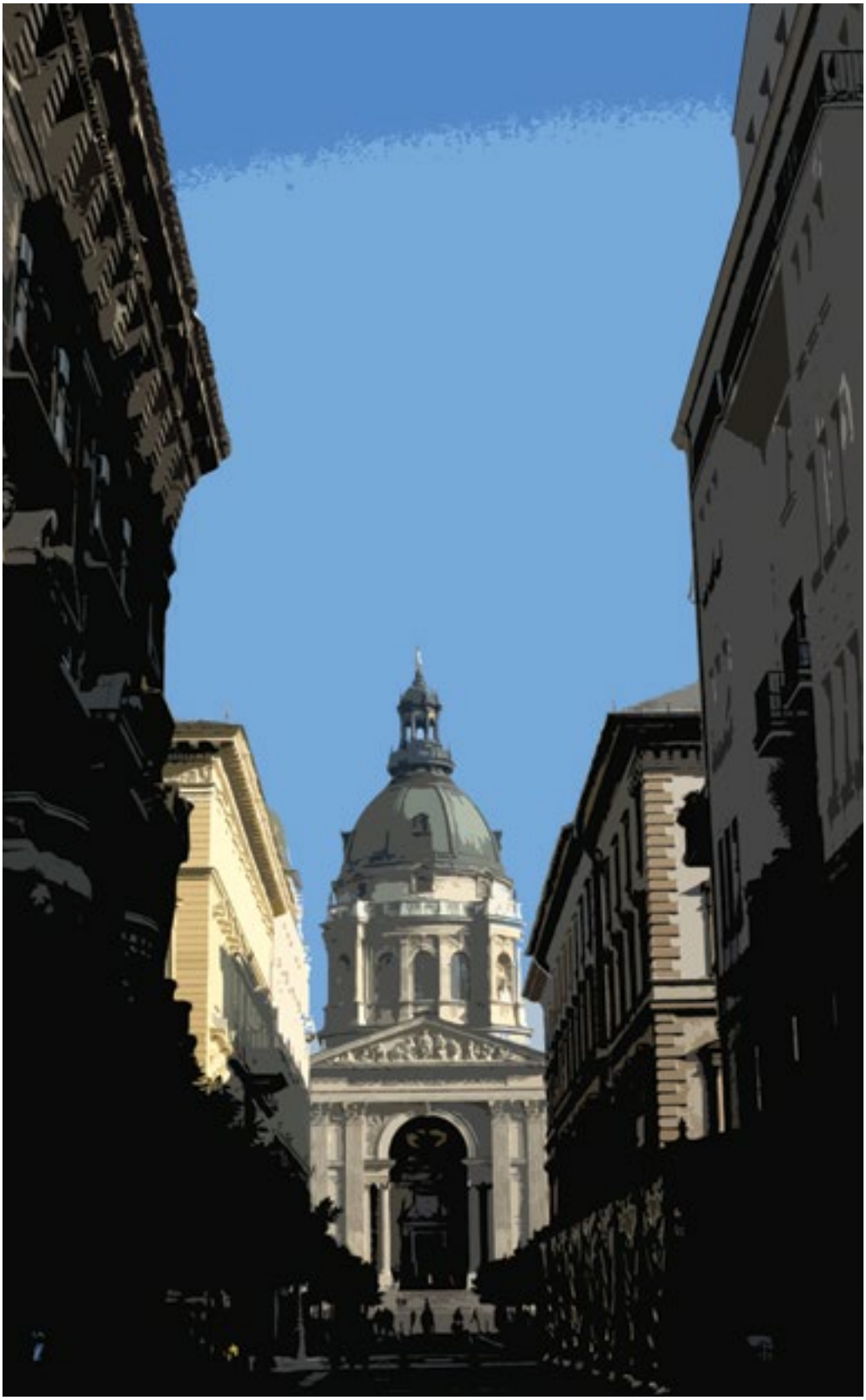
The opening hours of Budapest stores are generally 10.00-18.00 on weekdays and 10.00-13.00 on Saturday. The shopping centers are open from 10.00-21.00 from Monday to Saturday and from 10.00-18.00 on Sunday.

## Electricity

The voltage in Hungary is 230V, 50 Hz AC.

## Parking

If you drive a personal or rented car, always try to park at a guarded parking lot and do not leave any valuables in the car. Please note, that Budapest is divided into paying areas, with one parking meter in each street. The maximum parking time duration is 2 hours, tariffs may vary.



# Detailed Program

## MONDAY, 26 August, 2013 – Sofitel Budapest Ballroom

**07:40** Opening Remarks
**Gabor B. Racz**, MD, FIPP, Program Director
**Richard L. Rauck, MD, FIPP,** President of WIP
**Edit Racz**, MD, FIPP, Chair Local Committee

Moderator: **Serdar Erdine,** MD, FIPP

**08:00** Specific vs Non Specific Spinal Pain
**Gabor B. Racz,** MD, FIPP

**08:30** Drugs and Pumps for Intrathecal Drug Delivery
**Richard L. Rauck**, MD, FIPP

**09:00** Lumbosacral Spinal Canal Endoscopy – Lessons Learned
**James E. Heavner**, DVM, PhD, FIPP(Hon)

**09:30** New Therapy for Common Low Back Pain
**Hemmo Bosscher**, MD, FIPP

**10:00** Tarlov Cysts Plus Alternative to Kyphoplasty and Vertebroplasty
**Jan Peter Warnke**, MD

**10:30** Coffee Break

Moderator: **P. Prithvi Raj,** MD, FIPP

**11:00** RF – New Ideas Update
**Ricardo Ruiz-López**, MD, FIPP

**11:30** Basic Anatomy for Neuromodulation Techniques
**Jose de Andres**, MD, FIPP

**12:00** Targeting L5 for SIJ Pain

Moderator: **Carl Noe**, MD, FIPP
**Ira B. Fox**, MD, FIPP – Clinical Experience
**Adnan A. Al-Kaisey**, MD FIPP
**Gabor B. Racz**, MD, FIPP – Technique Details

**13:00** Lunch

**13:30** Transport to University
Labs Afternoon workshops

# TUESDAY, 27 August, 2013 – Sofitel Budapest Ballroom

| | |
|---|---|
| Moderator: | **Gabor B. Racz**, MD, FIPP |
| 08:00 – 09:30 | Industry Technical Presentations |
| 08:00 | Boston Scientific<br>to be determined |
| 08:15 | Epimed International<br>Steven R. Loretz |
| 08:30 | Medtronic<br>Thalia Kondonis |
| 08:45 | Stimwave Technologies, Inc.<br>**Laura Tyler Perryman**, MS, MBA |
| 09:00 | St Jude<br>**Ralph Justiz**, MD, FIPP |
| 09:15 | Discussion |
| 09:30 | RF Physics, Safety Lesion Size/Tissue Heterogeneity<br>**Eric Cosman, Jr.**, PhD |
| 10:00 | Coffee Break |
| Moderator: | **Mert Akbas**, MD, FIPP |
| 10:30 | Epidural Adhesiolysis Studies<br>**Ludger Gerdesmeyer**, MD, PhD, FIPP |
| 11:00 | Cervical Pain and Cervical Brachalgia<br>**Maarten van Kleef**, MD, FIPP |
| 11:30 | Botulinum Toxin, Its Properties and Use in Pain Medicine<br>**Chris Wells**, MD, FIPP |
| 12:00 | Neuromodulation<br>**Aaron Calodney**, MD, FIPP |
| 12:30 | High Frequency Spinal Cord Stimulation in the Management of Axial Back Pain<br>**Adnan A. Al-Kaisy**, MD, FIPP |
| 13:00 | Lunch |
| 13:30 | Transport to University<br>Labs Afternoon workshops |

# WEDNESDAY, 28 August, 2013 – Sofitel Budapest Ballroom

| | |
|---|---|
| Moderator: | **Kenneth B. Chapman,** MD, FIPP |
| 07:30 | Guidelines for Radiation Safety<br>**Juan Carlos Flores**, MD, FIPP |
| 08:00 | Recent Advances and Future Perspectives in the Management of Cancer Pain<br>**Kris C. P. Vissers**, MD, FIPP |
| 08:30 | Spinal Stenosis – New Methods for Treatment<br>**Raphael Justiz**, MD, FIPP |
| 09:00 | Neuropathic Pain<br>**Sudhir Diwan**, MD, FIPP |
| 09:30 | Imaging for Interventional Pain Therapy<br>**Andrea M. Trescot** MD, FIPP |
| 10:00 | Neurosurgical Approaches to Chronic Pain Management<br>**Lorand Eross**, MD, PhD, FIPP |
| 10:30 | Coffee Break |
| Moderator: | **Sudhir Diwan**, MD, FIPP |
| 11:00 | Facial Pain and Cervicogenic Headache<br>**Miles Day**, MD, FIPP |
| 11:30 | Use of Ultrasound in Interventional Pain Therapy<br>**Sang Chul Lee**, MD, PhD, FIPP |
| 12:00 | Vertebral Augmentation 2013<br>**Matthew Rupert**, MD, FIPP |
| 12:30 | Interventional Pain Therapy Complications – Recognition, Avoidance, Management<br>**John Nelson**, MD, FIPP |
| 13:00 | Lunch |
| 13:30 | Transport to University<br>Labs Afternoon workshops |

# FIPP Awards Ceremony

**Master of Ceremonies:**

**Maarten van Kleef**, MD, FIPP

**Opening Remarks – Local Organizing Committee**

**Edit Racz**, MD, FIPP
**Agnes Stogicza,** MD, FIPP
**Lorand Eross,** MD, PhD, FIPP

**Speaker:** **Richard L. Rauck**, MD, FIPP

**Presentation of Certificates to Fellows of Interventional Pain Practice (FIPP)**
**WIP Board of Examination Members and WIP Executive Board Members**
**FIPP honorees from Budapest 2012 and Maastricht 2013 FIPP Examinations**

## Budapest FIPP Examination September 2012

| | | |
|---|---|---|
| 716 | **Ajit Singh Deepak** | Malaysia |
| 717 | **Osama Ahmed Adulghani Alahdal** | Saudi Arabia |
| 718 | **Carl Csaba Balog** | USA |
| 719 | **Vaibhav Bhola** | India |
| 720 | **Jonathan Chan** | Australia |
| 721 | **Chee Kean Chen** | Malaysia |
| 722 | **Stéphanie De Naeyer** | Belgium |
| 723 | **Janier Desé** | Spain |
| 724 | **Nino Dobrovic** | USA |
| 725 | **Dominic Hegarty** | Ireland |
| 726 | **Malcolm Noel Hogg** | Australia |
| 727 | **Romil Jain** | Australia |
| 728 | **Sung Woo Kim** | South Korea |
| 729 | **Alexander Klyashtorny** | USA |
| 730 | **Geoffrey Malcolm Knox** | UK |
| 731 | **Janneke Evelyne Kruijswijk** | The Netherlands |
| 732 | **Heng-Hing Lim** | Malaysia |
| 733 | **Elba Maria Diaz Parodi** | Spain |
| 734 | **Raghavendra Ramanjulu** | India |
| 735 | **Shiv Pratap Singh Rana** | India |
| 736 | **Shalini Saksena** | India |
| 737 | **Pankaj Wadhwa** | Mauritius |
| 738 | **Albertus Sugeng Wibisono** | Indonesia |

# Maastricht FIPP Examination June 2013

| | | |
|---|---|---|
| 739 | **June Sun Bag** | South Korea |
| 740 | **Anneleen Brebels** | Belgium |
| 741 | **Remco D. H. de Boer** | The Netherlands |
| 742 | **Karel de Weert** | The Netherlands |
| 743 | **Loic Delplanque** | Belgium |
| 744 | **Stefan I.E.M.J. Evers** | Belgium |
| 745 | **Pieter-Jan Germonpré** | Belgium |
| 746 | **Helen Gharaei** | Iran |
| 747 | **Hossam Zarif Ghobrial** | Egypt |
| 748 | **José Manuel González Mesa** | Spain |
| 749 | **Christian Herrera Figueroa** | Colombia |
| 750 | **H. C. Koppers-Hoyset** | The Netherlands |
| 751 | **Zamil Mehboob Karim** | Australia |
| 752 | **Mehran Kouchek** | Iran |
| 753 | **Anand Kumar G S** | India |
| 754 | **Kevin Lathouwers** | Belgium |
| 755 | **Luk Sing Li** | Hong Kong |
| 756 | **Remko Liebregts** | The Netherlands |
| 757 | **Erich Karl-Heinz Mansfeld** | Namibia, Africa |
| 758 | **Emmanuel Mariaule** | Belgium |
| 759 | **Renate Munnikes** | The Netherlands |
| 760 | **Kris Nelissen** | Belgium |
| 761 | **Hitesh N. Patel** | India |
| 762 | **Dirk F.P.M. Peek** | The Netherlands |
| 763 | **Robert Rapcan** | Slovak Republic |
| 764 | **Steven Renes** | The Netherlands |
| 765 | **Malvinder Singh Sahi** | India |
| 766 | **Helwin Smits** | The Netherlands |
| 767 | **Wilco Eduard van Genderen** | The Netherlands |
| 768 | **Oscar Bernard Hendrik Anton Marie van Haagen** | The Netherlands |
| 769 | **Hans Christian Wartenberg** | The Netherlands |
| 770 | **Gavin Weekes** | Ireland |

# Syllabus

## **Gabor B. Racz**, MD, DABPM, ABIPP, FIPP

**BIOGRAPHICAL SKETCH**

Dr. Gabor B. Racz graduated from The University of Liverpool Medical School in UK. He completed residency and served on staff at State University of New York in Syracuse, New York. At Texas Tech University Health Sciences Center in Lubbock, Texas he is Grover Murray Professor, Professor and Chair Emeritus in Department of Anesthesiology, and Co-Director of the Pain Services. Dr. Racz is Founder and Director of the Budapest Conference since its beginning in 1996. He is Founder and Past President of World Institute of Pain, currently serving on the WIP Executive Board as well as Executive Board of American Society of Interventional Pain Physicians. He is a Founder and first president of Texas Pain Society.

**LECTURE**

### SPECIFIC VS. NON SPECIFIC SPINAL PAIN

**Objectives**

Upon completion of this presentation attendees will be able to discuss

- Recognizing specific back pain, provoke the recognizable back pain and treat it by re-establishing the free space between the dura and posterior longitudinal ligament.

**Key Points**

- Back pain is one of the largest cause of instability and physicians involve variations of patients comparing axial back pain with/without radiculopathy
- Fail to differentiate different components of back pain
- Many of these patients thus labeled as non-specific back pain and with/without diagnostic workup are often placed on all of medication specifically narcotics. Many of these patients recover; however, terminating the use of narcotics is not easy.
- The intended specific points will focus on identifying a specific reason for back pain by multiple pathologic processes, these include: spinal stenosis, failed back surgery, degenerative disc disease and secondary leaking into the epidural space, or similarly post traumatic annular tear. The diagnosis for the dura sticking to the posterior longitudinal ligament can be done by an examination which includes "dural tug." The "dural tug "pulls on the dura and thus in the presence of adhesion of the posterior longitudinal ligament, pulls on that most richly innervated structure in the spinal canal. The confirmation of the diagnosis is done by evaluating the radiological studies indicating possibly the site for specific adhesions. Following placing a transforaminal catheter as well as the opening the epidural space below the site of adhesions to allow escape of fluids ending increase safety. The transforaminal mid-canal catheter in itself is not painful. Injection of 5mL of preservative free saline opens up and stretches the adherent structures and the patient confirms the recognition of the usual back pain. Following this 5mL of contrast is injected, subsequently 5mL 750-1500 units of hyaluronidase or if available 150 units of human recombinant hyaluronidase (Hylenex). This facilitates dispersal of the contrast and demonstrates on AP and lateral views. The opening up and lateral run-off of the injectant substances. Next, usually inject 5mL .2% Ropivacaine and 4mg Dexamethasone (Decadron) or 40mg of Depo Medrol through the catheter. Thirty minutes later, 5mL of 10% sodium chloride injected in order to prolong the pain relief. The catheter subsequently reinjected by 5mL of local anesthetic followed by 5mL of 10% sodium chloride, 6-8 hours apart times 2. Injection between local anesthetic and sodium chloride is 20-30 min later.

**References**

1. Racz GB, Day MR, Heavner JE, Smith JP, Scott J, Noe CE, Nagy L, Ilner H. Epidural lysis of adhesions and percutaneous neuroplasty. In: Racz GB, Noe CE, eds. Pain Management – Current Issues and Opinions. 2012: 337–370. doi: 10.5772/39173.
2. Racz GB, Day MR, Heavner JE, Smith JP. The Racz Procedure: Lysis of Epidural Adhesions (Percutaneous Neuroplasty). In: Deer TR, Leong MS, Buvanendran A, Gordin V, Kim PS, Panchal SJ, Ray AL, eds. Comprehensive Treatment of Chronic Pain by Medical, Interventional, and Integrative Approaches. Vol. 50, 1st ed. New York, NY: Springer; 2013:521–534.
3. Dunn AL, Heavner JE, Racz GB, Day M. Hyaluronidase: a review of approved formulations,indications and off-label use in chronic pain management.Expert Opinion 2010; Vol 10. Number 1: 127-131.
4. Gerdesmeyer L, Wagenpfeil S, Birkenmaier C, Veihelmann A, Hauschild M, Wagner K, Al Muderis M, Gollwitzer H, Diehl P, and Toepfer A. Percutaneous Epidural Lysis of Adhesions in Chronic Lumbar Radicular Pain: A Randomized, Double-Blind, Placebo-Controlled Trial. Pain Physician 2013; 16: 185-196.
5. Koh WU, Choi SS, Park SY, Joo EY, Kim SH, Lee JD, Shin JY, Suh JH, Leem GL, Shin JW. Transforaminal Hypertonic Saline for the Treatment of Lumbar Lateral Canal Stenosis: A Double-Blinded, Randomized, Active-Control Trial. Pain Physician 2013; 16:197-211.

## **Richard L. Rauck**, MD, FIPP

**BIOGRAPHICAL SKETCH**

Dr. Richard Rauck, a well-known and respected Pain Management Physician, began his career at Wake Forest University Baptist Medical Center, where he began the Pain Management Center in 1986. He graduated from Bowman Gray School of Medicine (now called Wake Forest University School of Medicine) in 1982 and traveled to Columbus, Georgia and Cincinnati, Ohio to do his internship, residency and fellowship training. He began his research career in the 1980's and continues today. After leaving Wake Forest in 2000, he went into private practice with Piedmont Anesthesia and Pain Consultants, and started his own research center called The Center for Clinical Research. In 2004 he began his own pain management clinic and continued with The Center for Clinical Research, which is now housed together in one building. He treats a variety of pain management problems as well as speaking locally, nationally and internationally. Dr. Rauck is the current President of the World Institute of Pain.

**LECTURE**

### DRUGS AND PUMPS FOR INTRATHECAL DRUG DELIVERY

## **James E. Heavner,** DVM, PhD, FIPP(Hon)

**BIOGRAPHICAL SKETCH**

Dr. James E. Heavner is a Professor Emeritus of Anesthesiology, Cell Physiology and Molecular Biophysics and Clinical Professor of Anesthesiology at Texas Tech University Health Sciences Center. He also is an honorary Fellow of Interventional Pain Practice. His scientific career spans more than 40 years. His areas of research include pain mechanism and treatment and the pharmacology and toxicology of local anesthetics. He pioneered the development of epiduroscopy. He is active in numerous national and international professional organizations and is the Registrar for the Fellow of Interventional Pain Practice examination.

LECTURE

## LUMBOSACRAL SPINAL CANAL ENDOSCOPY – LESSONS LEARNED

**Objectives**

Upon completion of this presentation attendees will be able to discuss

- How epiduroscopy has furthered our understanding of pathophysiological processes associated with the development and maintenance of low back pain (LBP) and radiating pain (RP)
- How epiduroscopy has contributed to improved diagnosis of sources of low back pain (LBP) and radiating pain (RP), especially common low back pain, and the treatment as well as prediction of treatment outcomes
- How epiduroscopy has contributed to improved safety of interventional procedures on the spine
- How epiduroscopy has helped expand knowledge of spinal canal anatomy
- New treatment options emerging as a result of epiduroscopy
- Future direction of epiduroscopy

**Key Points**

- Epiduroscopy provides information that aids in establishing a diagnosis and prognosis, locating areas of pathology, and providing therapy via a minimally invasive approach in patients with low back pain and/or radiating pain.
- Epiduroscopy reveals pathological changes not reported from imaging studies such as CT scans and MRI.
- Future direction of epiduroscopy includes advances in equipment technology, greater use as a tool for diagnosis and prognosis, and new or improved therapies administered with the aid of epiduroscopy.
- Anatomic detail more fully disclosed by epiduroscopy, eg about the peridural membrane, is a basis for exploring new approaches for treating common low back pain
- Knowledge gained by performing epiduroscopy, such as degrees of epidural fibrosis and vascular variations, has contributed to improved safety and utilization of interventional procedures
- Treatment outcomes are highly predictable when spinal canal endoscopy findings are used to predict outcome

**References**


1. Bosscher HA, Heavner JE. Incidence and severity of epidural fibrosis after back surgery: An endoscopic study. Spine. In press. Pain Practice 5/09.
2. Heavner JE, Wyatt DE, Bosscher HA. Lumbosacral epiduroscopy complicated by intravascular injection: a report of two cases. Anesthesiology. 107:347-350, 2007.
3. Racz GB, Heavner JE, Bosscher HA, Helms.The MILD Procedure. Consultant's Corner. Primum non nocere. Pain Practice. Early View Online 3/26/13
4. Bosscher HA, Heavner JE. Lumbosacral epiduroscopy finding predict treatment outcomes. Pain Practice. In press 29Jul13
5. Bosscher HA, Heavner JE. Diagnosis of the vertebral level from which low back or leg pain originates. A comparison of clinical evaluation, MRI and epiduroscopy. Pain Practice. 12: 506-512, 2012.


## **Hemmo Bosscher,** MD, FIPP

**BIOGRAPHICAL SKETCH**

Dr. Hemmo Bosscher did his pain management fellowship with Dr. Racz at Texas Tech University Health Sciences in Lubbock, Texas in 2000. Dr. Bosscher has been in private practice in Lubbock since then. He has been actively involved with the FIPP. His research interest is epiduroscopy and its clinical utility. Several research papers, written with Dr. Heavner, have been published on this topic.

LECTURE

## NEW THERAPY FOR COMMON LOW BACK PAIN

**Objectives:**

- To present certain observations made using epiduroscopy in the evaluation and treatment of patients with low back pain.
- To propose an alternative pathophysiological mechanism of low back pain consistent with these observations.
- To introduce a new approach to the treatment of low back pain based on this theory.

**Key Points:**

- In many patients with low back pain, pain can be reproduced at a very specific site in the spinal canal.
- Pain reproduced at this site is referred to as common low back pain in this presentation.
- Among other sensitive tissues in the epidural space, a peridural membrane, possibly with perostium or synovium like properties, may play a critical role in the pathophysiology of common low back pain.
- Removal, desensitization or denervation of this membrane may give profound relief of back and leg pain.
- Epiduroscopy can perform this task in patients without a narrow lateral recess.
- Even very mild lateral recess stenosis may give obstruction to advancement of the endoscope and prevent proper treatment.
- A new procedure is introduced which may treat common low back pain in patients with a narrow lateral recess as well.

# **Jan Peter Warnke,** MD

### BIOGRAPHICAL SKETCH

Prof. Dr. Jan-Peter Warnke is currently Chief of Neurosurgery for The Paracelsus Clinic Group in Germany. He is appointed Professor for "Medicine-Ethics-Finances" at the University Zwickau, Germany. He held a post as Professor for Neurosurgery at the Gutenberg-University in Mainz, Germany.

Professor Warnke was appointed Chief of Neurosurgery for the Paracelsus Clinic Group for Germany in 1993, at age 33. He has developed the Paracelsus Clinic after the Wall fell from a community hospital to a centre of excellence, not only from a medical standpoint but also financially. Under his leadership, relations to universities throughout Europe have increased offering students an incite to practical medicine with state of the art equipment As a result, Paracelsus has been vaulted to an internationally recognized standard for neurosurgery in Europe, and for rare diseases as Leptomengeopathy and its variations, as Perineural Spinal Cysts (Tarlov Cysts) in the World.

Prior to joining Paracelsus Private Hospital Group, Jan-P. Warnke was a practicing Neurosurgeon and Assistant Professor in Neurosurgery at RWTH Aachen Germany, Rheinisch-Westfälische Technische Hochschule. His education is truly international including residencies in Germany, Hungary and Great Britain.

His interest in Neurosurgery focuses on Endoscopic Methods in Neuro-Oncology and the Neuro-Endoscopy of the spinal Subarachnoidal space.

LECTURE

## TARLOV CYSTS PLUS ALTERNATIVE TO KYPHOPLASTY AND VERTEBROPLASTY

**Objectives**

Upon completion of this presentation attendees will be able to discuss:

- Lumbar-sacral subarachnoidal space is approached by an endoscopic technique: Thecaloscopy
- Current techniques, practical use of the method for diagnostic and therapeutic reasons
- Most common pathologies of the leptomeningeals sheets (Arachnoid&Pia mater)
- Interventional options for treatment of Arachnoiditis
- Pathophysiology of Perineural Cysts, Cyst-related Pain-Syndroms and their relation to Arachnoiditis.
- Interventional options for Perineural Cysts.
- Basic knowledge about the technique and clinical results of the MIN treatment of osteoporotic fractures of the lumbar spine using the KIVA – System.

**References**


- Trough the sacral hiatus sectioning of filum terminale externum using a rigide endoscope a cadavar study, Mourgela S,Anagnostopoulou S, Sakellaropoulos A., Koulousakis A, Warnke J-P J Neurosurgical Sciences [Epub ahead of print]
- Therapieoptionen bei lumbaler adhäsiver Arachnoiditis, Warnke J-P, Mourgela S., Nervenarzt. 2007 Jun 22; [Epub ahead of print] German., PMID: 17581733 [PubMed - as supplied by publisher]
- Percutaneous approach for the thecaloscopy of the lumbar subarachnoidal space J.-P. Warnke, X. Di, S. Mourgela, A. Nourusi, M. Tschabitscher, Minim Invas Neurosurg 2007 Jun;50 (3):129 - 31[Kategorie B]
- Endoscopic treatment of lumbar arachnoiditis, J.-P. Warnke, S. Mourgela, Minim Invas Neurosurg 2007: 50: 1 - 6 [Kategorie B]
- Thecaloscopy Part III: First Clinical Applications, J. P. Warnke, H. Köppert, B. Bensch-Schreiter, J. Dzelzitis, M. Tschabitscher, Minim Invas Neurosurg 2003 46: 94 - 99
- Thecaloscopy Part II: Anatomical Landmarks, J. P. Warnke, S. Mourgela, M. Tschabitscher, J. Dzelzitis, Minim Invas Neurosurg 2001; 44:181 - 185
- Thecaloscopy Part I: The Endoscopy of the Lumbar Subarachnoid Space, Part I:Historical Review and Own Cadaver Studies, J. P. Warnke, M. Tschabitscher, A. Nobles, Minim Invas Neurosurg 2001; 44: 61 - 64

## **Ricardo Ruiz-López,** MD, FIPP

**BIOGRAPHICAL SKETCH**
Ricardo Ruiz-Lopez, MD, Neurosurg., FIPP, is Director of Barcelona Spine and Pain Institute (Institut de Columna Vertebral/Clínica del Dolor de Barcelona), Executive Member of the Board of Directors of Hospital Delfos (Barcelona) and CEO Project for Barcelona Spine & Surgery Clinic. After receiving his MD degree from the University of Madrid in 1975 and the Board of Neurosurgery in 1980, he founded in 1986 Clínica del Dolor de Barcelona. His major areas of scientific interest are the Neurosurgery of Pain, the Interventional Techniques and Surgery for Spinal Chronic Pain Conditions, and the development of new organizational models for patient care. Editor of a number of medical journals, he has published extensively on Pain Management and Interventional Pain Therapies. He is a Founding Member of various national and international societies on the pain field, and Visiting Professor and Lecturer at European and American Universities. Immediate Past President of the World Institute of Pain 2011-2013, President of the Catalan Pain Society 2006-2010, and Permanent Trustee of the World Institute of Pain Foundation.

**LECTURE**
### RF – NEW IDEAS UPDATE

## **Jose de Andres,** MD, FIPP

**BIOGRAPHICAL SKETCH**
Current Positions and responsabilities:
- Professor of Anaesthesiology of the Valencia University School of Medicine.
- Chairman of Anaesthesia , Critical Care and of the Multidisciplinary Pain Management Departments in the Valencia University General Hospital (Valencia, Spain).
- European Society of Regional Anesthesia and Pain Therapy (ESRA): General Secretary, Chairman of the scientific committee
- President of "Foundation for study and treatment of pain of the Valencian community". Valencia.Spain.

He contributed in the area of pain management and neuromodulation with chapters and collaborations in books of the speciality, and articles published in international and national journals. Reviewer on editorial boards of national and international journals in the field of Regional Anaesthesia and Pain Medicine.:Associate editor in the Journal "Regional Anesthesia and Pain Medicine". Editor of "Pain Practice". Associate Editor of "The Clinical Journal of Pain". Associate Editor of "European Journal of Pain-Supplements". Guest Reviewer in several international journals.

**LECTURE**
### BASIC ANATOMY FOR NEUROMODULATION TECHNIQUES

**Objective**
Spinal neuromodulation procedures have been used for over 30 years to treat different pain conditions, and has been proved effective in somatic,neuropathic, mixed or sympathetically mediated pain states.
The final effect of these therapies is influenced by the morphology of the different structures that lay between them and the axons, their thickness and electric conductivity.
After completing this lecture, participants should be able to:
- Recognize all the anatomic structures that are important in the clinical effect, such as the fatty

tissue inside the epidural space, membranes of dural sac, cerebrospinal fluid (CSF), spinal cord, nerve roots and rootlets.

- The distribution of epidural fat is variable along the extent of the spinal canal. At cervical level, there is little amount of adipose tissue and sometimes we can find a small posterior deposit at lower cervical levels (C7 to T1). Usually we do not find fat deposits at anterior or lateral regions.

At thoracic epidural level, it has been described a broad posterior band with "indentations" 16 that is continuous in the middle-upper thoracic region (T1-7), and discontinuous in the lower thoracic region (T8-12).

At lumbar level, the epidural fat is located in the anterior and posterior epidural space, although not inter-connected. The posterior epidural fat is more abundant around the discs of L3-4 and L4-5

- The membranes surrounding the spinal cord form the dural sac with cylindrical shape and variable thickness.
- The dura mater is the most external layer of the dural sac and is responsible for 90% of its total thickness. This fibrous structure, although permeable, confers mechanical resistance. The remaining internal 10% of the dural sac is formed by the arachnoid lamina, which is a cellular lamina that adds very little extra mechanical resistance (1). The arachnoid lamina is semi permeable, and influences the passage of substances through the dural wall. The arachnoid limits the diffusion of injected drugs to the epidural space. Dura mater has a thickness of about 0.35 mm (0.25 to 0.40) (2) that it is fairly constant along the spinal cord, with some small variations. It is comprised of concentric dural laminas containing fibers distributed at random in all spatial directions (3-6). The arachnoid lamina has a thickness of 50-60 microns (μm). Its barrier effect is due to arachnoid cells strongly bonded by specific membrane junctions. This cell layer represents a small thickness of about 10-15 μm.
- The volume of the CSF determines the effectiveness of stimulation at different levels, and has obvious relevance as a determinant of dilution of drugs in the subarachnoid space . There are oscillations of the CSF pressure which are synchronized with intracranial arterial pulsations. These changes of pressure could help the dilution of drugs injected in the CSF to reach a homogenous concentration around nerve roots and spinal cord.
- The relationship between CSF volume and nerve root at each vertebral level is an unknown subject that may be of interest when we consider the concentration of drugs in CSF and the amount of nerve tissue that has to cross. In the cadaver it is possible to measure the volume of each nerve root, but more difficult de amount of CSF related to each nerve root.
- Lumbar subarachnoid ligaments. These ligaments anchor the lateral, anterior and posterior sides of the spinal cord to the dural sac. A number of 21 dentate ligaments hold from each side of the spinal cord to the dural sac. These subarachnoid ligaments do not limit free flow of CSF in most of patients, due to the discontinuous characteristics along the dural sac.
- Conductivity of spinal structures. Cerebrospinal fluid (CSF) is the most conductive intraspinal element followed by nerve fibers of white matter. Therefore, an electrical field that reaches the CSF has the greatest potential to be conducted to nearby structures. Of the structures within the cord, the longitudinal white matter demonstrates the greatest conductivity. Transverse white matter, on the other hand, is much less conductive. Gray matter falls somewhere between. Epidural fat on the contrary, demonstrates very low conductivity.Dura mater also demonstrates low conductivity, but because it is so thin, it usually does not present significant resistance. Vertebral bone is the least conductive, insulating structures outside it from the electrical field.
- Stimulation of the dorsal root ganglion (DRG) can be obtained if the electrode is placed laterally in the spinal canal. It can be difficult to differentiate from stimulation of dorsal root entry-zone and/or dorsal horn. An early recruitment of the segmentary motor fibers (from spread of the current through the CSF to the anterior roots) associated with sensory paresthesias can also be indicative of stimulation of the root filaments. Stimulation of the

longitudinal fibers of the dorsal columns is characterized by paresthesias occurring in areas of the body caudal to the level of the electrode; the paresthesias are always ipsilateral to the electrode.

- The stimulation intensity increases substantially when the patient changes from a standing or sitting to a supine position. This can be explained by changes in the spinal cord and the thickness of the dorsal CSF space. The changes in threshold can be in the magnitude of 1V to 2V and can be responsible for either severe jolting or complete loss of stimulation.

## **Ira B. Fox,** MD, FIPP

**BIOGRAPHICAL SKETCH**

IRA FOX, M.D., DABPM, FIPP, ABIPP is the Founder of Anesthesia Pain Care Consultants, located in Tamarac, Fla. He is Honorary Treasurer of the World Institute of Pain. Dr. Fox is an Interventional Pain Anesthesiologist who serves as a Governing Board Member and Medical Director of the Surgery Center of Fort Lauderdale.

Fluent in both English and Spanish, Dr. Fox is a lifetime member of the American Society of Interventional Pain Physicians. He is also a member of the American Academy of Pain Medicine and the American Academy of Disability Evaluating Physicians.

Dr. Fox earned his undergraduate degree from Tulane University with a B.S. in Chemistry, and his M.D. from U.A. of Guadalajara, Mexico. He also attended the State University of NY at Stony Brook, Queens Hospital Center, an affiliate of Long Island Jewish Hillside Medical Center. His internship at Monmouth Medical Center focused on internal medicine. He completed his residency in anesthesiology at Monmouth Medical Center and pursued additional training in Pediatric Anesthesia and Critical Care Medicine at Monmouth. He was honored to serve as Chief Resident of Anesthesia at Monmouth Medical Center.

**LECTURE**

### TARGETING L5 FOR SI JOINT PAIN: CLINICAL EXPERIENCE

Lower back pain in the sacroiliac area (below the level of the L5 vertebra) is one of the most common patient complaints. Although the painful area appears to be anatomically located at the SI joint, one must realize there are other vital structures that can produce pain in that region. This "high traffic area" approximately 3x10cm in size, includes the SI joint itself as well as the L5 nerve root, L5-SI disc, and the L5-Si, facet joint. Despite maneuvers used on physical exam diagnosing the etiology of pain in the SI area can be challenging. Studies have linked pain on palpation medial to the posterior superior iliac spine with an SI joint pain generator. Other studies have reported referral pain patterns associated with SI joint arthropathy, however, these patterns can also be seen with L5 radicular pain as well as facetogenic pain at L4-5 and L5-SI.

Studies indicate the prevalence of SI joint pain to be between 10% - 30%. Local anesthetic blocks under fluoroscopic guidance can produce extensive false positives making the diagnosis very difficult. I believe that more attention needs to be placed on the close proximity of the L5 nerve root as it leaves the foramen and extends distally towards the SI area. Therefore, palpation to this region maybe more related to a possible L5 nerve root inflammation distally. Fluoroscopic images especially in patients with L5 foraminal stenosis have been saved and studied revealing contrast to spread toward the area of the SI joint itself. This is also seen in patients with epidural fibrosis at the junction of the L5 nerve root and ventral epidural space thus forcing contrast extra foraminally.

Retrospective evaluation of hundreds of patient in my practice have given enough evidence that this should be studied further and more formally. The problem is even more complicated when we consider that this pain may have multiple generators, each contributing partially to the presenting symptoms.

1. Maigne JY, Aivakiklis A, Pfefer F. Results of sacroiliac joint double block and value of sacroiliac pain provocation test in 54 patients with low back pain. Spine 1996; 21:1889-1892.
2. Manchikanti L, Singh V, Pampati V, Damron K, Barnhill R, Beyer C, Cash K. Evaluation of the relative contributions of various structures in chronic low back pain. Pain Physician 2001; 4:308-316.
3. Irwin RW, Watson T, Minick RP, Ambrosius WT. Age, body mass index, and gender differences in sacroiliac joint pathology. Am J Phys Med Rehabil 2007; 86:37-44.
4. Merskey H, Bogduk N. Classification of chronic pain. In: Merskey H, Bogduk N, eds. Descriptions of Chronic Pain Syndromes and Definition of Pain Terms, 2nd ed. IASP Press: Seattle, WA; 1994; 180-181.
5. Hansen HC, McKenzie-Brown AM, Cohen SP, Swicegood JR, Colson JD, Manchikanti L. Sacroiliac joint interventions: a systematic review. Pain Physician 2007; 10:165-184.
6. McKenzie-Brown AM, Shah RV, Sehgal N, Everett CR. A systematic review of sacroiliac joint interventions. Pain Physician 2005; 8:115-125.
7. Cohen SP. Sacroiliac joint pain: a comprehensive review of anatomy, diagnosis and treatment. Anesth Analg 2005; 101:1440-1453.
8. Boswell MV, Trescot AM, Datta S, Schultz DM, Hansen HC, Abdi S, Sehgal N, Shah RV, Singh V, Benyamin RM, Patel VB, Buenaventura RM, Colson JD, Cordner HJ, Epter RS, Jasper JF, Dunbar EE, Atluri SL, Bowman RC, Deer TR, Hansen HC, Staats PS, Smith HS, Burton AW, Kloth DS, Giordano J, Manchikanti L. Interventional techniques: evidence-based practice guidelines in the management of chronic spinal pain. Pain Physician 2007; 10:7-111.
9. Bogduk N. Sacroiliac joint blocks. In: Practice Guidelines for Spinal Diagnostic and Treatment Procedures, 1st ed. International Spine Intervention Society; 2004, pp 66-86.
10. Fortin JD, Dwyer AP, West S, Pier J. Sacroiliac joint: pain referral maps upon applying a new injection/arthrography technique. Part I: asymptomatic volunteers. Spine 1994; 19:1475-1482.
11. Slipman CW, Jackson HB, Lipetz JS, Chan KT, Lenrow D, Vresilovic EJ. Sacroiliac joint pain referral zones. Arch Phys Med Rehabil 2000; 81:334-338.

## **Gabor B. Racz**, MD, DABPM, ABIPP, FIPP

**LECTURE**

### TARGETING L5 FOR SIJ PAIN - TECHNIQUE DETAILS

Sacroiliac joint innervation is primarily in superior posterior inferior and middle of the post SI joint. Meticulous work of Joe Fortin failed to identify nerves and receptors to the interior portion of the SI Joint. Most practitioners focus on the innervation originating from the sacral neural formina. Clinical experiences show that multiple burnings by the use of radiofrequency often is unsuccessful in relieving pain originating from the SI Joint. Pain often originates from the lower lumbar spine especially with lower lumbar fusions. Multiple practitioners including Joe Fortin of Fort Wayne, IN have been able to anatomically point to a significant nerve originating from the L5 nerve root. On the clinician side, scarring in the vicinity of L5-S1 has resulted in resolution of the pain by Lysis of Adhesions especially of the L5 nerve root. Retrograde electrode placement of neuromodulation has similarly been able to identify and relieve pain where radiofrequency has failed. The issue of pain relief is not just necessarily coming from bigger and more lesionings, but also identifying the source of pain. Following lumbar fusion, the pelvis still needs to play a role in weight bearing and in the absence of motion in lumbar area, painful laxity of the SI joint may develop. The above observations should also be supplemented by additional consideration such as pain originating from the cluneal nerves, myofascial gluteus medius that often is diagnosed as SI joint mediated pain. Piriformis Syndrome, aberration of the relationship between

the Piriformis muscle and the sciatic nerve either by the Piriformis muscles actually perforate the sciatic nerve, requiring diagnosis followed by surgical repair. The purpose of the panel is to address this multi-focal nature of sacroliliac joint pain, myofascial pain coming from the quadratus lumborum muscle and even back pain originating from the psoas muscle. The emphasis on examination and recognition of possible explanations, therapies are essential for the treatment of pain and treatment labeled as SI Joint pain; therefore discussion of this topic is hugely important.

## **Eric Cosman, Jr.,** PhD

### BIOGRAPHICAL SKETCH

In his role as Scientific Director, Eric Cosman, Jr, conducts research on the physical and biological mechanisms of Radiofrequency (RF) in pain management, as well as their translation into clinical practice. Among his academic publications are seminal reports on the electric and thermal effects of RF and Pulsed RF, including the discovery of Pulsed RF heat flashes [9] and characterization of Bipolar RF heat lesion geometry [4]. Dr. Cosman is a regular speaker at interventional pain congresses and had authored numerous textbook chapters on radiofrequency physics [1,2,3,7,8]. He is also the chief designer of the G4 four-electrode radiofrequency generator.
Dr. Cosman received bachelors, masters, and doctoral degrees in Electrical Engineering and Computer Science at the Massachusetts Institute of Technology (MIT). His doctoral research focused on the inference of neural networks in humans based on functional neuroimaging data, such as fMRI, MEG, and EEG. His work was conducted in collaboration with the Surgical Planning Lab (SPL) and the Brigham and Women's Hospital and with the Athinoula A. Martinos. Center for Biomedical Imaging at the Massachusetts General Hospital (MGH).

### LECTURE

### RF PHYSICS, SAFETY LESION SIZE/TISSUE HETEROGENEITY

**Lecture Overview**

An understanding of the physics of radiofrequency (RF) can improve its clinical application and is critical to understanding, developing, and proving the efficacy of new applications of RF in pain management. Even after 60 years of radiofrequency's use in medicine, the last decade has seen the introduction of new RF treatment modalities like Pulsed RF and Bipolar RF, an expansion of target structures for RF in axial and peripheral anatomy, and substantial advances in RF biophysics.
Upon completion of this lecture, attendees will be able to discuss:

- The electric, thermal, and biological effects of continuous/thermal RF and pulsed RF (PRF) in pain management, including the latest research results.
- The physical meaning of RF generator readings and how to apply them clinically
- Thermal lesion size for monopolar and bipolar RF

**Key Points**

- Physicians have almost 60 years of experience using radiofrequency to create controlled, reproducible thermal lesions in the central and peripheral nervous system for the treatment of chronic facet joint pain, sacroiliac joint pain, discogenic pain, trigeminal neuralgia, neuropathic pain, peripheral pain, cancer pain, deafferentation pain, and movement disorders.
- Strong electric fields and current densities near the uninsulated tip of radiofrequency electrodes induce tissue heating, and the resulting thermal distribution is influenced by heat-conduction and blood-flow dynamics.
- Voltage, current, and power are measures of RF generator output. Impedance and temperature characterize the physical state of the tissue and RF electrode.
- Thermal lesion geometry is a function of electrode size, lesion time, and lesion temperature.
- Bipolar RF, in which current passes between two nearby active electrodes, is expanding treatment options by enabling more conformal and larger lesion geometry than does standard, monopolar RF.

- By delivering RF in intermittent bursts, pulsed RF exposes tissue to stronger electric fields with less average heating than continuous RF. Highly local "heat flashes" are present at points of high curvature on a PRF electrode.
- Emerging evidence from physical modeling, electron microscopy, electrophysiological measurement, and biological assay characterize biological effects of pulsed RF on nerves that may explain PRF's clinical effect.

**References**


- Cosman ER Jr, Gauci CA, Cosman ER Sr. The Physics of Radiofrequency and Pulsed Radiofrequency. In: Charles Gauci, ed. Manual of RF Techniques (3rd Edition). 2011.
- Cosman ER Jr, Gonzalez CD. Bipolar Radiofrequency Lesion Geometry: Implications for Palisade Treatment of Sacroiliac Joint Pain. Pain Practice 2011; 11(1): 3-22.
- Erdine S, Bilir A, Cosman ER Sr, Cosman ER Jr. Ultrastructural changes in axons following exposure to pulsed radiofrequency fields. Pain Practice 2009; 9(6): 407-417.
- Cosman ER Sr, Cosman ER Jr, Bove G. Blockage of Axonal Transmission by Pulsed Radiofrequency Fields. In: Proceedings of the Society of Neuroscience Conference; 2009 Oct 17-21; Chicago, IL, USA.
- Cosman ER Sr, Cosman ER Jr. Radiofrequency Lesions. In: Andres M. Lozano, Philip L. Gildenberg, and Ronald R. Tasker, eds. Textbook of Stereotactic and Functional Neurosurgery (2nd Edition). New York, NY: McGraw-Hill; 2009.
- Cosman ER Sr, Cosman ER Jr. The Physics of Pulsed Radiofrequency. In: Charles Gauci, ed. Manual of RF Techniques (2nd Edition). Amsterdam: Flivo Press; 2008.
- Cosman ER Jr, Cosman ER Sr. Electric and Thermal Field Effects in Tissue Around Radiofrequency Electrodes. Pain Medicine 2005; 6(6): 405-424.


## **Ludger Gerdesmeyer,** MD, PhD, FIPP

**BIOGRAPHICAL SKETCH**

Chairman orthopaedic/trauma Dept. of the University of Kiel / Germany

**LECTURE**

### EPIDURAL ADHESIOLYSIS STUDIES

**Objective**

The technique for lysis of epidural adhesions to treat lumbosacral radicular and/or low back pain was described more than 20 years ago. Today it is used worldwide in interventional pain practice, it is minimally invasive and is relatively easy to perform following specific interventional pain training courses.

The fundamental premises on which the technique is based are that 1. adhesions are present in the epidural cavity of patients with low back pain and/or radicular pain, 2. the adhesions prevent epidurally injected medication from reaching intended targets, 3. the adhesions contribute to the pathogenesis of pain by eg immobilizing nerve roots, 4. pain relief can be obtained by removing barriers that prevent drugs from reaching the target site and prevent the free movement of nerve roots.

The previously described technique is performing an epidurogram initially to identify filling defects indicative of epidural scarring, followed by advancing a catheter into the scar, injecting hyaluronidase to facilitate adhesiolysis and normal saline to hydrostatically separate adhesions and injecting anti-inflammatory and analgesic drugs and hypertonic saline to treat pain, inflammation and edema.

Since the technique was introduced, it has been modified in various ways, but the basic approach has remained unchanged.

Many studies have been done to evaluate the safety and efficacy of the procedure. The studies, as well as extensive clinical experience, attest to the efficacy as well as the safety of using epidural neurolysis to treat radicular and low back pain. Nevertheless, there is still demand for more evidence, especially from studies meeting high standards of evidence based medicine.
To show the efficacy of the lysis procedure a prospective randomized placebo controlled trial was performed. This talk will show the outcome of this RCT, the recent evidence and will give an overview of the available outcome studies which support the findings of the RCT.
Based on the findings of the latest RCT study as well as other studies it ´s believed the minimally invasive percutaneous adhesiolysis procedure should be the first choice treatment option for patients with chronic lumbosacral radicular pain.

## **Maarten van Kleef,** MD, FIPP

**BIOGRAPHICAL SKETCH**
Prof. Dr. Maarten van Kleef FIPP is an anesthesiologst/pain specialist and head of the sub-department Pain management of the University Hospital of Maastricht the Netherlands.
He has also an affiliation with the Free university of Amsterdam as a part-time Professor of Pain.
His main subject is research and education in Pain.

**LECTURE**
### CERVICAL PAIN AND CERVICAL BRACHALGIA

Spinal pain in this paper is divided in cervical, thoracic and lumbar pain and differs between facet pain and radicular pain. Recommendations formulated are based on "Grading strength of recommendations and quality of evidence in clinical guidelines" described by Guyatt et al.,1 and adapted by van Kleef et al.2
Cervical pain: Cervical pain is located in the area between the base of the skull and the first thoracic vertebra. In the general population, up to 30% to 50% of adults will experience cervical pain in any given year.3 History taking and physical examination should be based on distinguishing between facet related pain and radicular cervical pain, location of the disease level, and exclusion of risk factors for serious underlying pathology (red flags). Cervical radicular pain must be distinguished from cervical radiculopathy. Radiculopathy may be excluded with additional neurological testing. In the latter disorder there is an objective loss of sensory and/or motor function.4
More than 50% of patients presenting to a pain clinic with chronic neck pain suffer from facet related pain. The most common symptom is unilateral pain without radiation (fig. 1). Rotation and retroflexion are frequently painful or limited. For facet related cervical pain, interventional pain management techniques including intra-articular steroid injections, medial branch blocks, and radiofrequency treatment, may be considered.5 At present, there is no evidence to support cervical intra-articular corticosteroid injection. When applied this should be done in the context of a study. Therapeutic repetitive medial branch blocks, with or without corticosteroid added to the local anesthetic, result in a comparable short-term pain relief (2B+)Radiofrequency treatment of the ramus medialis of the cervical ramus dorsalis (facet) may be considered. The evidence to support its use in the management of degenerative cervical facet joint pain is derived from observational studies (2C+). 5
Pain extending into adjacent regions is defined as radiating cervical pain. The annual incidence rate for cervical radicular pain is estimated to be 83 per 100,000 population.6 Cervical radicular pain is characterized by pain in the neck that radiates over the posterior shoulder into the arm and sometimes into the hand. The radiation follows a segment-specific pattern.6 For subacute cervical radicular pain, the available evidence on efficacy and safety
supports a recommendation (2B+) of interlaminar cervical epidural corticosteroid administration. A recent negative randomized controlled trial of transforaminal cervical epidural corticosteroid

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administration, coupled with an increasing number of reports of serious adverse events, warrants a negative recommendation (2B-). Pulsed radiofrequency treatment adjacent to the cervical dorsal root ganglion is a recommended treatment for chronic cervical radicular pain (1B+) (fig. 2). When its effect is insufficient or of short duration, conventional radiofrequency treatment is recommended (2B+). In selected patients with cervical radicular pain, refractory to other treatment options, spinal cord stimulation may be considered. This treatment should be performed in specialized centres, preferentially study related.4

**References**

Van Zundert et al: evidence based guidelines interventional painmedicin Wiley 2010

## **Chris Wells,** MD, MB, CHB, LRCP, MRCS, LMCC, FRCA, FIPP

**BIOGRAPHICAL SKETCH**

Dr Chris Wells is a consultant anaesthetist who has specialised exclusively in Pain Medicine for 31 years. He lives and works in Liverpool UK. He is President Elect of EFIC, the European Federation of Pain Specialties, and is a Trustee of the WIP Foundation.
He has studied the use of Botulinum Toxin in Pain Medicine since 1996.

**LECTURE**

### BOTULINUM TOXIN, PROPERTIES AND USE IN PAIN MEDICINE

**Objectives**

Upon completion of this presentation attendees will be able to discuss
- The history of therapeutic use of Botulinum Toxin (BT)
- The pharmacological properties of BT
- The various types of BT and their differing properties
- Possible modes of action in pain relief
- The therapeutic indications for use in pain conditions
- Expected outcomes of treatments
- Limitations, complications and types of treatment
- Future direction in use of BT

**Key Points**

· C Botulinum identified in 1897, toxin purified in 1928 and first used medically in 1970's for strabismus and blepharospasm. Used cosmetically in 1980's.
· First use for pain in 1990's for torticollis and headache. Also licensed for other muscle spasms including cerebral palsey. Often used off label. Global market approaching $15 billion.
· Various different preparations available, with different potencies and properties. Doses not synonymous across groups. eg Botox, Dysport, Xeomin, Myobloc
· Few adverse events in correct application and dosage. Local pain at injection site, flu-like symptoms, and unwanted weakness. Potential lethal dose 3000 units of Botox means dose limited to 360u max in 12 weeks.
· Widely used for therapeutic indications including cervical dystonia (spasmodic torticollis) blepharospasm (excessive blinking), severe primary axillary hyperhidrosis, strabismus,
· achalasia, migraine and other headache disorders. Off label use for myofascial pain, piriformis syndrome, focal neuropathies ( including diabetic and phn), anal fissure, vaginismus, movement disorders, dystonias, and spinal cord injury related pain.

**References**

- Kukreja R, Singh BR (2009). "Botulinum Neurotoxins: Structure and Mechanism of Action". Microbial Toxins: Current Research and Future Trends. Caister Academic Press. ISBN 978-1-904455-44-8.

- Frank J. Erbguth (2004). "Historical notes on botulism, Clostridium botulinum, botulinum toxin, and the idea of the therapeutic use of the toxin". Movement Disorders ( John Wiley & Sons on behalf of the Movement Disorder Society) 19 (S8): S2–S6. doi:10.1002/mds.20003. PMID 15027048.
- Dodick, DW; Turkel, CC, DeGryse, RE, Aurora, SK, Silberstein, SD, Lipton, RB, Diener, HC, Brin, MF, PREEMPT Chronic Migraine Study, Group (2010 Jun). "OnabotulinumtoxinA for treatment of chronic migraine: pooled results from the double-blind, randomized, placebo-controlled phases of the PREEMPT clinical program". Headache 50 (6): 921–36. doi:10.1111/j.1526-4610.2010.01678.x. PMID 20487038.
- Brin MF, Lew MF, Adler CH, Comella CL, Factor SA, Jankovic J, O'Brien C, Murray JJ, Wallace JD, Willmer-Hulme A, Koller M (22 October 1999). "Safety and efficacy of NeuroBloc (botulinum toxin type B) in type A-resistant cervical dystonia". Neurology 53 (7): 1431–1438. ISSN 0028-3878. PMID 10534247.
- Ranoux D, Attal N, Morain F, Bouhassira D (September 2008). "Botulinum toxin type A induces direct analgesic effects in chronic neuropathic pain". Annals of neurology 64 (3): 274–83. doi:10.1002/ana.21427. PMID 18546285.
- Naumann M; So Y; Argoff CE; Childers, M. K.; Dykstra, D. D.; Gronseth, G. S.; Jabbari, B.; Kaufmann, H. C. et al. (May 2008). "Assessment: Botulinum neurotoxin in the treatment of autonomic disorders and pain (an evidence-based review): report of the Therapeutics and Technology Assessment Subcommittee of the American Academy of Neurology". Neurology 70 (19): 1707–14. doi:10.1212/01.wnl.0000311390.87642.d8. PMID 18458231.
- FDA Gives Update on Botulinum Toxin Safety Warnings; Established Names of Drugs Changed, FDA Press Announcement, August 3, 2009
- Foran PG; Mohammed N; Lisk GO; Nagwaney, S; Lawrence, GW; Johnson, E; Smith, L; Aoki, KR et al. (2003). "Evaluation of the therapeutic usefulness of botulinum neurotoxin B, C1, E, and F compared with the long lasting type A. Basis for distinct durations of inhibition of exocytosis in central neurons". J. Biol. Chem. 278 (2): 1363–71. doi:10.1074/jbc.M209821200. PMID 12381720.


## **Aaron Calodney,** MD, FIPP

### BIOGRAPHICAL SKETCH

Aaron Kenneth Calodney, MD is Past President of the Texas Pain Society. He currently sits on the Board of Directors of the American Society of Interventional Pain Physicians (ASIPP. Dr. Calodney is board-certified in Anesthesiology and carries subspecialty certification in Pain Management through the American Board of Anesthesiology. Dr. Calodney earned his medical degree from the University of Missouri School of Medicine and completed a family medicine internship at St. Joseph's Hospital in Syracuse, New York. His residency in anesthesiology and subsequent interventional pain management fellowship was completed at the University of Texas Health Science Center at Houston. He subsequently completed a fellowship in pediatric anesthesia at the Denver Children's Hospital. With particular interest in spine and special interests including neuromodulation and intrathecal drug delivery, biological treatment of the painful degenerative disc, peripheral nerve injury and radiofrequency ablation, Dr. Calodney has presented and published many articles and textbook chapters. He is actively involved in clinical research and has delivered over 250 invited lectures in the US and abroad. Dr. Calodney is a member of the American Society of Anesthesiologists, American Society of Regional Anesthesia and Pain Medicine, and many other elite medical societies. He is an author of the first Evidence Based Treatment Guidelines in Interventional Pain and Evidence Based Guidelines for the Use of Opioids published in the Pain Physician journal and on the National Guideline Clearinghouse.

### LECTURE
### NEUROMODULATION

## **Adnan A. Al-Kaisy,** MD, FIPP

**LECTURE**
### HIGH FREQUENCY SPINAL CORD STIMULATION IN THE MANAGEMENT OF AXIAL BACK PAIN

## **Juan Carlos Flores,** MD, FIPP

**BIOGRAPHICAL SKETCH**
Director of CAIDBA (EPP Award) Pain Center, Professor of Anatomy of La Plata School of Medicine, Buenos Aires Province, Argentina. And Chairman Latin American Section World Institute of Pain
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Jefe Sección Medicina del Dolor Clínica San Camilo
Miembro del Comité Editorial Pain Practice, Rev Españ del Dolor, Rev Uruguaya de Anestesiología y Reanim y Rev Argentina de Anestesiología
Past President Argentinian Federation of Anesthesia, Analgesia and Reanimation
Past President Pain Foundation (Fundación Dolor) Argentina
Past Director Carrera de Médicos Especialistas en Anestesiología de la Universidad de Buenos Aires
Past Director del Curso Universitario de Expertos en Medicina del Dolor y Cuidados Paliativos de la Fundación Dolor y la Universidad de Buenos Aires

**LECTURE**
### GUIDELINES FOR RADIATION SAFETY

**Objectives**:
Upon completion of this presentation attendees will be able to discuss
- What are and how are generated the ionizing radiation?
- Which are their biological effects?
- Which are the levels of exposition to X Rays of people that work in operating room?
- What kind of measures can we take to minimize our exposition during pain procedures?
- Consideration to take account during workshops to protect trainees, technicians and instructors
- Basic knowledge that must manage the pain expert in pain procedures with X Rays
- Should Radiation Safety management behavior or performance be taken into account in the certification program?
- How much mili-sievert or another equivalent exposes your body every minute when you are using pulsed mode o continuous mode?
- The dosimeter must be used? where?

**Key Points**
- What are X-Rays and how are they artificially generated?
- Radiation types and origin
- What type of radiation and risk of contamination we must know and protect of
- Biological effects of radiation
- Which are the shielding or protective resources to decrease patient and staff exposure to X Rays

- Levels of exposure. Work-related radiation measurement
- Criteria, check list, and rules before use X-Rays
- Knowledge of anatomy and radiology as a tool to decrease radiation exposition.
- What general principles could include Guidelines for Radiation Safety?
- Must we use specific recommendations, curricula and evaluation about Radiation Safety to teach during education and training process?
- Considering the place that pain procedures with images have reached as a primary tool for managing refractory pain: should WIP and related agencies promote this type of guidelines or standard of care about safety?
- Write and Keep with every patient effective monitoring program and all essential elements ensure that staff personnel in X-ray imaging are adequately and acceptably protected

**References**


1. National council of radiation protection and measurements: recommendations on limits for exposure to ionizing radiation. NCRP Report N 91 Washington DC 1987
2. International commission on radiological protection (ICRP): Radiation protection. ICRP Publication N 26 Oxford, Pergamon Press, 1977
3. Radiographic Imaging for Regional Anesthesia and Pain Management. P. Prithvi Raj, Leland Lou, Serdar Erdine, Peter S Staats, Steven Waldman. Churcill Livingstone. Chapter 1: Basic physics of Radiography; Chapter 2: Equipment used for Radiographic Imaging and Chapter 3: Radiation Safety. Churchill Livingstone. 2003.
4. Radiation safety for the Pain Specialist. Chapter 76. Howard S Smith and Scott M Fishman. 776-779. Principles and Practice of Pain Medicine. Carol A Warfield and Zahid H Bajwa. Mc Graw Hill
5. Radiat Prot Dosimetry. 2007;127(1-4):12-8. The ICRP protection quantities, equivalent and effective dose: their basis and application. Harrison JD, Streffer C.
6. J Appl Clin Med Phys. 2000 Winter;1(1):32-7. Protecting patients by training physicians in fluoroscopic radiation management. Archer BR, Wagner LK.
7. J Vasc Interv Radiol. 1994 Jan-Feb;5(1):71-84. Potential biological effects following high X-ray dose interventional procedures. Wagner LK, Eifel PJ, Geise RA.


## **Kris C. P. Vissers,** MD, FIPP

**BIOGRAPHICAL SKETCH**

K. Vissers is anesthesiologist, professor in Pain and Palliative Medicine and chairman of the Radboud University Expertise Center for Pain and Palliative Medicine at the Nijmegen Medical Centre in the Netherlands. He is President Elect and member of the Executive Board of the World Institute of Pain, Honorary Secretary of the Benelux Chapter of the World Institute of Pain.

**LECTURE**

### RECENT ADVANCES AND FUTURE PERSPECTIVES IN THE MANAGEMENT OF CANCER PAIN

**Objectives**

Upon completion of this presentation the attendees will be able to discuss

- The specific indications, the available evidence, complications and technical aspects of:
- cervical cordotomy
- celiac plexus block
- splanchnic nerve block
- plexus hypogastricus block
- lower end block

- The role of vertebroplasty or kyphoplasty for the treatment related to vertebral fractures with or without pathologic tumor invasion.
- The rationale for using intrathecal or epidural drug administration, the available evidence, potential complications, drug selection and technical aspects.
- The algorithm for treatment selection for cancer pain.

**Key Points**

- The cornerstone for the management of cancer pain is pharmacologic treatment according to the WHO pain ladder.
- Treatment outcome should be measured in terms of pain reduction but also quality of life.
- Side effects may seriously compromise the quality of life and/or limit the dose increase of medication.
- Celiac plexus and splanchnic nerve block are procedures that are documented to reduce pain and the need for opioids, moreover, these interventions can be repeated when the pain returns, without increased risk for complications or loss of efficacy.
- Cervical cordotomy is indicated for the management of, preferentially unilateral pain at the level below the dermatome C5. The potential complications justify to reserve this treatment for patients with a life expectancy of less than 1 year.
- The use of plexus hypogastricus block for patients with extensive tumors in the small pelvis was only documented in observational studies, reporting significant pain reduction in about 60% of the patients. This is a relatively safe technique
- The use of lower end block, this technique can only be considered in patients who experience pain in the small pelvis and who have lost normal bladder and/or rectal function.
- Bone metastases can be the cause of vertebral compression fractures. There is evidence that the vertebroplasty and kyphoplasty reduce pain and improve functionality. When performed by an experienced operator these procedures are relatively safe.
- The principle of intrathecal drug administration relies on the fact that the drug is administered directly at the site where the opioid receptors are present. In this way the analgesic dose can be significantly reduced and side effects are limited. This drug administration method has been documented to be efficient for the treatment of cancer pain with a significant neuropathic component.
- Epidural drug administration may be considered for a short treatment or for quick assessment of the required dosages.
- The treatment selection for patients with cancer pain should be based on the balance between efficacy and potential complications and side effects. It is imperative to exclude other causes of the pain, that may be treated by for example surgery, prior to perform an interventional pain management technique. In the case of abdominal pain the celiac plexus block and/or the splanchnic nerve block have been documented to reduce pain and the need for analgesics, thus rendering a better quality of life to the patient. These interventions may be considered prior to starting opioid treatment.

## **Raphael Justiz,** MD, FIPP

### BIOGRAPHICAL SKETCH

Dr Justiz earned a Bachelor and Masters in Sciences in Health Management from Florida International University in Miami, Florida. He received his medical doctorate from Medical college of Wisconsin in Milwaukee and completed his internship and residency in Internal medicine and Anesthesiology at the University Of South Florida College Of Medicine in Tampa. His postdoctoral fellowship in Anesthesiology and Pain Management was completed at Texas Tech University Health Sciences Center in Lubbock, Texas. Dr. Justiz remained on faculty after completing his fellowship in pain management at the International Pain Institute at Texas Tech University Health Sciences Center.

Dr. Justiz is board certified in Anesthesiology, Interventional Pain Management and Sports Medicine, with multiple board certifications in pain medicine. He is board certified in anesthesiology by the American Board of Anesthesiology and has Added Qualifications in Pain Management by the same board. He is also pain boarded by the World Institute of Pain (FIPP), and American Board of Interventional Pain Physicians (ABIPP), and boarded by the American College of Sports Medicine. Dr. Justiz is a member of numerous professional societies and associations.
Currently, Dr Justiz is the elected president and CEO of the Oklahoma Society of Interventional Pain Physicians, and is part of the guidelines writing committee for pain management for the American Society of Interventional Pain Physicians.
Dr. Justiz is also a pain management consultant/speaker for St. Jude Medical Neuromodulation Division, Anulex Technologies, and a developer of soft tissue repair products used in spinal treatments.
Dr. Justiz has published multiple book chapters and journal articles. His areas of interest include peripheral field/spinal cord stimulation and treatment of refractory head and facial pain and engages in ongoing research studies on neuromodulation for the treatment of pain.

**LECTURE**

## SPINAL STENOSIS – NEW METHODS FOR TREATMENT

**Objectives**

Upon completion of this presentation attendees will be able to discuss

- Spinal Stenosis
- Clinical Presentation
- Treatment options for Stenosis
- Minimally Invasive Lumbar Decompression
- Identify patient and workup
- How to perform MILD procedure
- Evidence
- Complications

**Key Points**

- Discuss spinal Stenosis including risk factors, epidemiology, its economic effects and clinical consequences. Look at the guidelines for determining spinal stenosis, and be able to recognize the disease process and what treatment options there are available.
- Discuss clinical presentation.
- Discuss ideal patient selection and workup.
- Discuss how minimally invasive lumbar decompression reduces pain and what mechanism are involved.
- Look at the indications, contraindications and relative contraindications involved with minimally invasive lumbar decompression.
- Discuss the different proper approach for MILD procedure. Look at the anatomical landmarks and proper imaging technique for safety. In detail define how the technique is performed including proper trajectory and access to ligamentum flavaum.
- Discuss the most recent evidence for MILD
- Recognize the common complications and practice safe techniques to avoid these complication

**References**

1. Vogt MT, Cawthon PM, Kang JD, Donaldson WF, Cauley JA, Nevitt MC. Prevalence of symptoms of cervical and lumbar stenosis among participants in the Osteoporotic Fractures in Men Study. Spine 2006 Jun 1;31(13):1445-51.
2. Kalichman L, Cole R, Kim DH, Li L, Suri P, Guermazi A, Hunter DJ. Spinal stenosis prevalence and association with symptoms: the Framingham Study. Spine J. 2009 Jul;9(7):545-50.

3. Hall S, Bartleson JD, Onofrio BM, Baker HL Jr, Okazaki H, O'Duffy JD. Lumbar spinal stenosis. Clinical features, diagnostic procedures, and results of surgical treatment in 68 patients. Ann Intern Med. 1985 Aug;103(2):271-5.
4. Tomkins CC, Dimoff KH, Forman HS, Gordon ES, McPhail J, Wong JR, Battié MC Physical therapy treatment options for lumbar spinal stenosis. J Back Musculoskelet Rehabil. 2010;23(1):31-7.
5. Brown LL. A double-blind, randomized, prospective study of epidural steroid injection vs. the mild® procedure in patients with symptomatic lumbar spinal stenosis. Pain Pract. 2012 Jun;12(5):333-41.
6. Helm Ii S, Benyamin RM, Chopra P, Deer TR, Justiz R. Percutaneous adhesiolysis in the management of chronic low back pain in post lumbar surgery syndrome and spinal stenosis: a systematic review. Pain Physician. 2012 Jul-Aug;15(4):E435-62.
7. Costantini A, Buchser E, Van Buyten JP. Spinal cord stimulation for the treatment of chronic pain in patients with lumbar spinal stenosis. Neuromodulation. 2010 Oct;13(4):275-9; discussion 279-80.

## **Sudhir Diwan,** MD, FIPP

**BIOGRAPHICAL SKETCH**

Dr. Sudhir Diwan, is recognized as a key opinion leader in the field of pain management, is the Executive Director of Manhattan Spine & Pain Medicine, New York city. Board certified in Pain Medicine and Anesthesiology, Dr. Diwan was the former Director of the Tri-Institutional Pain Fellowship Program and Division of Pain Medicine at Weill Medical College of Cornell University for 10 years, where he also served as associate professor of clinical anesthesiology at the New York Presbyterian Hospital, New York.

Dr. Diwan has published extensively in prestigious peer-reviewed medical journals and medical books on a variety of pain management topics. He is on the Editorial Board for the Pain Physician - an official journal of ASIPP, and Pain Practice – official journal of WIP. Dr. Diwan is the Examiner for the Certification Board for American Board of Interventional Pain Physicians (ABIPP) and Fellow of Interventional Pain Practice (FIPP) offered by the World Institute of Pain.

**LECTURE**

### NEUROPATHIC PAIN

Neuropathic Pain (honlapon lévő cím)

**Objectives**

Upon completion of this presentation attendees will be able to discuss

- Mechanism and symptomatic presentation of Neuropathic pain
- Pathophysiology of neuropathic pain
- The clinical presentation of mixed pain
- Why neuropathic pain is difficult to treat

**Key Points**

- First contact with a patient often results with an inadequate evaluation of the patients back pain.
- The evaluation of patients with back pain must include physical examination where different structures in the spinal canal need to be evaluated such as the disc, spinal canal content, nerve root, posterior longitudinal ligament elements, the facet joint, muscle groups, ventral lateral iliopsoas muscle spasm, and posterior element muscle groups related causes.

## **Andrea M. Trescot,** MD, FIPP

**BIOGRAPHICAL SKETCH**

Andrea Trescot, MD is past president of ASIPP, a former professor at the University of Washington in Seattle, Washington, and previous director of the pain fellowship programs at the University of Washington and the University of Florida. She graduated from the Medical University of South Carolina, with internship and residency in anesthesia at Bethesda Naval Hospital and a fellowship in pediatric anesthesia at National Children's Hospital in DC. She is a Diplomate of the American Board of Interventional Pain Physicians, a Fellow of Interventional Pain Practice. Dr. Trescot is board certified in anesthesia, pain management, interventional pain management and critical care. She was a pain clinic director in private practice for 20 years before she moved to academics. She returned to private practice, first back in Florida, and most recently in Alaska as director of the Trescot Pain Fellowship.

**LECTURE**

### IMAGING FOR INTERVENTIONAL PAIN THERAPY

For a therapy to be effective, the clinician needs to have the right diagnosis. Although the history and physical exam are critical components of the diagnostic process, imaging can confirm or refute that diagnosis, and imaging has allows the interventional pain physician to provide accurate diagnosis and treatment. As in other fields of medicine, imaging techniques have provided technologic advances in pain management. This lecture discusses the pain management indications and limitations of thermography, DEXA, fluoroscopy, CT, ultrasound, MRI, fMRI, bone scan, and PET scan, as well as the future directions of these techniques.

**Objectives**

Upon completion of this presentation, attendees should be able to discuss:

- The role of imaging in diagnosis of painful condition
- The distinction and indications for CT and MRI
- The role of fluoroscopy in diagnostic injections
- The advantages and disadvantages of fluoroscopy vs CT vs ultrasound for diagnostic and therapeutic interventions

**Key points**

- Not all imaging is the same; just like the difference between a hammer and a screwdriver, it is important to recognize the strengths and weaknesses of various imaging techniques.
- Many interventional techniques can be done by several techniques, such as fluoroscopy, CT, or ultrasound; the decision regarding which technique to choose should be based on the quality of the imaging, the risk to the patient (such as radiation exposure), and the availability of the equipment.

## **Lorand Eross,** MD, PhD, FIPP

**BIOGRAPHICAL SKETCH**

Dr. Lorand Eross is the director of Functional Neurosurgical Program and head of the Functional Neurosurgery Department at the National Institute of Neuroscience in Budapest. He is a board-certified neurologist and neurosurgeon. He got his PhD degree at Semmelweis University in 2010. His main interest is epilepsy surgery, movement disorder surgery, pain treatment, spasticity, intraoperative neuromonitoring and neuromodulation. He teaches at Semmelweis University School of Medicine and at Pazmany Peter University Faculty of Information Technology. His research activity is in vitro and in vivo electrophysiological investigational methods in epilepsy.

**LECTURE**

### NEUROSURGICAL APPROACHES TO CHRONIC PAIN MANAGEMENT

# **Miles Day,** MD, FIPP

**BIOGRAPHICAL SKETCH**

Dr. Miles R. Day is the Pain Management Fellowship Director and Professor for the Department of Anesthesiology and Pain Management at Texas Tech University School of Medicine. Dr. Day received his MD from Texas A&M University, and did his residency and fellowship at Texas Tech. He currently serves on the editorial boards of Pain Physician and Pain Practice journals.

**LECTURE**

## FACIAL PAIN AND CERVICOGENIC HEADACHE

Facial pain and cervicogenic headache can be devastating to those who experience them. In light of this, it is important for today's pain practitioner to be familiar with up-to-date diagnostic criteria for facial pain and cervicogenic headache. The pain practitioner should also be knowledgeable regarding diagnostic tools and available treatments. The International Headache Society (IHS) recently updated their diagnostic criteria for the various etiologies of facial pain as well as the diagnostic criteria for cervicogenic headache (CEH) (1). While the IHS criteria do not provide defining criteria for the features of CEH pain or its associated symptoms, the criteria established for CEH by the Cervicogenic Headache International Study Group does (2).

Part 3 of the IHS's International Classification of Headache Disorders focuses on cranial neuralgias, and central and primary causes of facial pain. Pain in the head and neck is mediated by afferent fibres in the trigeminal nerve, nervus intermedius, glossopharyngeal and vagus nerves and the upper cervical roots via the occipital nerves. Stimulation of these nerves by compression, distortion, exposure to cold or other forms of irritation or by a lesion in central pathways may give rise to stabbing or constant pain felt in the area innervated (1). A detailed history and physical exam is a must. Common diagnostic tools include MRI's and MRA's of the brain and cervical spine. Common diagnosis's include trigeminal, glossopharyngeal, and occipital neuralgia. Pharmacological treatment is usually effective and commonly includes tricyclic antidepressants (TCA's) and antiepileptic drugs (AED's). If the pain becomes refractory to these medications, interventional therapy can be implemented with percutaneous procedures or in some cases surgery.

Cervicogenic headaches are classified as secondary headaches by the IHS. The prevalence of CEH in the general population is estimated to be 0.4% to 2.5% and it is 4 times more prevalent in women than men (3). CEH is characterized by unilateral head pain of fluctuating intensity that is increased by movement of the head and radiates from frontal to occipital (3). Occasional attack-related phenomena include nausea, phono- and photophobia, dizziness, ipsilateral "blurred vision", difficulties in swallowing, and ipsilateral edema (mostly in the periocular area)(2). The etiology is a disorder or lesion of the cervical spine or soft tissues of the neck. As with facial pain, a thorough history and physical exam is important. Diagnostic tools such as radiography, CT and MRI can assist in making the diagnosis. Treatments range from pharmacologic (NSAID's, TCA's, AED's, muscle relaxants) to nonpharmacologic (physical therapy), and at some point may also include minimally invasive injections or surgery targeting the likely source of the pain.

**References**


1. The International Classification of Headache Disorders 2nd Edition, May 2005. Headache Classification Subcommittee of the International Headache Society (IHS).
2. Sjaastad O, Fredriksen T, Pfaffenrath V. Cervicogenic headache: diagnostic criteria. The Cervicogenic Headache International Study Group. Headache 1998;38:442-445.
3. Biondi D. Headache Disorders. In: Raj's Practical Management of Pain 4th Edition. Benzon, Rathmell, Wu, Turk, Argoff (Eds.).Mosby, Philadelphia, 2008.

## **Sang Chul Lee,** MD, MD, PhD, FIPP

**BIOGRAPHICAL SKETCH**

Prof. Sang Chul Lee is a Professor and Chairman of the Department of Anesthesiology and Pain Medicine, Seoul National University College of Medicine, and the President of Korean Spinal Pain Society and Korean IASP chapter.

**LECTURE**

### USE OF ULTRASOUND IN INTERVENTIONAL PAIN THERAPY

**Objectives**

Upon completion of this presentation attendees will be able to discuss

- Why we should use ultrasound as a guidance method in pain treatment
- What basic principles of ultrasound imaging are
- For what ultrasound guided is used in the field of pain treatment
- Relationships between the inserted needle and inner structures
- Proper postures during ultrasound guided intervention
- How Sonoanatomy compare with real anatomy
- Examples of ultrasound application for pain treatment

**Key Points**

- Ultrasonography has potential usefulness in pain management including diagnosis and interventional treatment.
- The rational for performing ultrasound guided treatment is that it provides information that aids in establishing a diagnosis and prognosis, locating areas of pathology, and providing therapy via a real-time visualization.
- Ultrasonography is the only modality that allows direct visualization of relationships between the inserted needle and inner structures such as vessels or nerves in the way of target areas to avoid an iatrogenic injury of them.
- Barriers to the use of ultrasound in clinical practice include necessity of training for operation due to some limitations of ultrasound-guided intervention such as unrecognized intravascular injection.
- Expected outcomes include ruling in or out area or areas of pathology, facilitating treatment, better forecasting of prognosis and future treatment options.

**References**


1. Andres JD, Sala-Blanch X. Ultrasound imaging techniques for regional nerve blocks. In: Interventional Pain Management: Image Guided Procedures, 2nd ed. P Raj et al, eds. Saunders Elsevier, Philadelphia, pp 584-596, 2008.
2. Bianchi S, Martinoli C. Ultrasound of the musculoskeletal system. Springer-Verlag Berlin Heidelberg, New York, 2007.
3. Lee SH et al. Ultrasound guided regional anesthesia & pain intervention. Hansol, Seoul, 2010.
4. Hadzic A. Textbook of regional anesthesia and acute pain management. McGraw-Hill, New York, pp 657-694, 2007.


## **Matthew Rupert,** MD, MS, FIPP, DABIPP

**BIOGRAPHICAL SKETCH**

Dr. Rupert is the founder and CEO of VERTEX Spine & Pain in Nashville, TN. Having a background in Aerospace Engineering and Biomechanical Engineering has driven Dr. Rupert's interest in applying minimally invasive pain treatments based on fundamental tissue properties. He continues to enjoy teaching in local and international settings.

LECTURE

## VERTEBRAL AUGMENTATION 2013

**Objectives**

Upon completion of this presentation attendees will be able to discuss

- Osteoporosis as a primary cause
- The anatomy of a vertebral compression fracture
- The indications and contraindications to vertebral augmentation
- Radiographic evaluation for diagnosis and surgical planning
- Various techniques for performance of augmentation
- Expected outcomes
- How fracture repair fits into a spectrum of care
- Clinical pearls and potential complications

**Key Points**

- Osteoporosis is very common and the majority of insufficiency fractures are vertebral.
- Vertebral augmentation can be performed with a high degree of safety and efficacy in appropriately selected patients.
- There are few contraindications in those who have failed conservative treatment.
- Radiologic evaluation by the surgeon is key to appropriate diagnosis and surgical planning.
- Live and multi-view imaging is key to appropriate needle placement and avoidance of complications.
- Vertebral augmentation is only a portion in the spectrum of care for this disease process.

# **John Nelson,** MD, FIPP

BIOGRAPHICAL SKETCH

John W. Nelson, MD, is in private practice at Advanced Pain Management of Oklahoma, PC, in Okahoma City. Dr. Nelson attended medical school at the Baylor College of Medicine and completed his internal medicine residency and Fellow at Mayo Clinic, Rochester, Minnesota. He then completed his anesthesiology residency and Pain Fellow in Kansas City, Missouri. He is Board-Certified in internal medicine, anesthesiology, pain management, and is a Fellow and Examiner for the World Institute of Pain. Dr. Nelson is a founding member of The Texas Pain Society.

LECTURE

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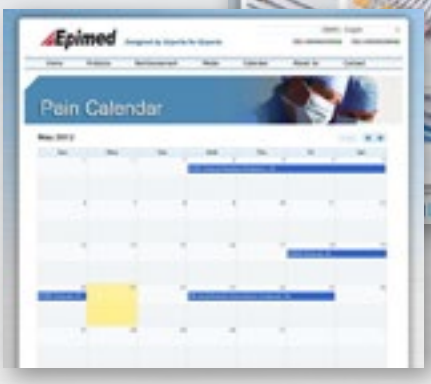


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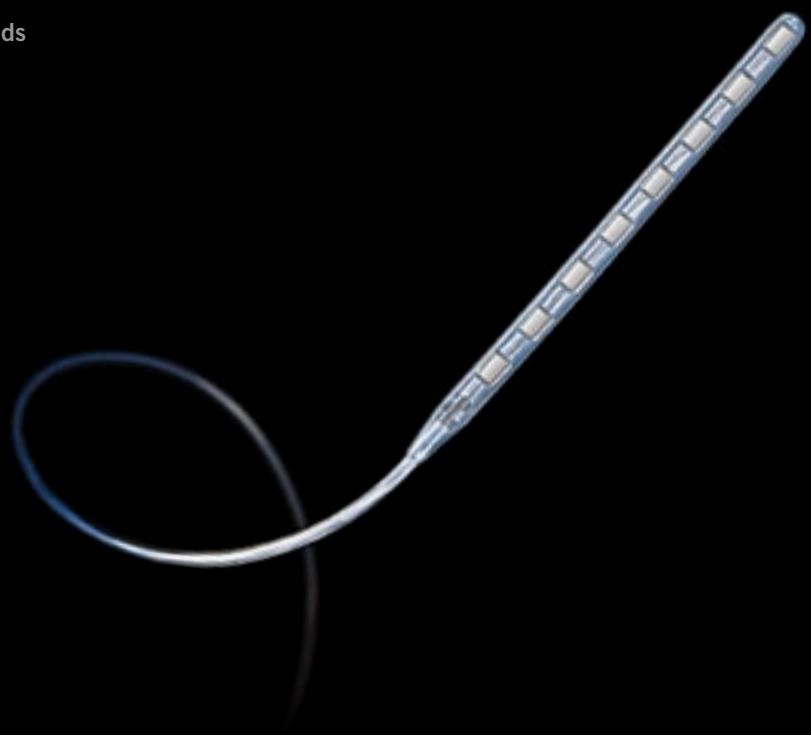

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1. North RB, Kidd DH, Olin JC, Sieracki JM. Spinal cord stimulation electrode design: prospective, randomized, controlled trial comparing percutaneous and laminectomy electrodes—part I: technical outcomes. *Neurosurgery*. 2002;51:381-390.
2. Manola L, Holsheimer J. Technical performance of percutaneous and laminectomy leads analyzed by modeling. *Neuromodulation*. 2004;7:231-241.


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