See You Next Year!

2015 ANNUAL MEETING

March 4-7, 2015
Phoenix, Arizona

JW Marriott Desert Ridge
Scientific Program

30TH ANNUAL MEETING
OF THE AANS/CNS SECTION ON
DISORDERS OF THE SPINE
AND PERIPHERAL NERVES

PUTTING PATIENTS FIRST
IN AN ERA OF CHANGE:
SOLUTIONS FOR THE FUTURE

March 5-8, 2014
The Walt Disney World Swan
and Dolphin Resort
Orlando, Florida

Jointly sponsored by the Congress of Neurological Surgeons and the AANS/CNS Section on Disorders of the Spine and Peripheral Nerves
Welcome to the 2014 Annual Meeting!

On behalf of the AANS/CNS Section on Disorders of the Spine and Peripheral Nerves Executive Committee, Annual Meeting Committee and Meritorious Service Recipient, Richard G. Fessler, we welcome you to the Walt Disney World Swan and Dolphin Resort for the 2014 Annual Meeting.

This dynamic scientific program, *Putting Patients First in an Era of Change: Solutions for the Future*, is incredibly timely. Our expert faculty, scientific sessions and more than 200 scientific abstracts offer the latest techniques, skills and information available – all designed to immediately impact your practice and ultimately enhance patient care.

Plus, with the popular David Cahill Memorial Controversies Sessions, you will have an opportunity to watch as experts debate hot-button issues that are affecting our specialty and gain more perspectives to assist in making critical decisions. This year also provides more optional education with a new cadaver course, eight special courses, three luncheon symposia and three society meetings all led by an expert faculty from both neurosurgery and orthopedic spine and peripheral nerve specialties.

Don’t forget to visit the Exhibit Hall with many of your favorite exhibitors displaying the latest products and services in neurosurgical and orthopedic technology. Our outstanding *What’s New* Sessions will showcase some of the latest advances in our field, so be sure to stop through during the Beverage Breaks and Lunches on Thursday and Friday!

We encourage you to make time in your schedule for our numerous networking opportunities. Catch up with both your corporate contacts and colleagues at the Opening Reception and Reception in the Exhibit Hall.

Again, we thank you for joining us in Orlando and look forward to an outstanding meeting experience.

Sincerely,

Michael W. Groff, MD, FACS
Chair

John J. Knightly, MD
Annual Meeting Chair

Michael Y. Wang, MD, FACS
Scientific Program Chair
Welcome International

On behalf of Michael Groff, Chair of AANS/CNS Joint Section on Disorders of the Spine and Peripheral Nerves, we want to welcome the Chinese Orthopedic Association (COA) as our International partner society for the 2014 Annual Meeting. We are excited to host distinguished thought leaders in spine from the COA to join us in Orlando for this year’s meeting and we look forward to stimulating scientific discussions and entertaining social engagements with our colleagues from the China. The inaugural partnership of the Joint Section on Disorders of the Spine and Peripheral Nerves and the COA marks an important step in our ongoing efforts to foster international collaboration with the Chinese and other spine surgeons around the world. We welcome Professors Wang and Tian and all the COA Membership. We are excited for this partnership of spinal experts and we look forward to a productive annual meeting in Orlando.

Joseph S. Cheng, MD, MS  Patrick C. Hsieh, MD, MSc

The Chinese Orthopedic Association is the largest association of orthopedic surgeons and researchers in skeletal biology in Asia. Most Chinese spinal surgeons are orthopedists. Nevertheless, we are delighted to begin to forge a relationship with AANS/CNS Section on the Disorders of the Spine and Peripheral Nerves. In this venue we hope to exchange our hard earned clinical experience, technical advances and new scientific information in the spine specialty. We also look forward to making new friendships.

Professor Dr. Tian Wei, MD, PhD
President of the Chinese Orthopedic Association (COA)
With the tremendous development of Chinese orthopedic medicine, especially Spinal Surgery in recent years, we have made so many achievements in areas such as spinal deformity surgery and degenerative spine surgery, etc. We are so delighted to witness more effective communication and interaction between Chinese and American Spine Surgeons. It is a great honor to participate with the AANS/CNS Section on Disorders of the Spine and Peripheral Nerves and extend and communicate relationships with friends who are from the states and worldwide.

Please allow me to wish the Spine Section a great success this year, and I am looking forward to seeing you next time.

Thanks and Regards,
Yan

Professor Dr. Yan Wang, MD
Immediate Past President of Chinese Orthopedic Association (COA)
Chairman of Chinese Spine Society President of Chinese Academy of Orthopedic Surgeons (CAOS)

Dear Brazilian Spine Surgeons,

I would like to personally welcome you to the 2014 Annual Meeting of the AANS/CNS Section on Disorders of the Spine and Peripheral Nerves, in Orlando, Florida, United States.

This is an important meeting that shares the best of science, evidence of recommendation, friendship and respect for patients. The Brazilian Spine Surgery Congress and the Spine Section Department of the Brazilian Neurosurgery Society are very happy and proud to have the Brazilian Surgeons as part of the scientific program.

I hope that you will show your experience in spinal surgery and enjoy this unique time to share ideas and make great new friends.

Thank you for your participation and I gratefully acknowledge the scientific committee of the Spine Section for the opportunity and honor that was given to me of participating in it.

Sincerely yours,

Asdrubal Falavigna, PhD
Chairman’s Biography

Michael W. Groff, MD, FACS
Director of Spinal Neurosurgery
Brigham and Women’s Hospital
Harvard University

Michael W. Groff, MD, FACS was born on May 21, 1966 in Amsterdam, Holland. He graduated from Swarthmore College with a major in Mathematics and attended Medical School at the University of Pittsburgh. In 1999 he completed residency training in Neurological Surgery at the Mount Sinai Hospital in New York City. He finished his formal medical training with a fellowship in Spinal Surgery at the Medical Collage of Wisconsin under the direction of Dr. Dennis Maiman.

Following the completion of his training, Dr. Groff became Director of Spinal Surgery at Indiana University. He subsequently relocated to Boston and is currently the Director of Spinal Neurosurgery at the Brigham and Women’s Hospital. Additionally, he serves as the Co-Director of the Spine Center and the Assistant Residency Program Director.

Dr. Groff’s research focuses on Health Services Research and Guidelines development. He has given innumerable lectures at national and international meetings and authored more than 40 peer reviewed articles and 10 book chapters. He has enjoyed the opportunity to serve the Section for many years and in many capacities culminating in this year as Chairman.

Dr. Groff continues to enjoy many avocational activities including flying and soccer, but none more than spending time with his wife and chasing after their three wonderful children.

Presidential Address
Thursday, March 6, 9:10 AM
Richard G. Fessler, MD, PhD
Professor, Department of Neurosurgery, Rush University Medical Center

Dr. Richard G. Fessler serves as Professor of Neurosurgery at the Rush University Medical Center. Prior to assuming this position he was Professor and Vice Chair of Neurosurgery at the Feinberg School of Medicine of Northwestern University and the John Harper Seeley Professor and Chief of Neurosurgery at the University of Chicago Hospitals and Clinics. He previously founded and directed the Institute for Spine Care at the Chicago Institute of Neurosurgery and Neuroresearch (CINN).

Dr. Fessler completed his Medical Doctorate with honors, and Surgical and Neurosurgical residencies at the University of Chicago. In addition to surgical training, Dr. Fessler completed a Doctorate of Philosophy in Pharmacology and Physiology and a Masters of Science in Psychology.

Dr. Fessler is internationally known for his contributions to endoscopic and microendoscopic surgical developments. He has been instrumental in developing many of the current minimally invasive surgical techniques, including “minimally invasive decompression of lumbar stenosis”, “minimally invasive microendoscopic posterior cervical discectomy”, “minimally invasive decompression of cervical stenosis”, “unilateral transfemoral lumbar interbody fusion”, “minimally invasive correction of adult spinal deformity” and has contributed to the development of many more.

Dr. Fessler is also well known for his pioneering research into human embryonic spinal cord transplantation for the treatment of spinal cord injury. He was co-principal investigator on the first human transplant study to evaluate the safety and efficacy of human embryonic spinal cord transplantation for the treatment of syringomyelia, and is the only physician in the United States to have performed these procedures. More recently, Dr. Fessler was the principle investigator of the Geron sponsored study evaluating the safety of transplantation of the stem cell GRNOPC-1 into humans suffering acute spinal cord injury.

Dr. Fessler is a member of the Congress of Neurological Surgeons, American Association of Neurological Surgeons, Neurosurgical Society of America, Joint Section on Disorders of the Spine and Peripheral Nerves, American College of Surgeons, Society of Neurological Surgeons and Southern Neurosurgical Society. He has held leadership positions for several of these professional organizations, and has been a course director or faculty member for several hundred courses sponsored by these groups.

A prolific author, Dr. Fessler has written seventeen books and contributed over 160 book chapters to medical texts. He has published over 160 articles in peer-reviewed journals and presented hundreds of papers at peer-reviewed symposia.

In addition to all of the above accomplishments, Dr. Fessler served as a Medical Specialist and Flight Surgeon for NASA/Space Shuttle.
MEETING AGENDA

WEDNESDAY, MARCH 5

1:30 – 5:30 PM Northern Hemisphere A4
$200 includes lunch

SOCIETY MEETING I: Chinese Orthopaedic Association
Course Director(s): Larry T. Khoo, Wei Tian, Yan Wang

1:30 – 1:55 PM
The Role of C2-C7 and O-C2 Angle in the Development of Dysphagia after Cervical Spine Surgery
Wei Tian

1:55 – 2:20 PM
Classification and Surgical Decision Making in Ankylosing Spondylitis Kyphosis: Analysis of 248 Patients
Yan Wang

2:20 – 2:35 PM
A Feasibility Research of Unilateral Incision MIS-TLIF Using Pedicle Screws and a Translaminar Screw Hybrid
Mao Keya

2:35 – 2:50 PM
How Much Correction May One-level PSO Create in the Treatment of Thoracolumbar Kyphosis Secondary to Ankylosing Spondylitis?
BangPing Qian

2:50 – 3:05 PM
The Chinese Experience with Total Sacrectomy
Wei Guo

3:05 – 3:30 PM
Break

3:30 – 3:45 PM
Lateral Approach
LiMing Rong

3:45 – 4:00 PM
Reducing the Radiation Exposure during Percutaneous Kyphoplasty (PKP) by Application of Remote Control Injection System (RCIS): A Prospective Randomized Controlled Study
ZhaoMin Zheng

4:00 – 4:15 PM
MIS-TLIF Using PIPELINE-VIPER2 System
LiMing Cheng

4:15 – 4:30 PM
Clinical and Radiologic Comparison of DCI Arthroplasty vs. ACDF for the Treatment of Cervical Myelopathy
HaiLong Feng

4:30 – 5:30 PM
Cases with Complications
Larry T. Khoo and Faculty
MEETING AGENDA

1:30 – 5:30 PM Oceanic 1

$200 includes lunch

**SOCIETY MEETING II: Brazilian Spine Society**

**Course Director(s):** Ricardo V. Botelho, Asdrubal Falavigna, Luiz Pimenta

**Faculty:** Beejal Y. Amin, Aluizio Augusto Arantes, E. Bertolini, Andre Cecchini, Elias Dakwar, Jefferson Walter Daniel, Fernando L. R. Dantas, Geraldo de Sa’ Carneiro Filho, Michael W. Groff, AF Joaquim, Virginie Lafage, Marcos Masini, J Milano, Osmar Moraes, Marcelo Luis Mudo, Ericson Sfredo, Mario A. Taricco, Marcio Vinhal

**Course Description:** This course will be presented in a debate format. Brazilian spine neurosurgeons will argue their perspectives with regard to management scenarios for spine disorders cases through lectures, interactive case presentations and discussion.

This course will provide practical, current didactic information on spine disorders with particular emphasis on surgical approaches, stabilization techniques, complications avoidance and management, surgical and non-surgical decision making and management as well as discussion on future trends.

**Learning Objectives:** Following completion of this course, participants will be able to:

- Analyze the evolution of spinal surgery in Brazil
- Recognize technical nuances of spinal surgery practiced in Brazil
- Develop strategies for complication avoidance and management
- Describe the evaluation and appropriate management of a number of spinal pathologies
- List the advantages and disadvantages of spinal surgical techniques

1:30 – 2:00 PM

**Module 1: Craniocervical-Basilar Invagination**

*Marcio Vinhal*

1:30 – 1:35 PM

**Case Presentation**

*Geraldo De Sa Carneiro Filho*

1:35 – 1:45 PM

**Basilar Invagination – Reduction and Posterior Fixation**

*Ricardo V. Botelho*

1:45 – 1:55 PM

**Basilar Invagination – Endoscopic Anterior Approach**

*E. Bertolini*

1:55 – 2:00 PM

**Case Resolution**

*Geraldo De Sa Carneiro Filho*

2:00 – 2:40 PM

**Module 2: Cervical–Compressive Radiculopathy**

*Marcos Masini*
2:00 – 2:05 PM
Case Presentation
Marcos Masini

2:05 – 2:15 PM
Anterior Approach
Mario A. Taricco

2:15 – 2:25 PM
Posterior Approach
Aluizio Augusto Arantes

2:25 – 2:35 PM
Questions and Comments

2:35 – 2:40 PM
Case Resolution
Marcos Masini

2:40 – 2:45 PM
Module 3: Lumbar – Degenerative Disease
Andre Cecchini

2:45 – 2:55 PM
Sagittal Balance
Virginie Lafage

2:55 – 3:05 PM
Espondilolistese TLIF
Fernando L. R. Dantas

3:05 – 3:15 PM
Espondilolistese XLIF
Luiz Pimenta

3:15 – 3:25 PM
Surgical Planning for Degenerative Scoliosis
Asdrubal Falavigna

3:25 – 3:40 PM
MIS Lateral Retroperitoneal Transpsoas for Adult Spine Deformity. Can Balance Be Achieved?
Elias Dakwar

3:40 – 3:55 PM
MIS Posterior Approach for Degenerative Scoliosis
Beejal Y. Amin

3:55 – 4:05 PM
Questions and Comments

4:05 – 4:10 PM
Case Resolution
Osmar Moraes

4:10 – 4:30 PM
Break
MEETING AGENDA

4:30 – 5:30 PM
Module 4: Trauma
Jefferson Walter Daniel

4:30 – 4:35 PM
Case Presentation
Ericson Sfredo

4:35 – 4:45 PM
Surgical Treatment of Acute Phase Cervical Spine Injury

4:45 – 4:55 PM
Critical Review of Thoracolumbar Trauma Classifications Systems
AF Joaquim

4:55 – 5:05 PM
Augmentation in Trauma Vertebral Fracture: Indications and Techniques
Marcelo Luis Mudo

5:05 – 5:15 PM
TLICS2 Burst Fracture: Surgical Indications?
J. Milano

5:15 – 5:25 PM
Questions and Comments

5:25 – 5:30 PM
Case Resolution
Ericson Sfredo

1:30 – 5:30 PM Oceanic 3

$200 includes lunch

SOCIETY MEETING III: American College of Osteopathic Surgeons (Neurosurgical Discipline)

Course Director(s): Robert M. Galler, Steven Vanni

Course Description: This course will provide an update on the progress in research by resident, fellow and attending neurosurgical spine surgeons. Clinical and laboratory research will be presented and discussed in a forum intended to promote an active exchange of ideas. Insights on the identity of AOBS certified neurosurgeons in the United States will be reviewed.

Learning Objectives: Upon completion of this course, participants will be able to:

▶ Integrate the latest in research into clinical practice
▶ Discuss the various updates as they relate to cutting edge research
▶ Explain how the new ACGME guidelines may have significant impact on AOBS neurosurgical practices
1:30 – 1:45 PM
Allograft Cellular Bone Matrix Retaining Native Mesenchymal Stem Cells and Osteoprogenitor Cells vs. rBMP in Extreme Lateral Interbody Fusion
Seth Shawn Molloy

1:45 – 2:00 PM
3-Level Minimally Invasive vs. Open Trans-Foraminal Interbody Fusion
Pradeep Setty

2:00 – 2:15 PM
Surgical Treatment of Idiopathic Syringomyelia: Silastic Wedge Syringosubarachnoid Shunting Technique
Lee Sandquist

2:15 – 2:30 PM
Kyphotic Progression after Thoracolumbar Burst Fractures Treated Conservatively, with MIS, or Via Open Approach
Mark A. Rivkin

2:30 – 2:45 PM
Comparison of O-Arm vs. Fluoronav Image-Guided Lumbar Pedicle Screw Placement: A Single Institutions Experience
Bryan D. Bolinger

2:45 – 3:00 PM
Infection after Spinal Instrumentation for Traumatic Fractures Compared to Intra-operative Cultures
Jordan Synkowski

3:00 – 3:15 PM
START Study: Sacroiliac Joint ARThrodesis: A Retrospective Outcomes Study of the First 56 Minimally Invasive Fusions
Stephanie Falatko

3:15 – 3:30 PM
Management of Congenital Pediatric Spine Disorders: Cincinnati Childrens Hospital Experience
Valentine Nduku

3:30 – 3:45 PM
Operative Morbidity and Outcomes in Patients over 65 Years Old Undergoing Instrumented Fusion
James S. Harman

3:45 – 4:00 PM
Biomechanical Comparison of Thoracolumbar Burst Fracture Stability Using Various Instrumented Fixation Techniques with Expandable Cage
Ripul Rajen Panchal

4:00 – 4:30 PM
Cellular Transplantation Strategies in Spinal Cord Injury
Allan D. Levi
SPECIAL COURSE I: Neurosurgical Spine: Business and Compensation

Course Director(s): Domagoj Coric, John K. Ratliff, Luis M. Tumilalan

Faculty: Paul M. Arnold, Gary M. Bloomgarden, Michael T. Foley, John J. Knightly, Michael P. Steinmetz

Course Description: This course will provide up-to-date information on current issues in compensation and practice management for neurosurgical spine surgeons. Coding scenarios will be reviewed for the correct coding of routine as well as complex spinal procedures. The impact of quality measures on neurosurgical reimbursement will be discussed. Insights on management of a neurosurgical practice will be reviewed.

Learning Objectives: Upon completion of this course, participants will be able to:
▶ Integrate the newest changes in CPT coding for spine
▶ Discuss the potential financial impact of transition to a hospital-based practice
▶ Associate how outcomes collection and quality measures may have significant impact on spine practices

1:30 – 1:45 PM
Introduction
Domagoj Coric, John K. Ratliff

1:45 – 2:15 PM
2014 CPT Coding Update
Luis Tumilalan

2:15 – 2:45 PM
Hospital Negotiations and Ancillary Revenue Generation
Domagoj Coric

2:45 – 3:15 PM
Defining the Quality and Value of your Care Through Practice Data Collection
Michael T. Foley

3:15 – 3:30 PM
Break

3:30 – 4:00 PM
Transition to Hospital Employment: A Surgeon’s Perspective
John J. Knightly

$200 includes lunch
MEETING AGENDA

WEDNESDAY

4:00 – 4:30 PM
Patient Satisfaction:
What Really Drives Patient Perception
Michael P. Steinmetz

4:30 – 5:00 PM
Introduction to Hospital Accounting
Gary M. Bloomgarden

5:00 – 5:30 PM
Discussion

1:30 – 5:30 PM Northern Hemisphere A2
$200 includes lunch
SPECIAL COURSE II:
Cases and Complications with the Masters

Course Director(s): Richard G. Fessler, Regis W. Haid
Faculty: Christopher P. Ames, Robert F. Heary,
Larry T. Khoo, Charles Kuntz, IV, Frank LaMarca,
John E. O’Toole, Christopher I. Shaffrey, Vincent C. Traynelis,
Juan S. Uribe, Michael Y. Wang

Course Description: This course will discuss the evolution
in diagnosis and treatment of spinal disorders, as well
as management of complications of treatment, from the
perspective of those who have extensively contributed to
that evolution. Attendees will gain wisdom from historical
knowledge and experiential narration.

Learning Objectives: Upon completion of this course,
participants will be able to:
▶ Discuss the gravity of decisions that lead to complications
▶ Discuss the underlying principles that might be used to
  minimize complications
▶ Develop strategies that can be used to deal with surgical
  complications

1:30 – 1:50 PM
Management of Adult Degenerative Lumbar Scoliosis
Christopher I. Shaffrey

1:50 – 2:10 PM
Lessons Learned In Cervical Sagittal Balance
Christopher P. Ames

2:10 – 2:30 PM
Patient Selection in Lumbar Fusion
Robert F. Heary

2:30 – 2:50 PM
Technique Selection in Lumbar Fusion
(ALIF, TLIF or Lateral)
Larry T. Khoo

2:50 – 3:10 PM
Break

3:10 – 3:30 PM
Pros and Cons of Minimally Invasive TLIF
Frank LaMarca
3:30 – 3:50 PM
Pathophysiology of Cervical Myelopathy
John O’Toole

3:50 – 4:10 PM
Lateral Retroperitoneal Fusion for Degenerative Deformity
Juan S. Uribe

4:10 – 4:30 PM
Update on Selected Topics by the Masters
Vincent C. Traynelis

4:30 – 4:50 PM
Global Balance of the Spine
Charles Kuntz, IV

4:50 – 5:30 PM
Questions and Comments
All Faculty

1:30–5:30 PM Northern Hemisphere A3
$200 includes lunch

SPECIAL COURSE III: Spinal Deformity: What the Surgeon Needs to Know
Course Director(s): Robert F. Heary, Praveen V. Mummaneni, Christopher I. Shaffrey
Faculty: Christopher P. Ames, Sigurd Berven, John R. Dimar, Steven D. Glassman, Charles Kuntz, IV, Nathan Lebwohl
Course Description: This course will discuss adult spinal deformity with a focus on the evaluation, classification, and treatment options available to this patient population. Non-surgical management options will be noted but emphasis will be placed on surgical correction principles and techniques. Complication management and operative outcomes will be emphasized.

Learning Objectives: Upon completion of this course, participants will be able to:
▶ Review indications for non-operative and operative management of adult spinal deformity surgery
▶ Review spinopelvic anatomy and biomechanical parameters related to spinal deformity
▶ Discuss the surgical techniques to reestablish sagittal balance and discuss complication avoidance/management

1:30 –1:45 PM
Spinal Balance Principles
Charles Kuntz, IV

1:45 – 2:00 PM
Anterior and Posterior Options for Cervical Kyphosis
Praveen V. Mummaneni

2:00 – 2:15 PM
Thoracic Kyphosis Fixation and Correction
Sigurd Berven
## MEETING AGENDA

### 2:15 – 2:30 PM
**Deformity Principles and Thoracolumbar Spinal Trauma**  
*Robert F. Heary*

### 2:30 – 3:00 PM
**When Does Degenerative Lumbar Disease Become Deformity?**  
*Christopher I. Shaffrey*

### 3:00 – 3:30 PM
**Break**

### 3:30 – 3:45 PM
**Bone Graft Options in Adult Degenerative Spinal Deformity. What Works and What Fails?**  
*Christopher P. Ames*

### 3:45 – 4:15 PM
**PJK Risk Factors, Avoidance and Management**  
*Nathan Lebwohl*

### 4:15 – 4:45 PM
**Sacropelvic Fixation**  
*John R. Dimar*

### 4:45 – 5:15 PM
**Appropriate Use Guidelines and Socioeconomics of Spinal Deformity**  
*Steven D. Glassman*

### 5:15 – 5:30 PM
**Cases with Complications**  
*All Faculty*

### 1:30 – 5:30 PM Americas Seminar

$200 includes lunch  
**SPECIAL COURSE IV: Advanced MIS Techniques—Managing MIS Complications**

**Course Director(s): Daniel J. Hoh, Langston T. Holly**  
**Faculty: Anthony Frempong-Boadu, Robert E. Isaacs, Jean-Pierre Mobasser, John E. O’Toole, Sharad Rajpal, Juan S. Uribe**

**Course Description:** This course will cover contemporary data and experience through MIS case-based, interactive, didactic presentations. Faculty will discuss their evaluation and treatment algorithms regarding minimally invasive vs. open surgical options to maximize complication avoidance. Topics include the management of far lateral disc herniations, management of TLIF complications, advanced fusion techniques for deformity surgery, and the integration of MIS and computer image guidance.

**Learning Objectives:** Upon completion of this course, participants will be able to:
- Discuss indications for tubular and percutaneous access of the spine for the treatment of various conditions
- Discuss complications related to minimally invasive spine
surgery and management strategies

- Discuss strategies for incorporating multiple MIS technologies and/or hybrid approaches (including computer image guidance) to treat complex pathologies

1:30 – 1:45 PM
**Introduction**
Daniel J. Hoh, Langston T. Holly

1:45 – 2:20 PM
**Expanding Indications for Tubular and Percutaneous Access of the Spine**
Sharad Rajpal

2:20 – 2:55 PM
**Lateral Techniques for Deformity Correction**
Juan S. Uribe

2:55 – 3:30 PM
**Managing MIS Complications**
Anthony Frempong-Boadu

3:30 – 3:45 PM
**Break**

3:45 – 4:15 PM
**Integration of Computer Image Guided Surgery and MIS**
Jean-Pierre Mobasser

4:15 – 4:45 PM
**Hybrid MIS Strategies: Multi-modal Approaches, Techniques and Technologies**
Robert E. Isaacs

4:45 – 5:15 PM
**Advocating for MIS: Patient Quality, Cost Effectiveness and Payor Policy Issues**
John O’Toole

5:15 – 5:30 PM
**Discussion**

1:30 – 5:30 PM Southern Hemisphere IV

$200 includes lunch

**SPECIAL COURSE V: Managing Metastatic Spine Tumors**

**Course Director(s):** Ziya L. Gokaslan, Narayan Sundaresan

**Faculty:** Mark H. Bilsky, Ilya Laufer, Ehud Mendel, Laurence D. Rhines, Meic H. Schmidt, Daniel M. Sciubba

**Course Description:** This course will provide a comprehensive review of the care of patients with metastatic spine tumors. The experts in the field of Spinal Oncology will discuss topics such as evaluation of patients with metastatic spine disease, minimally invasive and open surgical treatment options, conventional and stereotactic radiosurgery as well as vertebroplasty/kyphoplasty with relevant up-to-date review of the literature. It will be a case-based interactive
format, a state-of-the-art review of the topic.

**Learning Objectives:** Upon completion of this course, participants will be able to:

▶ Comprehensively evaluate the patients with metastatic spine tumors presenting with myelopathy, cauda equina syndrome or pain
▶ Discuss the appropriate treatment options for a given patient including conventional radiation therapy, stereotactic surgery, minimally invasive and traditional open surgical procedures
▶ Identify appropriate patients who are candidates for vertebroplasty and kyphoplasty
▶ Review published data on the effectiveness of these various treatment modalities in patients with metastatic spine disease

1:30 – 1:45 PM
**Introduction**
Ziya Gokaslan

1:45 – 2:20 PM
**Evaluation and Decision Making**
Laurence D. Rhines

2:20 – 2:55 PM
**Conventional and Stereotactic Radiosurgery**
Ehud Mendel

2:55 – 3:30 PM
**Role of Verebroplasty and Kyphoplasty**
Meic H. Schmidt

3:30 – 3:45 PM
**Break**

3:45 – 4:15 PM
**Surgical Treatment of Metastatic Disease Including Separation Surgery**
Mark H. Bilsky

4:15 – 4:45 PM
**Separation Surgery**
Ilya Laufer

4:45 – 5:15 PM
**Role of MIS in Metastatic Spine Disease**
Daniel M. Sciubba

5:15 – 5:30 PM
**Discussion**
Narayan Sundaresan
SPECIAL COURSE VI: Spinal Trauma in the Elderly—NP/PA Course

Course Director(s): Michael P. Steinmetz, Andrea L. Strayer
Course Description: This course will provide practical, current didactic information on perioperative pain management issues with particular emphasis on up-to-date practical bedside and outpatient management strategies. Interactive case presentations will illustrate treatment and care considerations. Expert advanced practice nurse, physician assistant and neurosurgeon faculty will explore the challenges of caring for this complex patient population.
Learning Objectives: Upon completion of this course, participants will be able to:
▶ Analyze common fractures in the elderly including accurate identification and classification
▶ Analyze treatment options of common fractures in the elderly
▶ Discuss medical management of frequently encountered issues in the elderly after spinal trauma
▶ Discuss determination of fracture healing endpoint in the elderly patient

1:30 – 1:45 PM
Diagnosis and Classification of O-C Dislocation, Jefferson Fracture, Hangman’s Fracture and Odontoid Fractures
John H. Shin

1:45 – 2:00 PM
Classification of O-C Dislocation, Jefferson Fracture, Hangman’s Fracture and Odontoid Fractures
Daniel J. Hoh

2:00 – 2:15 PM
Treatment of O-C Dislocation, Jefferson Fracture and Hangman’s Fractures
Sharad Rajpal

2:15 – 2:30 PM
Treatment of Odontoid Fractures OP/nonOP
Michael P. Steinmetz

2:30 – 2:45 PM
Classification and Treatment of Subaxial Spine Fractures
Gregory R. Trost

2:45 – 3:00 PM
Ankylosing Spondylitis
Andrea L. Strayer

3:00 – 3:15 PM
Break
3:15 – 3:45 PM
Bowel and Bladder; Elderly; Influence of Opioids; Critical, Acute and Long Term Management
Maria Oliveira

3:45 – 4:00 PM
Medical/Pharmacologic Management of Osteoporosis
Shelly Schmoller

4:00 – 4:15 PM
Treatment of Thoracolumbar Dislocation, Burst and Compression Fractures
Nathaniel P. Brooks

4:15 – 4:30 PM
Minimally Invasive Treatment of T/L Fractures
David J. Hart

4:30 – 5:00 PM
Vertebroplasty and Kyphoplasty
Vincent J. Miele

5:00 – 5:15 PM
Trouble Shooting: Patient Calls after Discharge, When to Worry, Including Halo Problem Solving, Change Functional Status, Brace Issues
Denise K. Brost

5:15 – 5:30 PM
Healing Endpoint
Ajit A. Krishnany

6:30 – 8:00 PM
Cabana Deck

OPENING RECEPTION
Mingle with your colleagues from across the globe on the Cabana Deck during the 2014 Opening Reception! Enjoy a lavish spread of hors d’oeuvres and beverages while taking in the spectacular Florida sunset. Each medical attendee and spouse/guest registered for the meeting will receive one complimentary ticket. Resort casual attire is recommended for this event.
THURSDAY, MARCH 6

6:30 – 7:00 AM Southern Hemisphere I-III

6:30 – 6:55 AM
SUNRISE SESSION I: Tales from the Front Lines
Moderator(s): Beejal Y. Amin, David J. Hart, Luis M. Tumialan

6:55 – 7:00 AM
Introductory Remarks/Meeting Announcements
Michael Y. Wang

7:00 – 9:00 AM Southern Hemisphere I-III

SCIENTIFIC SESSION I
The Spine Surgeon as Patient Advocate
Moderator(s): Robert Galler, ShiSheng He, John J. Knightly

Learning Objectives: Upon completion of this course, participants will be able to:
▶ Appraise advocacy issues related to patient care and within the field of spine care and in healthcare overall
▶ Relate the evolution of patient advocacy issues and the perceptions of different stakeholders on patient care
▶ Recognize the challenges in defining and achieving patient advocacy in spine and peripheral nerve surgery

7:00 – 7:10 AM
The Spinal Surgeon as an Advocate in the Modern Healthcare Environment
Gerald E. Rodts, Jr.

7:10 – 7:20 AM
The Role of the Surgeon for Multidisciplinary Cancer Patients
Laurence D. Rhines

7:20 – 7:30 AM
Advocating for the Elderly Spine Patient
Richard G. Fessler

7:30 – 7:40 AM
Is There a Future for Deformity Surgery?
Christopher P. Ames

7:40 – 7:50 AM
Advocating for Spinal Cord Injury Patients
Barth A. Green

7:50 – 8:00 AM
Advocating with Payors
Daniel J. Hoh

8:00 – 8:10 AM
The Spine Surgeon and the Medical Industry
Daniel K. Resnick
8:10 – 8:25 AM
The Massachusetts Healthcare Experience:
Lesson for the Future
Charles H. Cho

8:25 – 9:00 AM
Discussion

9:00 – 10:00 AM
Moderator(s): Paul M. Arnold, Dean Chou, Yan Wang

9:00 – 9:05 AM
Meritorious Member Award
John J. Knightly

9:05 – 9:10 AM
Introduction of Chair
Charles Kuntz, IV

9:10 – 9:35 AM
Presidential Address
Michael W. Groff

9:35 – 9:40 AM
Introduction of Meritorious Award Recipient
Curtis A. Dickman

9:40 – 10:00 AM
Meritorious Award Address
Richard G. Fessler

10:00 – 10:30 AM Northern Hemisphere B-E
What’s New Session I/Coffee Break
Moderator(s): D. Kojo Hamilton, Daniel J. Hoh, Praveen V. Mummaneni

10:30 – 10:50 AM Southern Hemisphere I-III
Special Lecturer
Story Musgrave

10:50 AM – 12:00 PM Southern Hemisphere I-III
SCIENTIFIC SESSION II
SRS Co-Sponsored Session
Moderator(s): John R. Dimar, Praveen V. Mummaneni, Wei Tian
Learning Objectives: Upon completion of this course, participants will be able to:

▶ Appraise the radiographic assessments of spinal deformity
and their impact on management
▶ Discuss the potential utility and limitations of minimally invasive approaches to deformity surgery
▶ Describe approaches to the commonly presented problems in the management of adult spinal deformity

10:50 – 11:00 AM
Memory Metals in Spinal Deformity Surgery
Yan Wang

11:00 – 11:10 AM
Sagittal Alignment: Radiographic and Clinical Evaluation
Charles Kuntz, IV

11:10 – 11:20 AM
Overview of Spinal Osteotomy Techniques
Steven D. Glassman

11:20 – 11:30 AM
Vertebral Column Resection for Severe Deformities
Sigurd Berven

11:30 – 11:40 AM
Evaluation, Treatment, and Management of Proximal Junctional Kyphosis
Christopher I. Shaffrey

11:40 – 11:50 AM
MIS Approaches to Deformity Surgery
Juan S. Uribe

11:50 AM – 12:00 PM
Discussion

12:00 – 1:00 PM
Northern Hemisphere B-E

What’s New Session II/Lunch with Exhibitors

Moderator(s): Daniel J. Hoh, Yi Lu, Srinivas K. Prasad, Daniel M. Sciubba

1:00 – 2:30 PM
Southern Hemisphere I-III

SCIENTIFIC SESSION III:
Regulation and Data in the New Era

Moderator(s): Asdrubal Falavigna, Gerald E. Rodts, Jr., Cheerag D. Upadhyaya

Learning Objectives: Upon completion of this course, participants will be able to:
▶ Discuss updated guidelines, indications, and expected outcomes for surgical treatment of spine conditions
▶ Discuss how outcomes collection and quality measures may have significant impact on spine practices
▶ Describe the impact of value based care on spine practices

1:00 – 1:10 PM
Regulation and Systems of Practice in the Hospital
Katie Orrico
MEETING AGENDA

1:10 – 1:20 PM
Clinical Guidelines and Your Practice
James S. Harrop

1:20 – 1:30 PM
Registries: The Good, The Bad, and The Ugly
Zoher Ghogawala

1:30 – 1:40 PM
Stratification of Providers by Payors: Conflict of Interest?
John E. O’Toole

1:40 – 1:50 PM
Use of Milliman Guidelines by Payors
Joseph S. Cheng

1:50 – 2:00 PM
Industry and Compliance
Ed Crowe

2:00 – 2:10 PM
The Impact of Patient Satisfaction Surveys
John J. Knightly

2:10 – 2:20 PM
Update on ICD-10: What You Need to Know
R. Patrick Jacob

2:20 – 2:30 PM
Discussion

2:30 – 3:30 PM Southern Hemisphere I-III

ORAL PRESENTATIONS I
Moderator(s): Frank LaMarca, Nathan Lebwohl, LiMing Rong

2:30—2:38 PM
100. Cerebrospinal Fluid Drainage and Induced Hypertension Improve Spinal Cord Perfusion in the Setting of Acute Spinal Cord Injury
Nikolay L. Martirosyan

2:38 – 2:42 PM
Discussant: Paul Park

2:42 – 2:50 PM
101. Outcomes After ALIF vs. TLIF For Treatment of Symptomatic L5-S1 Spondylolisthesis: A Prospective, Multi-Institutional Comparative Effectiveness Study
Owoicho Adogwa

2:50 – 2:54 PM
Discussant: Marjorie Wang

2:54 – 3:02 PM
102. Pre-operative Depression, ODI Scores, and EQ-5D Scores are Significant Factors in Patient Satisfaction Following Lumbar Spine Surgery
Timothy C. Ryken
3:02 – 3:06 PM  
**Discussant:** Rod J. Oskouian

3:06 – 3:14 PM  
**103.** Two-Year Prospective, Multicenter Analysis of Consecutive Adult Spinal Deformity (ASD) Patients Demonstrates Higher Fusion Grade, Lower Implant Failures and Greater Improvement in SRS-22r Scores for Patients Treated with Recombinant Human Bone Morpho 
Kai-Ming G. Fu

3:14 – 3:18 PM  
**Discussant:** Christopher E. Wolfla

3:18 – 3:26 PM  
**104.** High-Density Collagen Gel Can Repair Annular Defects and Restore Biomechanical Function to Needle-Punctured Intervertebral Discs 
Peter Grunert

3:26 – 3:30 PM  
**Discussant:** Kai-Ming G. Fu

3:30 – 4:00 PM  
Northern Hemisphere B-E  
**What’s New Session III/Coffee Break**  
**Moderator(s):** Daniel J. Hoh, Scott A. Meyer, Paul Park, Cheerag D. Upadhyaya

2:30 – 6:00 PM  
Southern Hemisphere IV  
**Peripheral Nerve Surgery: Case Based Approach and Review** (concurrent)  
**Course Director(s):** Rajiv Midha, Robert J. Spinner  
**Faculty:** Michael J. Dorsi, Amgad S. Hanna, Marie Noelle Hebert-Blouin, Allan D. Levi, Shaun T. O’Leary, Nader Pouratian

2:30 – 2:40 PM  
Clinical Approach to the Peripheral Nerve Patient  
Robert J. Spinner

2:40 – 2:50 PM  
Fundamentals of Nerve Injury and Regeneration  
Rajiv Midha

2:50 – 3:20 PM  
Upper Extremity Entrapments  
Nader Pouratian

3:20 – 3:50 PM  
Lower Extremity Entrapments  
Marie Noelle Hebert-Blouin

3:50 – 4:00 PM  
Break
<table>
<thead>
<tr>
<th>Time</th>
<th>Session/Case Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>4:00 – 4:30 PM</td>
<td>Injury and Repair&lt;br&gt;Amgad S. Hanna</td>
</tr>
<tr>
<td>4:30 – 5:00 PM</td>
<td>Nerve Tumors&lt;br&gt;Shaun T. O’Leary</td>
</tr>
<tr>
<td>5:00 – 5:30 PM</td>
<td>Pain&lt;br&gt;Michael J. Dorsi</td>
</tr>
<tr>
<td>5:30 – 6:00 PM</td>
<td>Hot Seat Cases (Board Review Format)&lt;br&gt;Allan D. Levi</td>
</tr>
<tr>
<td>4:00 – 6:00 PM</td>
<td>Southern Hemisphere I-III</td>
</tr>
</tbody>
</table>

**SCIENTIFIC SESSION IV: Oral Poster Presentations I** (concurrent)

**Moderator(s):** Langston T. Holly, Michael K. Rosner, Mario A. Taricco

<table>
<thead>
<tr>
<th>Time</th>
<th>Poster Number</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>4:00 – 4:05 PM</td>
<td>200.</td>
<td>2013 Haid Award: The Role of Sacral Slope in Lumbosacral Fusion: A Biomechanical Study&lt;br&gt;Doniel Drazin</td>
</tr>
<tr>
<td>4:05 – 4:10 PM</td>
<td>201.</td>
<td>Anterior vs. Posterior Surgical Approaches in Treatment of Cervical Spondylotic Myelopathy (CSM): Outcomes of the International AOspine Multicenter Prospective CSM-I Study.&lt;br&gt;Michael G. Fehlings</td>
</tr>
<tr>
<td>4:15 – 4:20 PM</td>
<td>203.</td>
<td>Responsiveness of Depression and its Influence on Surgical Outcomes of Lumbar Degenerative Diseases&lt;br&gt;Asdrubal Falavigna</td>
</tr>
<tr>
<td>4:20 – 4:25 PM</td>
<td>204.</td>
<td>Regenerative Electrodes Enable Functional Electrical Stimulation of Peripheral Motor Axons and Distal Musculature&lt;br&gt;Wilson Zachary Ray</td>
</tr>
<tr>
<td>4:25 – 4:30 PM</td>
<td>205.</td>
<td>Anterior Approaches for Symptomatic Central Herniated Thoracic Discs&lt;br&gt;Justin Charles Clark</td>
</tr>
</tbody>
</table>
MEETING AGENDA

4:30 – 4:35 PM
206. Kineflex® Cervical Arthroplasty: Long-term Clinical and Radiographic Outcomes from a Prospective Randomized IDE Study
Domagoj Coric

4:35 – 4:40 PM
207. Two Level Corpectomy vs. Three Level Discectomy of the Cervical Spine: Analysis of Spinal Alignment, Adjacent Level Disease, Neck Pain and Neurologic Function
Dean Chou

4:40 – 4:45 PM
208. Stand Alone Lateral Interbody Fusion (saMIS) vs. Circumferential Minimally Invasive Surgery (cMIS) for Adult Spinal Deformity (ASD)
Adam S. Kanter

4:45 – 4:50 PM
209. Pain, Disability and the Surgeon’s Recommendation Against Surgical Intervention May Negatively Impact Satisfaction Scores in Patients with Spinal Disorders
Marcus D. Mazur

4:50 – 4:55 PM
210. Regeneration of Rabbit Intervertebral Discs using A Single Low-Concentration Injection of Human Disc Progenitor Cells
Kevin T. Foley

4:55 – 5:00 PM
Discussion

5:00 – 5:05 PM
211. C5 Palsy Following Posterior Cervical Decompression and Fusion: Cost and Quality of Life Implications
Jacob A. Miller

5:05 – 5:10 PM
212. Spinal Cord Fiber Optic Monitoring
Robert M. Galler

5:10 – 5:15 PM
213. Adjacent Level Ligamentous Injury Associated with Traumatic Cervical Spine Fractures: Indications for Magnetic Resonance Imaging and Implications for Treatment
Basem I. Awad

5:15 – 5:20 PM
214. Sacroplasty for Tumor-associated Sacral Insufficiency Fractures
Nelson Moussazadeh
MEETING AGENDA

5:20 – 5:25 PM  
215. Routine Use of Recombinant Human Bone Morphogenetic Protein-2 in Posterior Fusions of the Pediatric Spine and Incidence of Cancer  
Christina Sayama

5:25 – 5:30 PM  
216. Optimal Duration of Conservative Management Prior to Surgery for Cervical and Lumbar Radiculopathy: A Literature Review  
Vincent J. Alentado

5:30 – 5:35 PM  
217. The Predictive Value of Transcranial Magnetic Stimulation of the Motor Cortex in Cervical Myelopathy  
Marcus D. Mazur

5:35 – 5:40 PM  
218. Superior Cluneal Nerve Entrapment Neuropathy after Posterior Lumbar Spinal Surgery  
Masahiko Akiyama

5:40 – 5:45 PM  
219. Intra-Operative Epidural Anesthetic Injection For Control Of Immediate Post Operative Pain In PACU After Lumbar Spinal Surgery  
Fred H. Geisler

5:45 – 5:50 PM  
220. Evaluation of CSF Dynamics via Cine Flow MRI Following Extradural Chiari I Decompression  
Jennifer L. Quon

5:50 – 5:55 PM  
221. PPAR-δ Complements the Benefits of Surgical Decompression in a Novel Mouse Model of Cervical Spondylotic Myelopathy  
Spyridon K. Karadimas

5:55 – 6:00 PM  
Discussion

4:00 – 6:00 PM Americas Seminar

SCIENTIFIC SESSION IV: Oral Poster Presentations II (concurrent)  
Moderator(s): Carl Lauryssen, Scott A. Meyer, JingLong Yan

4:00 – 4:05 PM  
222. An FDA IDE Clinical Trial through 48 Months: Cervical TDR vs. ACDF  
Michael S. Hisey

4:05 – 4:10 PM  
223. Cost-utility Analysis of Anterior Cervical Discectomy and Fusion with Plating (ACDFP) vs. Posterior Cervical Foraminotomy (PCF) for Patients with Single-level Cervical Radiculopathy at 1-year Follow-up  
Matthew D. Alvin
4:10 – 4:15 PM  
**224.** Outcomes of Lumbopelvic Fixation with S2-Alar-Iliac Screws or Iliac Bolts  
*Marcus D. Mazur*

4:15 – 4:20 PM  
**225.** Allograft vs. Autograft in Occipitocervical Fusion: Radiological and Clinical Outcomes  
*Jakub Godzik*

4:25 – 4:30 PM  
**227.** New Findings in Lipomatosis of Nerve: A Review of 52 Cases Evaluated at One Institution  
*Mark Mahan*

4:30 – 4:35 PM  
**228.** Wrong Level Surgery in the Thoracic Spine: A Survey Based Evaluation  
*Eric A. Potts*

4:35 – 4:40 PM  
**229.** No Difference in Postoperative Complications, Pain and Functional Outcomes Up to 2 Years After Incidental Durotomy in Lumbar Spinal Fusion: A Prospective, Multi-Institutional, Propensity Matched Analysis of 1,741 Patients  
*Owoicho Adogwa*

4:40 – 4:45 PM  
**230.** Prospective Evaluation of a Low Dose Radiation Protocol for Minimally Invasive Transforaminal Lumbar Interbody Fusions  
*Justin C. Clark*

4:45 – 4:50 PM  
**231.** Diffusion Tensor Imaging is a Biomarker for Disease Severity in Cervical Spondylotic Myelopathy  
*Michael Mumert*

4:50 – 4:55 PM  
**232.** ALL Release by Lateral Approach for Anterior Column Reconstruction—Anatomy, Technique and Early Results  
*Luiz Pimenta*

4:55 – 5:00 PM  
Discussion

5:00 – 5:05 PM  
**233.** Utility of Delayed Surgical Repair of Neonatal Brachial Plexus Palsy  
*Zarina S. Ali*
5:05 – 5:10 PM  
234. Hemangiomas of the Spine: Results of Surgical Management and Prognostic Variables for Local Recurrence and Mortality in a Multicenter Study  
Christina L. Goldstein

5:10 – 5:15 PM  
235. Intraoperative 32P Plaque Brachytherapy in Patients with Circumferential and Previously Radiated Spinal Metastases  
Ilya Laufer

5:15 – 5:20 PM  
236. START Study: Sacroiliac Joint Arthrodesis: A Retrospective Outcomes Study of the First 56 Minimally Invasive Fusions  
Stephanie Falatko

5:20 – 5:25 PM  
237. Clinical Outcome of Patients with Lumbar Fusion Using the Cortical Bone Trajectory  
Matthew Neal

5:25 – 5:30 PM  
238. Cost Comparison of Intraoperative 3-Dimensional Imaging vs. Electrophysiologic Monitoring to Check Pedicle Screw Accuracy  
Christopher Villar

5:30 – 5:35 PM  
239. The Impact of Preoperative Depression on Quality of Life Outcomes Following Lumbar Surgery  
Jacob A. Miller

5:35 – 5:40 PM  
Ashish Suri

5:40 – 5:45 PM  
241. Does the Presence of Low Back Pain Modify the Surgical Prognosis of Discectomy in Patients with Symptomatic and Refractory Lumbar Disc Herniation?  
Asdrubal Falavigna

5:45 – 5:50 PM  
Praveen V. Mummaneni

5:50 – 5:55 PM  
243. Microendoscopic Decompression for Cervical Spondylotic Myelopathy  
Nader S. Dahdaleh
**FRIDAY, MARCH 7**

**6:30 – 6:55 AM** Southern Hemisphere I-III

**SUNRISE SESSION II**  
**Tales from the Front Lines: Case Presentations**

**Moderator(s):** Tanvir Choudhri, Anthony H. Sin, Gregory R. Trost

**7:00 – 8:00 AM** Southern Hemisphere I-III

**SCIENTIFIC SESSION V**  
**This is Not Your Father’s Laminectomy**

**Moderator(s):** Junichi Mizuno, Charles A. Sansur, Ryan Scott Trombly

**Learning Objectives:** Upon completion of this course, participants will be able to:

▶ Explain the current state-of-the-art treatment of spinal stenosis
▶ Describe the benefits of using an endoscope in laminectomies
▶ Discuss patient selection for a hemilaminectomy vs. a laminectomy

**7:00 – 7:10 AM**

**MIS Hemilaminectomy**  
Stephen Ritland

**7:10 – 7:20 AM**

**Tubular Base Laminectomy**  
Faheem A. Sandhu

**7:20 – 7:30 AM**

**Endoscopic Decompression**  
Yue Zhou

**7:30 – 7:40 AM**

**Facet Shaving**  
Carl Lauryssen
MEETING AGENDA

7:40 – 7:50 AM
Decompression through the Spinous Process
Michael MacMillan

7:50 – 8:00 AM
Discussion

8:00 – 9:30 AM
Southern Hemisphere I-III

ORAL PRESENTATIONS II
Moderator(s): Kurt M. Eichholz, Meic H. Schmidt, Yu Liang

8:00 – 8:08 AM
105. Adjacent Segment Degeneration Incidence Reduced after Total Disc Replacement Compared with Anterior Discectomy and Fusion for Treatment of One and Two Level Cervical Degenerative Disc Disease: 4-Year Results from an FDA IDE Clinical Trial
David A. Cavanaugh

8:08 – 8:12 AM
Discussant: Eric A. Potts

8:12 – 8:20 AM
106. Less Invasive Surgery for Treating Adult Spinal Deformities (ASD): Ceiling Effects for Cobb Angle Correction with Three Different Techniques
Kai-Ming G. Fu

8:20 – 8:24 AM
Discussant: Jean-Valery Coumans

8:24 – 8:32 AM
107. HRQoL Scores and Radiographic Parameters Do Not Drive Patient Satisfaction after Adult Spinal Deformity Surgery
D. Kojo Hamilton

8:32 – 8:36 AM
Discussant: Ajit A. Krishnaney

8:36 – 8:44 AM
Tarlov Cysts
William C. Welch

8:44 – 8:48 AM
Discussant: Vincent C. Traynelis

8:48 – 8:56 AM
109. Incidence and Prognostic Factors of C5 Palsy: A Clinical Study of 1,001 Cases and Review of the Literature
Mohamad Bydon

8:56 – 9:00 AM
Discussant: John Chi
9:00 – 9:08 AM
**110. The NIS Database Does Not Accurately Reflect Surgical Indications for Fusion**
Yakov Gologorsky

9:08 – 9:12 AM
**Discussant:** Robert F. Heary

9:12 – 9:20 AM
**111. Prospective Study of Biologic Disc Repair with NuQu Percutaneous Allogeneic Chondrocytes with Two-year Follow-up**
Domagoj Coric

9:20 – 9:24 AM
**Discussant:** Gregory R. Trost

9:24 – 9:30 AM
**Discussion**

9:30 – 10:00 AM
**Northern Hemisphere B-E**

**What’s New Session IV/Coffee Break**

**Moderator(s):** David J. Hart, Daniel Refai, Luis M. Tumialan

10:00 – 11:15 AM
**Southern Hemisphere I-III**

**SCIENTIFIC SESSION VI**

**Lumbar Degenerative Spondylolisthesis**

**Moderator(s):** Christopher Bono, Michael W. Groff, Xifeng Zhang

**Learning Objectives:** Upon completion of this course, participants will be able to:
- Discuss the updated guidelines, indications, and expected outcomes for surgical treatment of lumbar degenerative spondylolisthesis

10:00 – 10:15 AM
**Spondylolisthesis: To Fuse or Not**
Zoher Ghogawala

10:15 – 10:30 AM
**Indirect vs. Direct Decompression**
Charles A. Sansur

10:30 – 10:45 AM
**Open and MIS Options**
Daniel J. Hoh

10:45 – 11:00 AM
**Pelvic Incidence and the Importance of Sagittal Balance**
Nicholas Theodore

11:00 – 11:15 AM
**Evidence and Outcomes**
Christopher Bono
MEETING AGENDA

11:30 AM – 12:30 PM  Southern Hemisphere I-III

**SCIENTIFIC SESSION VII**

**Awards and Oral Poster Breakouts**

**Moderator(s):** Charles L. Branch, Joseph S. Cheng, Jefferson Walter Daniel

11:30 – 11:40 AM

**MAYFIELD AND OTHER AWARDS**

John Chi, Adam S. Kanter

11:40 – 11:45 AM

**112. Efficacy and Safety of Surgical Treatment Cervical Spondylotic Myelopathy (CSM). Outcomes of the AOSpine Multicenter Prospective CSM-I Study**

Michael G. Fehlings

11:45 – 11:48 AM

**Discussant:** Daniel J. Hoh

11:48 – 11:53 AM

**113. Comparison of Radiographic Results after Minimally Invasive (MIS), Hybrid (HYB) and Open (OPEN) Surgery for Adult Spinal Deformity (ASD): A Multicenter Study of 184 Patients**

Richard G. Fessler

11:53 – 11:56 AM

**Discussant:** Kai-Ming G. Fu

11:56 AM – 12:01 PM


Melissa C. Werndle

12:01 – 12:04 PM

**Discussant:** R. John Hurlbert

12:04 – 12:09 PM

**115. Circulating Tumor DNA as a Biomarker for Malignant Peripheral Nerve Sheath Tumors**

Chetan Bettegowda

12:09 – 12:12 PM

**Discussant:** Robert J. Spinner

12:12 – 12:17 PM

**116. Survival and Recurrence Following Resection of Chordoma in the Mobile Spine: Results of 171 Patients from the AOSpine Primary Tumor Knowledge Forum**

Patricia L. Zadnik

12:17 – 12:20 PM

**Discussant:** Patrick C. Hsieh

12:20 – 12:25 PM

**117. Investigating Patient Perceptions: Analyzing the Role of Positive Spine MRI Findings on Patients’ Perceived Need for Surgery**

J. Nicole Bentley

12:25 – 12:30 PM
12:25 – 12:28 PM  
**Discussant:** Karin R. Swartz

12:30 – 1:00 PM  
CNS/AANS Section on Disorders of the Spine and Peripheral Nerves Business Meeting

12:30 – 12:33 PM  
**Update on N2QOD**  
Zoher Ghogawala

12:33 – 12:36 PM  
**Washington Committee**  
John Wilson

12:36 – 12:39 PM  
**Secretary’s Report**  
Praveen V. Mummaneni

12:39 – 12:42 PM  
**Treasurer’s Report**  
Charles Kuntz, IV

12:42 – 12:45 PM  
**Future Sites Committee Report**  
Iain H. Kalfas

12:45 – 12:48 PM  
**CPT Committee Report**  
John K. Ratliff

12:48 – 12:51 PM  
**Guidelines Committee Report**

12:51 – 12:54 PM  
**Newsletter/Website Committee Report**  
Eric A. Potts

12:54 – 12:57 PM  
**Nominating Committee Report**  
Joseph S. Cheng

12:57 – 1:00 PM  
Northern Hemisphere B-E

1:00 – 1:30 PM  
**What’s New Session V/Lunch with Exhibitors**

**Moderator(s):** Ajit A. Krishnaney, Yi Lu, Wilson Zachary Ray

1:00 – 2:30 PM  
Northern Hemisphere A4

$200 includes lunch

**LUNCHEON SYMPOSUM I:**  
**Revision Spine Surgery**

**Course Director(s):** Iain H. Kalfas, Michael G. Kaiser  
**Faculty:** Francis Farhadi, Robert F. Heary, Gregory R. Trost  
**Course Description:** This course will provide state-of-the-art information on complication avoidance during revision spine surgery. Faculty will discuss their clinical experience
and lessons learned via interactive case discussions.

**Learning Objectives:** Upon completion of this course, participants will be able to:

- Explain the management issues unique to revision surgery
- Appraise the common reasons for spinal instrumentation failure
- Integrate strategies for the management of postoperative deformity and adjacent segment failure
- Formulate strategies to avoid and repair CSF leak/pseudomeningocele

**Meeting Agenda**

1:00 – 1:18 PM  
*Revision Surgery for Thoracolumbar Instrumentation Failure*  
*Gregory R. Trost*

1:18 – 1:36 pm  
*Revision Surgery for Iatrogenic Cervical Deformity*  
*Iain H. Kalfas*

1:36 – 1:54 PM  
*Role of MIS in Revision Spine Surgery*  
*Francis Farhadi*

1:54 – 2:12 PM  
*Revision Surgery for Flat Back Syndrome after Lumbar Fusion*  
*Robert F. Heary*

2:12 – 2:30 PM  
*Revision Surgery for CSF Leak/Pseudomeningocele*  
*Michael G. Kaiser*

1:00 – 2:30 PM  
Northern Hemisphere A3  

$200 includes lunch

**Luncheon Symposium II: Update of Spine Guidelines**  
**Course Director(s):** Daniel K. Resnick  
**Faculty:** Zoher Ghogawala, Praveen V. Mummaneni  
**Course Description:** This didactic course will provide an overview of the guidelines process as well as an introduction to several of the new clinical practice guidelines developed by the section on the topics of cervical spine trauma and lumbar fusion.

**Learning Objectives:** Upon completion of this course, participants will be able to:

- Describe the principles of guideline development
- Discuss the role of spine surgeons in the development of clinical practice guidelines
- Describe the role of fusion in the treatment of axial back pain
- Describe the role of fusion for the treatment of degenerative spondylolisthesis
1:00 – 1:10 PM  
Development and Utilization of Guidelines  
Daniel K. Resnick

1:10 – 1:30 PM  
Fusion for Axial Back Pain  
Praveen V. Mummaneni

1:30 – 1:50 PM  
Fusion for Spondylolisthesis  
Zoher Ghogawala

1:50 – 2:20 PM  
Vertebral Artery Injury in Cervical Trauma

2:20 – 2:30 PM  
BMP’s Post YODA  
Daniel K. Resnick

1:00 – 2:30 PM Northern Hemisphere A2  

$200 includes lunch  

**LUNCHEON SYMPOSIUM III:**  
Lateral Retroperitoneal Interbody Fusion:  
Technique and Outcomes

Course Director(s): Regis W. Haid, Adam S. Kanter  
Faculty: John C. Liu, Juan S. Uribe  
Course Description: This course will focus on the indications, outcomes and complications of the lateral retroperitoneal transposa fusion technique. Specific lectures will concentrate on anatomy and approach, literature based outcomes, complication avoidance and management, and clinical pearls. Biomechanics of stand-alone vs. supplemented techniques will be discussed. Interaction and discussion among participants will be encouraged.  

Learning Objectives: Upon completion of this course, participants will be able to:  
- Review and discuss indications for lateral thoracolumbar interbody approaches and surgery  
- Discuss the complications and their avoidance in these procedures  
- Review the clinical and radiographic results in lateral thoracolumbar interbody fusion procedures

1:00 – 1:20 PM  
Basic Overview, Technique and Pearls  
John C. Liu

1:20 – 1:30 PM  
Discussion

1:30 – 1:50 PM  
Stand Alone vs. Post Fixation  
Adam S. Kanter

1:50 – 2:00 PM  
Discussion
MEETING AGENDA

2:00 – 2:20 PM
Degenerative Deformity Correction
Juan S. Uribe

2:20 – 2:30 PM
Discussion

1:30 – 5:30 PM
Americas Seminar

$200 includes lunch

SPECIAL COURSE VII: Hands On Spine: Indications, Techniques and Complication Avoidance for the NP/PA Assistant

Course Director(s): Michael P. Steinmetz, Andrea L. Strayer, Eve C. Tsai
Faculty: Nathaniel P. Brooks, Marc Eichler, David J. Hart, Daniel J. Hoh, Jeffrey R. Holtz, Durand Jones, Sharad Rajpal, Mohammed F. Shamji, John H. Shin, Carl W. Stopper, Gregory R. Trost

Course Description: Directed toward the spine surgery physician assistant, nurse practitioner, and nurse colleagues, this special course will incorporate hands on surgical intervention techniques with saw bones and a variety of instrumentation systems. The hands on learning will be supported by an overview of cervical to sacral surgical indications and complication avoidance.

Learning Objectives: Upon completion of this course, participants will be able to:
▶ Analyze indications, techniques and complication avoidance for common spine surgical procedures.
▶ Demonstrate hands on techniques utilizing saw bones

1:30 – 2:15 PM
C 1-2 Fixation, C 1-2 Wiring, Odontoid Screws
Marc Eichler, Durand Jones, Gregory R. Trost

2:15 – 3:30 PM
Cervical Translaminar Fixation, Cervical Lateral mass Fixation, Anterior Cervical Discectomy and Fusion, and Corpectomy
Sharad Rajpal, John H. Shin

3:30 – 3:45 PM
Break

3:45 – 4:45 PM
TLIF, DLIF, PLIF, PLF
Nathaniel P. Brooks, David J. Hart, Daniel J. Hoh, Jeffrey R. Holtz

4:45 – 5:30 PM
Iliac Screws, Bone Graft Harvest
Mohammed F. Shamji, Carl W. Stopper
3:30 – 5:30 PM Atlantic Hall C

$500 includes lunch

**NEW CADAVER COURSE: Innovative Technologies in Spine and Peripheral Nerve Surgery**

**Course Director(s):** Daniel J. Hoh, Eric J. Woodard  
**Faculty:** Allan J. Belzberg, Darryl J. Dirisio, Asdrubal Falavigna, Lines Jacques, Ross R. Moquin, Paul Park, Wilson Zachary Ray, Faheem A. Sandhu, Albert E. Telfeian, Steven Vanni, Lynda Jun-San Yang  
**Learning Objectives:** Upon completion of this course, participants will be able to:

- Describe indications and techniques for various new technologies in spine surgery
- Describe indications and techniques for various new technologies in peripheral nerve surgery
- Describe complication avoidance and management for various new technologies in spine and peripheral nerve surgery

6:30 – 9:00 PM Southern Hemisphere IV

**YOUNG NEUROSURGEONS’ DINNER**

Story Musgrave  
All residents, fellows and young neurosurgeons are encouraged to attend this special event.

**RSVP to DePuy Synthes Spine, Booth #207**

7:00 – 8:00 AM Southern Hemisphere I-III

**SCIENTIFIC SESSION VIII**  
**Osteobiologics in the Spine and Oral Poster Presentations III**

**Moderator(s):** Junichi Mizuno, Daniel Refai, Daniel M. Sciubba  
**Learning Objectives:** Upon completion of this course, participants will be able to:

- Describe the different types of osteobiologics available
- Discuss the evaluation and use of osteobiologics in clinical practice

7:00 – 7:05 AM

**BMP Controversies Overview**  
Allan D. Levi

7:05 – 7:15 AM

**Yoda Overview**  
Christopher Bono
7:15 – 7:25 AM
**BMP Dosages**
Daniel K. Resnick

7:25 – 7:35 AM
**BMP and Cancer Associations**
Thomas E. Mroz

7:40 – 7:45 AM
245. **Total Hospital Costs of Surgical Treatment for Adult Spinal Deformity (ASD): An Extended Follow-up Study**
Ian McCarthy

7:45 – 7:50 AM
**Surgical Strategy for the Treatment of Congenital Atlanto-Axial Dislocations**
Feng-Zeng Jian

7:50 – 7:55 AM
247. **Cost-effectiveness of Minimally Invasive vs. Open Correction of Adult Degenerative Deformity**
Raqeeb M. Haque

7:55 – 8:00 AM
**Discussion**

8:00 – 10:00 AM Southern Hemisphere I-III

**David Cahill Memorial Controversies Sessions**

*Moderator(s):* Charles L. Branch, Adam S. Kanter, XiuChun Yu

8:00 – 8:10 AM
**Introduction of Cahill Session**
Regis W. Haid

8:10 – 8:20 AM
**Central Cord Syndrome: Decompress Early**
James S. Harrop

8:20 – 8:30 AM
**Central Cord Syndrome: Decompression Can Wait**
Robert F. Heary

8:30 – 8:40 AM
**Scoliosis Can All Be Done from Behind**
Tyler R. Koski

8:40 – 8:50 AM
**Circumferential Techniques Add Value**
David O. Okonkwo

8:50 – 9:00 AM
**MIS Deformity Surgery: Wave of the Future**
Juan S. Uribe
9:00 – 9:10 AM  
**MIS Deformity Surgery: Passing Fad**  
*Christopher I. Shaffrey*

9:10 – 9:20 AM  
**Severe Osteoporosis: Fixate with Techniques to Ensure Solid Bone Purchase**  
*Praveen V. Mummaneni*

9:20 – 9:30 AM  
**Severe Osteoporosis: Minimize Hardware**  
*John K. Ratliff*

9:30 – 9:40 AM  
**Double Crush: Decompress Peripheral Nerves First**  
*Allan J. Belzberg*

9:40 – 9:50 AM  
**Double Crush: Decompress Spinal Nerves First**  
*Andrew T. Dailey*

9:50 – 10:00 AM  
**Questions and Comments**

10:00 – 10:30 AM  
**Coffee Break**

10:30 AM – 12:30 PM  
**Southern Hemisphere I-III**

**SCIENTIFIC SESSION IX**

*Moderator(s): Marjorie C. Wang, Harshpal Singh, XiuChun Yu*

10:30 – 11:00 AM  
**Fellowship Awards**  
*John Chi, Michael P. Steinmetz*

11:05 – 11:10 AM  
**249. Prospective Analysis of Risk Factors for Proximal Junctional Failure in Adult Deformity Patients Improve Our Understanding of Surgical Treatment Strategies for Adults with Spinal Deformity**  
*D. Kojo Hamilton*

11:10 – 11:15 AM  
**250. Quantitative Analysis of MRI Spinal Cord Compression and Canal Compromise in Patients with Cervical Spondyloitic Myelopathy: Results from the Prospective, Multicenter AOSpine North American Study**  
*Aria Nouri*

11:15 – 11:20 AM  
**251. A Clinical Prediction Model to Assess Surgical Outcome in Patients with Cervical Spondyloitic Myelopathy: Internal and External Validation using the Prospective Multicenter AOSpine North American and International Datasets in 764 Patients**  
*Lindsay Tetreault*
<table>
<thead>
<tr>
<th>Session</th>
<th>Title</th>
<th>Speaker</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:20 – 11:25 AM</td>
<td><strong>252. Complication Avoidance and Management in Thoracic Disc Surgery: Experience with 64 Patients</strong>&lt;br&gt;Noel I. Perin</td>
<td></td>
</tr>
<tr>
<td>11:25 – 11:30 AM</td>
<td><strong>Discussion</strong></td>
<td></td>
</tr>
<tr>
<td>11:30 – 11:35 AM</td>
<td><strong>253. Intraoperative Vancomycin Use in Spinal Surgery: Single Institution Experience and Microbial Trends</strong>&lt;br&gt;George M. Ghobrial</td>
<td></td>
</tr>
<tr>
<td>11:35 – 11:40 AM</td>
<td><strong>254. Upper Extremity SSEP Monitoring in Posterior Thoracic and Lumbar Surgery to Prevent Peripheral Nerve Injury</strong>&lt;br&gt;Kenneth M Crandall</td>
<td></td>
</tr>
<tr>
<td>11:40 – 11:45 AM</td>
<td><strong>255. Three- and Four- Level Anterior Cervical Discectomy And Fusion Using PEEK Cages And Plate Fixation For The Treatment of Cervical Spondylosis. Report of 78 Cases</strong>&lt;br&gt;Gabriel A. Gonzales-Portillo</td>
<td></td>
</tr>
<tr>
<td>11:45 – 11:50 AM</td>
<td><strong>256. The FGFR/MEK/ERK/Brachyury Pathway is Critical for Chordoma Cell Growth and Survival</strong>&lt;br&gt;Wesley Hsu</td>
<td></td>
</tr>
<tr>
<td>11:50 – 11:55 AM</td>
<td><strong>257. Nasal MRSA Colonization: Impact on Surgical Site Infection Following Spine Surgery</strong>&lt;br&gt;Vismay Thakkar</td>
<td></td>
</tr>
<tr>
<td>11:55 AM – 12:00 PM</td>
<td><strong>Discussion</strong></td>
<td></td>
</tr>
<tr>
<td>12:00 – 12:05 PM</td>
<td><strong>258. Outcomes After Cervical Laminectomy with Instrumented Fusion vs. Expansile Laminoplasty: A Propensity Matched Study of 8587 Patients</strong>&lt;br&gt;Owoicho Adogwa</td>
<td></td>
</tr>
<tr>
<td>12:05 – 12:10 PM</td>
<td><strong>259. Quantitative Analysis of MRI Signal Change in Patients with Cervical Spondylotic Myelopathy: Results from the Prospective, Multicenter AOSpine North American Study</strong>&lt;br&gt;Aria Nouri</td>
<td></td>
</tr>
</tbody>
</table>
12:15 – 12:20 PM
261. Functional Outcomes After Lumbar Spine Fusion Between Patients with Spondylolisthesis and Those with Degenerative Disc Disease (DDD): A Propensity Matched Prospective, Multi-Institutional Longitudinal Study of 1,741 Patients
Owoicho Adogwa

12:20 – 12:25 PM
262. Analysis of Local Sagittal and Spinopelvic Parameters in a Stand-alone ALIF for L5S1 DDD – Minimum 2-year Follow-up
Luiz Pimenta

12:25 – 12:30 PM
Discussion

The AANS/CNS Section on Disorders of the Spine and Peripheral Nerves gratefully acknowledges:

Medtronic

Neurosurgical Leadership Ambassador

for providing an Educational Grant in support of the 2014 Annual Meeting!
- Find Meeting Rooms
- Browse Complete Abstracts and Posters
- See Who’s Registered
- Explore the Exhibit Hall
- And More!
The Exhibit Hall, located in Northern Hemisphere B-E, features more than 40 companies displaying the latest neurosurgical and orthopedic technology, equipment, products and services.

<table>
<thead>
<tr>
<th>Company</th>
<th>Booth No.</th>
<th>Contact Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>AccelSPINE</td>
<td>105</td>
<td>214-545-5836&lt;br&gt;www.accelspine.com</td>
</tr>
<tr>
<td>Advanced Biologics</td>
<td>402</td>
<td>800-272-0267&lt;br&gt;www.advancedbiologics.com</td>
</tr>
<tr>
<td>Alphatec Spine, Inc.</td>
<td>504</td>
<td>760-431-9286&lt;br&gt;www.alphatecspine.com</td>
</tr>
<tr>
<td>AOSpine North America</td>
<td>200</td>
<td>610-993-5132&lt;br&gt;www.aospine.org</td>
</tr>
<tr>
<td>Baxano Surgical, Inc.</td>
<td>100</td>
<td>408-514-2200&lt;br&gt;www.baxano.com</td>
</tr>
<tr>
<td>Benvenue Medical, Inc.</td>
<td>408</td>
<td>408-454-9300&lt;br&gt;www.benvenuemedical.com</td>
</tr>
<tr>
<td>Biomet Spine &amp; Bone Healing Technologies</td>
<td>115</td>
<td>973-299-9300&lt;br&gt;www.biometspine.com</td>
</tr>
<tr>
<td>Captiva Spine</td>
<td>202</td>
<td>877-772-5571&lt;br&gt;www.captivaspine.com</td>
</tr>
<tr>
<td>Centinel Spine, Inc.</td>
<td>104</td>
<td>212-583-9700&lt;br&gt;www.centinelspine.com</td>
</tr>
<tr>
<td>Congress of Neurological Surgeons</td>
<td>501</td>
<td>847-240-2500&lt;br&gt;www.cns.org</td>
</tr>
<tr>
<td>DePuy Synthes Spine</td>
<td>207</td>
<td>508-880-8100&lt;br&gt;www.Depuysynthes.com</td>
</tr>
<tr>
<td>Company</td>
<td>Phone</td>
<td>Website</td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>----------------</td>
<td>--------------------------------------</td>
</tr>
<tr>
<td>Gauthier Biomedical</td>
<td>866-546-0010</td>
<td><a href="http://www.gauthierbiomedical.com">www.gauthierbiomedical.com</a></td>
</tr>
<tr>
<td>Globus Medical</td>
<td>610-930-1800</td>
<td><a href="http://www.globusmedical.com">www.globusmedical.com</a></td>
</tr>
<tr>
<td>GS Medical Company</td>
<td>831-477-1307</td>
<td><a href="http://www.gsmedicalusa.com">www.gsmedicalusa.com</a></td>
</tr>
<tr>
<td>Integra</td>
<td>609-275-0500</td>
<td><a href="http://www.integralife.com">www.integralife.com</a></td>
</tr>
<tr>
<td>Joimax, Inc.</td>
<td>949-859-3472</td>
<td><a href="http://www.joimax.com">www.joimax.com</a></td>
</tr>
<tr>
<td>K2M, Inc.</td>
<td>703-777-3155</td>
<td><a href="http://www.k2m.com">www.k2m.com</a></td>
</tr>
<tr>
<td>LDR</td>
<td>512-344-3300</td>
<td><a href="http://www.ldrspine.com">www.ldrspine.com</a></td>
</tr>
<tr>
<td>Life Instrument Corporation</td>
<td>781-849-0109</td>
<td><a href="http://www.lifeinstruments.com">www.lifeinstruments.com</a></td>
</tr>
<tr>
<td>Lilly USA, LLC</td>
<td>317-651-6557</td>
<td><a href="http://www.lilly.com">www.lilly.com</a></td>
</tr>
<tr>
<td>Lippincott Williams and Wilkins – WKH</td>
<td>215-521-8300</td>
<td><a href="http://www.lww.com">www.lww.com</a></td>
</tr>
<tr>
<td>Medtronic</td>
<td>901-396-3133</td>
<td><a href="http://www.medtronic.com">www.medtronic.com</a></td>
</tr>
<tr>
<td>MiMedx Group, Inc.</td>
<td>888-543-1917</td>
<td><a href="http://www.mimedx.com">www.mimedx.com</a></td>
</tr>
<tr>
<td>NovaBone Products LLC</td>
<td>386-462-7660</td>
<td><a href="http://www.novabone.com">www.novabone.com</a></td>
</tr>
</tbody>
</table>
## EXHIBITOR INFORMATION

<table>
<thead>
<tr>
<th>Company</th>
<th>Phone Number</th>
<th>Website Link</th>
</tr>
</thead>
<tbody>
<tr>
<td>NuTech Medical</td>
<td>205-290-2158</td>
<td><a href="http://www.nutechspine.com">www.nutechspine.com</a></td>
</tr>
<tr>
<td>NuVasive</td>
<td>858-909-1800</td>
<td><a href="http://www.nuvasive.com">www.nuvasive.com</a></td>
</tr>
<tr>
<td>Orthofix, Inc.</td>
<td>214-937-2200</td>
<td><a href="http://www.orthofix.com">www.orthofix.com</a></td>
</tr>
<tr>
<td>Paradigm Spine, LLC</td>
<td>212-367-7274</td>
<td><a href="http://www.paradigmspine.com">www.paradigmspine.com</a></td>
</tr>
<tr>
<td>RTI Surgical</td>
<td>512-372-4355</td>
<td><a href="http://www.rtix.com">www.rtix.com</a></td>
</tr>
<tr>
<td>Safewire LLC</td>
<td>800-286-9155</td>
<td><a href="http://www.safe-wire.com">www.safe-wire.com</a></td>
</tr>
<tr>
<td>SI-BONE, Inc.</td>
<td>408-207-0700</td>
<td><a href="http://www.si-bone.com">www.si-bone.com</a></td>
</tr>
<tr>
<td>Spine Wave</td>
<td>203-944-9494</td>
<td><a href="http://www.spinewave.com">www.spinewave.com</a></td>
</tr>
<tr>
<td>SpineCraft</td>
<td>630-920-7300</td>
<td><a href="http://www.spinecraft.com">www.spinecraft.com</a></td>
</tr>
<tr>
<td>Spineology Inc.</td>
<td>651-256-8500</td>
<td><a href="http://www.spineology.com">www.spineology.com</a></td>
</tr>
<tr>
<td>Stryker</td>
<td>800-253-3210</td>
<td><a href="http://www.stryker.com">www.stryker.com</a></td>
</tr>
<tr>
<td>TeDan Surgical Innovations</td>
<td>713-726-0886</td>
<td><a href="http://www.tedansurgical.com">www.tedansurgical.com</a></td>
</tr>
<tr>
<td>Thompson Surgical Instruments</td>
<td>231-922-0177</td>
<td><a href="http://www.thompsonsurgical.com">www.thompsonsurgical.com</a></td>
</tr>
</tbody>
</table>
Find the latest research, procedures, products and services during the *What’s New* sessions!

Join these exhibitors in the Demonstration Theater for exciting 10-minute presentations during beverage and lunch breaks.

### THURSDAY

10:00 – 10:30 AM

<table>
<thead>
<tr>
<th>Company</th>
<th>Exhibit Number</th>
<th>Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>NuVasive</td>
<td>103</td>
<td></td>
</tr>
<tr>
<td>Biomet</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

12:00 – 1:00 PM

<table>
<thead>
<tr>
<th>Company</th>
<th>Exhibit Number</th>
<th>Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medtronic</td>
<td>300</td>
<td></td>
</tr>
<tr>
<td>Integra</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DePuy Synthes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Globus Medical</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3:30 – 4:00 PM

<table>
<thead>
<tr>
<th>Company</th>
<th>Exhibit Number</th>
<th>Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medtronic</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### FRIDAY

9:30 – 10:00 AM

<table>
<thead>
<tr>
<th>Company</th>
<th>Exhibit Number</th>
<th>Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>NuVasive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DePuy Synthes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1:00 – 1:30 PM

<table>
<thead>
<tr>
<th>Company</th>
<th>Exhibit Number</th>
<th>Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Globus Medical</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ACCREDITATION
This activity has been planned and implemented in accordance with the Essentials Areas and policies of the Accreditation Council for Continuing Medical Education through the joint sponsorship of the Congress of Neurological Surgeons and the CNS/AANS Section on Disorders of the Spine and Peripheral Nerves. The Congress of Neurological Surgeons is accredited by the ACCME to provide continuing medical education for physicians.

AMA CREDIT DESIGNATION STATEMENT
US Physicians: The CNS designates this live activity for a maximum of 28.75 AMA PRA Category 1 Credits™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

CME CREDIT
*A maximum of 21.25 AMA PRA Category 1 Credits™ may be earned for Scientific Sessions only.

Physician Assistant/Physician Extender: Attendees will receive credits for attendance at the general Scientific Program and for any optional events attended. Each physician assistant/physician extender should contact his or her individual membership association and certification board to determine the requirements for accepting credits. All attendees will receive a Certificate of Attendance.

Additional CME Credits can be earned by attending the following:
Special Courses
Attendees will receive a maximum of 3.75 AMA PRA Category 1 Credits™ for each eligible half-day Special Course. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Luncheon Symposia
Attendees will receive a maximum of 1.5 AMA PRA Category 1 Credits™ for each eligible Luncheon Symposium. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

POSTERS
Physicians may claim AMA PRA Category 1 Credit™ directly from the AMA for preparing a poster presentation, which also includes the published abstracts. Physicians may claim them on their AMA PRA certificate application or apply directly to the AMA for an AMA PRA Category 1 Credit™ certificate. Physicians may claim AMA PRA Category 2 Credit™ for viewing scientific posters. Physicians should self-claim credit on their AMA PRA certificate application form.
CLAIMING CME CREDIT
CME credits can be claimed through the online CME system at www.cns.org. Log in using your last name and the e-mail address with which you registered. You will need to enter the number of hours you are claiming for each session you attended. Physicians should only claim credit for the learning activities at the Annual Meeting in which they actively participated. The CME tracking system lets you create and email a CME certificate immediately following the 2014 Annual Meeting either while you are still in Orlando or from the convenience of your home or office.

DISCLOSURES
The Accreditation Council for Continuing Medical Education Updated Standards for Commercial Support requires that anyone in a position to control the content of the educational activity has disclosed all financial relationships with any commercial interest. Failure or refusal to disclose or the inability to satisfactorily resolve the identified conflict may result in the withdrawal of the invitation to participate in any of the CNS educational activities. The ACCME defines a “commercial interest” as any entity producing, marketing, re-selling or distributing healthcare goods or services consumed by, or used on, patients.

FDA STATEMENT
Some drugs or medical devices demonstrated at the Annual Meeting have not been cleared by the FDA or have been cleared by the FDA for specific purposes only. The FDA has stated that it is the responsibility of the physician to determine the FDA clearance status of each drug or medical devices he or she wishes to use in clinical practice. The CNS policy provides that “off label” uses of a drug or medical device may be described at the Annual Meeting so long as the “off label” use of the drug or medical device is also specifically disclosed. Any drug or medical device is “off label” if the described use is not set forth on the products approval label. It is also each speaker’s responsibility to include the FDA clearance status of any device or drug requiring FDA approval discussed or described in their presentation or to describe the lack of FDA clearance for any “off label” uses discussed. Speakers from the audience are also required, therefore, to indicate any relevant personal/professional relationships as they discuss a given topic.
SPEAKER READY ROOM
The Speaker Ready Room, located in Europe 3, will be available:

- **Wednesday, March 5** 8:00 AM – 6:00 PM
- **Thursday, March 6** 6:00 AM – 6:00 PM
- **Friday, March 7** 6:00 AM – 5:00 PM
- **Saturday, March 8** 6:00 AM – 12:00 PM

All speakers and abstract presenters should visit the Speaker Ready Room prior to their presentation. All Scientific Session faculty are required to check-in at the Speaker Ready Room 24 hours ahead of your presentation.

EXHIBIT HALL
Northern Hemisphere B-E
- **Thursday, March 6** 9:00 AM – 7:00 PM
- **Friday, March 7** 9:00 AM – 2:00 PM

REGISTRATION
North Hemisphere Foyer
- **Wednesday, March 5** 12:30 – 6:00 PM
- **Thursday, March 6** 6:00 AM – 6:00 PM
- **Friday, March 7** 6:00 AM – 5:30 PM
- **Saturday, March 8** 6:00 AM – 12:00 PM

NO SMOKING POLICY
Smoking is not permitted at any official CNS/AANS Section on Disorders of the Spine and Peripheral Nerves Annual Meeting event. The Walt Disney Swan and Dolphin Resort is a non-smoking hotel.

DISCLAIMER
The material presented at the 2014 Annual Meeting has been made available by the CNS/AANS Section on Disorders of the Spine and Peripheral Nerves and the CNS for educational purposes only. These materials are not intended to represent the only, nor necessarily the best method or procedure appropriate for the medical situations discussed, but rather are intended to present an approach, view, statement or opinion of the faculty, which may be helpful to others who face similar situations.

All drugs and medical devices used in the United States are administered in accordance with the Food and Drug Administration (FDA) regulations. These regulations vary depending on the risks associated with the drug or medical devices compared to products already on the market, and the scope of the clinical data available.

Some drugs and medical devices demonstrated or described within the print publications of the CNS/AANS Section of Disorders of the Spine and Peripheral Nerves jointly sponsored by the CNS have FDA clearance for use for
specific purposes or for use only in restricted research settings. The FDA has stated that it is the responsibility of the physician to determine the FDA status of each drug or device he or she wants to use in compliance with applicable laws.

Neither the content (written or oral) of any course, seminar or other presentation in the program, nor the use of a specific product in conjunction therewith, nor the exhibition of any materials by any parties coincident with the program, should be construed as indicating endorsement or approval of the views presented, the products used or the materials exhibited by the CNS/AANS Section on Disorders of the Spine and Peripheral Nerves jointly sponsored by the CNS, or by its committees, commissions or affiliates.

OPENING RECEPTION
Cabana Deck

Wednesday, March 5 6:30 – 8:00 PM

Enjoy a lavish array of food and refreshments while reconnecting with colleagues and meeting new contacts at the Opening Reception. Take in the magic and wonder of the reception at the Walt Disney World Swan and Dolphin Resort. Each medical attendee and spouse/guest registered for the meeting will receive one complimentary ticket. Resort casual attire is recommended.

RECEPTION WITH EXHIBITORS
Northern Hemisphere B-E

Thursday, March 6 6:00 – 7:00 PM

Interact with colleagues and corporate contacts while enjoying pre-dinner cocktails and hors d’oeuvres during this exciting networking event in the Exhibit Hall. Business casual attire is recommended.

YOUNG NEUROSURGEONS’ DINNER
Southern Hemisphere IV

Friday, March 7 6:30 PM

All residents, fellows and young neurosurgeons are welcome. RSVP to DePuy Synthes Spine, Booth #207

Purpose of the CNS/AANS Section on Disorders of the Spine and Peripheral Nerves

To foster the use of spinal neurosurgical methods for the treatment of diseases of the spinal neural elements, the spine and peripheral nerves. To advance spinal neurosurgery and related sciences, improve patient care, support meaningful basic and clinical research, provide leadership in undergraduate and graduate continuing education and promote administrative facilities necessary to achieve these goals.
The Congress of Neurological Surgeons controls the content and production of this CME activity and attempts to assure the presentation of balanced, objective information. In accordance with the Standards for Commercial Support established by the Accreditation Council for Continuing Medical Education, speakers are asked to disclose any relationship they have with commercial companies which may be related to the content of their lecture.

Speakers who have disclosed a relationship with commercial companies whose products may have a relevance to their presentation are listed below. Planners are designated by P and faculty by F. Disclosures are as of January 3, 2014.

### Positional Interest Codes

<table>
<thead>
<tr>
<th>Code</th>
<th>Positional Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CEO</td>
</tr>
<tr>
<td>2</td>
<td>Consultant</td>
</tr>
<tr>
<td>3</td>
<td>Director</td>
</tr>
<tr>
<td>4</td>
<td>Editorial Board</td>
</tr>
<tr>
<td>5</td>
<td>Employee</td>
</tr>
<tr>
<td>6</td>
<td>N/A</td>
</tr>
<tr>
<td>7</td>
<td>Officer</td>
</tr>
<tr>
<td>8</td>
<td>Owner</td>
</tr>
<tr>
<td>9</td>
<td>Royalty</td>
</tr>
<tr>
<td>10</td>
<td>Other</td>
</tr>
<tr>
<td>11</td>
<td>Honoraria</td>
</tr>
</tbody>
</table>

**Behrooz A. Akbarnia, MD**
- Consulting Agreement - DePuy Spine (2), K2M (2), Nuvasive (2); Royalty - DePuy Spine (2), Nuvasive (2)

**Todd Albert, MD**
- Consulting Agreement - Facetlink (6), United Healthcare (4); Other - CSRS, SRS, IMAST, AOAC (6), Vertec (6), In Vivo Therapeutics (6), Paradigm Spine (6), Biomerix (6), Breakaway Imaging (6), Crosstree (6), Invuity (6), Pioneer (6), Gentis (6), ASIP (6), PMIG (6); Royalty - Biomer (2), Depuy (2)

**Christopher P. Ames, MD**
- Consulting Agreement - DePuy (2), Medtronic (2), Styker (2); Other - Baxano Surgical (6), Doctors Research Group (6), Fish & Richardson, P.C. (6), Visualase (6); Royalty - ASCULAP (6), LANX (6); Salary - UCSF (5)

**Beejal Y. Amin, MD**
- Honoraria - Globus (6)

**Neel Anand, MD**
- Other - Trans 1 (6)

**Paul M. Arnold, MD**
- Consulting Agreement - AOSpine North America (2), Integra Life (2), Lifespine (2), Medtronic Sofamor Danek (2), MIEMS (2), SpineWave (2), Styker Spine (2); Honoraria - University of Missouri (6); Other - AOSpine North America (3); Ownership Interest - Z-plasty (6)

**Anthony L. Asher, MD, FACS**
- Consulting Agreement - Hyperbranch Medical Technologies (2), Medtronic Corporation (2); Other - NeuroPoint Alliance (3)

**Hyun Bae, MD**
- Royalty - NuVasive, Inc (2)

**Edward C. Benzel, MD**
- Royalty - AxioMed (2), DePuy (2)

**Shay Bess, MD**
- Consulting Agreement - Allosource (6), Alphatec (6), DePuy Spine (6), K2 Medical (6), Medtronic Sofamor Danek (6); Royalty - Pioneer (6)

**Mark H. Bilsky, MD**
- Consulting Agreement - Varian (6); Honoraria - Globus Medical (6); Royalty - DePuy Spine (2)

**Oheneba Boachie-Adjei, MD**
- Consulting Agreement - DePuy Spine (2), K2M (2), Trans1 Inc (2); Other - Medtronic (6)

**Christopher Bono, MD**
- Consulting Agreement - Harvard Clinical Research Institute (2); Royalty - Informa Health Care (6), Wolter Kluwer (6)
Stefano Boriani, MD³  
Other - AOSpine International (7)  
Charles L. Branch, MDF  
Consulting Agreement - Medtronic (2); Royalty - Medtronic (6)  

Charles L. Branch, MD  
Consulting Agreement - Medtronic (2); Royalty - Medtronic (2)  

Nathaniel P. Brooks, MD⁴  
Consulting Agreement - Medtronic  
Midas Rex (2); Honoraria - Medtronic (6)  

Brandon Bucklen, PhD  
Salary - Globus Medical Inc (5)  

Douglas C. Burton, MD⁴  
Consulting Agreement - DePuy Spine (6); Royalty - DePuy Spine (6)  

Dean Chou, MD, PhD  
Consulting Agreement - Globus (2); Honoraria - Depuy (6), Orthofix (2); Other - AOSpine International (6)  

Domagoj Coric, MD, PhD  
Consulting Agreement - Globus Medical (2), Medtronic (2), Spine Wave (2), United Healthcare (2); Ownership Interest - Spinal Wave (2); Royalty - Pioneer Surgical (2), Spine Wave (2)  

Andrew T. Dailey, MD⁴  
Consulting Agreement - Biomet (2); Honoraria - AO North America (6)  

Reginald J. Davis, MD⁴  
Consulting Agreement - LDR (2), Vertiflex (2)  

Mark B. Dekutoski, MD⁴  
Consulting Agreement - Mayo Medical Ventures/Medtronic (2); Honoraria - AO Foundation (6); Other - Broadwater Associates CME Group (6), DePuy (6), Medtronic (6), Stryker (6), Synthes (6)  

Vedat Deviren, MD⁴  
Consulting Agreement - Medtronic (2), Nuvasive (2), Stryker (2); Honoraria - Guidepoint (6)  

Darryl J. Dirisio, MD  
Ownership Interest - Revivo Medical (8)  

Galina Dulatedova, MD  
Salary - DiscGenics (5)  

Eric H. Elowitz, MD⁴  
Consulting Agreement - Nuvasive (2)  

Michael G. Fehlings, MD, PhD, FRCCS, FACS  
Royalty - Skyline Plate (6)  

Richard G. Fessler, MD⁴  
Consulting Agreement - Lanx (2); Ownership Interest - In Queue Innovations (8); Royalty - DePuy (6), Medtronic (6); Royalty - Stryker (6)  

Charles Fisher, MD  
Consulting Agreement - Medtronic (2); Other - AO (6), DePuy (6), Synthes (6), Royalty - Medtronic (6)  

Kevin T. Foley, MD, FACS  
Consulting Agreement - ArthroCare (2), Medtronic (2), NuVasive (2); Intellectual Fees - ArthroCare (6); Ownership Interest - Discgenics (3), TrueVision (3); Royalty - Medtronic (6)  

Daryl R. Fourney, MD, FACS, FRCS(C)  
Honoraria - AOSpine North America (6); Other - Asubio Pharmaceuticals (6), Rick Hansen Foundation (6), Royal University Hospital Foundation (6), Saskatchewan Health Research Foundation (6)  

Anthony Frempong-Boadu, MD⁴  
Consulting Agreement - Medtronics (6)  

Steven E. Gaede, MD⁴  
Consulting Agreement - LDR (2)  

Fred H. Geisler, MD, PhD  
Consulting Agreement - DPClinical (2), Medtronic (2), Mesoblast (2), NuVasive (2), SI-BONE (2), Spinal Motion (2), Vertiflex (2); Ownership Interest - Rhasuler, Inc. (7), Spinal Integration (2); Royalty - Aesculap (2)  

Steven D. Glassman, MD  
Other - Medtronic (6), Nuvasive-funds to data base (6), SRS-President (7); Royalty - Medtronic (2); Salary - Norton Health Care (5)  

Ziya L. Gokaslan, MD⁴  
Honoraria - AO Foundation (6); Other - AO North America (6), AO Spine International (6), DePuy (6), NREF (6); Ownership Interest - US Spine & Spinal Kinetics (8)
Michael W. Groff, MD, FACS
Consulting Agreement - Depuy (2), EBI Spine Biomet (2)

Munish Gupta, MD
Consulting Agreement - DePuy Spine (2), Lanx (2), Osteotech (2), Honoraria - AO (2); Intellectual Fees - Medtronic (6); Other - FOSA (7); Ownership Interest - Acrotech (6), I&J (6), Pfizer (6), Pioneer (6), Proctor and Gamble (6); Royalty - DePuy Spine (6)

Richard D. Guyer, MD
Consulting Agreement - Spinal Motion (2)

Regis W. Haid, MD
Consulting Agreement - Globus Medical (2), Piedmont Health Care (2), Other - Nuvasive (6); Other Financial or Material Support - Globus Medical (6), Medtronic Sofamor Danek (10); Ownership Interest - Spine Universe (4); Royalty - Medtronic (6)

John Hao, MD
Salary - Globus (5)

James S. Harrop, MD, FACS
Consulting Agreement - Depuy Spine (2), Ethicon (2); Intellectual Fees - Biowentis (2), ICON (2)

David J. Hart, MD
Consulting Agreement - Baxano Surgical (2), Depuy Spine (2)

Robert Hart, MD
Consulting Agreement - DePuy Spine (6), Medtronic (6); Honoraria - Depuy Synthes Spine (6), Medtronic (6); Other - Depuy Spine (6), Medtronic (6); Other - OREF (6), Spine Connect (6); Royalty - DePuy Synthes Spine (6), Seaspine (6)

Robert F. Heary, MD
Royalty - Depuy Spine (6), Thieme Medical Publishers (6), Zimmer Spine (6)

Michael S. Hisey, MD
Other - Zimmer (6); Royalty - LDR Spine (6), Zimmer (6)

Langston T. Holly, MD
Consulting Agreement - Medtronic (6)

Richard A. Hostin, MD
Consulting Agreement - Depuy Spine (6); Other - DJO (6)

Patrick C. Hsieh, MD, MS
Consulting Agreement - Depuy (2), Medtronic (2)

Mir Hussain, BS
Salary - Globus Medical Inc. (5)

International Spine Study Group
Other - DePuy Spine (6), Medtronic Sofamor Danek (6)

Robert E. Isaacs, MD
Consulting Agreement - Nuvasive, Inc. (2); Other - Nuvasive, Inc. (6), Safewire (7); Ownership Interest - Sfereay Spine, LLC (3); Royalty - Nuvasive, Inc. (6)

R. Patrick Jacob, MD
Consulting Agreement - Synthes Spine (2)

J. Patrick Johnson, MD
Consulting Agreement - Alphatec Spine, Inc. (2), Spinewave (2); Ownership Interest - Pioneer Surgical Technology (2)

Iain H. Kalfas, MD
Honoraria - Depuy Synthes Spine (6), Strker Spine (6); Royalty - Mako Surgical (6)

Steven N. Kalkanis, MD
Other - Biomet Spine (2), Ethicon (2)

Adam S. Kanter, MD
Other - NuVasive, Inc. (6); Royalty - Lanx (2)

Norio Kawahara, MD
Other - AO Spine International (7)

Larry T. Khoo, MD
Consulting Agreement - Aesclap Spine (2), Depuy Spine (10), Globus Medical (10), Trasn1 (10), Zimmer Spine (10)

Han Jo Kim, MD
Consulting Agreement - Medtronic (6)

Kee Kim, MD
Consulting Agreement - Stryker (6); Other - Molecular Matrix (3); Royalty - Globus (2), LDR (6), SpinalUSA (6)

Eric Klineberg, MD
Honoraria - AO (6), Depuy Spine (6)
DISCLOSURES

Tyler R. Koski, MDf
Consulting Agreement - Globus (2), MB innovations / Spinewave (2), Medtronic (2), Nuvasive (2)

Charles Kuntz, MDf, F
Other - Neurosurgery (4), Synthes/DePuy - Research/Education (6); Ownership Interest - Mayfield Clinic (8), Precision Radiotherapy (8), Priority Consult (8), The Christ Hospital Spine Surgery Center (8); Salary - University of Cincinnati (5)

Frank LaMarca, MDf
Consulting Agreement - Biomet (2), Globus (2); Honoraria - Depuy (2)

Virginie Lafage, PhDf
Consulting Agreement - Medtronic Sofamor Danek (6); Honoraria - Depuy Spine (6), K2M (6); Ownership Interest - Nemaris (8)

Ilya Laufer, MDf
Consulting Agreement - Depuy / Synthes (2), SpineWave (2)

Nathan Lebwohl, MDf
Consulting Agreement - Depuy Synthes (2)

Allan D. Levi, MD, PhDf
Honoraria - Depuy (6), Medtronic (6)

John C. Liu, MDf
Consulting Agreement - Medtronic (2)

Alessandro Luzzati, MDf
Other - AOSpine International (7)

Michael MacMillan, MDf
Consulting Agreement - Medtronic Surgery Advisory Board (6)

Frederick F. Marciano, MDf
Royalty - Synthes (2)

Ian McCarthy, PhDf
Other - Nuvasive (6)

Matthew J. McGirt, MDf, F
Other - Depuy (6)

Jean-Pierre Mobasser, MDf
Consulting Agreement - Medtronic (2); Royalty - Innomed (6)

Ross R. Moquin, MDf
Consulting Agreement - K2M (2), Thomas E. Mroz, MDF, Honoraria - AO Spine North America (6); Ownership Interest - PearlDiver, Inc (6)

Praveen V. Mummaneni, MDf
Honoraria - Depuy Spine (6), Globus (6); Ownership Interest - 2N LLC (royalty from Depuy, QMP, and Thieme) (8)

Gregory Mundis, MDf
Consulting Agreement - Nuvasive (6); Honoraria - Depuy Spine (6); Royalty - K2M (6)

Pierce D. Nunley, MDf
Consulting Agreement - LDR (2); Other - LDR (6)

Michael F. O’Brien, MDf
Consulting Agreement - Depuy Synthes Spine (6), Nuvasive (6), Osteotech (6)

Donna D. Ohnmeiss, MDf
Other - 4WEB (6), Mazor (6), Medtronic Neuro (6)

David O. Okonkwo, MD, PhDf
Royalty - Lanx (6)

Rod J. Oskouian, MDf
Consulting Agreement - Nuvasive (2), Stryker (2); Royalty - Globus (2)

John E. O’Toole, MD, MSf
Consulting Agreement - Globus Medical (2), Neoxt Spine (2), Pioneer Surgical (2)

Ripul Rajen Panchal, DOf
Consulting Agreement - Mizuho Orthopedic Systems, Inc (2)

Paul Park, MDf
Consulting Agreement - Globus (2), Medtronic (2); Royalty - Globus (6)

Matthew Phillips, MDf
Salary - Globus Medical Inc (3)

Luis Pimenta, MDf
Consulting Agreement - NuVasive (2), Zygogne Tech (2)

Randall W. Porter, MDf
Ownership Interest - Lanx Stock holder (8)

Eric A. Potts, MDf, F
Consulting Agreement - Medtronic (2); Royalty - Medtronic (6)

Nader Pouratian, MD, PhDf
Other - Medtronic (6)
Srinivas K. Prasad, MD, PhD
Consulting Agreement - Stryker Spine (6); Honoraria - Depuy Synthes Spine (6)

Joel M. Press, MD
Consulting Agreement - UnitedHealth Group, Inc (2)

Nasir A. Quraishi, MD, FACS
Other - AOSpine International (7)

Kris Radcliff, MD, FACS
Consulting Agreement - Globus Medical (6); Royalty - Globus Medical (6)

Sharad Rajpal, MD, FACS
Consulting Agreement - Larx (2), LDR (6), Medtronic (2)

John K. Ratliff, MD, FACS
Consulting Agreement - Biomet Spine (2), Stryker Spine (2); Royalty - Stryker Spine (2)

Wilson Zachary Ray, MD, FACS
Consulting Agreement - Ulrich (2); Honoraria - Depuy/Synthes Spine (6)

Daniel K. Resnick, MD, FACS
Consulting Agreement - Asterias (2); Other - CNS (7), North American Spine Society (6)

Laurence D. Rhines, MD, FACS
Honoraria - Globus (2), Stryker (2); Other - AOSpine International (7)

Stephen Ritland, MD, FACS
Consulting Agreement - Medtronic (2); Intellectual Fees - Medtronic (2); Royalty - Johnson and Johnson (2), Medtronic (2)

Analiz Rodriguez, MD, PhD
Other - Mon特斯 Medical (6)

Gerald E. Rodts, MD, FACS
Consulting Agreement - Globus Medical, Inc. (2), Medtronic (2), Orthofix, Inc. (2); Other - SpineUniverse.com (3); Royalty - Globus Medical, Inc. (2)

Timothy C. Ryken, MD, MS, FACS
Consulting Agreement - Arbor Pharm Inc. (2), Medtronic Inc (2)

Faheem A. Sandhu, MD, PhD
Royalty - K2M (2)

Charles A. Sansur, MD, MHS
Consulting Agreement - Depuy Synthes (2), Medtronic (2)

Meic Schmidt, MD
Consulting Agreement - Aesculap (2)

Frank Schwab, MD, PhD
Consulting Agreement - DePuy Spine (2), Medtronic (6), Stryker Spine (6); Other - DePuy Spine (6); Ownership Interest - Nemaris (8); Royalty - Medtronic (6)

Daniel M. Scibba, BS, MD, FACS
Other - Depuy Spine (10); Consulting Agreement – Medtronic (2), Nuvasive (2), Globus (2), Depuy (2)

Christopher I. Shaffrey, MD, FACS
Consulting Agreement - Biomet (6), Medtronic (6), Nuvasive (6); Honoraria - Globus (6), Stryker (6); Intellectual Fees - Biomet (6), Medtronic (6), Nuvasive (6); Other - AOSpine North America (6) Other - Department of Defense (6), NACTN (6), NIH (6), NREF (6); Royalty - Biomet (6), Medtronic (6), Nuvasive (6)

Ashwini Dayal Sharan, MD, FACS
Consulting Agreement - Medtronic (2), SJM (2); Other - Tigerlabs (8); Ownership Interest - ICP (7), ICVRX (6)

Lara Ionescu Silverman, PhD
Ownership Interest - DiscGenics (5)

Jonathan Slotkin, MD, FACS
Consulting Agreement - InVivo Therapeutics (2), Stryker Spine (2)

Justin S. Smith, MD, PhD
Consulting Agreement - Biomet (2), Depuy Spine (6), Globus (6), Medtronic Sofamor Danek (2); Honoraria - Depuy Spine (6); Other - Depuy Spine (6)

Michael P. Steinmetz, MD, FACS
Consulting Agreement - Biomet Spine (2), Depuy Synthes (2), Medtronic (2)

Terry Tandeski, PhD
Salary - Discogenics, Inc (5)

Nicholas Theodore, MD, FACS
Royalty - Depuy Synthes Spine (6), Stryker Spine (6)

Vincent C. Traynelis, MD, FACS
Consulting Agreement - Medtronic (2); Intellectual Fees - Medtronic (6)
Gregory R. Trost, MD 
Consulting Agreement - Medtronic (2)

Eve C. Tsai, MD, PhD, FRCSC, CIP 
Honoraria - Synthes/Depuy (6)

Luis M. Tumialan, MD, F  
Consulting Agreement - Medtronic (2)

Juan S. Uribe, MD, F 
Consulting Agreement - NuVasive (2), Orthofix (2)

Alexander R. Vaccaro, MD  
Consulting Agreement - Gerson Lehman Group (2), Guidepoint Global (2), Medacorp (2), Ownership Interest - Advanced Spinal Intellectual Properties (6), Bonovo Orthopaedics (6), Computational Biodynamics (6), Cross Current (6), Cytonics (6), Ownership Interest - Disc Motion Technology (6), Electrolux (6), Flagship Surgical (6), Flow Pharma (6), Gamma Spine (6), Globus Medical (6), In Vivo (6), K2 Medical (6), Location Based Intelligence (6), Neucore (6), Orthovita (6), Paradigm Spine (6), Progressive Spinal Technologies (6), R.I.S (6), Replication Medica (6), Small Bone innovations (6), Spine Medica (6), Spinning (6), Stout Medical (6), Syndicom (6), Vertiflex (6), Royalty - Aesculap (6), Biomet (6), Depuy (6), Globus Medical (6), K-2 Medical (6), Nuvasive (6), Stryker Spine (6)

Peter Varga, MD  
Other - AOSpine International (7)

Michael Y. Wang, MD, FACS  
Consulting Agreement - Aesculap Spine (2), Depuy Spine (2), Globus (2); Royalty - Depuy Spine (9)

Clarence B. Watridge, MD  
Other - Medical Education & Research Institute (7), Medtronic (6), NIH/NINDS (6), Spinal Motion (6)

Richard P. Williams, MB, BS, FRACS, FAOrthA  
Other - AOSpine International (7)

Eric John Woodard, MD  
Consulting Agreement - Stryker Spine (2); Honoraria - Depuy Spine (6); Ownership Interest - In Vivo Therapeutics (3)

Yoshiya Josh Yamada, MD, FRCP  
Consulting Agreement - Varian Medical Systems (2), Honoraria - Institute for Medical Education (2), Other - American Brachytherapy Society (3)

Jack E. Zigler, MD  
Consulting Agreement - Kineflex (2), LDR (2), Synthes Spine (6); Other - Expanding Orthopaedics (6), FlexusSpine (6), Medtronic (6), Depuy (6), AO Spine (6); Royalty - K2M (ALIF inserter) (6), Osprey (allograft bone design) (6), Zimmer Spine (cervical plate) (6)
The following individuals have disclosed that they do not have a relationship with commercial companies whose products may have a relevance to their participation in the Annual Meeting. Planners are designated by P and Faculty by F. Disclosures as of January 3, 2014.

Kail G. Abdullah, MD
Owoicho Adogwa, MD
Yousef Ahmed, MD
Vincent J. Alentado, BS
Manuel Alvarado, MD
Aluizio Augusto Arantes, MD
Rodrigo Augusto Amaral, MD
Edward Andrews, MD
Basem I. Awad, MD
Britty Baby, MD
Gregory W. Balturshot, BS, MD
Subhashish Banerji, MD
Ronald HMA Bartels, MD, PhD
Allan J. Belzberg, BSc, MD, FRCS(C)
E. Bertolini, MD
Chen Bettgegowda, MD
Erica F. Bisson, MD
Gary Bloomgarden, MD
Patrick Boland, MD
Daryn D. Bolinger, DO
Julia Bossard, MD
Valentina Briceno, RN
Darrel S. Brodke, MD
Denise Brot, MSRN, CNRN, APNP
Thabata Bueno, MS
Abh Bydon, MD
Daniel Carr, MD
Andre Cecchini, MD
James Chadduck, MD
Joseph S. Cheng, MD, MS
Subha Chintalacharuvu, PhD
Charles H. Cho, MD, MBA
Tanvir Choudhri, MD
Jeffry Claridige, MD
John J. Como, MD
Jean-Valery Coumans, MD
Jeffrey W. Cozzens, MD
Ed Crowe, MD
Elias Dakwar, MD
Jefferson Walter Daniel, MD, PhD
Fernando Dantas, MD
Timothy Darlington, MD
Geraldo de Sa Carneiro Filho, MD
Helton Delfino, MD
Sanjay S. Dhall, MD
Curtis A. Dickman, MD
Michael L. DiLuna, MD
John Dimar, MD
Michael J. Dorsi, MD
Jessica A Droke, MD
Kurt M. Eichholz, MD
Matthew G. Ewend, MD
Stephanie Falatko, MD
Asdrubal Falavigna, PhD
Daniel Robert Fasset, MD
Bryan B. Ferguson, REPT, CNIM, MCSE
Thomas F. Floyd, MD
Kai-Ming G. Fu, MD, PhD
Robert M. Galler, DO
George M. Gbobi, MD
Zoher Ghogawala, MD, FACS
Heather Givans, NP
Jakub Godzik, BA
Gabriel A. Gonzales-Portillo, MD, FAANS, FACS
Chiara A. Gonzales-Portillo, MD
Taymaw W. Graham, MD
Barth A. Green, MD
Peter Grunert, MD
Barton L. Guthrie, MD
D. Kojo Hamilton, MD
Amgad S. Hanna, MD
Raqueeb M. Haque, MD
James S. Harman, DO
J. Frederick Harrington, MD
Marie-Noelle Hebert-Blouin, MD
Gregory G. Heuer, MD, PhD
Daniel J. Hoh, MD
Antwain Howard, DVM, DCLAM
Wesley Hsu, MD
Mary I. Huang, MD
R. John Hurlbert, MD, PhD, FACS, FRCS(C)
J. Bryan Iorgulescu, BS
Gary Jasmer, MD
Rubens Jensen, PhD
AF Joaquim, MD
Payal Jotwani, BS
Wayel Kaakaji, MD
Shashank Sharad Kale, MBBS, MS, MCh, MD
Spyridon Karadimas, MD, PhD
Saad Khairi, MD
John J. Knightly, MD
M. Adam Kremer, BS, MD
Ajit A. Krishnaney, MD
Max Ostrinsky Krucoff, MD
Shekar N. Kupad, MD, PhD
Sanjeev Lalwani, MBBS, MD
Michael J. Lanz, MD
Brandon Lawrence, MD
Eric Lis, MD
Daniel C. Lu, MD, PhD
Daniel Lubelski, MD
Matthew R. MacEwan, BSE, PhD
Luis Marchi, MSC
Michael D. Martin, MD
Nikolay L. Martirosyan, MD
Marcos Masini, MD
Vin Mathur, MD
Marcus D. Mazur, MD
Andrew J. Meuesen, MA, LIS
Ehud Mendel, MD
Scott A. Meyer, MD
Rajiv Midha, MD
Vincent J. Miele, MD
Jacob A. Miller, BS
Junichi Mizuno, MD
Seth Shawn Molloy, DO, MSC
Timothy A. Moore, MD
Osmar Moraes, MD
Daniel Moran, PhD
Marcelo Luis Mudo, MD
The AANS/CNS Section on Disorders of the Spine and Peripheral Nerves gratefully acknowledges:

BOMET
SPINE & BONE HEALING TECHNOLOGIES

Neurosurgical Education Partner

for providing an Educational Grant in support of the 2014 Annual Meeting!
The AANS/CNS Section on Disorders of the Spine and Peripheral Nerves gratefully acknowledges:

Future Of Neurosurgery Ambassador

for providing an Educational Grant in support of the 2014 Annual Meeting!

Corporate Supporters of the 2014 Annual Meeting and Special Courses

The following companies have provided an educational grant in support of the DSPN Annual Meeting:

- Biomet
- DePuy Synthes
- Globus
- Integra
- Joimax
- K2M
- Medtronic
- NuVasive
- SpineWave

The following companies have provided support for Special Courses:

- Biomet
- DePuy Synthes
- Globus
- Integra
- Joimax
- K2M
- Medtronic
- NuVasive
- SpineWave
- Stryker
CONGRATULATIONS TO THE 2014 AWARD AND FELLOWSHIP RECIPIENTS!

Nikolay L. Martirosyan, MD
Mayfield Basic Science Award

Owoicho Adogwa, MD, MPH
Mayfield Clinical Science Award
Outcomes Committee Award

Roger Hartl, MD
Ronald Apfelbaum Research Award
supported by Aesculap

Jay Turner, MD
David Cahill Fellowship
supported by DePuy Synthes Spine

Khoi Than, MD
Ralph Cloward Fellowship
supported by NuVasive

Ahmed Ibrahim, MBBS, PhD
H. Alan Crockard International Fellowship
supported by DePuy Synthes Spine

Yuval Shapira, MD
David Kline Research Award
supported by Integra

Andrew T. Healy, MD
Regis W. Haid, Jr. Adult Deformity Research Award
supported by Globus

Kai-Ming Fu, MD
Regis W. Haid, Jr. Adult Deformity Research Award
supported by Globus

Benjamin Elder, MD
Sanford Larson Research Award
supported by DePuy Synthes Spine

Rory Murphy, MD
Sanford Larson Research Award
supported by DePuy Synthes Spine

Oscar Ramirez, MD
Sonntag International Fellowship
supported by NuVasive
THANK YOU
to the following companies for
providing an educational
grant in support of the
2014 Annual Meeting!

NEUROSURGICAL LEADERSHIP AMBASSADOR

FUTURE OF NEUROSURGERY AMBASSADOR

NEUROSURGICAL EDUCATION PARTNER

SUPPORTERS

As of February 12, 2014