INTRAOPERATIVE NEUROPHYSIOLOGIC MONITORING

JOINT CROSS-ATLANTIC EDUCATIONAL SYMPOSIUM

Thursday – Saturday
November 4-6, 2010
Groningen, Holland ■ The Netherlands

Program Chair & Host:

H. LOUIS JOURNEE, MD, PhD
This symposium provides comprehensive updates for neurophysiologic monitoring professionals and advanced practitioners who collaborate on the neuromonitoring team, as well as surgeons and anesthesiologists who require intraoperative neuromonitoring (IONM) during procedures. Experts from the international IONM community will examine common and important updates, including:

- SEP & Transcranial Motor Evoked Potentials and EMG for spine surgery
- Auditory Evoked Potentials and Cranial Nerve monitoring for craniotomy and skull-based monitoring
- EEG and SEP for carotid endarterectomy and aneurysm monitoring
- Didactic sessions and interactive panel forums will focus on pre-existing conditions, data analysis, anesthetic considerations, complications and troubleshooting.

Intraoperative monitoring professionals • Neurophysiologists • Neurosurgeons • Neurologists • Orthopedists • ENT Surgeons • Anesthesiologists • Nurses • Audiologists • Professionals involved in interventional intraoperative neuromonitoring of evoked potentials, EMG and EEG during surgical procedures

At the completion of this symposium, participants should be able to:

- Discuss the comprehensive principles for conducting and interpreting intraoperative neurophysiological monitoring across multimodality applications of IONM
- Identify neuroanatomy and neurophysiology relevant to IOM
- Describe the principles and methods of recording and monitoring
- Identify Develop an understanding of the elements for clinical decision making during IOM.
- Develop an understanding of the basic aspects related to the business of IOM.

Registration is available online at:
http://www.esnm.org
<table>
<thead>
<tr>
<th>Name</th>
<th>Title and Institutions</th>
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<tbody>
<tr>
<td>Jeffery E. Arle, MD, PhD</td>
<td>Department of Neurosurgery, Lahey Clinic, Burlington, MA USA</td>
</tr>
<tr>
<td>David B. MacDonald, MD, FRCP(C), ABCN</td>
<td>Head, Section of Neurophysiology, Department of Neurosciences, King Faisal Specialist Hospital, Riyadh, Saudi Arabia</td>
</tr>
<tr>
<td>Rebecca Clark-Bash, CLTM, CNIM, F.ASNM</td>
<td>President, Director of Education &amp; Training, Knowledge Plus, Inc., Lincolnshire, IL USA</td>
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<tr>
<td>Jan Jacob A. Mooij, MD, PhD</td>
<td>Chief Dept of Neurosurgery, University Medical Center Groningen, Groningen, The Netherlands</td>
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<tr>
<td>Ulrich Beese, MD, PhD</td>
<td>Dept of Anesthesiology, University Medical Center Groningen, The Netherlands.</td>
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<tr>
<td>Aage R. Møller, PhD, D. Med. Sci.</td>
<td>Professor of Cognition and Neuroscience, MF Jonsson Endowed Chair, School of Behav. &amp; Brain Sciences, The University of Texas at Dallas, Richardson, TX USA</td>
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<tr>
<td>Bernard Allan Cohen, PhD, D.ABNM</td>
<td>Neurological Monitoring Associates, LLC, Milwaukee, WI USA</td>
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<tr>
<td>Ernst B Muskens</td>
<td>Dept of Clinical Neurophysiology, University Medical Center Groningen, Groningen, The Netherlands</td>
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<tr>
<td>Cor J. Kalkman MD, PhD</td>
<td>Department of Anesthesiology, University Medical Center Utrecht, Utrecht, The Netherlands</td>
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<tr>
<td>Dachling Pang, MD, FRCS (C), FRCS (Eng), FACS</td>
<td>Prof of Pediatric Neurosurgery, Univ of California Davis, Regional Centre for Pediatric Neurosurgery, Kaiser Permanente Hospitals, Oakland, California USA</td>
</tr>
<tr>
<td>Vedran Deletis, MD, PhD</td>
<td>Director, Intraoperative Neurophysiology, Institute for Neurology &amp; Neurosurgery, St. Lukes Roosevelt Hospital, New York, NY USA</td>
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<tr>
<td>Herbert E Polak</td>
<td>Dept of anesthesics, Sint Maartenskliniek, Nijmegen, The Netherlands</td>
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<tr>
<td>Josep M. Espadaler, MD, PhD</td>
<td>Dir, Clin. Neurophysiology Depart, Hospital del Mar, Assoc Prof., Med School, Univ. Autonoma de Barcelona, Barcelona, Spain</td>
</tr>
<tr>
<td>Ilona Rácz</td>
<td>Dept of anesthesics, Sint Maartenskliniek, Nijmegen, The Netherlands</td>
</tr>
</tbody>
</table>
ASNM Groningen Symposium Faculty (II)

Isabel Fernandez-Conejero, MD  
Department of Intraoperative Neurophysiology  
Hospital Universitari de Bellvitge, L'Hospitalet de Llobregat  
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Sint Maartenskliniek  
Nijmegen, The Netherlands

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The Netherlands

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University Medical Center Groningen  
Groningen, The Netherlands

H. Louis Journee, MD, PhD  
Depts of Neurosurgery* an Orthopedics~  
*University Medical Center Groningen  
~Sint Maartenskliniek Nijmegen, The Netherlands

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General and Pediatric Neurosurgery  
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Sint Maartenskliniek  
Nijmegen, The Netherlands

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Department for Neuroscience  
Lab. for Human Experimental Neurophysiology  
School of Medicine, University of Split, Coratia

Francesco Sala, MD, PhD  
Section of Neurosurgery, Assist Prof of Neurosurgery  
Head Intraoperative Neurophysiology Unit  
Department of Neurological Sciences and Vistion  
University of Verona, Italy

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Tod Sloan, MD, MBA, PhD  
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University of Colorado at Denver, School of Medicine, Department of Anesthesiology, Aurora, Colorado USA

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University Medical Center Groningen  
Groningen, The Netherlands

Mark Stecker MD, PhD, D.ABNM, F.ASNM  
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Marshall University School of Medicine / Cabell Huntington Hospital, Huntington, WV USA

PD Dr. med. Andrea Szelenyi  
Department for Neurosurgery  
Johann Wolfgang Goethe University Hospital  
Frankfurt, Germany

Chuck Yingling PhD, D.ABNM, F.ASNM  
Adjunct Faculty-Clinical Professor  
Professor of Otolaryngology / Head and Neck Surgery  
Stanford School of Medicine, Palo Alto, CA
**Thursday November 4, 2010**

9:00 a.m.  Welcome by the ASNM & ISIN Presidents
- Bernie Cohen, PhD, DABNM
- Karl F. Kothbauer, M. D.

9:10 a.m.  Introduction & Host Welcome
- H. Louis Journee, MD, PhD

**Session I: Comprehensive Principles in Intra-Operative Neurophysiology**

9:15 a.m.  *  Sensory system and sensory evoked potentials
- David B. MacDonald, MD, FRCP(C), ABCN

9:45 a.m.  *  Motor system and Motor Evoked Potential
- Vedran Deletis, MD, PhD

10:15 a.m.  *  Auditory Evoked Potentials: Neurophysiology and IONM
- Aage R. Møller, PhD, D. Med. Sci.

10:45 a.m.  *  Break with Exhibitors

11:00 a.m.  Anesthetic principles
- Tod Sloan, MD, MBA, PhD

11:30 a.m.  Selective Vascular Model Studies on Ischemic Effects on Responses of Motor Pathways & Muscles
- Cor J. Kalkman MD, PhD

11:50 a.m.  Evaluation Live IONM
- Moderator: H. Louis Journee, MD, PhD

12:30 p.m.  Lunch

*) subjected to delay reservation breaking live IOM session

### Session II: Concurrent Focus Sessions

<table>
<thead>
<tr>
<th>Neurosurgery I: Workshops &amp; Hands-on</th>
<th>1:30 p.m.</th>
<th>Vascular and Brain Tumor Surgery</th>
<th>Szelenyi</th>
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<tbody>
<tr>
<td></td>
<td>2:15 p.m.</td>
<td>MEP IONM in the Brain Stem Region</td>
<td>Fernandez</td>
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<tr>
<td>Neurosurgery II: Advanced Applications</td>
<td>1:30 p.m.</td>
<td>DBS: Micro-Electrode Recording</td>
<td>Shils &amp; Arle</td>
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<td>2:15 p.m.</td>
<td>Conus-Cauda Surgery</td>
<td>Yingling</td>
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<tr>
<td>Spine Surgery</td>
<td>1:30 p.m.</td>
<td>Scoliosis Surgery</td>
<td>Polak &amp; Rácz</td>
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<td>2:15 p.m.</td>
<td>Spinal Monitoring</td>
<td>Skinner</td>
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<tr>
<td>Vascular Surgery</td>
<td>1:30 p.m.</td>
<td>Proper Charting and Medical Legal Aspects of IONM</td>
<td>Cohen</td>
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<td>2:15 p.m.</td>
<td>Thoraco-Abdominal Aneurysms</td>
<td>Lange</td>
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3:00 p.m.  Poster Presentations: Practical Issues in Neurophysiologic Monitoring
- Moderator: Brett Netterton

3:30 p.m.  Break with Exhibitors
**Thursday November 4, 2010 (continued)**

Forum discussion:

**Quality Development & Management of Intraoperative Nueromonitoring Service**

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<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Speaker(s)</th>
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<tbody>
<tr>
<td>4:00 p.m.</td>
<td>Televoting I</td>
<td>Moderator: Mark Stecker MD, PhD</td>
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<tr>
<td>4:10 p.m.</td>
<td>Establishing A Quality IOM Program: US Experience</td>
<td>Mark Stecker MD, PhD</td>
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<tr>
<td>4:00 p.m.</td>
<td>Establishing A Quality IOM Program: Europe Experience</td>
<td>Andrea Szelenyi MD, PhD</td>
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<td>4:40 p.m.</td>
<td>Requirements for IOM in a Hospital Organization: Challenges &amp; Integration in Medical Care Programs, Financing, Education programs and Credentialing</td>
<td>Rebecca Clark Bash, R.EEG/EP T. CNIM, CLTM, FASNM</td>
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<tr>
<td>5:10 p.m.</td>
<td>Remote Monitoring: Coping with Understaffing-Features and Limitations of Remote Monitoring From Opposite Views</td>
<td>Charles Yingling PhD, DABNM, FASNM</td>
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<tr>
<td>5:30 p.m.</td>
<td>Intraoperative Monitoring Service Outsourcing: Pros &amp; Cons</td>
<td>Rebecca Clark Bash, R.EEG/EP T. CNIM, CLTM, FASNM</td>
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<tr>
<td>5:40 p.m.</td>
<td>Televoting II</td>
<td>Moderator: Mark Stecker MD, PhD</td>
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<td>5:50 p.m.</td>
<td>Forum Discussion Guided by Televoting Questionary</td>
<td>Moderator: Mark Stecker MD, PhD</td>
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<tr>
<td>6:15 p.m.</td>
<td>Adjourn</td>
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**Please Join Us**

For

**ASNM & ISIN**

**Cocktail Reception**

When: Thursday Evening

Time: 6:15 p.m. – 8:00 p.m.

Location:
Friday November 5, 2010

7:30 a.m.   Breakfast Open Discussion Sessions (Select One)

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<tbody>
<tr>
<td>I. TES-MEP Monitoring</td>
<td>V. Monitoring in Aneurysm and Brain Tumor Surgery</td>
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<td>PD Dr. med. Andrea Szelényi</td>
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<tr>
<td>II. Fossa Posterior Monitoring: Auditory, Motor &amp; Cranial Nerve</td>
<td>VI. Mapping of Eloquent Areas of the Brain</td>
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<tr>
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<td>Isabel Fernandez-Conejero, MD</td>
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<td>III. Spinal Cord Monitoring</td>
<td>VII. Anesthetic Considerations in Monitoring</td>
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<td>Tod Sloan, MD, MBA, PhD</td>
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<td>IV. Micro-Electrode Recording</td>
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### Scientific Session: Spinal Cord Monitoring

- 8:30 a.m. Warning Criteria Using Epidural Recorded D-waves & Muscular MEP's in Medulary Tumor Surgery
  - Karl F. Kothbauer, M.D.
- 8:55 a.m. Warning Amplitude Criteria of TES Evoked MEP’s in Reconstructive Spine Surgery
  - Danielle Langeloo MD, PhD
- 9:10 a.m. Warning Criteria Based on TES Threshold & Morphology of MEP’s.
  - Chuck Yingling PhD, D.ABNM, F.ASNM
- 9:35 a.m. Continuous EMG Monitoring in Spinal Cord Surgery: An Experimental Study & Features in TES-MEP Clinical Monitoring
  - Stanley Skinner, MD, PhD
- 10:00 a.m. Current Warning MEP Criteria: What Do and Don’t They Share?
  - H. Louis Journee, MD, PhD
- 10:15 a.m. Break with Exhibitors

### Scientific Session: Optimizing TES

- 10:30 a.m. Physiological base of MEP and D-waves
  - Professor Roger Lemon, BSc, MA, PhD, FMedSci
- 11:00 a.m. Inter-Patient Variability of Inter-Pulse Interval (IPI) in TES
  - Chantal van Hal MD
- 11:15 a.m. Minimizing TES Induced Movements
  - Eric Hoebink MD
- 11:30 a.m. How and When to Use Conditioning Techniques?
  - H. Louis Journee, MD, PhD
- 11:50 a.m. Procedure for Optimizing TES Parameters
  - H. Louis Journee, MD, PhD

### Scientific Session: Safety of Transelectrical Stimulation (TES)

- 12:00 p.m. Safety of Transcranial Stimulation
  - David B. MacDonald, MD, FRCP(C), ABCN
- 12:30 p.m. Lunch

### Scientific Session: Neurosurgery (Brain)

A. Workshop: Neurophysiologic Mapping of Motor Speech Related Cortical Areas

- 2:00 p.m. Neurophysiology of TMS Inducing Speech Arrest and Its’ Mechanisms
  - M.Sc. Maja Rogic´
- 2:10 p.m. Neurophysiologic Markers of Motor Speech Related Cortical Areas
  - Vedran Deletis, MD, PhD
- 2:20 p.m. Preoperative Testing of Patients Requiring Surgery of Motor Cortex Eloquent Areas
  - Josep M. Espadaler, MD, PhD
Friday November 5, 2010 (continued)

2:30 p.m.  New Approach to the Intraoperative Neurophysiologic Mapping of the Eloquent Cortex
  ■ Isabel Fernandez-Conejero, MD
2:40 p.m.  Live Demonstration Using Magnetically Induced Speech Arrest & Pre-Operative Mapping
3:00 p.m.  Open Discussion

Scientific Session: Fossa Posterior
3:10 p.m.  Neurophysiology in Neurosurgical Treatment of Hemifacial Spasm
  ■ Jan Jacob A. Mooij, MD, PhD
3:30 p.m.  Intraoperative Monitoring of The Corticobulbar Pathways
  ■ Isabel Fernandez-Conejero, MD

3:50 p.m.  Break with Exhibitors

Scientific Session: Supra Tentorial Region
4:10 p.m.  MEP Monitoring Aneurysm and Brain Tumor Surgery
  ■ PD Dr. med. Andrea Szelényi
4:30 p.m.  Cortical & Subcortical Mapping
  ■ Francesco Sala, MD
4:50 p.m.  Open Discussion

Scientific Session: Functional Neurosurgery
5:00 p.m.  Neuromodulation: Present and Future Trends
  ■ Michiel J. Staal MD, PhD
4:20 p.m.  Modeled Neurophysiological assessment of SCS electrodes and motor Cortex Stimulation
  ■ Jeffrey E. Arle, MD, PhD
5:40 p.m.  Deep Brain Stimulation: Micro-Electrode Recording
  ■ Jay L. Shils, PhD, D.ABNM, F.ASNM
6:00 p.m.  Neurophysiological Assessment in Placement of MCS Electrodes
  ■ Jay L. Shils, PhD, D.ABNM, F.ASNM
6:15 p.m.  Open Discussion

Workshops
Colloquium rooms (Participation is Limited to 25 Attendees)
5:00 a.m.

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<tr>
<td>■ Isabel Fernandez-Conejero, MD</td>
<td>■ Fiete Lange MD, PhD &amp; Ernst B Muskens</td>
<td>■ Rebecca Clark Bash, R.EEG/EP T. CNIM, CLTM, FASNM</td>
<td>■ Ulrich Beese MD, PhD</td>
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5:45 p.m.  Scientific Poster Presentations
 Eric Hoebink MD

Exhibit Hall Cocktail Reception
6:30 p.m. – 7:30 p.m.
Friday Evening

Please Join Us This Last Night in Groningen!
JOINT CROSS-ATLANTIC EDUCATION SYMPOSIUM

Netherlands

Saturday November 6, 2010

Spinal and conus cauda monitoring
8:00 a.m.  The Use of Electrophysiology Monitoring During Surgery for Spinal Dysraphism
- Dachling Pang, MD, FRCS (C), FRCS (Eng), FACS

9:00 a.m.  Conus-Cauda Surgery: Monitoring & Mapping Afferent Pathways and BCR
- Vedran Deletis, MD, PhD

9:20 a.m.  Value and Pitfalls of Motor Mapping & Monitoring in the Cauda Equina.
- Francesco Sala, MD

9:40 a.m.  Pediatric Surgery in the Conus Cauda Region
- Eelco W. Hoving, MD, PhD

9:55 a.m.  How to Tailor Anesthesia for IOM in Pediatrics
- Tod Sloan, MD, MBA, PhD

10:10 a.m.  Motor Monitoring in Young Children
- H. Louis Journee, MD, PhD

10:30 a.m.  Break with Exhibitors

Forum Presentations: Role of IOM Societies & Future Changes in Care Models
10:50 a.m.  Televoting I
- Moderator: Karl F. Kothbauer, MD

11:00 a.m.  ASNM Vision on Education and Credentialing in the United States
- Mark Stecker MD, PhD

11:15 a.m.  ISIN Vision on Education and Credentialing in Europe
- Francesco Sala MD

11:30 a.m.  Contemporary challenges for ION societies
- Karl F. Kothbauer, MD

11:55 a.m.  Televoting II
- Moderator: Karl Kothbauer, MD

12:05 a.m.  Forum Discussion Guided by the Televoting Questionary
- Moderator: Karl F. Kothbauer, MD

12:35 a.m.  Announcement of ISIN Education Programs Starting in Barcelona 2011
- Isabel Fernandez-Conejero, MD

12:40 p.m.  Concluding remarks by the Presidents of the ASNM & ISIN
- Bernie Cohen, PhD, DABNM
- Karl F. Kothbauer, M. D.

12:30  Adjourn

ASNM requires disclosure and resolution of all conflicts of interest to insure balance, independence, objectivity and scientific rigor in all CME programming. Conflicts of interest of all individuals who control CME content will be identified and resolved prior to this educational activity. Full disclosure will be made in the syllabus. Presenters will also disclose discussion of off-label uses.

ACCREDITATION & CREDITS
- CME credits are applied at the TUFT's University Medical School
- Accreditation has been requested at the European Union Medical Specialists / European Accreditation Council for Continuing Medical Education (UEMS/EACCME)
- For Dutch participants accreditation is requested by: de nederlandse verenigingen voor Anesthesiologie (NVA), Heelkunde (NVvH), Neurochirurgie (NVVN), Neurologie (NVN) en de Nederlandse Orthopedie vereniging (NOV)
- ASET ACE credits shall be applied for.
INTRAOPERATIVE NEUROPHYSIOLOGIC MONITORING

JOINT CROSS-ATLANTIC EDUCATION SYMPOSIUM

University Medical Center Groningen
The Netherlands

Registration Information:
The registration fee includes tuition, electronic version of course syllabus, daily continental breakfast, both receptions & break refreshments.
Registration is accepted on-line at:  www.esnm.org

Confirmations will be sent for registrations directly from the website. Registrations cannot be processed or confirmed without full payment.

Symposium Rates: Before Oct 1st After Oct 1st
- Program Registration $ 400 (€ 300) $ 400 (€ 300)
- Technologists & Students $ 270 (€ 200) $ 270 (€ 200)
- Technologist Registering with Full Price Physician $ 100 (€ 75) $ 100 (€ 75)
- Printed Handout* $ 100 (€ 75) $ 100 (€ 75)

Syllabus Options: The registration fee includes an electronic version of the course material (e.g.: USB flash drive or disk). A printed syllabus is available for an additional charge and must be ordered in advance.

- Extra Ticket for Thursday Evening Cocktail Reception $ 50 (€ ) $ 50 (€)
- Extra Ticket for Friday Evening Cocktail Reception $ 50 (€) $ 50 (€)

Meeting Location:
University Medical Center Groningen
Add Room Names or Main Conference Room
Hanzeplein 1
Groningen
The Netherlands
Hospital Number for Directions:

Hotel & Hostel Information:
Visit  http://www.esnm.org
Traveling to Groningen

Groningen is located in The Netherlands with 185,000 inhabitants and is the capital of the province of Groningen. Groningen city was founded around 1100 A.D. and has a rich history, which can clearly be seen from the old medieval buildings in the downtown area.

By train
Groningen has three train stations, the central station (Station Groningen), Groningen Europapark and Groningen Noord. All trains eventually arrive at the central station; only a few trains stop at the smaller stations. There are direct trains from Schiphol airport (Amsterdam), Utrecht and Rotterdam to Groningen (2-2.5 hours) and Amsterdam Centraal can be reached with one change.

Exhibitor Opportunities - Contact Us:

Interesting in Exhibiting?
Please contact the Wenckebach Instituut, Postgraduate School of Medicine
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(f) +31 (0)50 361 1819
mail to: paog@wenckebach.umcg.nl

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Questions? Contact Us:

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Phone: (Country Code: 001) 800 479-7979
Fax: (Country Code: 001) 800 479-7989

Website: www.asnm.org