

Neuromodulation

Spring 2004

Newsletter of the International Neuromodulation Society

President's Message

Dear friends and colleagues,

I was somewhat surprised when I became the 5th President of the International Neuromodulation Society (INS). Obviously I was pleased by the esteem and appreciation expressed by my colleagues, but at the same time, I hoped that I could fulfill the role of President, leading this Society competently and with the efficiency and grace of my predecessors.

As you may know, the Society was founded in Paris in 1990, thanks to the efforts of a preliminary board, of which I was a member. It was at this time that the preliminary board accepted my proposal to name the Society The International Neuromodulation Society (INS), instead of The International Neurostimulation Society (which had been the tentative name during The International Congress on Epidural Spinal Cord Stimulation, held in Groningen 1-3 June 1989).

We wanted to include all kinds of neuromodulation interventions in this field, not just electrical stimulation, realizing that the nervous system should be viewed not only as a complex electrical system of integrated circuits, but also as an intricate chemical laboratory. Pioneers in neuromodulation recognized early on that the result of modulating the function of the nervous system, either by electrical or chemical means, would indirectly affect other systems in the body, and that neuromodulation could treat conditions which do not directly involve the nervous system.

The first objective of this Society was to create a stimulating environment and venue for scientists and clinicians with different backgrounds to unite and to study the effects of neuromodulation and its mechanisms of action. Progress in this field would have not been made and will not continue without utilizing a multidisciplinary approach in treating both the patient and the disease.

My ongoing goal is to increase the interest and involvement of specialists in different fields in our Society and our Congresses. We've already taken many steps in this direction, such as collaborating with The International Functional Electrical Stimulation Society and publishing functional electrical stimulation articles in our journal, *Neuromodulation*. Pursuing this objective, we shall hold the next INS Congress immediately prior to The World Society for Stereotactic and Functional Neurosurgery Meeting, both of which will take place at the same venue in Rome. It will be an extraordinary opportunity to introduce more neurosurgeons to the INS and increase collaboration between the two Societies, thus facilitating the exchange of information among our respective members.

I, therefore, invite you to reserve the week of 10 - 17 June 2005 to join us in Rome — not only to play an active role in making this a most scientifically stimulating event, but also to appreciate the magnificence of The Eternal City.

Finally, I congratulate Dr. Enrique Reig and Dr. Elliot Krames for the successful organization of the 6th INS World Congress in Madrid in June 2003. The scientific programme was outstanding, covering all fields of interest in neuromodulation, with emphasis on the basic mechanisms and on new applications of neuromodulation. The excellent scientific program as well as the cultural and social events made the Congress in Madrid really memorable. Likewise, this Congress would not have been possible were it not for the generous support of corporate sponsors. I want to take this opportunity to acknowledge them and to convey the Society's gratitude. I look forward to seeing you in Rome in June 2005.

Mario Meglio, MD
INS President

INS Congress in Madrid - June 2003

I would like to inform our members and readers of the activities, events, and science of the recent 6th World Congress of the International Neuromodulation Society and the 6th Annual Meeting of the Spanish Pain Society, co-hosted by Dr. Enrique Reig of Madrid, and myself. The Congress took place in the heart of Madrid at the Palacio de Congressos, a most excellent facility, uniting approximately 550 physicians, nurses, scientists and representatives of Industry from all over the globe, to learn from experts in the field of neuromodulation and pain, to network, share technology and have a good time. The science and presentations of the Congress were superb, as were the activities and events hosted by the Society and Industry. Complemented by Spain's rich history, culture, and cuisine, the Congress was truly a memorable event. I congratulate Dr. Reig and Ana Ayala, the Congress Manager, on a job well done for the Society, our members, and the attendees of the meeting.

Physicians from Europe, the Middle East and the Americas attended the Congress.

Argentina.....	7
Austria.....	5
Belgium.....	26
Brazil.....	1
Canada.....	12
Czech Republic.....	4
Denmark.....	2
France.....	14
Germany.....	16
Greece.....	3
Ireland.....	2
Israel.....	6
Italy.....	60
Jordan.....	1
Mexico.....	2
Portugal.....	6
Puerto Rico.....	2
Scotland.....	1
Spain.....	178
Sweden.....	8
Switzerland.....	21
The Netherlands.....	23
Turkey.....	1
United Kingdom.....	21
United States.....	71

The meeting started on Wednesday, June 25, with a Cadaver Demonstrations Course at the University of Madrid Medical School, which was attended by 60 persons. An expert panel of five faculty

members taught the "audience" interventional techniques for the head, neck, thorax, lumbar spine and the sympathetic nervous system. Our faculty, chaired by myself, included Kenneth Aló from the USA, Serdar Erdine from Turkey, Gabor Racz from the USA, Marten Van Kleef from the Netherlands, and Jan Van Zundert from Belgium.

Providing a unique educational experience for all involved, a two-way video and audio system connected the audience in the main hall via sight and sound to the faculty 300 meters away. With this technology, it felt like we were standing right with the faculty in the anatomy lab, interacting with ease and immediacy. I want to congratulate all on a superb course.

On Wednesday evening, Brian Simpson, Immediate Past President of the INS, gave an excellent presentation on the "History of the INS," followed by our keynote speaker, Al Mann, founder of Advanced Bionics and the Al Mann Foundation. Dr. Mann, a well-known scientist, inventor, entrepreneur, philanthropist, and neuromodulatory device manufacturer, gave us an inspirational talk entitled "Bringing an Idea to The Marketplace."

I want to extend a heartfelt thanks to all of our sponsors and exhibitors, whose gracious support made this meeting possible.

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We all are looking forward to 2005 for the 7th World Congress of the INS to be held in Rome, Italy. We are certain that Mario Meglio, President of the INS, and host of the 7th Congress, will organize an exceptional educational and cultural event.

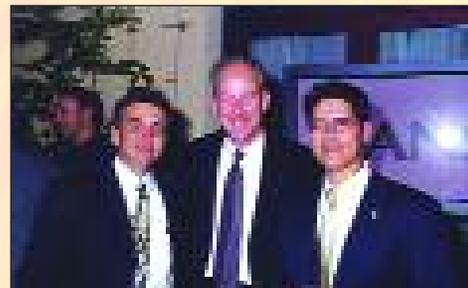
*Elliot S. Krames, MD
Co-Chairman of the 6th World
Congress of the INS in Madrid*



Left:
Elliot Krames,
and Ana Ayala,
Congress Manager



Right:
Mario Meglio,
INS President,
and Enrique Reig,
Congress Chairman



Above:
Peter Staats, NANS Past President,
Scott Drees and Chris Chavez of ANS

Below:
Nancy Santilli of Elan, Jonathan Wogel
of Medtronic, and Elliot Krames



Neuromodulation for Angina Pectoris and Myocardial Ischemia

Robert D Foreman PhD & Mike JL DeJongste MD

Introduction. During the last two to three decades the neural pathways that signal angina pectoris resulting from myocardial ischemia have been rediscovered as important key players in the progression and sequels of ischemic heart disease. As a consequence, new approaches directed at the central and peripheral nervous systems have been added to the prevailing armamentarium of medication and revascularization for treatment of chronic angina pectoris. The purpose of this bulletin is to discuss a few of the underlying mechanisms of electrical neuromodulation for angina pectoris, which is one of the novel therapies.

The problem of angina pectoris and myocardial ischemia. In patients suffering from ischemic heart disease, angina pectoris usually results from an imbalance between myocardial oxygen consumption (demand) and coronary blood flow (supply). This discrepancy occurs when vessel obstruction or vasospasm reduces local blood flow to cardiac muscle or when the oxygen demand of the muscle is increased, for example during exercise. Often this imbalance can be treated by using conventional therapies; however, there is a population of patients who suffer from angina pectoris who are refractory to these therapies. The condition of these patients is defined as severe angina pectoris class (III-IV of the Canadian Cardiac Society), and is unresponsive to standard anti-ischemic therapies such as medication and revascularization, is paralleled by reversible myocardial ischemia, and is the result of significant coronary artery disease. Patients who suffer from this so-called 'chronic refractory angina pectoris' commonly have a long history of coronary artery disease and are classified as survivors of the disease. As coronary artery disease continues to worsen, they often require numerous hospital admissions to control pain, and subsequently, these patients experience a very poor quality of life.

Modulation of the nervous system through spinal cord stimulation (electrical neuromodulation) is one of the most successful adjuvant therapies for treating these chronically ill patients. Relief of angina pectoris is most beneficial when electrical neuromodulation is applied through electrodes that are placed in the epidural space at levels T1-T2. The stimulus intensity is initially

increased to induce paresthesias that cover the precordial chest in the regions where the patients experience angina pectoris. After the electrode is placed, the intensity of the stimulus is reduced below the level producing paresthesias. The mechanisms producing the salutary effects of electrical neuromodulation are only partially unravelled. Furthermore, since electrical neuromodulation is not yet approved treatment for angina pectoris in North America, clinicians in the USA and Canada seldom treat these chronic pain patients with this therapy. The search to identify the underlying mechanisms of neuromodulation continues; however, it has already been shown that spinal cord stimulation reduces frequency and number of angina attacks, with subsequent improvement in quality of life, and improved cardiac function (i.e. the reduction in myocardial ischemia). These patients are suffering needlessly by withholding this option. This needless suffering is further exemplified since more than 80% of the patients in Europe treated with electrical neuromodulation are successful.

Underlying Mechanisms. In addition to experimental data indicating that electrical neuromodulation inhibits impulse transmission within the spinothalamic tract, most clinical observations support the notion that electrical neuromodulation improves the myocardial oxygen demand-supply ratio. In this regard, recent clinical studies have shown that electrical neuromodulation decreases myocardial lactate production, perhaps because of a reduction in cardiac myocyte metabolism and thus oxygen demand. It is also proposed from patient studies that electrical neuromodulation preferentially redistributes myocardial blood flow to regions of myocardial ischemia.

In a clinical setting, the antianginal effects of electrical neuromodulation far outlast the duration of the stimulation period, but the mechanism or mechanisms producing this long lasting effect need to be elucidated. Our initial studies showed that electrical neuromodulation of the dorsal columns of the T1-T2 segments in a canine model suppressed the activity generated by intrinsic cardiac neurons (ICN), whether it was applied before, during or following the onset of a 2-minute coronary artery occlusion. Furthermore, electrical neuromodulation-induced suppression

of ICN activity persisted long after the stimulus was terminated, implying that the neural suppressing effects of electrical neuromodulation are long-lived and supporting the clinical studies, which indicate a similar cardio-protective benefit even after electrical neuromodulation is discontinued. In summary, it appears that electrical neuromodulation may influence the function of the final common neural pathway of the heart, the intrinsic cardiac nervous system, in the presence of severe ischemic challenge.

In the canine model the anti-anginal effects of electrical neuromodulation did not appear to be dependent upon redistribution of coronary blood flow alterations in cardiac work. Regional cardiac blood flow distribution evoked by transient occlusion of a major coronary artery in canines was unaffected by electrical neuromodulation of the dorsal column of the T1-T2 segments. Moreover, left ventricular pressure-volume loops evoked by transient coronary occlusion were likewise unaffected. However, it should be pointed out that these studies were conducted in an animal model with a normal heart. Nevertheless, one might conclude from these animal studies that the anti-angina effects of electrical neuromodulation do not reflect modulation of the cardiac supply/demand balance but rather involve other neuro-humoral mechanisms which protect the heart from some of the deleterious consequences attending myocardial ischemia and the resultant angina.

To protect the heart electrical neuromodulation apparently activates efferent and afferent neural projections to and from the heart. These projections may activate intrinsic cardiac neural processes that release various endogenous neurochemical active substances that stabilize the heart during myocardial ischemia. Furthermore, results of animal experiments have demonstrated that pre-emptive stimulation improves the survival of ischemic skin flaps. This effect may be analogous to the effect of ischemic preconditioning, where brief episodes of coronary artery occlusion (5 min) followed by a reperfusion phase (10 min) reduces the potential for cell death within the risk zone for up to 90 minutes. The main clinical drawback to the ischemic preconditioning stress is that these cardioprotective effects rapidly become ineffective within a few days. In contrast to the short-term effects of ischemic precondition-

Benelux Neuromodulation Society

In 2002, four Belgian and Dutch INS members initiated the foundation of an INS Chapter in the Benelux countries. A large number of potential members were asked to join this Chapter and the INS. Almost 40 people applied for membership and the initiative group, supported administratively by Marja de Regt, started a procedure for the election of the first Executive Board of the Chapter. All members were invited to nominate themselves and other members as a candidate for each of four Executive Board positions, which finally led to 10 candidates. In a written election in November 2002 by all members, Liong Liem (President), Bart Nuttin (Vice-President), Jan Holsheimer (Secretary) and Jean-Pierre van Buyten (Treasurer) were elected as the first Executive Board members, who started to prepare the inaugural meeting of the Chapter.

On March 1, 2003, the inaugural meeting took place in Nieuwegein in the presence of the President of the INS, Brian Simpson. It was decided that the name of the new INS Chapter would be "Benelux Neuromodulation Society" (BNS). Marja de Regt was willing to continue her well appreciated support of the Chapter. Among several items on the agenda related to the organisation of the BNS, it was decided that the next meeting would be held on November 21-22, 2003. The agenda also included two presentations. Brian Simpson discussed the underexposed issue "Are we selecting the patients and assessing the outcome appropriately", whereas Jan Holsheimer initiated a discussion with his presentation "Neuromodulation: more than just pain management". Although a large majority of the current membership are pain clinicians, there was a strong feeling that the BNS should not stick to neuromodulation in chronic pain management, but instead, cover a wide range of applications including motor and psychiatric disorders, epilepsy, etc., thereby attracting physicians and scientists in a large variety of disciplines. This was a clear message and the Executive Board concluded that the next meeting should cover a variety of neuromodulatory interventions by electrical stimulation of targets in the brain.

The meeting "Neuromodulation by means of electrical brain stimulation" on

November 21-22 in Leuven and organised by Bart Nuttin was attended by over 40 participants, including various neurologists, neurosurgeons and psychiatrists who enrolled as new members. The keynote lecture was given by Dr. Nguyen on "Motor cortex stimulation in chronic pain and motor disorders". Other presentations were on DBS in movement disorders, epilepsy, tinnitus, persistent vegetative state, obsessive-compulsive disorder and the "Gilles de la Tourette" syndrome, and on "Field modelling in motor cortex stimulation". The program of this first meeting of the BNS was considered as very attractive and interesting by the attendants and it is up to the Executive Board to continue this success at the next meeting which will be held on November 19-20, 2004, in Maastricht.

Jan Holsheimer, PhD
Secretary of the Benelux Neuromodulation Society

Italian Neuromodulation Society

The Italian Chapter has 47 members, distributed throughout each Italian Region, who specialize primarily in anaesthesiology or neurosurgery.

In 2003, the Italian Chapter organized 3 Meetings:

- The National Meeting in conjunction with the XXV Congress of AISD (Italian Section of IASP)
- The 2nd International Meeting on Pain Therapy in the centre-south
- The 2nd Ins Italian Chapter Congress in the centre-north

During these Meetings the Board drew up guidelines for the use of spinal implants, and they confirmed their intention collaborate with the Italian Chapter Ethics Committee to create a standard document on the use of implantation procedures.

In 2004, the Society's focus will be on establishing an implantation register and on creating study groups who will prepare literature for distribution throughout the Italian community. The Italian Chapter will hold its Annual Congress in conjunction with The 26th National Congress of AISD (Italian Chapter of International Association for

the Study of Pain) on 27-29 May 2004, in Vasto, Italy.

North American Neuromodulation Society

The North American Neuromodulation Society (NANS) is dedicated to advancing the field of Neuromodulation through clinical research, education, and print material within the United States while increasing the avenues of development for its members through professional networking systems, ongoing communication and other opportunities.

The NANS will hold its first stand-alone meeting on April 28 - May 1, 2004, at the Loews Hotel at Universal Orlando, Florida, immediately prior to the American Association of Neurological Surgeons' Annual Meeting.

Neuromodulation Society of the United Kingdom and Ireland

Report on The Third Annual Scientific Meeting of the United Kingdom and Ireland Chapter of the International Neuromodulation Society, held 10th - 11th October 2003, Governor's Hall, St. Thomas' Hospital, London.

Dr. Adnan Alkaisy organized the meeting with the assistance of Anne Moys, his secretary, and Lyndy Wesley, his partner. Dr. Adnan Alkaisy and Dr. Simon Thomson prepared the scientific programme.

This was another very successful meeting, attended by 60 delegates and speakers, and graciously supported by Industry from a variety of backgrounds. Special thanks must be given to Medtronic UK Neuro-division for their generous support of INS(UKI).

The ASM of INS(UKI) aims to bring together a group of professionals from a wide background that has a substantial interest in neuromodulation therapies. Each year we try to have a number of themes. Last year we chose:

- To present the results or protocols of randomised prospective studies which have recently been completed or are still in progress
- To present and discuss new and developing techniques of neuromodulation

Publications

Neuromodulation, Journal of the International Neuromodulation Society and the Official Journal of the International Functional Electrical Stimulation Society (IFESS)

Published by Blackwell Publishing

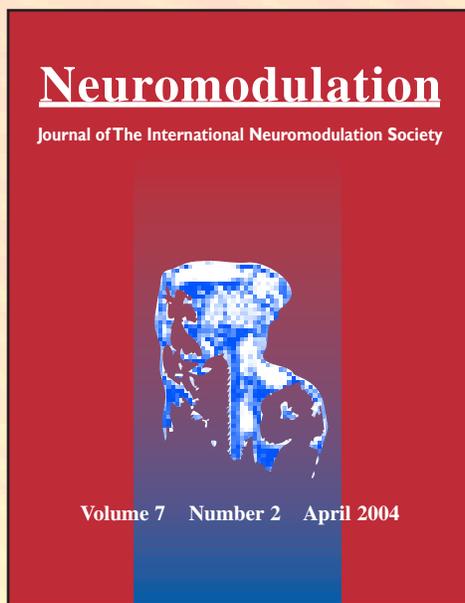
Elliot S. Krames, MD, Editor-in-Chief

Neuromodulation disseminates scientific and clinical information relevant to the field of neuromodulation. The journal advances the basic and clinical science of the field of neuromodulation. *Neuromodulation* publishes original, scientific works, scientific reviews, abstracts of papers accepted for review at national and international congresses, and past and future news of events and activities of the society and its membership. *Neuromodulation* expertly addresses the multidisciplinary scope of the topic by covering such topics as anesthesiology, angiology, cardiology, neurology, neuroscience, rehabilitation medicine, urology and vascular surgery.

Neuromodulation will apply for inclusion in Index Medicus in 2004. It is currently Indexed/Abstracted in SciSearch, ISI Alerting Services, and Neuroscience Citation Index.

This is your Journal. Please submit your articles relevant to neuromodulation to the Journal. With each and every submission, our Journal and Society grow.

For more information please visit <http://www.neuromodulation.com/Neuromodulation.htm>



Electrical Stimulation and the Relief of Pain
Pain Research and Clinical Management,
Volume 15

Edited by

B.A. Simpson, Department of Neurosurgery,
University Hospital of Wales, Cardiff, UK

This book is about the history, science, technology and current clinical applications of electrical stimulation for the relief of pain. The clinical applications are diverse, from angina and the pain of peripheral vascular disease to the agony of interstitial cystitis (a promising new indication), from the mysterious and disabling complex regional pain syndromes to phantom pain and stroke pain. The contributors reflect the multidisciplinary nature of the subject in a unique

compilation. All parts of the nervous system can be stimulated to provide relief of otherwise intractable pain, from the peripheral nerves through the spinal cord to the brain, and the book is organised on this basis.

To view full Table of Contents please visit the book's homepage at: www.elsevier.com/locate/isbn/0444512586

Published by Elsevier (2003)

Hardbound

ISBN: 0-444-51258-6

300 pages

Price: USD 80 / EUR 80

INS Congress Faculty Dinner in Madrid

Right:

Mike DeJongste,
Brian Simpson,
Robert Foreman,
and Bengt Linderoth



Left:

Jan Holsheimer and
Ross Davis



Right:

Samuel Hassenbusch,
Enrique Reig, Michael
Stanton-Hicks, and
John Oakley



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SEPTEMBER 9-10-11, 2004

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ing as derived from clinical experience, it appears that the benefits of electrical neuromodulation on cardiac function are maintained for years. This may be related to the ability of the nervous system, under control of electrical neuromodulation, to release the appropriate endogenous neurochemicals where and when they are needed and at levels that are sufficiently low to minimize the potential for receptor down regulation.

In conclusion. Electrical neuromodulation employs its effects at different levels in the neural hierarchy for cardiac control. At the heart, the clinically observed improvement in ischemia has not been confirmed yet experimentally. However, clearly electrical neuromodulation stabilizes the activity of the ICN, influences the propagation of impulses at the spinal level, and alters cerebral blood flow in cardiovascular centers. Furthermore, electrical neuromodulation is not blocking afferent signals from the heart, but rather alter the involved neural pathways in response to the threatening of injury-evoked dysfunction (plasticity) and subsequently shifts the sensitized neural threshold for angina in the patient to a more tolerable level.

- To highlight the role of deep brain stimulation in pain and movement disorders
- To present and discuss interesting case histories, complications and their management
- To present a vision for how our Society might serve its membership in the future

Time was given to the annual general meeting of the Society. According to the INS(UKI) constitution each officer is appointed for a period of 2 years with the option to continue for a further 2 years. Dr. Simon Thomson has served 2 years as President of INS(UKI). The board recommended to the Society that he continue for a further 2 years. This was agreed.

We had a presentation from Dr. Simon Thomson and Shaun Moffatt (Marketing and Business development strategist) on the future developments of our Society. The proposal is to commission the construction of a website with a secure area accessible by individualised password. This would allow for our first project: a secure professional discussion forum.

Dr. Paul Eldridge shall organize the Fourth Annual Scientific Meeting, which will take place on 12-13 November

2004, in Liverpool. The venue and scientific programme have still to be clarified.

Our membership continues to grow; and now that we have the bank standing order system we hope it will be easier to maintain. The attendance at our ASM has increased from 30 in 2001, to 40 in 2002, and 60 in 2003. Please spread the word about our Society and try and get colleagues to join as together we have a good chance of achieving mainstream recognition for our work.

*Dr. Simon Thomson
President of INS(UKI)
Secretary to INS
Editor of INS Newsletter*



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Educational Conferences

2004

28 April - 1 May

The 10th Annual Meeting
of the North American
Neuromodulation Society
Royal Pacific Resort,
Orlando, Florida, USA

For additional information,
contact:

Kris Haskin,
Executive Director, NANS
4700 W. Lake Avenue
60025 Glenview, IL, USA

Tel: +1 847 375-4714

Fax: +1 877 594-6704

E-mail: american@neuromodulation.org

Website:

www.neuromodulation.org

7 -10 September

The 9th Annual
International Functional
Electrical Stimulation
Society Conference
Bournemouth
International Centre (BIC),
Bournemouth, England,
United Kingdom

Chairman: Ian Swain, Ph.D.

E-mail:

ifess2004@salisburyfes.com

For additional information,
visit the Conference web site:
<http://www.ifessnet2004.tk/>

12-13 November

Fourth Annual Scientific
Meeting of the UK and
Irish Chapter of the INS -
INS (UKI) in Liverpool

For additional
information, contact:

Paul Eldridge, MD,
Chairman, at:
paulre1222@aol.com

2005

10-13 June

The 7th Congress of the
International Neuromodulation Society
Rome, Italy

Chairman: Professor Mario Meglio,
INS President

For additional information, contact the
Organizing Secretariat:

PTS Congressi Srl

Via Tevere, 20

00198 Rome

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Tel: +39 06 85355590

Fax: +30 06 85356060

E-mail: INS.Rome2005@ptsroma.it

www.ptsroma.it/INS-ROME2005

27-29 May

INS Italian Chapter Annual Congress in
conjunction with
The 26th National Congress of AISD
(Italian Chapter of International
Association for the Study of Pain).
Location: Vasto, Italy

For additional information, contact:

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Facsimile: +39 541 439808

Email: italiacapitolo@isalrq.it

Website: www.isalrq.it

19-20 November

The 2nd Scientific Meeting of the
Benelux Neuromodulation Society
Maastricht, The Netherlands

For additional information, contact:

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The Netherlands

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14-17 June

The 14th Meeting of the World Society
for Stereotactic and Functional
Neurosurgery (June 14-17)
Rome, Italy

Chairman: Professor Mario Meglio,
INS President

For additional information, contact the
Organizing Secretariat:

PTS Congressi Srl

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www.ptsroma.it/WSSFN-ROME2005



Medtronic

The International Neuromodulation Society is a society that fosters cooperation and partnership between clinicians, scientists and industry. We are proud of this cooperation. We would like to take this opportunity to thank our corporate partners for all of their support since the inception of the International Neuromodulation Society. Without the support of our corporate partners, our Society, the journal, *Neuromodulation*, and the chapters of the INS would not be in existence today.

Now you can find information about the INS, its national chapters, upcoming meetings and the INS' journal, *Neuromodulation*, on line!

Visit the new INS web site today **www.neuromodulation.com**

INTERNATIONAL NEUROMODULATION SOCIETY MEMBERSHIP APPLICATION

The goal of the International Neuromodulation Society (INS) is to promote therapeutic neuromodulation in its broadest sense at a clinical and scientific level. A major focus of the Society is to promote and achieve high standards of clinical and scientific investigation through the exchange of knowledge by organizing regular scientific meetings and publishing the journal *Neuromodulation*, enabling collaboration and communication within and between working groups nationally and internationally. The scientific objectives of the INS are to increase our understanding of the mechanisms of neuromodulation and to evaluate existing and new applications. The clinical objectives are to refine the indications for this therapy and to extend the application and availability, thereby maximizing the benefit individually and collectively.

The Journal, *Neuromodulation* is dedicated to the dissemination of scientific and clinical information relevant to all individuals and groups interested in the field of neuromodulation. It is the goal of *Neuromodulation*, to enhance normal bodily function or to reduce bodily dysfunction by modulating normal and abnormal function of the peripheral and central nervous systems. This approach for today and the future is made possible by a positive partnership of basic scientists, industry and clinical scientists. The INS, the journal, *Neuromodulation*, and the INS' chapters are proud to join this partnership.

The International Neuromodulation Society has the following chapters:

- North American Neuromodulation Society Italian Neuromodulation Society Benelux Neuromodulation Society
Neuromodulation Society of the United Kingdom and Ireland

By joining any one of the chapters of the INS, persons receive membership not only in the chapter itself but also receive membership benefits of the International Neuromodulation Society.

The advantages of membership include but are not limited to:

Excellent, and increasingly large, international meetings every two to three years as well as chapter meetings.

The International Neuromodulation Society's journal, *Neuromodulation*, four issues per annum and now in its sixth volume.

Informative newsletters published semi-annually.

Registration discounts to INS conferences.

www.neuromodulation.com

Members of the International Neuromodulation Society receive the journal, *NEUROMODULATION*.

Please check all disciplines that apply:

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| <input type="checkbox"/> Implanter | <input type="checkbox"/> Nurse | <input type="checkbox"/> Non-implanter | <input type="checkbox"/> Other _____ | |

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- Membership for the Benelux Neuromodulation Society. Membership Rate: \$150.00
- Membership for the Italian Neuromodulation Society. Membership Rate: \$135.00
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**Tia Sofatzis, Executive Director, INS, 2000 Van Ness Avenue, Suite 402, San Francisco, CA 94109-USA
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