



Neuromodulation News: January 2015

A Message from the President

Dear INS members,

Welcome all to 2015, an important year for the International Neuromodulation Society, as we come to the close of our 25th year and look ahead to our 12th Biennial World Congress from June 6th to 11th in Montreal, Quebec, Canada. As we usher in the New Year, I have been thinking about newly reported results in our field, and how the insights they suggest could impact our future practices and an ever-widening variety of patients.

First, I want to share my excitement about the congress scientific programme that has taken shape through the Scientific Program Committee, under the leadership of Dr. Timothy Deer, and with active local support from the Canadian Neuromodulation Society. To help create the invited programme, as you know, we sought proposals from our membership for mini-symposia. The preliminary scientific programme is now ready for viewing as a PDF at http://www.neuromodulation.com/ins-congress.

Since the INS congresses in Seoul in 2009, London in 2011, and Berlin in 2013, we have steadily increased daily time and space for oral poster presentations. This encourages real exchange of ideas and sharing of fresh data. We have kept the poster exhibition format as a physical presentation rather than a search on plasma screens to try to foster browsing, author presence and discussion. There are for-and-against arguments for these different styles of poster management, and I value your views on this, as do my colleagues on the program committee. All accepted abstracts will be published in the online version of <u>Neuromodulation: Technology at the Neural Interface</u> and will be available to congress attendees on a data stick.

The INS just completed its 25th year (an early history of the society is online <u>here</u>). In compiling the newsletter, website editor Nancy Garcia has reached out to a number of the pioneers of the INS and summarized their perspectives in an article in this edition. I am sure you will agree that our senior colleagues should be proud of starting something that has endured and grown so spectacularly. The growth is all the more impressive since the society's accomplishments have virtually all come about through the spirit of volunteering. Apart from the editor's stipend and the salaries of the society and editorial staff, all that we have done is built upon the principles of service.

Along these lines, many of you have approached Dr. Deer and I to ask how you can be more involved in the mission of the INS, and we salute you with hearty thanks for building upon that spirit.

With the society's worldwide presence, our inauguration of chapter societies has continued through 2014 with the creation of the Nordic Neuromodulation Society (NNS). NNS members had their first meeting in Helsinki, Finland in September 2014. Dr. Kaare Meier is chairman, and through his and the board's voluntary efforts, has drawn this chapter society together. He is fostering inclusion and society value with the creation of multiple discussion forums within the NNS website.

In 2015 we look forward to announcing the creation of the Turkish Neuromodulation Society. For members new and old, please take advantage of your membership, <u>book for the 12th World Congress</u> <u>meeting early</u>, enjoy your membership discount, engage in our website Forum discussions, and join our Google discussion group. Now is the time to <u>renew</u> if you've let your membership lapse.

Our membership overall remains on an upward trajectory while it does wax and wane, with some change noticeable, for instance, in between biennial congresses, and in those countries affected by austerity and exchange rate crises. At the moment one or two of our chapter societies are in need of resuscitation to meet the criteria to be fully recognised as a chapter of the INS.

I want to spend the rest of this message getting some thoughts out of my head and onto the page about potentially exciting new directions. So please indulge me.

Scientific progress is made by dogged attention to scientific method. Phenomena are observed and

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tested against the current theory of the day. For the most part the theory of the day remains unchanged, perhaps enhanced a little. Gradually more and more contradictory observations accrue until such a time that the theory has to undergo a revolution. This is when true progress is made.

For example, we often draw upon the Gate Control Theory to explain the analgesic effect of neurostimulation but nowadays we accept that this is insufficient to explain how the clinical application of action potential generation in A beta fibres relieves neuropathic pain but not nociceptive pain. Modifications of the Gate Control Theory have shown how orthodromic activation of branches of A beta fibres will enhance segmental release of GABA and other inhibitory neuropeptides in neuropathic pain models (in which GABA release is impaired). However the theory really should predict nociceptive pain analgesia with neurostimulation. Led by the belief that the activation of as many A beta fibres in the pain area as possible is important for maximizing clinical outcomes of SCS, various developments have been aimed at achieving that. Prof. Jan Holsheimer's model of current flows from epidurally placed electrodes has informed design strategies of electrode spacing and arrays. Modeling current flow and incorporating feedback loops to maintain optimal stimulation throughout all activity are just two methods being used.

Then out of the left field comes the concept of high-rate stimulation, specifically at 10KHz. Although there is a science of conduction block in closely applied peripheral nerve stimulation, this is patently not the mechanism of action in high-frequency (HF) 10K spinal cord stimulation (SCS). There are no parasthesiae or A beta action potentials. There is no mapping of the parasthesiae to the pain area, although it appears as if there are certain target areas that need to be stimulated. Until recently we just had non-controlled observational studies, so we could not be certain if we were observing a true treatment effect. A recent non-inferiority FDA study of HF10KHz versus standard SCS was presented at the annual scientific meeting of the North American Neuromodulation Society (NANS) in December 2014. Well done to Dr. Leonardo Kapural who presented this by the way! This showed non-inferiority to standard SCS in patients with dominant back pain over leg pain. Now we have more questions than answers. We need to confirm the treatment effect in an equipoised setting, and understand the mechanism of action from animal models and precise clinical research. Will this finding be a Theory Revolution moment, or just a tweaking of current Gate Control Theory? We will know more over the next couple of years!

Are we underestimating the role that neuromodulation plays in modern medicine? I think we are, however I don't think that the implantable devices that we have available to us today will drive this change. External neuromodulation devices utilizing electrical or magnetic induced electrical stimulation are likely to be the main drivers of neuromodulation into widespread medical usage. The devices used may well have different models of reimbursement, where the device is given away free (like a phone contract) but the prescription is based upon a month's per use prescription cost. Healthcare systems may feel more encouraged to adopt neuromodulation on such a basis. This way they only pay for successful therapy on a pro rata basis, rather than a high start up cost with the hope of future health care cost reductions.

If neuromodulation is more widely adopted then I believe that invasive types neuromodulation will also have a bigger place in the neuromodulation hierarchy but based upon a much wider base of external neuromodulation use. There will still be conditions such as chronic neuropathic back and leg pain that for reasons to do with efficacy and convenience of use will more likely be administered from an implanted device.

Now that the connections are being made between the inflammatory cascade and neural stimulation targets, such as the vagus nerve, it opens up the possibility of a role in systemic disease management ranging from breathlessness management in asthma and heart failure, to disease modification in rheumatoid arthritis or Crohn's disease. Psychiatric disorders such as anxiety, depression, eating disorders and other disorders thought to be of central origin such as fibromyalgia and Parkinson's disease may also be amenable to stimulation through non-invasive devices stimulating peripheral neural targets or using transcranial direct current stimulation or transcranial repetitive magnetic stimulation with directional technology to stimulate cortical or deep brain targets.

My final item for thought provocation is the matter of responder identification. Indeed this and mechanisms of action of neurostimulation form a <u>full-day satellite symposium</u> on Sunday 7th June immediately prior to the main congress. One of the early "selling points" of neuromodulation was that it was reversible and non-destructive. We also knew that it did not work on everyone. These two facts lent themselves to the concept of "Trying before you buy". Nowadays the trial test period has become lodged as a prerequisite before neuromodulation is applied. It drives up costs and complications. In the future a minority of patients will need a trial as we will soon be able to identify phenotypes that have a high (greater than 95%) certainty of response. I foresee that at least 75% of our patients will be managed by receiving a permanent implant after a phenotype screen, with the remainder being managed with a trial period.

Possible methodologies for responder identification might include better analysis of the phenotype using results from careful clinical history and precise sensory profiling, central conduction time measures and other biomarkers.

I hope this newsletter has been thought provoking. If it has, and you want to share and learn more, then



INTERNATIONAL NEUROMODULATION SOCIETY

12TH WORLD CONGRESS Neuromodulation: Medicine Evolving Through Technology

MONTREAL, QC, CANADA Fairmont Queen Elizabeth Hotel

ABSTRACT DEADLINE 14 February 2015

Abstract deadline - now 14 Feb., 2015



INS 13th World Congress Edinburgh, Scotland, UK Save the Date!

May 27 - June 1, 2017



MEDLINE-Indexed, and Now Published 8 Times a Year!

Unique Member Benefit

INS 2015 in Montreal this 6th to 11th June is the place to be! For those of you on Twitter, we are tagging congress discussion with #INS2015, and our Facebook page includes an <u>event</u> section for this congress.

As a final note, please book your flights and accommodation early since the F1 Grand Prix chose to have its race weekend on 6th and 7th June in Montreal as well. At the same time, please be sure to check the <u>Canadian government's website</u> and <u>apply for a visa</u>, if necessary.

Warm wishes for a happy New Year,

Dr. Simon Thomson, MBBS, FFPMRCA President of INS

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12th International Neuromodulation Society World Congress Final Abstract Deadline Will Be 14 February 2015

Due to popular request, the abstract submission deadline for the INS 12th World Congress, "Neuromodulation: Medicine Evolving Through Technology," has been extended until **14 February 2015**. To see the call for abstracts, please visit <u>http://www.neuromodulation.com/2015-call-for-abstracts</u>. While 14 February 2015 is the final deadline, we encourage you to <u>submit your abstract</u> and <u>register</u> as soon as possible for the Congress, which will take place at the Fairmont Queen Elizabeth Hotel in Montreal, Quebec, Canada on **6-11 June 2015**.

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Neuromodulation: Technology at the Neural Interface Publishes Meeting Abstracts

The International Neuromodulation Society has published abstracts from the 41st Neural Interfaces Conference (NIC). They appear in the online edition of <u>Neuromodulation: Technology at the Neural</u> <u>Interface</u>, issue 17:5 (July 2014). Through the collaboration efforts of Drs. Joseph Pancrazio and Robert Rennaker, the NIC Steering Committee and NIC abstract authors, more than 80 abstracts have been posted in the online edition. Members may read the abstracts upon signing into the journal website.

The INS appreciates the opportunity to publish the proceedings and extend the reach of this work to our membership/readership. The 41st NIC meeting took place in June 2014 at the University of Texas. It was partially supported by the university and the National Institutes of Health, whose Deep Brain Stimulation Consortium shared knowledge there with the neural prosthesis community.

Meanwhile, the INS also plans to publish abstracts from 2014 annual scientific meetings of the German Neuromodulation Society (DGNM) and North American Neuromodulation Society (NANS), with the first set appearing online in volume 18:2 of *Neuromodulation: Technology at the Neural Interface* (February 2015).

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Wiley Explains How to Publish Via Open Access

In a new three-minute video "<u>Understanding Open Access</u>," Wiley explains that Open Access can allow authors to let others see their work without paying for a copy of an article or a subscription, while still having it appear in journals that are indexed in PubMed for convenient citing by others. The process of pursuing Open Access publication includes meeting requirements by research funders and selecting between different licensing options. The video explains how to sort through those details with the help of the publisher.

OnlineOpen is available for *Neuromodulation: Technology at the Neural Interface* to authors of primary research articles who wish to make their article available to non-subscribers on publication, or whose funding agency requires grantees to archive the final version of their article. For the full list of terms and conditions, see http://wileyonlinelibrary.com/onlineopen#OnlineOpen Terms.

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Upon the International Neuromodulation Society's 25th Anniversary, Pioneers Look Back

Soon after the International Neuromodulation Society (INS) formed in 1989, Dr. Patrick Wall, who codeveloped the Melzack & Wall Gate Theory that inspired neurostimulation, declared at the society's first international congress in 1992 that, "Stimulation of identified specific groups of nerve cells will be a very



Members may log in and visit the members-only section's Global Discussion Forum to participate; watch for updates on our Expert Panels announcement page. large challenge, but we must face that challenge."

Twenty-five years later, toward the end of 2014, founding and early members of the INS looked back at establishing that direction and the surprises and challenges they met along the way. Their views were solicited for a perspective newsletter article to mark the anniversary.

Mike DeJongste, MD, PhD, and Michiel Staal, MD, PhD recall that the INS had its origins in an interdisciplinary meeting about spinal cord stimulation in the Netherlands in 1989. The meeting was organized by a diverse group of Dutch medical specialists who had closely cooperated on spinal cord stimulation (SCS) for spasticity. Called "ICESS: International CONGRESS ON EPIDURAL SPINAL CORD STIMULATION," the meeting took place from June 1-3, 1989 in Groningen, the Netherlands and addressed movement (i.e. spasticity), pain and cardiovascular disorders.

A subsequent meeting in Paris on April 21, 1990 drew representatives of different disciplines from France, Belgium, the Netherlands, Germany, England, and Italy. They included Lars Eric Augustinsson, MD, a Swedish neurosurgeon; J. M. Gybels, MD, PhD; N. Lambooy, MD; Geert H. J. J. Spincemaille, MD, PhD; V. Rettori, MD; and F. Sellier, MD. The official name "International Neuromodulation Society" was selected, and the first board was elected: Lee S. Illis, MD, a British neurologist, chairman; J. C. Sier, MD, a Dutch vascular surgeon, secretary; and Dr. Staal, a Dutch neurosurgeon, treasurer; with board members J. U. Krainick, MD, a German neurosurgeon; Mario Meglio, MD, an Italian neurosurgeon; and Daniel Galley, MD, a French cardiologist.

First International Congress and Early Meetings

The First International Congress of the INS was convened by this board, in Rome, on June 3-6, 1992. Drs. Meglio and Illis write in the introduction to the published proceedings that the congress was intended to "define the state of the art and to outline the most promising research projects." They add that the society was founded "to promote research, both experimental and clinical, in the field of electrical stimulation and pharmacological stimulation of the nervous system."

Brian Simpson, MA, MD, FRCS, recalls, "At the first Annual General Meeting, in Amsterdam on Nov. 6, 1993, apart from the board members only one ordinary member attended – me!" By 1995, he was on the board. Swedish neurosurgeon Bengt Linderoth, MD, PhD, joined the board by 1996 and recalls the society in early years as a very small group, a " 'family type of organization' where we all knew each other."

Dr. DeJongste said a "beginner's mistake" might be that once the original board had organized a second congress in Rome in 1992 and their first term ended, the entire board decided to step down rather than looking for continuity by leaving at least one member on the new board. The new board was presided over by Giancarlo Barolat, MD. The fact that the entire first board left constituted one of the first surprises for Dr. Barolat, who noted that the founders faced hostility from existing European pain and neurosurgical societies, which viewed the INS as another potential competitor.

Dr. Barolat was surprised "that the society actually survived, despite the attacks by other societies and the difficulty in finding its own identity and niche. There were many times, early on, that the existence of the society was questioned by the board itself," he said, pointing out that, "as I was given the presidency of the society, all the existing board quit at once." He believes it was, and remains, a challenge to involve a breadth of disciplines such as cardiology, urology, vascular surgery, neurology, and basic science.

Since 1990, Dr. Barolat had collaborated on modeling spinal cord stimulation with Jan Holsheimer, PhD, a Dutch electrophysiologist/biophysicist (and Honorary Lifetime Member of the INS since 2007). Dr. Barolat brought him onto the board in November 1993.

Prof. Holsheimer recalls there was a slow warming-up period for board members to continue to get to know each other and decide how large the membership should be – for instance, if it could just be board members and some invited friends. Before the structure became more formalized, he says, "to avoid stressful situations the initial board meetings were held without an agenda and minutes of the previous meeting. The board took its job seriously and did not make decisions before an issue had been discussed at three subsequent meetings."



Caption: At a 1995 board meeting in Italy, starting from the left foreground and going back around the table toward the far wall, are Brian Simpson, MD; possibly Wolfhard Winkelmüller, MD (behind Dr. Simpson, in a white shirt); Robert Foreman, PhD; then-INS President Giancarlo Barolat, MD; then-Executive Director Sherri Kae Calkins; José Antonio de Vera Reyes, MD; Claus Naumann, MD; Lars Augustinsson, MD; Jan Holsheimer, PhD; and Mike DeJongste, MD, PhD. (Photo courtesy of Dr. Giancarlo Barolat)

Elliot Krames, MD, became involved after the second INS Congress in Goteborg, Sweden in 1994, which was organized by Dr. Augustinsson. "Cooking in my kitchen one night in 1994, I received a call from Giancarlo Barolat," Dr. Krames recalls. "I knew Giancarlo only from his published works and was honored by his call and invitation. He asked if I would like to be on the board of the INS. Of course, I said I would." Dr. Krames and Dr. Barolat had both already been asked to join the board of the just-formed U.S. society, which would soon change its name from the American Neuromodulation Society to the North American Neuromodulation Society (NANS), and not long after, become associated with INS.

Dr. Krames had heard that the INS held meetings in Europe and had wanted to be a part. He attended his first board meeting in Lucerne, Switzerland in 1997, which included a visit to a well-known rehabilitation center in Nottwil. Dr. Krames remembers a discussion there on how to increase INS membership – he believes there were only 10 dues-paying members at that time, and that not all board members were paid-up members.

The Journal is Conceived

When the discussion turned to a newsletter for the society, he drew his attention away from the window outside the schoolroom where the meeting was held, with sheep grazing in the meadow outside ("a very beautiful and peaceful scene") and raised his hand to say that "if we are a scientific society, we should have a journal." Some board members were not convinced that this proposal was a good idea, and raised objections. But when the proposal came to a vote several hours later, he was asked to create the journal. Dr. Krames states that he knew nothing of scientific journals or the process of how to even go about starting one.

"Well I did and am glad," he says now. "I think that the journal led to the real birth of the society and has been a focal point to its growth" – with "thanks to Bob Levy in no small way." Robert Levy, MD, PhD, has guided the journal through its growth as the second editor-in-chief since 2009.

In Dr. Simpson's view, the INS owes Dr. Krames a huge debt for nurturing that vision and for investing more than a decade of very hard work in it, adding that after the journal "came of age", Dr. Levy "has brilliantly taken forward the further development of this essential component of the INS." Dr. Barolat considers the journal "the most credible vehicle for clinical and scientific information in the field."

Dr. Krames adds, "Our funding industry partners wondered early on why 'they' needed another society. Today, our society is the only one representing the science, clinical access to the therapies, and education of healthcare providers about the benefits of neuromodulation. It was through the journal and our ever-increasingly successful meetings that they slowly came onboard."

Early Challenges and Assistance in the Growth of the Society

Overall, Dr. Barolat has been pleasantly surprised the society has developed a clinical background and very strong scientific presence, which he mainly credits "to the relentless efforts of Drs. [Robert] Foreman, Linderoth and Krames."

Getting there, Dr. Linderoth notes, was not without challenges. "One challenge was the merging of different professions into neuromodulators; functional neurosurgeons, anesthetists, pain clinicians, basic researchers, engineers, statisticians, epidemiologists, economists and people concerned with legal matters and compensation etc. Dr. Linderoth goes on to say that "One big problem with starting up a new journal, *Neuromodulation*, [in 1998] was that it was not accepted in any of the existing scientific databases. The impact factor thus was 0.0. It was of course difficult to advise PhD students to submit research articles to *Neuromodulation* since they would not be retrievable after publication. I am personally happy that one paper written together with Bob Foreman in 1999 was one of the most downloaded and cited of the articles. Due to the hard work of Elliot Krames and especially by Robert Levy, the journal is now attracting a high degree of attention, has an increasing impact and is listed in PubMed. The articles of high quality have increased and the rejection rate is also rising."

Dr. Simpson counts as challenges growing the membership sufficiently to achieve and maintain viability, as well as striking the right balance in its structure. "There was always the risk of . . . not representing and promulgating the increasing breadth of the field of neuromodulation. Aiming for a broad church generated an initially less-than-welcoming attitude from the World Society for Stereotactic and Functional Neurosurgery, although, fortunately, relationships improved as the INS matured."

However, the founders were not without help in the earliest days. Following the ICESS congress, notes Dr. Staal, "several grants enabled the researchers in the Netherlands to initiate clinical studies with neuromodulation for several indications, making several meetings possible in order to elaborate our plans for establishing the INS. Later specialists from other disciplines joined the Dutch 'neuromodulation family' (cardiologist Dr. DeJongste and several anesthesiologists)."

The Chosen Name and Its Significance

Even choosing the name "neuromodulation" was not a simple matter. There was discussion among the board members with terms bandied about such as neural prosthetics, neural augmentation, etc. Drs. Staal and DeJongste say the term neuromodulation was a "Dutch invention". During a later discussion, Dr. Krames notes in a <u>2006 NANS newsletter article</u>, "the term neuromodulation was proposed by Mario Meglio and accepted by the preliminary board of the society to include all neurodevices implanted to help and improve function in humankind."

The term neuromodulation links the therapy to the underlying physiology and the unfolding quest to refine insight and interventions. "INS has always supported the research and knowledge about mechanisms of action in neuromodulation," comments Dr. Linderoth. "For a long time I thought that we were only a very, very small group doing this but now it is also rapidly expanding. A very important thing is that the INS has increased the cross-fertilization . . . Moreover, the INS has attracted much support from the neuromodulation manufacturing industry and actually driven the development of new treatment algorithms (which we now see just the start of . . .)" – as well as influencing industry in the development of new and more-refined devices, indications, and stimulation targets.

In the <u>2004 INS newsletter</u>, Dr. Meglio, who had advocated for the society's name to use the term "neuromodulation," wrote as then-president of the INS:

"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 not have been made and will not continue without utilizing a multidisciplinary approach in treating both the patient and the disease."

Dr. Krames proposed adding to the journal title the phrase "*Technology at the Neural Interface*" in 2007 to distinguish between pharmacologic neuromodulation from systemic agents and device neuromodulation – and to attract submissions from all of applied neuroscience. He now relishes seeing newer branches of the field such as brain-computer interfaces, brain-machine interfaces, optogenetics and bioelectric medicine, saying, "Our field might just represent the future of medicine!"

"The most gratifying thing about the INS today," he continues, "with the increasing interest amongst clinicians, scientists, and engineers, is the notion that we are all in this together."

Chapter Formation

In the early years, Dr. Barolat had formulated, with Dr. Simpson, the idea of national and regional chapters as a way of expanding the reach of the society. When Dr. Krames brought this idea to the NANS board in the 1990s, he encountered some initial skepticism. However, he believes NANS joining the INS was a game-changer, since "the USA implanters were now part of a worldwide federation of implanters and the INS just doubled its growth."

Dr. Barolat counts as the most tangible change of the INS "the number of members as well as member societies, which have skyrocketed in the recent years. INS has become, de facto, the champion society for neuromodulation all throughout the world. And that is an undisputed fact."

Growing the membership sufficiently to achieve and maintain viability was very challenging, Dr. Simpson says. He made chapter development one of the priorities of his presidency in 2000 - 2003, with a resulting impact on the full board, since chapter presidents automatically have a seat there.

Both he and Dr. Krames credit Tia Sofatzis with providing needed continuity as a unifying force for the growth of the society, as well as being central to creation of the journal. (She has been managing editor of the journal since 1998 and became executive director of the INS in 2001.)

Room to Grow

Prof. Holsheimer sees a need for a big effort to have specialists in various disciplines communicate together and bring neuromodulation to a higher scientific and technological level, pointing out that strictly basic sciences and technology themselves play only a minor role in enabling interdisciplinary establishment of proven capabilities. He does believe founding the journal "determined further activities, primarily an urgent growth of the membership to make the journal a success."

Among the many pluses of the society, Drs. Staal and DeJongste still note that despite the rapid growth of the society and development of professionalism, there have been relatively fewer contributions from younger colleagues, perhaps due to lack of interest from regional specialty societies (maybe because neuromodulation is not in the official curriculum), and some lag in widespread use of neuromodulation for the full range of indications, as well as unrealized potential to integrate different neuromodulation applications within one center.

All the same, Dr. Linderoth sees an upward curve with rapidly spreading, active interest in many facets of neuromodulation therapy. He predicts current strides will develop exponentially. For instance, he is part of one research team constructing future nano-sized "electrobiological GABA interneurons" for implantation in the spinal cord and another research team that has implanted cell probes that secrete nerve growth factor into discrete brain targets of 10 Alzheimer's patients. "This is to me the translation of neurostimulation to restorative neuromodulation/reparative neuromodulation – the pace here was slower and the difficulties we had to meet were larger – but we will master this too, in the end."

(Note: For a brief historical run-down of milestones in the first 18 years of INS please see http://www.neuromodulation.com/history----ins)

The International Neuromodulation Society Seeks Copies of Photos and Documents from the Early Years

The International Neuromodulation Society has completed its 25th year! To recognize that milestone, we ask members and colleagues to share material from 1998 - 2000, such as copies of photographs (ideally, along with IDs of the people pictured), printed meeting information, or other similar memorabilia. You may send scans to Public Education and Website Manager Nancy Garcia at <u>ngarcia (at)</u> <u>neuromodulation.com</u>. The information is intended to be compiled for presentation and sharing with members and colleagues, as well as to be kept in a centralized fashion with archival material generated by the society over the years. Information from prior to the year 2000 is most welcome. We thank you in advance for your support of this endeavor!

Meanwhile, an overview of the society's history from 1989 - 2007 is posted on the INS website, as well as copies of <u>newsletters dating back to 2004</u>. Many thanks in advance to all contributors.



Chapter News

Argentina

Sociedad Argentina de Neuromodulación (SANE)

Dear colleagues and friends of INS:

We are pleased to inform you about our activities since our last Board meeting, last July in Montreal.

During this period we continue to struggle against the lack of financial support from industry, government, or other source, that limits some of our achievements and make us fall into a vicious circle that we continue to break.

1) Internal relationships:

We are always facing the critical issue of the number of our members, which are 24, with eight possible additional applications, for a possible total of 32.

In order to keep our members sharing group enthusiasm we have tried to sustain periodic meetings and to incorporate non-physician members as a way to enlarge multidisciplinary research and development. Already we have two engineers and one researcher associated.

While some members have unfortunately left due to geographic or other reasons, our former secretary and founding partner, Dr. Fabián Cremaschi, has developed a regional sub–chapter in the west area of our country (provinces of Mendoza and San Juan). This was shown to INS Board when we organized, under INS support, a visit that was both a great time with lovely company and a very useful tool for our national expansion.

One challenge in collecting member fees is posed by the difficulty of exchanging foreign currency due to current national policy. That is expected to be addressed, thanks to the efforts of INS and Executive Director Tia Sofatzis, through installing credit card payment. We also look forward to the affordability and ease of an automated electronic dues payment renewal option.

2) Institutional relationships:

Having finally obtained our governmental recognition as an nonprofit organization, we have signed an inter-institutional agreement with the Instituto Nacional de Tecnología Industrial (INTI), the governmental technological organization, in order to cooperate with technical help, and we are evaluating a potential agreement with a private university (Universidad de Moron).

3) International relationships:

We have organized, through INS full support, and a modest help of local industry, the Mendoza meeting in October 2014, which was also the 3rd Brazilian - Argentinian and 2nd Polish - Argentinian joint meeting, where we enjoyed a quite uplifting scientific program by joining local, regional and international colleagues and friends.

4) Scientific activity:

a) We are preparing presentations and posters for the next INS World Congress in Montreal 2015 and some of our members are involved in assisting this event.

b) We have recently published a new paper in *Neuromodulation* and we are preparing other ones.
c) We have published seven papers last year in our revue Neurotarget. Other papers are in process.
d) Dr. Fabián Piedimonte and Dr. Juan Carlos Andreani have reviewed papers for *Neuromodulation*.

e) We have re-started our review *Neurotarget*, through a new cycle, publishing our first issue on March 2015 and by growing from 3 to 4 annual issues.

f) The SANE is going to be represented at the Sociedad Latinoamericana de Neurocirugía Funcional (SLANFE) Meeting on May 2015, in Santiago, Chile, in order to continue to offer membership to foreign colleagues whose countries could be homes for future national chapters of the INS, and help them with that task through our experience. This will be the continuation of that task already started during the SLANFE meeting in Puerto Vallata, Chile in 2013 and in the SLANFE training course, held in Buenos Aires, Argentina, on September 2015.

5) Development of neuromodulation activities:

We continue to grow the Programa Provincial de Neuromodulation (PPNM) which is directed by some of our senior members and has the support of the government of the Province of Buenos Aires, Argentina. This program is intended to increase access to the technology and practical assistance to the population of that area of our country (more than 15 million people, representing about 40% of our total population), to serve as the basis for a provincial law for implants and to provide our experience for the establishment of international guidelines for neuromodulation procedures. We have already evaluated hundreds and treated more than 100 patients, and we have also treated patients living in other regions of our country.

We have made 14 periodic reports about PPNM to the Public Health authorities and we presented the organization at the INS 10th World Congress in London, during the event RECOBRAN II (Brazil and Argentinian Joint meeting 2012) and during the INS 11th World Congress in Berlin in June 2013, through institutional posters on each of those events. We are presenting a poster with another institutional update during the INS 12th World Congress in Montreal, next June, 2015.

6) The Argentinian and regional community of neuromodulation and functional neurosurgery remain optimistic that Buenos Aires, Argentina might someday be the home of a future World Congress of the INS, which could be an important step to enlarge our activities in Argentina and in our region, as it was shown when the World meeting of the International association for the Study of Pain (IASP) was held in Buenos Aires on October 2014.

With best regards for all the worldwide colleagues,

Juan Carlos M. Andreani President SANE

Fabián Piedimonte; Past - President SANE

Miguel Zangone Vice - President SANE

Noemi Rosenfeld Secretary SANE

Juan Pablo Puente Executive Director

Germany

Dear friends and colleagues of INS:

We are pleased to update you about our activities since our last board meeting, last July in Montreal. During this period we continued to intensify our efforts to gain support for our activities from the medical device industry.

1) Internal:

Our annual conference took place in Bad Oeynhausen, Germany from 28. to 29. November 2014. The meeting was dedicated to intensifying interdisciplinary efforts within both cardiology as well as vascular medicine. Therefore the meeting was situated in one of the leading centers for cardiac and diabetes medicine in Germany.

Prof. Braunsdorf reported on the past activities of the Deutsche Gesellschaft für Neuromodulation (DGNM), also about the various efforts to consolidate the status of the society. As a visible result of his work, we could welcome the 102nd active member of the German society for neuromodulation.

One of the current issues has been to remind all members to pay their dues, but we are confident that, as the new automatic electronic system of payment is introduced, this can be overcome.

With respect to education, DGNM will host, in cooperation with St. Jude Medical, multiple workshops and training courses for residents and fellows, starting in January. Multidisciplinary research and developments will be included in these activities.

We intend to support and develop fellowships for pain nurses so that they may receive dedicated neuromodulation certifications. Therefore we will call for professional acceptance.

DGNM members voted for a new board with the following results: Jan Vesper, MD, PhD, Düsseldorf, president; Wilhelm Eisner, MD, PhD, Innsbruck (Austria), vice president; Christian Mantsch, MD, Minden, past and present secretary; Johannes Kuchta, MD, Bonn, treasurer. The new board members would like to thank Prof. Werner Braunsdorf for his efforts and contribution over the past several years. They expressed hope he will advise and assist the new board.

2) National relationships:

We struggle with acceptance of our society by guideline committees in Germany (e.g. the Association of the Scientific Medical Societies (Arbeitsgemeinschaft der Wissenschaftlichen Medizinischen Fachgesellschaften, AWMF). We still have to obtain the acceptance of this national board for medical guidelines, which is very essential, since our goal is a sustained reimbursement of the different methods by insurance companies, both for outpatients and within hospitals. Prof. Tronnier is already involved in this board. Regarding cooperation with the medical device companies, we are confident that they will continue to support our activities as they have in the past.

The office of the society will change from Heilbronn to Berlin as soon as possible, since one of the past presidents, Dr. Vadokas, has resigned. We will keep you informed.

3) International relationships:



In order to keep our members involved, we would like to introduce interim meetings, which are associated to the neighbor societies as German Society for Neurosurgery, The German Society for Clinical Neurophysiology, The German Pain Society e.g.. Furthermore we will encourage the Swiss, French and Austrian branches to create joint meetings with our society. We are looking forward to holding a meeting in London with the Neuromodulation Society of the United Kingdom and Ireland in Nov. 2015.

4) Scientific activity:

We are preparing presentations and posters for the next INS World Congress in Montreal 2015. Also, we will implement scientific activities in deep brain stimulation for movement disorders, psychiatric indications and orphans diseases like Huntington's chorea.

With best regards for all the worldwide colleagues for 2015

Prof. Dr. Jan Vesper Prof. Wilhelm Eisner Dr. Christian Mantsch Dr. Johannes Kuchta Prof. Werner Braunsdorf

Italy

The Italian Chapter continues its activities involving other specialists. Our chapter collaborates with the Italian Society of Functional Neurosurgery and with neurologists of LIMPE. This collaboration brings to the participation of these colleagues to our National Congress to be held in Venice on 16-17-18 April 2015. Colleagues from Europe will participate at our Congress for a collaboration that goes beyond the boundaries of the European chapters. We are also planning our 3rd cadaver lab with theoretical and practical session and final examination, after the cadaver course on Stimwave system held in Budapest.

Gianni Colini Baldeschi, MD, FIPP President, Capitolo Italiano INS

Nordic



The Nordic region (Denmark, Finland, Iceland, Norway, and Sweden) is a very large and geographically diverse territory bound together by strong cultural and historical ties. The countries share similar, mostly public-based health care systems and have a long tradition of scientific and clinical collaboration. Despite this, there has been no formal partnership in the field of neuromodulation so far.

The Nordic Neuromodulation Society (NNS) was founded during a special session at the Berlin INS meeting in June 2013. The assembly elected Kaare Meier, MD, PhD (Denmark) as chairman, Kari Sulkko, MD (Finland) as treasurer, and Anders Wåhlstedt, MD (Sweden) as secretary.

Following this session, work began on registering potential members, planning the first NNS meeting, and settling formalities with the tireless help of INS Executive Director Tia Sofatzis.

The inaugural meeting was held in Helsinki, Finland, September 2014, and featured one and a half day of clinical and scientific talks combined with plenary discussions on practical and organizational matters. Almost 70 attendees made their way to the Finnish capital to discuss their new organization, to listen to talks by clinicians and researchers from around the Nordic region, and to get inspired by two lectures held by Neuromodulation Editor-in-Chief, Professor Robert Levy.

At the General Assembly the founding executive board was re-elected, and Audun Stubhaug, DMSc was elected as the Norwegian board member.

The next NNS meeting will be held 10 June 2015 during the INS congress in Canada, and the 2016 NNS meeting will be hosted by our Swedish colleagues.

At the time of writing, the NNS has been formally accepted as a regional chapter of the INS and has 55 members.

A homepage has been established and can be found at http://nordicneuro.org/.

As most of the activities between meetings are expected to take place online, a complete set of forums have been set up and can be reached at http://nordicneuro.org/forum/ (registration required!).

And finally, a logo contest has been held, electing the entry created by Katrin Svabo Bech and Andreas Nørgaard Glud a clear winner.

Thank you to you all for a very exciting 2014!

Vaare them

Kaare Meier, MD, PhD Chairman, Nordic Neuromodulation Society

North America

Dear colleagues,

It was an eventful year for the North American Neuromodulation Society (NANS). The year 2014 was the 20th anniversary of NANS, which was highlighted at our annual scientific meeting in Las Vegas, NV in December, where we were pleased to see many of you. This year's conference had a record attendance exceeding over 2,100 attendees.

As well as keynote speaker Robert Greenberg, MD PhD, president and CEO of Second Sight, we were honored to acknowledge our NANS past presidents and our Lifetime Achievement and Distinguished Service winners, respectively, Alim Louis Benabid, MD PhD, and David Caraway, MD PhD. The scientific sessions included a range of therapies and also an expanded session on urologic neuromodulation.

Pre-meeting workshops included:

- An intrathecal drug delivery (ITTD) management workshop

- A workshop for allied health workers that related to the ITTD workshop and presented neuromodulation therapies in clinical practice settings

- A workshop on high-quality customer service in healthcare delivery

 - A residents and fellows workshop on spinal cord stimulation, including neuromodulation therapies for urologic disorders and a neuromodulation primer for neurology residents, which had over 130 participants

- An afternoon concurrent session for residents and fellows covering various topics including getting started in a new practice and negotiating contracts

- There was also a first ever session dedicated to a new special interest section focusing on women in neuromodulation

In addition, the third annual NANS I3: Investment, Invention, and Invigoration Forum covered new and future developments in the field for an audience of researchers, industry partners, and emerging companies.

Finally, one addition to the exhibit hall this year was a historical display with devices arranged in a timeline highlighting major milestones in the evolution of neuromodulation therapies. The fall NANS newsletter recognizes many individuals who expended tremendous effort to make the scientific meeting and preconference workshops a success. I hope many of you who enjoyed the meeting, or could not make it, will also strongly consider participating in the INS 12th World Congress in June 2015 in Montreal for an international perspective.

Among other developments, in July 2014, the NANS board held a two-day strategic retreat to look at our performance in meeting objectives laid out at the first retreat in 2009, and to look ahead to the next three to five years. We have been able to execute nearly every one of the objectives outlined in 2009, and look forward to expanding our reach.

A development from the initial 2009 retreat was the formation of focused committees. Prompted by several requests, a new committee has now been formed to explore education and credentialing, looking at opportunities and potential subjects as well as pros and cons of NANS becoming a credentialing body. Meanwhile, we have formed an Industry Relations Council as a forum to explore issues beyond advocacy, such as a device registry, clinical data collection guidelines, physician training, and credentialing. There also will be a focus on how industry and NANS can work together to face reimbursement challenges.

Finally, NANS provided articles to Pain Pathways magazine in the fall for a special issue on neuromodulation, and began overhauling its website.

With best regards,

David Kloth, MD



President, NANS



From left to right, past NANS presidents were honored at the 2014 annual meeting: David Kloth, MD (2014 -); Richard North, MD (2004-2005); Jaimie Henderson, MD (2007-2009); Robert Foreman, PhD (2009-20011); Joshua Prager, MD (2005-2007); Peter Staats, MD (2003-2004); Michael Stanton-Hicks, MBBS, MD (1994-1998); and Ali Rezai, MD (2011-2013)

Poland

The Polish Neuromodulation Society (PTN) enjoyed another year of successes in 2014.

We organised our first regional meeting on 21 March 2014 in the historic port city of Szczecin, once home to Pomeranian princes and birthplace of Catherine the Great.

In collaboration with colleagues from local neuromodulation centres, PTN put together an exciting full day programme for a multidisciplinary audience of over 50 delegates who joined us from the local city and across Poland.

Highlights of the meeting included talks by PTN members Dr. Dariusz Jezewski, Dr Leszek Herbowski, Dr. Teo Goroszeniuk and Dr. Andrzej Krol on intrathecal drug delivery, spinal cord stimulation, invasive and non-invasive peripheral neuromodulation, and new possibilities with ultrasound.

We were very grateful for the support and contributions from the industry, including Medtronic Poland, St Jude Medical Poland and the Danish electromechanics company Ferrosan Medical Devices with its manufacturing arm based in Szczecin.

We are looking forward to organising further regional meetings in cities around Poland in 2015.

On 13-14 June 2014 the society was pleased to jointly organise the VII Hands-on Cadaver Workshop in Poland on Interventional Pain Relief and Neuromodulation Procedures with the Interventional Section of the Polish Association for the Study of Pain and the London Pain Forum.

Neuromodulation topics covered across the two day workshop in lectures and on the hands-on stations included 10KHz high frequency spinal cord stimulation, dorsal root ganglion stimulation, occipital nerve stimulation, ultrasound guided peripheral neuromodulation and intrathecal drug delivery.

INS members Dr. Maciej Stepniewski (Switzerland), Dr. Ashish Gulve (UK), Dr. Przemyslaw Strulak (Austria), Dr. Jacek Rykowski (Poland), Dr. Witold Libionka (Poland), Dr. Wieslaw Lach (Poland), Dr. Andrzej Krol (UK), Dr. Piotr Buczkowski (UK) and Dr. Teo Goroszeniuk (UK) all contributed to the teaching at the event.

Delegates from 5 neuromodulation centres in Poland took part in the meeting, as well as colleagues from further afield. Vital equipment support for the neuromodulation programme was provided by Nevro, working with Alteris in Poland, St Jude Medical Poland and Flowonix.

Planning ahead for 2015, on 18-20 June the Polish Neuromodulation Society, with its partners, will be organising its IV International Conference on Interventional Pain Medicine and Neuromodulation in the medieval city of Torun followed by the VIII Hand on Cadaver Course in Poland at the Medical University of Gdansk.

We are delighted that Dr Chris Wells, President of the European Pain Federation, and Prof Jose de Andres, President of the European Society for Regional Anaesthesia and Pain Therapy will be with us once again in Poland in June.

Working closely with the city authorities in Torun, the local hospitals and the media we are aiming to get the conference televised on Polish TV to disseminate the neuromodulation message around Poland.

Wishing all INS colleagues and Chapters a very productive and rewarding 2015,

Dr Wiesław Łach Secretary of the Polish Neuromodulation Society

United Kingdom and Ireland

Neuromodulation Society of the United Kingdom and Ireland (NSUKI) Update for 2014:



After years in development, the National Neuromodulation Registry (NNR), an online database that will capture data from every implant performed in the UK, has just been launch as a pilot, active in seven centres. It is hoped that this will be rolled out nationally around February/March of 2015. The UK National Institute for Clinical Excellence (NICE) failed to sanction the use of spinal cord stimulation in angina without more robust evidence of its efficacy - the results of the RASCAL study will hopefully be made public by next February which will add to the evidence.

NSUKI had a very successful joint meeting with the Swiss Society for Interventional Pain medicine (SSIPM) and the Swiss Neuromodulation Society in Montreux in November 2014. The quality of presentations and the international faculty were of a very high standard, while the venue in Montreux at the Suisse Majestic Hotel was exceptionally attractive. The neuromodulation specialist nurses from the UK (SPIN) joined us in Montreux, and our links with them are growing stronger. It is hoped that one nurse member of SPIN from each of the active neuromodulation centres in the UK will join NSUKI, increasing our membership and affording them a link with NSUKI and the INS, and access to the online journal at each unit.

We are already planning a larger joint meeting for next year, probably in November and probably in London, between NSUKI and the German and Swiss neuromodulation societies. SPIN and the British Interventional Pain Society will also be involved, perhaps attracting up to 200 delegates or more. NSUKI continues to offer financial support to trainees attending its meeting, and has just advertised two research bursaries for £5000 each, to be decided after a closing date in January.

With his term completed, I took over from Sam Eldabe, MB ChB, FFPMRCA as president at our annual general meeting in Montreux – Sam is such a popular and respected clinician and scientist that he is an impossible act to follow, and I am remarkably fortunate that he is both a colleague and a good friend.

Roger Strachan, MD FRCSE FRSC(SN) President, NSUKI



Neuromodulation from a Medical Resident's Perspective

International Neuromodulation Society volunteer Shannon Hann, MD, a neurosurgery resident at Thomas Jefferson University Hospital, has written an article for the International Neuromodulation Society media partner Student Doctor Network, in tandem with INS President Simon Thomson, about how she discovered the field of neuromodulation after graduating from medical school.

In her article, "<u>Coming to a Future Near You: Neuromodulation, a Multi-Specialty Field</u>," Dr. Hann presents an overview of surgical interventions and treatments that any healthcare provider may encounter during a professional career -- either in a patient, or when seeking to refer a patient for potential specialty care -- regardless of that professional's own chosen field.

Anticipating that neuromodulation treatments will become more ubiquitous, the article also includes space for readers to comment or share experiences with training programs that involve neuromodulation. It also lists sources for further information and guidance, such as the <u>Neuromodulation Appropriateness</u> <u>Consensus Committee guidelines</u> published in *Neuromodulation: Technology at the Neural Interface* in August 2014.

Dr. Hann is active in the NANS Residents and Fellows Section, which has grown from 37 members a year ago to some 130 members at the most recent NANS meeting in December 2014.

v Method for Members to Obtain INS Username and Passwords	
International Neuromodulation Society web host MemberClicks will be rolling out a c dling of usernames and passwords beginning Jan. 19, 2015:	hange to the
Users who click the "Forgot Password" button on the login page will be sent a link t	o reset their
INS administrators will be unable to issue passwords to members.	swords Users
click this link will be sent their details in a separate email.	
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Icast for Neurologists Highlights Neuromodulation Appropriatenes sensus Committee Guidelines	S
national Neuromodulation Society President-Elect Timothy Deer, MD, was asked at te a brief (under three minutes) podcast that highlights a special report in touch Neu <i>rology</i> that summarizes the findings of the Neuromodulation Appropriateness Conse unittee. The findings were detailed in the August 2014 issue of <u>Neuromodulation: Te</u> <i>ral Interface</i> (Volume 17:6), and summarized in a special report by Dr. Deer and Jass ley Golovac, MD, Simon Thomson, BBS, FFPMRCA. Their report appeared in the fabi-annual journal, <u>U.S. Neurology</u> (Volume 10 Issue 2 Fall 2014), and will be in the propean issue, <i>European Neurological Review</i> , in early 2015.	press time to cology's <i>U.S.</i> nsus chnology at the on Pope, MD, all 2014 issue of rint edition of the
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