wssfn
World Society for Stereotactic and Functional Neurosurgery
NEWSLETTER
WINTER 2020

LETTER FROM THE PRESIDENT

Jin Woo Chang

Dear Colleagues and Friends,

This is my first letter for our members of WSSFN.

First of all, I would like to express my special thanks to all of you for your confidence in having elected me as president of WSSFN.

As the first Korean neurosurgeon chosen for this prestigious position, I will do my best to develop and to encourage active participation and communication among members globally.

This would require participation in the society from members who have an active practice in divergent areas of the world, especially from the traditionally underrepresented areas such as Asia, Latin America and Africa.

I plan to achieve this goal not only by the biennial congress meeting but also by utilizing methods of communication which have a more frequent interval, such as newsletters, journals and other forms of communication. The 2020 Dubai Interim meeting we have planned is another example of the effort of our society to reach a larger audience.

As you might notice during the NY meeting in June, I also felt extreme pride in the accomplishment of our society not only because of the number of attendees but also the amount of tremendous and diverse academic activities. I sincerely appreciate all the efforts by the past president Michael Schulder.

Recently, stereotactic & functional neurosrgery has become one of the most important subspecialties in neurosurgery by merging the state of the art science and technology as well as a less invasive surgical technique such as MR guided focused ultrasound and LITT.

We functional neurosurgeons have become leaders in advancing the less invasive but more effective sugical techniques by applying the state of the art knowledge of neuroscience.

Thus, I am trying to make the 19th WSSFN meeting, which will be held on June 20-23, 2021 in South Korea, demonstrate the recent innovation of clinical and basic research fields. Mark your calendars!

Especially, I would like to cover Artificial Intelligence and defining the future of neuromudulation.

Because of the rapid surge of the elderly population and better understanding of the circuitry in the brain, I am convinced that the role of functional neurosurgeons

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FROM THE EDITOR

Erich Richter

The WSSFN has entered a vibrant time with our new Biennial meeting format. In this issue, Dr. Chang shares his vision for the upcoming 2020 Dubai interim meeting and the Biennial meeting chaired by Kendell Lee in Inchon, South Korea. We celebrate the 2019 Meeting in Manhattan, and look forward to the 5th meeting of the Russian Congress in Moscow. Dr. Hodaie was recognized for passing the 1000 surgeries for Trigeminal Neuralgia mark, and congratulations are in order! Dr. Roberts has passed the torch for our flagship journal to Dr. Lozano, Tipu Aziz received the highest honor in Britain for a neurosurgeon, and we regretfully mourn the passing of Dr. Phillip Gildenberg. The DBS Think Tank held a local chapter meeting in advance of the World Congress for Parkinson's Disease, and the WSSFN had its 5th successful Webinar. It is truly a vibrant time for our society, and and we thank all of you for continuing be part of this ongoing endeavor. A special thanks to Dr. Diaz for continuing our tradition of highlighting the history of the development of Stereotactic and Functional Neurosurgery around the world.

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Have feedback or news to share?
Contact us! Melody Dian *mdian@centurytel.net*

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will increase for many of the refractory neurological disorders such as Alzheimer's disease, depression, stroke, etc.

Kendell Lee will be chairing the scientific program committee to make the most appropriate and innovative scientific program for 2021 WSSFN meeting.

The meeting will be held during the warm Spring which is the most pleasant period just before the early Summer in Korea.

Finally, I would like to thank again all members of our society and hope the have your continuous support and active participation.

Sincerely,
Jin Woo Chang
WSSFN President
Korea

The History Of Spanish Functional Neurosurgery

Torres Diaz

History of the Spanish Functional Neurosurgery dates to the 50-60's, when Spain was slowly recovering from the Spanish Civil War (1936-39), and the National Health System was created, which facilitated the organization of the different specialties. (1, 2)

The most prominent and internationally recognized figure has been Sixto Obrador (1911-1978), one of the most active and prolific functional neurosurgeons of that period, and the author of more than 400 articles, reviews and 15 books and monographs about the nervous system. After his bachelor's degree, he obtained a scholarship to work at Oxford University's Laboratory of Physiology with Charles Scott Sherrington, at the National Hospital for Nervous Diseases in London with Kinner Wilson, and at the University of Yale with John Fulton, among other renowned centers. After residing for a time in Mexico, he returned to Madrid in 1945. He was the first in Europe to perform a hemisferectomy in 1952, and the first to perform an experiment in the field of Functional Neurosurgery in Spain, which was the electrostimulation and coagulation of the thalamus in a patient with myoclonic epilepsy. Dr. Obrador described a technique for the lesion of the globus pallidus (GP) in Parkinsonian patients with a cannula that rotated and separated the brain tissue, through a temporal entry hole. Despite its effectiveness in relieving stiffness, recurrence occurred in a high percentage of cases, and the complication rate was high, so that lesions through open surgery to the basal ganglia without stereotactic devices were virtually abandoned. (3-6)

As there were no stereotactic frames in the country at that time, some Spanish neurosurgeons went abroad to learn how to use different stereotactic instruments. Of these neurosurgeons, three significantly contributed to the expansion of the stereotactic technique in Spain: Dr G Bravo (1957-60), Dr G Dierssen (1958–61) and Dr. F Isamat (1960-61). (1, 2)

Between 1957 and 1960, Dr. Bravo was in New York working with Irving Cooper. Both were pioneers in the development of localization and lesion techniques of the GP and the thalamus, combining an inflated balloon and alcohol injection for the treatment of movement disorders. They also confirmed that lesions in the posterolateral nucleus of the thalamus, were more effective in relieving stiffness and tremor, than lesions in the GP. Back in Spain, Dr. Bravo developed, with great success, the surgical treatment of Parkinson's disease and other movement disorders.(10, 11) Also, together with Juan Miravet, he developed an operating room for the surgical treatment of epilepsy, following Tailarach and Bancaud's methology. In this operating room, the implantation of electrodes under stereotactic conditions, with subdural electrodes and resections, was possible; there was an adjacent neurophysiology room, with two electroencephalographic recording devices, and 4 simultaneous cameras. This design, which was never published, was probably one of the first videoelectroencephalography (VEEG) units in the world. Juan Miravet was the first neurosurgeon in charge of the Epilepsy Surgery Unit, and subsequently, this position was held by Rafael García de Sola. In 1990, Dr Garcia de Sola resumed this activity at the University Hospital of La Princesa, Madrid, which is probably the most active Spanish Epilepsy Surgery Unit in recent years.(1, 12) In the late eighties, Bartolomé Oliver and Antonio Russi created an Epilepsy Surgery Unit, and in 1998, the Ministry of Health carried out a review on epilepsy surgery in Spain. The Ministry of Health, in 2000, officially recognized 14 reference centers in Spain. In 2010, it created the CSUR program (Centers, Services and Reference Units), demanding higher levels of activity and quality of care. Other CSURs have been recognized, including those involved with the surgical treatment of movement disorders. (1)

Guillermo Dierssen (1927-1999), has also been an outstanding and innovative figure in Spanish Functional Neurosurgery. His studies are specially dedicated to the analysis of dyskinesias and specifically, of hemibalism, with a series of 116 patients. In them he described that several structures, and not just the STN, were the anatomical substrate of hemibalism. In addition, several patients with subthalamic lesions showed no clinical signs of hemibalism.(13-15)

We must also acknowledge, in that period, Fabian Isamat, who was largely responsible for the incorporation of Spanish Functional Neurosurgery in Europe. After completing his residency in in the USA, in 1961 he returned to Europe, and was appointed as the Head of Neurosurgery at the New Bellvitge Hospital in Barcelona. He became very involved in neurosurgical education in Europe and within the European Association of Neurosurgical Societies (EANS), becoming Chairman of the Committee (1979-1983). He was the president of ENAS from 1983 to 1987, and Vice President of the World Federation of Neurosurgical Societies (1985-1989) among other positions.(2)

One of the first devices to chronically stimulate the brain in the world was developed by a Spaniard, Dr. Delgado. The "stinoceiver" was undoubtedly one of the great Spanish innovations in functional neurosurgery, developed during the 1960s. It consisted of a device connected to the electrodes and controlled by radio waves, which could record neuronal activity and also allowed the stimulation of internal structures. Dr. Delgado, worked at the University of Yale with Dr. J.Fulton for 20 years, and after his return to Madrid, worked with Dr. Obrador and Dr. J.G. Martin Rodriguez. The device was tested on different animal species, including a bull, and was finally implanted in a patient with a phantom limb in 1968, in the caudate and septal nucleus. Dr Martín Rodríguez, in turn, performed numerous stereotactic interventions in movement disorders. It is worth highlighting his contribution to the study of electrophysiology of the pulvinar nucleus and its relationship with the mechanism of pain.(16-18)

Regarding radiosurgery, Dr JL Barcia-Salorio, was another pioneer in Spain. Basing its development on the Leksell framework, he designed and built the Barcia framework, and in 1975, he performed the first radiosurgical treatment in Spain. He also developed the application of low doses of radiotherapy on patients with resistant epilepsy, who had previously been unsuccessfully treated with a temporary lobectomy. In 1990, the first LINAC for radiosurgery was installed at the San Francisco de Asís Sanatorium in Madrid, under the direction of Dr. Samblas and Dr. JC Bustos, and later new units and gamma knife centres were opened. (1,2, 19-21)

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WSSFN 2019 ***Biennial*** Meeting Report

Jin Woo Chang, Michael Schulder, Melody Dian

Yes, that's right – if it needs re-emphasizing, this past June marked the move to biennial meetings, instead of the previous quadrennial schedule. The dynamism of our field and our society was made clear when two years after the outstanding prior conference in Berlin 2017, we had even more attendees at, and abstracts submitted to, WSSFN 2019 in New York City.

The conference was held from June 24 – 27 at the New York Hilton Midtown, a venerable location in the heart of Manhattan. I hope that WSSFN members had a good time and enjoyed the city, but the meeting was well attended the whole time, even up to the very end. Our theme was "Opportunities and Controversies". As such, special attention was paid to new technologies and indications in stereotactic and functional neurosurgery, and on some of the ethical challenges that are inevitable when new therapies are offered and new indications are proposed. Some examples of the former include reports of trials of DBS for patients with tinnitus and of focused ultrasound for those with Alzheimer's disease. Overall, the scientific program committee, headed by Joseph Neimat, succeeded in introducing new content and new formats into the WSSFN proceedings.

We also had a special film presentation by Lone Frank, neurobiologist and author of **The Pleasure Shock**, a superb biography of Robert Heath that features many of our leading WSSFN members. Dr. Frank screened her new award-winning film about Heath, **Hunting for Hedonia.** Popcorn was served, and a lively panel discussion of the ethical issues in psychiatric surgery followed, with intense audience participation. Another plenary session was devoted to the participation of leading neuroscientists such as Georg Schaltenbrand in the Nazi Party and their use of human subjects for cruel experimentation. What emerged from this discussion was the extent to which similar, terrible deeds were carried out by investigators of many nationalities, all over the world. A sobering and cautionary tale, indeed.

We had a full house at our meeting gala at The Lighthouse at Pier 60, an iconic New York venue situated on the Hudson River. The weather was perfect and it was all just great fun, with the accompaniment of Shabbar Danish and his hard rockin' colleagues. The dance floor was full…now, how often does that happen at a neurosurgical meeting?

I would like to thank Kenes International, who defied various dire predictions and proved (yet again) that it is possible to run a scientific event in Manhattan, and without a drain on the society's coffers. And of course, a special nod to our executive director Melody Dian, whose unfailing patience and good humor keeps everyone on track all the way through.

Jin Woo Chang is planning a spectacular conference in Incheon in June 2021. I hope that he will surpass WSSFN 2019 but in the meantime thanks to all who made last June's meeting such a terrific event.

Jean Regis, Takaomi Taira, Michael Schulder, Jin Woo Chang, Mojgan Hodaie, Bomin Sun, Konstantin Slavin

WSSFN has been proud to bestow a number of awards over the years.

These awards have highlighted the work of many members who have provided the specialty with their expertise and dedication, and many up and coming members who were provided travel grants to attend the WSSFN meetings and further their education and commitment to our speciality.

Please visit the WSSFN website www.wssfn.org under meeting and awards for a list of more current awardees including the NYC 2019 meeting.

History Of Spanish Functional Neurosurgery Continued

In the field of surgery for psychiatric disorders, we must undoubtedly mention, Dr. Burzaco, since he was a pioneer in Spain. His most important contribution was the thermolesion of the stria terminalis in patients with severe aggressiveness. After training in England and Sweden, he returned to Spain in 1962, and practiced stereotactic neurosurgery for the treatment of epilepsy, pain and movement disorders. In 1966, with the collaboration of López-Ibor, he made the first interventions in psychosurgery. He published 108 capsulotomies in patients with obsessive compulsive disorder (OCD), and from 1993 he actively collaborated in the gamma knife stereotactic radiosurgery project at the Ruber International hospital, which was continued by Roberto Martínez.(22-27)

In 2010, Dr García de Sola and García Navarrete created the Spanish Society of Functional and Stereotactic Neurosurgery (SENFE), which has already held 6 national and international conferences. In 2010, they edited the first book on Spanish Functional Neurosurgery, with the collaboration of the most outstanding specialists in the Spanish-speaking world. This year, the first edition of the First Master on Functional Neurosurgery in Spanish language was launched.

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2) History of Stereotactic and Functional neurosurgery in Spain. Jorge Guridi, Textbook of Functional and Stereotactic Neurosurgery. Andres M. Lozano, Philip L. Gildenberg, Ronald R. Tasker (Eds.) Second edition, Springer Verlag Berlin Heidelberg 2009

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Torres Diaz

Sixto Obrador, the "father" of functional neurosurgery in Spain

Announcing a Change in Editor of the *Stereotactic and Functional Neurosurgery*

Extending our deepest appreciation and thank you to David Roberts for his years as editor and a warm welcome to Andrews Lozano as the new journal editor.

Please see the personal message from Dr. Roberts.

Dear WSSFN members,

This marks the last year of my editorship. It has been a great privilege and honor to have had the opportunity to serve in this capacity, and I am deeply appreciative of all the work, guidance and support all of you have given. Thank you. Your journal has evolved substantially over the years: it has successfully transitioned into the on-line digital era, raised its Impact Factor eight-fold, received and published manuscripts from all parts of the world, and become the official journal of the World, American, European, Indian, Japanese, Korean, Middle East, Russian, China and Latin American stereotactic societies. It has long been the archive of pioneering work in our field, and we are confident that the journal will reach only greater heights going forward.

We are delighted that Andres Lozano, MD, PhD, has agreed to take up the journal's editorship and steward Stereotactic and Functional Neurosurgery into a new decade. The Chair of Neurosurgery at the University of Toronto, Andres has been a long-time editorial board member of Stereotactic and Functional Neurosurgery, former president of the WSSFN and the ASSFN, and the 2013 recipient of the Ronald Tasker Award given quadrennial by the WSSFN. He is intimately familiar with the journal and its constituencies, and brings further editorial experiences from his time as the editor-in-chief of the Textbook of Stereotactic and Functional Neurosurgery, as well as from positions on other journals' editorial boards. His work has spanned clinical practice, research, and teaching with long-standing research projects dedicated to identifying and testing novel therapeutic applications for deep brain stimulation. With respect to the journal, in his own words, "We are witnessing a convergence of important advances in the understanding of normal and pathological brain structure and function. The journal is in a position to document and transmit these exciting developments and to serve as a forum for debate and discussion. In so doing, it will act as an accelerator for the creation and distribution of new knowledge and treatments in neurological and psychiatric disorders."

We look forward to Karger's continued collaboration on Stereotactic and Functional Neurosurgery and serving our stereotactic colleagues and societies through the journal.

With best regards,

David
David W. Roberts, MD
Editor-in-Chief

Dr. Mojgan Hodaie's 1,000th TGN Operation

Photo: University Health Network

Please take a moment to read the special article highlighting Dr. Hodaie's accomplishment by following the link.

https://www.cbc.ca/news/canada/toronto/trigeminal-neuralgia-surgery-1.5426944

Congratulations to her on this exceptional milestone!

5th Russian International Congress

Andrey Sitnikov

Dear Colleagues,

On behalf of the Russian Association of Functional Neurosurgeons, I would like to invite you to 5th anniversary International Congress “Functional Neurosurgery: The Past, the Present and the Future” which will take place May 21 - 22, 2020 in Moscow, Russia.

Functional neurosurgery in Russia has a long history and tradition, and your kind participation would be appreciated. This 5th RAFN Congress promises to be a highlight for the multidisciplinary community that forms the heart and soul of functional neurosurgery. The Organizing Committee aims to provide a successive forum for researchers and clinicians from all over the world to exchange state-of-the-art ideas in the emerging fields of functional and stereotactic neurosurgery.

The International Symposium features prominent speakers from the international neurosurgical world. After the lectures, we will engage each invited speaker in a panel discussion with the audience.

Besides the scientific and educational activities that you will be able to enjoy during your attendance at RAFN 2020, the Organizing Committee will work hard to make you feel welcome in the city of Moscow.

We sincerely hope that you will all find your way to Moscow in May 2020 to actively participate in RAFN anniversary 2020 Congress, to meet and interact with friends and colleagues from all over the world and to enjoy Moscow’s hospitality.

Andrey Sitnikov
Russia

Front Row (left to right) Prof. Juan A. Barcia, Dr. Andrey Sitnikov, Prof. Damianos Sakas, Prof. Konstantin Slavin
Back Row (left to right) Dr. Aditya Gupta, Dr. Faisal Al Otaibi, Prof. Parag Patil, Dr. Georgy Grigoryan, Prof. Chris Honey

Functional Neurosurgery:

The Past
The Present
and The Future

21-22 May, 2020
Russia, Moscow

Takashi Morishita

DBS Think Tank "East" 2019 in Kyoto, Japan

DBS think tank meetings have been held annually since 2013 when Drs. Kelly Foote and Michael Okun started in Florida, and the proceedings have been published in scientific journals. These meetings are unique in that invited scientists with multidisciplinary specialties discuss the future direction of DBS therapy.

This year, the first Asian-Australasian Chapter, DBS Think Tank "East" meeting, took place on June 3 as a pre-meeting of the 5th World Congress on Parkinson's disease. The meeting was hosted by members of the University of Florida and Fukuoka University. Even though the meeting was considered a local chapter, many well-known scientists from all over the world attended to discuss the latest advances in DBS therapy. Presenters included Dr. Bomin Sun and his team from China, Dr. Jin Woo Chang from South Korea, Dr. Terry Coyne from Australia, Dr. Valerie Voon from the U.K., Drs. Foote and Okun and their team from Florida, and Dr. Genko Oyama and our Fukuoka University team from Japan.

There were five sessions with topics covering Movement Disorders, Psychiatry, Dystonia Clinical Trial, New Technologies, and DBS in Asia. In the meeting, the differences of DBS practice among countries were highlighted with the results of an internet DBS survey presented by Dr. Chencheng Zhang, and there were cutting-edge topics such as a DBS application for addiction presented by Dr. Voon and closed-loop DBS for Tourette syndrome presented by Dr. Foote. After the meeting, attendees enjoyed a small beer party in the same conference room, and later toured around Kyoto.

The venue for the next DBS Think Tank "East" meeting has not been decided yet. However, continuing this Asian-Australasian Chapter may help to further develop regional DBS research.

Takashi Morishita
Japan

Professor Tipu Aziz
Recipient of Britain's Highest Neurosurgery Honour

Professor Tipu Aziz from the Nuffield Department of Surgical Sciences (NDS) at Oxford University has been awarded the Medal of the Society of British Neurological Surgeons (SBNS) for his lifetime achievement in neurosurgery.

The prestigious SBNS medal is awarded to UK neurosurgeons in recognition of their contribution to British neurosurgery and is Britain's highest neurosurgery honour.

Professor Aziz was instrumental in the rise of functional neurosurgery both in the UK and internationally. He studied for his MD under Professor Alan Crossman in Manchester, elucidating pathways in the basal ganglia and providing the first robust evidence that the subthalamic nucleus was a potential target in functional neurosurgery. Along with the work of Delong in the US, this catalyzed the field that has led to over a quarter of a million STN DBS procedures worldwide.

Professor Aziz started the Functional Neurosurgery Unit at Oxford and has continued to lead groundbreaking research alongside his clinical practice where he has performed over 1500 implantations. His research on the pedunculopontine nucleus (PPN) in primates also led to the PPN becoming a target in certain subtypes of Parkinson's disease. He has led the world in DBS for chronic pain, having started anterior cingulate DBS. In addition to his own accomplishments, he has supervised over 20 PhDs, numerous fellows (many of whom have started DBS services in their own countries), and countless trainees. He has set up functional units around the world, particularly in the Bangladesh, India and Ukraine.

Commenting on his award, Professor Aziz said: 'I am deeply honoured that the SBNS has awarded me the medal. It is been given to neurosurgeons who have made particularly significant contributions to UK neurosurgery over a lifetime. Particularly significant is that I am the first serving neurosurgeon to be selected. Much of the work I have done has been in Oxford and I feel it is an award both personally and to the University. Significantly to me is that a neurosurgeon Sir Hugh Cairns created the Nuffield Department of Surgery.'

The nomination was made by Professor Alex Green, Spalding Associate Professor and Consultant Neurosurgeon at NDS, who also attended the Society Gala Dinner. This year, SBNS presented two medals with Professor John Pickard from the University of Cambridge receiving the other medal, nominated by his colleague Professor Peter Hutchinson.

Tipu Aziz receiving SBNS medal from the president Neil KitchenThe SBNS President Neil Kitchen (pictured left) presented Professor Aziz with the medal during the Society Gala Dinner at the SBNS Scientific Spring Meeting on Thursday 21 March, held at the Principal Hotel in Manchester.

Neil Kitchen and Tipu Aziz

L-R: Prof. Peter Hutchinson, Prof. Tipu Aziz, Prof. John Pickard and Prof. Alex Green

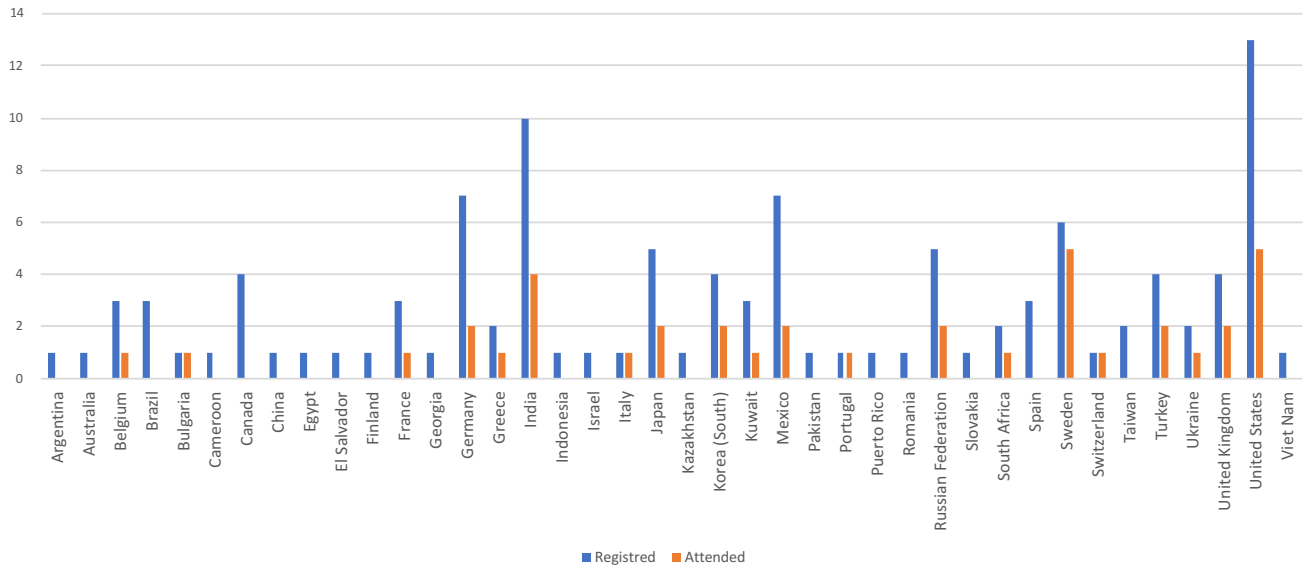
WSSFN Webinar Report November 2019

Neuromodulation for Tremor and Related Conditions.

- **Prof. Patric Blomstedt** - Umea, Sweden
  Topic: “Targeting the caudal Zona Incerta for movement disorders”

- **Prof. Ludvic Zrinzo** - London, UK
  Topic: “Targeting the motor thalmus for ablation and DBS”

Number of registration & attendees per country



Philip L. Gildenberg, MD, PhD

1935-2020

Phil Gildenberg was born in March 1935 in Hazelton, PA. He attended Valley Forge Military Academy and was awarded a scholarship to the University of Pennsylvania, where he graduated with honors having majored in zoology. Dr. Gildenberg then received his MD from the Temple University School of Medicine in 1959. During medical school he came to know Ernest Spiegel and Henry Wycis, who in essence invented human stereotactic neurosurgery, and were on the faculty at Temple. He worked with them throughout his neurosurgical residency at Temple, and began working on his PhD there. After Dr. Spiegel retired, Dr. Gildenberg completed his PhD thesis as an NIH Post-Doctor Fellow with Prof. Rolf Hassler at the Max Planck Institute for Brain Research in Frankfurt. He then joined the Cleveland Clinic as a junior faculty member, and in 1972, at the age of 37, was recruited to be the founding Chief of Neurosurgery at the University of Arizona College of Medicine. In 1975, Dr. Gildenberg became the founding Chair of Neurosurgery at the University of Texas, Houston. In 1982 he created the Houston Stereotactic Center, and continued to practice until 2001.

Many of us knew Phil Gildenberg from his tireless work for the field of stereotactic and functional neurosurgery. He kept the candle burning through decades when the few practitioners were derided as being “needle docs”, and he played a key role in the development and dissemination of computer-aided technology that has made stereotaxis ubiquitous. Dr. Gildenberg edited our journal, *Stereotactic and Functional Neurosurgery*, from 1975 (when it was known as *Applied Neurophysiology*) through 2001. At first with Dr. Ronald Tasker, and in the second edition with Dr. Andres Lozano, he edited the **Textbook of Stereotactic and Functional Neurosurgery**. Dr. Gildenberg served as the President of the American and World Societies for Stereotactic and Functional Neurosurgery in the 1990s, when not many people were pursuing those titles. He was the record keeper, the wise counsel, and the cheerleader for organized stereotactic and functional neurosurgery for decades. There is a lectureship in his name at the Baylor College of Medicine, where he was Adjunct Professor of Neurosurgery for many years, and the Philip Gildenberg award given by the Congress of Neurological Surgeons each year for the best resident or fellow paper in functional neurosurgery.

If you were fortunate to know Phil Gildenberg personally, you saw what a wonderful mentor he was to young neurosurgeons from whom he had nothing to gain except his desire to support others who shared his interests, and the palpable pleasure he took in seeing others grow their careers. In this, and in all of his manifold activities, he partnered with his wife, Patricia Franklin, who also took an interest in the community of stereotactic neurosurgeons and shared Phil’s delight in promoting young colleagues.

Dr. Gildenberg developed Parkinson’s disease in 2011, but did not care to talk about it and certainly did not complain. He died on January 15, 2020, and Pat died of lung cancer four days later, a month after that diagnosis of which her husband was not aware. Many of us owe Phil Gildenberg a debt that we can’t repay except by keeping his memory alive and inspiring others, as he did many times over, to succeed and excel as stereotactic and functional neurosurgeons.

Michael Schulder, MD

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