



WORLD NEUROLOGY

THE OFFICIAL NEWSLETTER OF THE WORLD FEDERATION OF NEUROLOGY

An Epidemic of Mucormycosis Strikes India During the COVID-19 Pandemic

BY CHANDRASHEKHAR MESHARAM

The second wave of the COVID-19 pandemic was devastating in India with a sudden spurt in cases during the second quarter of the year, and with the count of daily cases crossing 400,000. During this pandemic, there was another epidemic of the fungal infection mucormycosis.

This pandemic and epidemic completely exposed the lacunae in the health care system in the country. There was a shortage of medicines, a shortage of hospital beds, a shortage of oxygen supply, and a shortage of health care personnel, resulting in high morbidity and mortality. According to the statement on June 28 by the Union Health Minister, 40,845 cases of mucormycosis were reported in the country. Out of these, 85% patients had COVID-19, 62% had diabetes as a comorbidity, and 63% of patients had

received steroids. The alarming fact is that 32% of the patients were in the age group of 18 to 45 years.

Mucormycosis is caused by saprophytic fungi of the order Mucorales, which are found in decaying organic matter and soil samples. *Rhizopus Arrhizus* is the most common etiological agent in India. Mucormycosis is an angioinvasive disease causing tissue infarction and necrosis. Rhino-orbito-cerebral mucor is the most common presentation, followed by pulmonary, cutaneous, gastrointestinal, renal, and disseminated disease.

Rhino-orbito-cerebral mucormycosis (ROCM) is often encountered by neurologists. Clinical manifestations of ROCM syndrome include new onset unilateral headache, facial pain, facial numbness, orbital pain, diplopia,

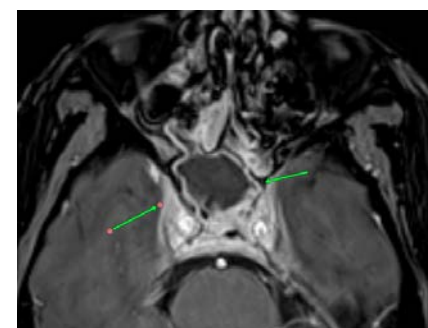


CHANDRASHEKHAR MESHARAM

ophthalmoplegia, impairment of vision, orbital swelling, ptosis, proptosis, papilledema, nasal discharge, and epistaxis. Black discoloration of skin and mucosa are characteristic of mucor infection. Sometimes there is cavernous sinus thrombosis and internal carotid artery block. The majority of patients with ROCM in association with COVID-19 develop symptoms between day 10 and day 15 post COVID-19. However, delayed presentation can occur up to three months.

Imaging findings on CT or MRI that suggest the diagnosis are non-enhancing hypointense mucosa over nasal turbinate and nasal septum (black turbinate sign), concomitant involvement of paranasal sinuses and orbit, bone erosion or destruction, cavernous sinus involvement

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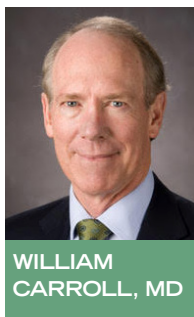
MRI images of mucormycosis with cavernous sinus involvement in a patient with COVID-19.

PRESIDENT'S COLUMN

Excitement in the Air

Despite the dampening effect of the pandemic on all aspects of our lives, the next few months look set to present a welcome diversion. This month, we celebrate the Eighth World Brain Day (WBD), and in October, the XXV World Congress of Neurology (WCN) during which the WFN Council of Delegates will hold its Annual General Meeting and elect the next president, vice president, and trustee.

The first World Brain Day was the idea of Prof. Mohammad Wasay of Pakistan and was held in 2014. Since then, the WFN has held consecutive World Brain



WILLIAM CARROLL, MD

Days on July 22 to celebrate the foundation of the WFN, to promote awareness of and advocate for better care and treatment of the brain and nervous system. With each World Brain Day, the WFN has made significant advances in the preparation, focus, and delivery of the key messages.

In recent times, the WFN has partnered with a member of the Global Neurology Alliance, extended the campaign from one day to two or three months and engaged in an ever-enlarging media and social media program.

The WBD is our premier annual event.

It's a time of intense collaboration with a member of the GNA whose disease is the subject of the WBD campaign. In successive campaigns, we have seen the numbers of people reached through the promotional activities rise steadily and are now at more than 50 million. At no other time during the year does the WFN have the opportunity to reach so many people and to promote our mission in such a unique way. The opportunity to focus on a single disease or area of neurological health provides unparalleled scope for the WFN and GNA partner to illustrate the value of such global advocacy. It also enables WFN member societies to

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FROM THE EDITORS

BY STEVEN L. LEWIS, MD, EDITOR,
AND WALTER STRUHAL, MD, CO-EDITOR

We would like to welcome all neurologists worldwide to the July-August issue of *World Neurology*. This issue begins with the important and sobering update by Dr. Chandrashekhar Meshram about the epidemic of rhino-orbito-cerebral mucormycosis occurring within the COVID-19 pandemic, including its current treatment recommendations.

On a more uplifting note, WFN President Prof. William M. Carroll provides us a number of important updates in his President's Column, including the ongoing festivities for this year's World Brain Day, the exciting plans for the World Congress of Neurology just a few short months away, and the Annual General Meeting of the Council of Delegates of the WFN.

WFN First Vice President, Prof. Ryuji Kaji also provides an update on the four candidate cities for World Congress of Neurology 2025. This is followed by the statements from each of these candidate cities: Beijing, Brisbane,



STEVEN L. LEWIS, MD



WALTER STRUHAL, MD

Istanbul, and Seoul. Following these proposals are the statements from each of the candidates for WFN elected trustee, first vice president, and president.

In this issue's history column, Prof. Peter Koehler provides a detailed analysis of the likely migraine occurring in the renowned scientist, Christiaan Huygens. And in his ongoing column, WFN Secretary General Prof. Wolfgang Grisold updates us on the activities of the WFN Finance Committee and the Specialty Group on Neuroepidemiology.

Profs. Satish Khadilkar and Sarosh Katrak describe the history and evolution of the highly successful

AAN-WFN Continuum Program in Mumbai, and its recent conversion to a digital format. Prof. Mustapha El Alaoui-Faris details his look back on eight years of experience successfully training Sub-Saharan African Neurologists at the WFN Training Center in Rabat, and provides his thoughts for further optimization of these educational efforts. Dr. Lawrence Robbins provides a personal view of setting up a neurology clinic in Central America, and advice for others considering such volunteer opportunities.

Finally, Prof. Aida Kondybayeva updates us on the details of the recent and highly successful neurology Online Update meeting held in Kazakhstan.

Thank you for your interest in *World Neurology* and the many activities detailed in these issues. We look forward to seeing so many of you attending the upcoming World Congress of Neurology this October. As always, we look forward to your contributions to this publication, including updates on the many recent and ongoing activities of this year's World Brain Day. •

COVID 19 and the AAN-WFN Continuum Program in Mumbai

BY SATISH KHADILKAR AND SAROSH KATRAK

The COVID pandemic had universal effects on medicine, and Mumbai was no exception. In fact, being a densely populated city with lots of international travelers, the cases appeared early and the magnitude was high, throwing the health system off gear.

While most of the younger neurologists continued to work, they had to be involved with COVID duties as well. The focus shifted to service medicine and service neurology in a major way, and academic activities had to take a back seat.

The AAN-WFN Continuum Program has been operational in Mumbai since 2005, initiated by S. M. Katrak as per the advice given by Ted Munsat. The first event was held at Mumbai on July 17, 2005, on multiple sclerosis and was attended by postgraduate students from five institutions. Following the success of the program at Mumbai, teachers in other cities of India also conducted *Continuums* in their cities, and the programs were well regarded by students and practitioners.

Satish Khadilkar had attended the programs since the beginning and participated more actively in the later years, taking

up the responsibility as co-convenor of the program with Katrak's guidance and advice, and as convenor since 2021.

Virtual platforms gradually developed, and the government opened up online consultations in 2020. We decided to shift to an online platform for this CME program. Having worked with physical copies of *Continuum* and in-person meetings, it was a challenge to acclimatize to this form of learning.

Interestingly, it did not prove too difficult, particularly for younger colleagues. We conducted the first online *Continuum* program Dec. 27, 2020, on the topic of neurocritical care. It was attended by 48 participants.

In 2021, we have conducted programs on dementia, epilepsy, and demyelinating disorders, which were attended by

approximately 50-85 students from various institutions in Mumbai, other places in the state of Maharashtra, and a few from the state of Gujrat. We incorporated the Google forms for virtual feedback. All participants do not complete the forms, and we are exploring ways to facilitate the process.

We have recently adopted a system wherein a mentor helps the presenter to prepare his slides. This approach has much increased the clarity and utility of the presentations, time management, homogeneity of the group, and the individuals find themselves more involved. We intend to persist with this pattern and are in discussion with other centers in India to adopt this method in their centers for these *Continuum* programs. •



PRESIDENT'S COLUMN

continued from page 1

connect with the WFN over a two- to three-month period in the latter half of each year.

The WFN is indebted to the WBD Committee chaired by Prof. Tissa Wijeratne and to our media partner, Yakkety Yak, headed by Ashley Logan.

PREVIOUS WORLD BRAIN DAY TOPICS

- 2014** Brain Health
- 2015** Epilepsy (ILAE)
- 2016** Brain Health and Ageing (ADI)
- 2017** Stroke (WSO)
- 2018** Clean Air for Brain Health (WFN Environmental Neurology SG)
- 2019** Migraine (IHS)
- 2020** Parkinson's Disease (IPD and MDS)

This year, we are proud to have the Multiple Sclerosis International Federation as partners in the promotion of the need for effective treatment for MS. There are highly effective treatments available that can dramatically reduce the rate of disability accrual, and in some instances reduce the level of disability, but they are woefully inaccessible to large numbers of people with MS. Indeed, this campaign is as much about informing people of the benefit of highly effective treatments as it is about highlighting the inequities of access to those therapies. Inequity of access to neurological services and to brain health in general is a core focus of the WFN which it, in turn, shares with the WHO.

The WCN is the premier biennial event for the WFN where the educational effort is focused on advancing the knowledge and practice skills of neurologists, particularly young

neurologists. The effort that the WFN and Kenes, our PCO, make for the WCN to be presented as one of the pre-eminent educational opportunities is enormous but worth it. This effort, and the recognition of it, depend almost entirely on the Scientific Program Committee and its chair. We are indebted to Prof. Chris Kennard for his outstanding devotion to the 2019 WCN and this upcoming World Congress. He joins a number of other celebrated senior figures who have each built an admirable record for the WCN programs. After the 2021 Congress, Prof. Kennard will step down and his place will be taken by another worthy individual.

The chair of the Scientific Program Committee must have broad neurology experience including at clinical, scientific, and academic levels. The chair must also be aware of the historical development of neurology and its specialties and the evolving trends. It is the crafting of this perspective with the selection of the leading teachers and lecturers that is a skill often not acknowledged by us. The WFN has benefited greatly from the efforts of Prof. Kennard.

A World Congress of Neurology is a unique event. Although large annual neurology congresses, such as the AAN and EAN annual meetings, are held in different locations within North America and Europe and provide the neurological fraternity with essential updates, the WCN has the ability to complement them both by rotating locations around the world. The WCN, located in a different world region and developed over two years by a Scientific Program Committee influenced by that region, attracts neurologists, young neurologists, and training physicians who might otherwise not be exposed to a major neurology meeting. The opportunity for neurologists in that region to meet, mingle, and interact with an international faculty and colleagues is a profoundly important feature of the WCN. The WCN is also where the prestigious medals are awarded; please see box on page 12 for this year's awardees.

“Working with Kenes and the WFN, they have prepared a spectacular entry point for this virtual World Congress of Neurology, no less than the famous Colosseum. The arriving delegates will also be welcomed by music of Ottorino Respighi or Antonio Vivaldi as they select from an average of 33 sessions to attend each day.”

Of course, each World Congress is the product of a team effort. For 2021 first and foremost is the Society of Italian Neurologists (SIN), the host Member Society, who joined with the WFN to form the key WCN committees. Together with the WFN PCO, Kenes, the committees developed the program with valuable contributions from members of the Global Neurology Alliance, WFN regional organizations, and industry. The role of the Society of Italian Neurologists for this World Congress is remarkably different from usual. Instead of welcoming delegates to the Eternal City, the Society of Italian Neurologists has had a different experience due to the current pandemic.

Working with Kenes and the WFN, they have prepared a spectacular entry point for this virtual World Congress of Neurology, no less than the famous Colosseum. The arriving delegates will also be welcomed by music of Ottorino Respighi or Antonio Vivaldi as they select from an average of 33 sessions to attend each day.

The contribution from the Society of Italian Neurologists has been nothing less than outstanding. Every potential difficulty has been solved promptly and amicably, building an expectation of an outstanding virtual World Congress of Neurology. The WFN is deeply appreciative of the efforts of Antonio Federico, Congress president; Gioacchino Tedeschi, SIN president; and Bruno

Giometto, Alfredo Berardelli, Gianluigi Mancardi, and Barbara Frati.

The third and final of these three anticipated events is the Annual General Meeting of the WFN Council of Delegates. It will be held Oct. 2, 2021, the day before the World Congress commences. As in 2020, elections will be electronic so that all eligible member societies will have the opportunity to vote at a time of their choosing.

The results will again be announced during the AGM. Voting this year will be particularly important. Member societies will elect a new president from three candidates and new vice president also from three candidates, and for one elected trustee for the Federation. The elected trustee will take up that office from Oct. 3, and the elected president and vice president from Jan. 1, 2022. Member societies will also decide by vote the venue and host society for the World Congress of Neurology 2025. Information concerning the procedures and timetable for these important elections will be communicated directly to each member society and can also be found on the WFN website.

I thank all who have contributed to the preparation of these upcoming events and look forward to seeing as many friends, colleagues, and member societies as possible participate in them, demonstrating to all that together we are stronger than the challenges we face. •

WCN 2025 List of Candidate Cities Finalized

BY RYUJI KAJI MD, PHD

The World Congress of Neurology will be held virtually Oct 3-7, 2021, in Rome. Thank you for submitting more than 2,000 abstracts, which are very high in quality scientifically and clinically. WCN 2023 is scheduled from Oct 13-19 in Montreal, Canada.

The venue of WCN 2025 will be selected from Asian-Oceanian cities by electronic voting by the council of delegates this year. The winner will be announced at the online Annual General



RYUJI KAJI

Meeting just before WCN 2021.

Since the conventional site visits by the committee members were not possible because of the pandemic, we had to carefully scrutinize the documents and information provided by the host societies to determine the finalists with the help of Kenes, our Professional Congress Organizer (PCO).

I am now respectfully reporting four cities as finalists: Brisbane, Australia; Seoul, South Korea; Beijing, China; and Istanbul, Turkey. Congratulations to

all! Evaluation of these cities will be announced later by Kenes.

Each candidate society produced a statement detailing and promoting the bid, which is published in this issue of World Neurology, as well as a five-minute video version of the bid which is displayed on the WFN website in the period before the WFN member societies vote on the 2025 venue.

I wish good luck for all the candidates! •

Ryuji Kaji, MD, PhD, is chair of the Congress Committee and is first vice president of the WFN.



XXVII WORLD CONGRESS OF NEUROLOGY CANDIDATE COUNTRY

Beijing, China

Members of the Chinese Society of Neurology (CSN) are keen to host the XXVII World Congress of Neurology (WCN) in 2025 in Beijing. It will give the CSN great honor to welcome their colleagues worldwide to participate this prestigious event, for the first time, in China.

Chinese Society of Neurology: A Brief Introduction

With 14 branch societies and 700,000 members, CSN is a non-profit national social organization established in 1910 and has the institutional aim of promoting scientific research, clinical prevention, diagnosis, and treatment of neurological diseases. CSN is now the largest and most well-known society with a focus on neurology in China. CSN plays a leading and active role in the nation's medical education, training, and professional exchanges in the area of neurology and brain health.

Outlook to World Congress of Neurology 2025

CSN will strive to deliver a high-level XXVII WCN for neurologists, scientists, practitioners, and experts to share academic achievements, participate various education and training activities, and translate scientific advances into action all over the world. By closely collaborating with World Federation of Neurology (WFN), national and international academic organizations and media, CSN will also be committed to distribute updated knowledge from WCN 2025 to various countries around the world.

During the XXVII WCN, we are going to address a wide range of new global neurological challenges, highlighting the challenges of diagnosis and treatment for neurological diseases in developing countries and potential solutions. We would also like to provide opportunities for members of the community to have immersive and personalized experience of scientific research and clinical practice in China by visiting our hospitals and research institutes in Beijing. We aim to bridge global resources and build international clinical and scientific networks to facilitate local and international collaborations, and, ultimately, accelerate neurological research and therapy.

Positive Impact on Chinese Neurological Community

China is the most populous and the largest developing country in the world, with a population of 1.4 billion. While they have made some impressive progress, more efforts are needed to meet the challenges posed by an aging population—the

most vulnerable group to neurological diseases. XXVII WCN in 2025 will provide an extraordinary opportunity to bring together both local and international scientists, clinicians, public health experts, and policy makers to promote health and address the urging need to alleviate the epidemic of neurological diseases in China.

Extensive Experience in Organizing Conferences

CSN holds more than 20 academic conferences each year, the largest of which is an annual neurological meeting that attracted about 8,000 participants nationwide in 2019. Prof. Yongjun Wang, the president of CSN and president of Beijing Tiantan Hospital, and his team are also experienced in organizing international congresses. The most well-known is Tiantan International Stroke Conference, which has been held annually since 2000 with about 10,000 delegates attending.

Fantastic Venue and City

China National Convention Center (CNCC), the proposed conference venue, covers an area of 270,000 square meters, with a construction area of 530,000 square meters, and has enough capacity to hold large-scale conferences. CNCC is right next to the Bird Nest Stadium (China National Stadium for the 2008 Olympics opening and closing ceremony) and is suitable for viewing the beautiful scenery of Beijing. Around CNCC, there are plenty of luxury and comfortable hotels to accommodate enough attendees. CNCC is 25 km away from the Beijing Capital Airport, which is convenient to travel to and from most countries.

Beijing is China's capital city, with over 21 million residents with an administrative area of 16,410 km². With its history of more than 3,000 years, combining both modern and traditional style, Beijing has become a global city and one of the world's leading centers for culture, education, and science and technology. By the end of 2019, there are 11,311 medical and health institutions, including 733 hospitals and about 100,000 practicing (assistant) physicians.

This bid has received overwhelming support from the entire CSN. We pledge to make sure the conference is successful, and the stay of doctors, researchers, and guests in Beijing an enjoyable and memorable experience. •

XXVII WORLD CONGRESS OF NEUROLOGY CANDIDATE COUNTRY

Brisbane, Australia

It is with great anticipation and excitement that the Australian New Zealand Association of Neurologists (ANZAN) submits this bid for the 2025 World Congress of Neurology (WCN) to be awarded to Brisbane.

Australia and New Zealand are proud multicultural nations. Approximately 50% of our populations are born overseas or born to parents of overseas origin, many from the Asian and Oceanic region. This gives us a unique understanding of and ability to cater to the needs of the regional and international neurological community.

Australia and New Zealand have a tradition of excellence in neurology and have contributed to major advances in understanding of neurological disease through strong national and international collaborations, in both basic and clinical research.

Education is the most important aim of the conference. Our members are well placed to help design and deliver a high-quality program that is diverse and inclusive of both local and international experts and registrants, and of young speakers. We would advocate for topics that are of relevance and interest to our region and also of global relevance. These are sessions on indigenous health, led by indigenous members of the scientific community, and climate change. Climate change is a critical issue in Oceania, whose islands are predicted to suffer catastrophic effects from rising sea levels. We will highlight the importance of this issue by ensuring and advertising that the meeting is carbon neutral.

Australia is experienced in holding large-scale international scientific meetings and will offer our unique antipodean hospitality. We will contribute a strong local flavour to the meeting by drawing on our unique indigenous cultures and our vibrant local music and entertainment.

Brisbane is a superb place for a conference. It receives direct flights from the Americas, Europe, and Asia. The Brisbane Convention and Entertainment Centre (BCEC) is in the heart of the city, with hotels of all grades within easy walking distance. The BCEC is modern and well-designed, with beautiful theatres and spaces, and a collection of superb Australian aboriginal art. The BCEC was voted the World's Best Convention Centre in 2016-2018. In 2014, it was selected to host the G20 summit (the "best ever"). It has a dedicated "dietary requirements" kitchen that can satisfy all cultures and

needs.

The BCEC is close to parks, museums, theatres and restaurants, and the riverside district. delegates can easily walk or cycle along the river. WCN will 'own Brisbane' for the week - signs in the airport, banners in the streets and lit-up buildings will welcome delegates to our city, and also highlight to the public the importance and value of neurological sciences. We have identified a range of striking locations for the official dinners and, to showcase Australia and New Zealand cuisine and culture, we are already planning a spectacular event for all delegates.

The bid, if successful, will be supported by nearly \$1 million in funding from city, state, and federal government, mitigating the risk of hosting the WCN.

The World Federation of Neurology has a goal of increasing access to neurological services, and the congress regularly offers support to neurologists from low-income countries. In addition, to advance neurology in our region, ANZAN will invite, as our sponsored guests, the physicians who care for neurological patients in Oceania. We anticipate this will lead to significantly increased personal connections among our nations, and provide pathways for neurology training.

Furthermore, as a legacy, any profits from the Congress will be used for education in our region. ANZAN already has a category of membership for neurologists from low-income countries and though our Asia-Pacific committee has a diverse programme of teaching, that will be extended to become a lasting benefit of holding the WCN in Brisbane.

Australia and New Zealand are a unique pair of countries that are worth exploring. The Australian aboriginal people have the world's oldest living culture, and the indigenous peoples of New Zealand and the Oceanian region have a rich Polynesian culture. Visitors can also explore our cities, beaches, deserts, reefs and rainforests. All the important sites can be reached easily from Brisbane.

As additional arguments in favor of our bid, we point out that the ability of Brisbane to host major events is recognized by its listing as the preferred host for the 2032 Olympic games. Furthermore, the WCN has been held in the Southern hemisphere on only three previous occasions. The ability to highlight and advocate for neurological sciences would provide benefit to our region by locating the Congress once again in the southern hemisphere. •

XXVII WORLD CONGRESS OF NEUROLOGY CANDIDATE COUNTRY

Istanbul, Turkey

On the behalf of the Turkish Neurological Society, it is a great pleasure and honor for us to submit this letter of intent to the World Federation of Neurology (WFN) to host the World Congress of Neurology in 2025, in Istanbul.

The Turkish Neurological Society was established on May 12, 1992, as a separate society. The aim of our society is to increase awareness of neurological diseases in Turkey, to investigate the impact of neurological diseases on public health, to make preventive studies, and to improve education and research facilities of professionals related to neurology. Moreover, increasing the recognition of neurological diseases, improving the diagnostic and therapeutic interventions with the collaboration of related fields including child neurology, neurosurgery, psychiatry, radiology, cardiology, physical treatment and rehabilitation, ophthalmology, and otology are accepted as the main goals. In addition to neurologists acting as our full members, we have psychologists, physiotherapists, nurses, and medical students acting as associated members who work together to catch the target. The overall number of members is around 2,600 at the time being who will be looking forward to attending the World Congress of Neurology, which will be held in their country.

Istanbul, as Turkey's most populous city a cultural and financial center, bridges Europe and Asia both physically and culturally. From this point of view, one may easily recognize its unique location in connection with the opportunities it presents regarding international events and organizations. The city is offering an outstanding infrastructure in the framework of the conference and exhibition venues, best accommodation alternatives with almost 112,000-bed capacity and over 222 five- and four-star hotels, Istanbul offers a variety of options, including top international and domestic hotel brands, at a variety of price points. In the widest price range, and most enjoyable social event opportunities together with cultural and historical aspects belonging to the times where Istanbul used to be the capital of three ancient empires: Roman, Byzantine, and Ottoman Empires. Istanbul is an ideal city to convene congresses with 100 to 30,000 or more participants.

The city is home to seven convention centers and three exhibition centers, each

capable of hosting major events with thousands of delegates. Istanbul has four independent meeting clusters spread around the city—The Congress Valley, the Golden Horn, the Airport Area, and the Asian side.

Istanbul Congress Center is located in the city center and covers an area of 120,000 m² on a total of eight floors, which includes a 3,705-pax auditorium, meeting halls, and exhibition areas. It is only at a walking distance from a wide range of hotels, restaurants, and attractions.

Istanbul is considered one of the main air traffic hubs connecting many international airlines from Europe to Middle East, Asia and Africa and served by more than 50 airlines from all parts of the world. Travel time to Istanbul from all major cities of Europe is between two and three hours. The national carrier of Turkey, Turkish Airlines (THY) has branches in almost all of the European countries also member of Star Alliance. Most of the countries' citizens may obtain their visa at the airport upon arrival.

As a strong verification to its prestigious ranking Istanbul hosted conferences in recent years that received praise from all sides. Some of the main congresses are World Dental Congress FDI, with 15,000, International Congress of the European Academy of Dermatology and Venereology EADV hosting 8,100 delegates, EFNS-ENS Joint Congress of Neurology with 5,000, Ninth World Stroke Congress WCS with 2,500 can be counted within the prestigious meetings that Istanbul hosted.

We believe that the World Congress of Neurology will be an excellent opportunity for academic and scientific exchange among neurologists from all over the world, with the reasonable and attractive costs that will be committed. It will be a great facility for thousands of neurologists not only from Turkey but also from the region to attend this organization at the southeastern part of our continent. With your great support and our experience, our goal is to make the World Neurology Congress 2025 a glorious, unforgettable event.

We look forward to welcoming you to Turkey. We would be honored to receive your support to organize this event in Istanbul in 2025.

Let us meet where the continents meet. •

XXVII WORLD CONGRESS OF NEUROLOGY CANDIDATE COUNTRY

Seoul, South Korea

Seoul, the capital of South Korea, is a city where both modern and traditional cultures coexist. Remnants of history are seen among modern architecture in this mega-city. Whether for business or leisure, travelers can enjoy this global city steeped in tradition and history. Traveling to Seoul is convenient with visa-free entry for 112 countries and direct flights to and from 108 cities and 54 countries. In addition, the city is considered to be one of the safest in the world, with the highest safety and lowest crime index in 2016. Furthermore, because Seoul is accessible and safe for locals and tourists, the Union of International Associations has recognized it as one of the top three convention cities for five consecutive years. Coupled with Korea's highly successful response to the COVID-19 pandemic and its continuous efforts to safeguard its citizens and tourists, Seoul is the perfect place for people to come together for mutual exchanges of ideas through international conventions.

We propose to hold the 2025 World Congress Neurology (WCN 2025) at COEX, a global convention center located in Gangnam, the heart of modern Seoul, where major technological hubs are clustered. COEX has a subterranean design that combines vibrant spaces with state-of-the-art facilities, and we anticipate using approximately half of the venue for the event. The venue's design and layout will provide ample space for academic and scientific activities, including lectures and sessions as well as social events. Numerous international conferences, such as the G20 Seoul Summit and the Asia-Europe Summit (ASEM), have been successfully held at this venue. COEX is surrounded by hotels, Duty-Free shops, banks, a large department store, and emergency facilities, such as hospitals and police and fire stations. In addition, COEX has Asia's largest underground mall with over 300 stores and restaurants, a movie theater, a library, and even an aquarium. The variety of activities COEX offers allows participants to unwind after a day of scientific pursuit and networking. They may opt to go shopping, take a stroll in nearby parks, visit a spa, or enjoy their entertainment of choice.

Additionally, traveling to and from the venue and airport—anywhere within Seoul—is convenient thanks to an abundance of taxis and mass transportation, including the subway and bus. Participants can quickly get around the city and fully enjoy its culture, history, aesthetics, and architectural design. Therefore, we anticipate that hosting the event at COEX will provide an overall unforgettable experience for all.

Inspired by the World Federation of Neurology's steadfast drive despite the many difficulties the COVID-19 pandemic posed, the Korean Neurological Association (KNA) is more committed than ever to support the growth, knowledge, and innovation of the neurological society by ensuring the successful organization of this premier educational event.

We believe that this could take place in the heart of Seoul and wish to extend our support and enthusiasm moving forward. Furthermore, we hope that by hosting this event, we will pave the way for a more robust network among the various international neurological societies, including the KNA, to achieve high-quality neurologic care. Although the association is a relatively new society founded in 1982, we have extensive experience hosting major scientific meetings over the last decade. Specifically, we have successfully hosted 2,600 participants at the World Stroke Congress 2010 and 1,600 participants during the 2018 AOCN (the most attended AOCN meeting), both in Seoul. Thus, the KNA is more than capable of organizing and hosting such a big conference while ensuring that participants enjoy both the Congress's scientific programs and social events, as well as any leisure activities.

In Seoul, our fellow World Federation of Neurology members will surely enjoy furthering themselves in pursuing the skills and knowledge needed in neuroscience. Moreover, they will also enjoy socializing with locals and fellow convention attendees; enjoy authentic Korean cuisine; explore the country's culture, local activities, shopping, and everything in between. We believe that Seoul is suitable for the WCN 2025 and hope you will strongly consider our capital for the future conference. •

Migraine in Famous People: The Case of Christiaan Huygens

BY PETER J. KOEHLER

Many famous persons, today as well as in the past, suffer(ed) from migraine. With a prevalence of around 16% for women and 8% for men, it ranks high in the Global Burden of Disability.¹ Going back in history, it may be difficult to make a retrospective diagnosis, in particular, if not all symptoms, as described in current diagnostic classifications, are mentioned. However, the disability can often be recognized quite easily, as in the following case. In this essay, I will discuss a 17th century scientist, who was suffering from frequent headaches, possibly migraine.

Conversation in Latin at Age 9

Christiaan Huygens (1629-1695) was born in The Hague (Netherlands) as the second son of Suzanna van Baerle (1599-1637) and Constantijn Huygens (1596-1687), who had been a diplomat and secretary of two Princes of Orange. Constantijn was also a poet and composer. He was interested in the arts and is considered by some the discoverer of the talent of Rembrandt (and Lievens), who at the time were working in nearby Leyden. He was acquainted with Descartes and played an important role in the publication of his *Discours de la méthode (Dioptrics)*. Most probably, they first met at Hofwijck castle, Huygens' summer residency just outside of The Hague, in May 1642. Descartes wrote about Constantijn Huygens: "The honour to know him I cherish as one of the most happy things that happened to me." Huygens wrote about Descartes: "Truly, he is a man superior to all esteem that one would wish to render him."

Christiaan was educated at home and excelled in nearly all subjects. He was able, for instance, to converse in Latin at age 9. Following a two-year study period of law and mathematics at Leyden University, he continued his studies at the Orange

College in Breda. Despite his father's wish to become a diplomat, Christiaan was interested in mathematics rather than law. He, as well as his father, corresponded with the French philosopher and mathematician Marin Mersenne (1588-1648). Constantijn called his son "mon Archimède," in imitation of the Mersenne, who had noticed the remarkable gift of young Christiaan and encouraged him to continue his mathematical studies.

Designs for an Improved Microscope

Thus, Christiaan became famous as mathematician, physicist (considered a founder of mathematic physics), and astronomer, who corresponded with and became Fellow (1663) of the Royal Society (London), as well as member (and research director) de l'Académie des Sciences (Paris). At the latter academy, he was served and paid by King Louis XIV. Christiaan invented the pendulum clock² and described light as a wave phenomenon;³ moreover, he discovered the moon Titan of Saturnus (1655; publication of *De Saturni Luna observatio nova* in 1656). He constructed a variety of optical instruments, often in close association with his older brother Constantijn.⁴ He not only used telescopes, but was also interested in microscopes. Already in the 1650s, the brothers had compound microscopes. Christiaan's enthusiasm for this instrument increased after he had translated and presented the work of Antoni van Leeuwenhoek at the Paris Académie. He also wrote to Nehemia Grew (1641-1712), the Secretary of the Royal Society in London, that he "directed [his] mind to constructing a new microscope, excited by that new observation, which shows that the semen is full of living vivacious animalcula."⁵ As Van Leeuwenhoek's letter was published in the *Philosophical Transactions* only a year after receipt, Huygens' short description became the first.⁴ Not satisfied with Leeuwenhoek's original instrument, Huygens made six designs of an improved simple microscope with a diaphragm revolver as well as a specimen revolver. The improvement concerned the quality

of the image and the manipulation of the specimens.⁴ In August 1678, he wrote to his brother about a more practical type of microscope. The design was used by several instrument makers.

Incapacitating Headache

In the 22-volume *Oeuvres Complètes* (OC 1888-1950), that includes his correspondence (in Latin, German, English, and Italian) and writings, mainly written in (old) French, interesting information can be found about his chronic headache.

In 1652, in a letter to Frans van Schooten junior, who was professor of mathematics at the University of Leyden, Christiaan wrote about his headaches for the first time. He must have been 23 years old. Due to headache that was not always present, but occurred at the most inconvenient moments, he was often unable to work, unless he was able to overcome the pain by willpower. About 10 years later, we learn about the treatment that was applied as advised by his physician. In a letter to his younger brother Lodewijk, he complained about his headaches and mentioned that he had had himself bled and purged. These kinds of treatments were indeed quite common and should be explained in the context of contemporary humoral medicine.⁷

Since my latest [letter] I have taken advise of our medic Libergen [*sic*], who had me purged and bled, having done that, I had a nasty cold as I have never known to have had, in such a way that I not only have to stay at home, but also have to abstain from reading, writing, or meditating, because as soon as I do I have a headache.

The Liebergen family counted numerous physicians. Huygens probably referred to Willem van Liebergen (1601-1674), who had studied philosophy and medicine at Leyden University.

Christiaan had to apologize himself regularly for his behavior due to headache. After he moved to Paris and became a member of the new Académie Royale des



Christiaan Huygens; painting by Caspar Netscher (public domain).

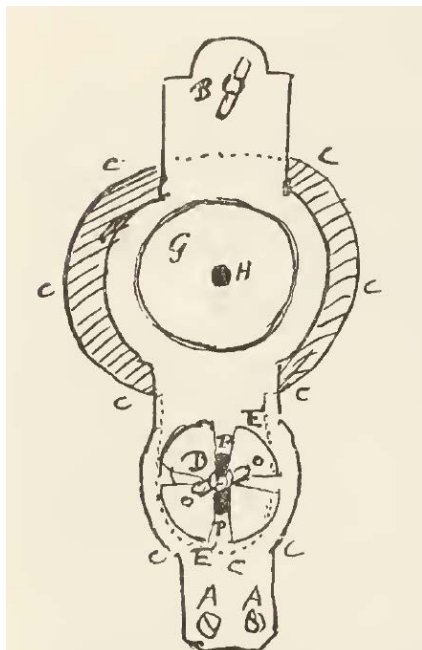
Sciences, he wrote to the husband of his sister Susanna that due to headache, he had been unable to write him, although he usually was punctual with this respect. He still felt some remnants of the latest period.

A few months later, in November 1666, he wrote to the same person that writing caused headache. In 1677, Constantijn sr. wrote about his son's health. "My Archimedes has recovered well enough from his ailment, although always frail and subject to headaches." A year later, Constantijn jr. wrote, "My brother has a severe headache." At age 56, Christiaan was still suffering from headaches, writing "I have written a part of the memoirs, as you know and would have completed it without headaches that, since Easter day, have annoyed me and by which, still today, I did not go outside."

Half a year later, he wrote again to his brother Constantijn that "since three days there is a constant fog here that gives me very annoying migraines." In the spring of 1686, he wrote to the same brother that next to an inguinal hernia, he was still suffering from headaches. "Meanwhile I am suffering as you may believe, in addition I have been tormented anyhow all these days by my migraines, that now begin to leave me."

Correspondence With European Scientists

In his correspondence with many famous persons of the period, Christiaan sometimes referred to his headache. In January 1664, the French poet and critic Jean Chapelain (1595-1674), who also corresponded with Constantijn sr., wrote to Christiaan: "I am glad at least about the relief that you experienced with respect to you headache." Toward the end of that year, Christiaan wrote to natural philosopher Sir Robert Moray (1608-1673), one of the founding members of the Royal Society, "Not having been able to respond in the usual way, I should not let leave the mail another time without acquitting myself of this duty despite an annoying headache that lasted this whole



(left) Design for a microscope in letter to his brother Constantijn 1678.⁹

(above) Brass microscope with five diaphragms and object revolver for six specimens after design by Christiaan Huygens (c 1680). Courtesy Boerhaave Museum, Leiden (V 26952).



**CANDIDATE STATEMENT FOR ELECTED WFN TRUSTEE:
ALLA GUEKHT****Alla Guekht**

It has been a tremendous privilege to serve as Elected Trustee of the World Federation of Neurology with the rich tapestry of more than 120 national societies and hard work of the most talented professionals in neurology in the world. It was a great honor to be able, especially at the challenging times of COVID-19 pandemic, to contribute to achieving the WFN mission to foster quality neurology and brain health.

As the trustee of the WFN, I have become integrated into its outstanding multifaceted work. I have learned so much from our president, esteemed colleagues in the Board of Trustees, WFN committees, regional and national organizations, neurologists from many countries of the world, and the WFN staff members.

In my role as the WFN trustee, I contributed to the successful development of the collaboration with the WHO. Adoption of the Resolution WHA 73_R10: Global Actions on Epilepsy and Other Neurological Disorders was the landmark event and unprecedented recognition of the global importance of these conditions; the WHO made a commitment to develop a 10-year Intersectoral Global Action Plan on Epilepsy and Other Neurological Disorders and to include in this plan “ambitious, but achievable, global targets on reducing preventable cases of, and avoidable deaths ..., strengthening service coverage and access to essential medicines,

improving surveillance and critical research and addressing discrimination and stigma.” The WFN, in collaboration with the International League Against Epilepsy, the International Bureau for Epilepsy, the International Child Neurology Association and European Federation of Neurological Associations, powerfully advocated for this resolution, actively participating in the 71st and 72nd WHA and the 146th WHO executive board meeting, where the historical decision to discuss a possible draft resolution on further action on epilepsy and other neurological disorders had been made.

Notably, WFN actively supported the WHO actions aimed on prevention and treatment of non-communicable disorders, and, indeed, productive collaboration with the WHO strengthened the Global Neurological Alliance.

As the WFN trustee, I have been deeply involved in the WHO COVID-19 NeuroForum and NeuroResearch Coalition, co-chairing the WHO NeuroForum follow-up and long-term impact working group, which meaningfully contributed to the creation of the WHO Case Report Form for Post-COVID conditions and is working on several important projects on prevention and care of patients with its neurological manifestations.

I worked in the WFN Membership Committee, communicating with several neurological societies, and bringing them closer to the WFN as the potential new members. I was privileged to contribute actively to the WCN.

I feel very much honored to be nominated for the re-election. During my term as WFN trustee, I have become aware of both the exciting opportunities as well as the significant challenges facing the global neurological community. If re-elected, I will continue to serve faithfully to the WFN, working diligently, fostering partnership with national, regional, and international neurologic societies and disease-based organizations, further developing collaboration with the WHO in order to assist the WFN to achieve its mission to improve neurological care, education, and research worldwide. •

**CANDIDATE STATEMENT FOR FIRST VICE PRESIDENT:
RIADH GOUIDER****Riadh Gouider**

I trained at the Charles Nicolle Hospital in Tunis, and in La Pitié Salpêtrière Hospital in Paris. This mixture of learning and training encouraged me to explore global neurology.

My journey with the World Federation of Neurology (WFN) began in 1993 during the 15th World Congress of Neurology (WCN) in Vancouver. Since then, my enthusiasm and commitment to WFN has never wavered.

Being the national delegate of the Tunisian Society of Neurology for almost a decade (2005-2015) showed me how important a delegate can be as a crucial link between his national society and the international neurology community.

Appointed as a regional director for Pan-Arab region from 2008-2010 and regional director Africa from 2012-2015 taught me the crucial role of the six regions in WFN strategy and actions, especially when the neurology resources are scarce.

To support the WFN in its mission to promote global neurological education and training, I participated in the accreditation of three teaching centers : Rabat, Dakar, and Cairo.

Lately, I had the honor to be designated as the convener of the first WFN/AFAN e-Learning Day, which took place in October 2020, the second will be held in November 2021.

My involvement on several committees of WFN: as a co-chair of the e-Learning Task Force, the Education Committee, the specialty groups, and the e-Communication Committee, provided me with invaluable insight into those committees' functions, the development of their activities, and their positions within WFN.

The most important influence was my election for two terms as an elected trustee from 2014 to 2020. This position filled me with a strong sense of pride and gave me the chance to significantly contribute to the challenges the WFN has faced and the opportunities to participate in the activities of the WCN meetings.

I have had the honor of serving the WFN through a variety of roles.

I feel that I am experienced and honored to stand for the role of first vice president.

If elected, I pledge to support the mission of the WFN to contribute to the advancement of teaching and practice of neurology throughout the world.

I will focus on:

- Provision of access to quality training programs and teaching materials to neurologists, trainees, and health care professionals from all over the world through the e-learning capabilities.

- Creation of more teaching centers all over the world, especially Africa, Central and Southeast Asia, Latin America, parts of Eastern Europe, providing equal educational opportunities in regions with fewer neurologists.

- Strengthening relations among south and north countries and be an active contributor to the dissemination of information and scientific progress.

To further empower and strengthen the links of communications between WFN and regional organizations.

Enhance the cooperation of WFN with international organizations such as the WHO and neurological NGOs.

My fellow delegates, I am asking for your vote to be elected as first vice president. Regardless the results of the election, I promise to continue working for the WFN with the same enthusiasm and commitment. •

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CANDIDATE STATEMENT FOR FIRST VICE PRESIDENT: GUSTAVO ROMÁN



Gustavo Román

I was honored by my nomination as candidate for vice president of the World Federation of Neurology (WFN) from the American Academy of Neurology and neurologists from Colombia, my homeland, Brazil, Chile, Honduras, Panama, Uruguay, Spain, and France.

My mentor, Prof. Charles Poser, who served as editor of *World Neurology* in 1960 instilled in me the importance of the WFN in a globalized world. Over four decades, I served two terms as elected trustee of the WFN and participated in numerous activities.

I was born in Colombia and as an intern encountered the challenges of neurologists working in tropical countries: confronting formidable diseases with minimal diagnostic tools and a limited therapeutic arsenal. With a scholarship, I studied at the Salpêtrière in France and learned the enduring value of clinical neurology and neuropathology. Back in Colombia, I was appointed neurology faculty and wrote two textbooks: *Practical Neurology* and *Tropical Neurology*.

I joined Texas Tech University as professor of neurology and interim chair of neurology. In 1990, I was appointed chief of neuroepidemiology at the National Institutes of Health (NIH). I published *HTLV-1 and the Nervous System*; contributed to the diagnostic criteria

for vascular dementia and guidelines for epidemiological studies on epilepsy; I co-authored *Neurocysticercosis: A Clinical Handbook* and participated in a multinational study of epidemic neuropathy in Cuba. I chronicled this experience in the book *Cuban Blindness: Diary of a Mysterious Epidemic Neuropathy*.

I returned to teaching at the University of Texas San Antonio as professor of neurology, medicine (geriatrics), and geriatric psychiatry and established the Alzheimer Disease Clinic. In 2010, I was selected the "Jack Blanton Endowed Chair" to organize a new memory center at Methodist Neurological Institute where I currently serve as professor of neurology, Weill Cornell Medical College, New York, and Texas A&M College of Medicine.

At the beginning of the pandemic, in early 2020, as chair of the environmental neurology specialty group of the WFN, I proposed creating international neurological registries of COVID-19 among neurological societies worldwide (*Lancet Neurology* 2020;19:484). With the group, I wrote the first comprehensive review on the neurology of COVID-19 (*J Neurol Sci* 414 (2020) 116884). These efforts resulted in the formation of scientific groups, such as the global COVID-19 Neuro Research Coalition (*Ann Neurol* 2021;89:1059).

As vice president of the WFN, I pledge to continue addressing the needs of neurologists worldwide during this pandemic, with emphasis on education and accessibility to scientific information to better serve neurological patients. Nontraditional methods and creative solutions such as telemedicine that have proven effective during the pandemic may have myriad applications in regions of the world with few neurologists.

We must be ready for future challenges, and the WFN is the only institution capable of serving as link of union and coordinating core for neurologists around the world. As vice president, I pledge to advance the goals and mission of the WFN in forging the future of neurology around the world. •

CANDIDATE STATEMENT FOR FIRST VICE PRESIDENT: GUY ROULEAU



Guy Rouleau

I am honored that the Canadian Neurological Society (CNS) has nominated me for the position of WFN first vice president.

Following medical school at the University of Ottawa, I did neurology training at McGill University and research training at Harvard (PhD 1989). I then began my career as a clinician-scientist at McGill. In 2004, I moved to the University of Montreal as director of research at Ste-Justine Hospital. I returned to McGill in 2013 as chair of the department of neurology and neurosurgery, and director of the Montreal Neurological Institute-Hospital (MNI). My work focuses on genetic diseases of the brain, and I have published over 800 articles in peer-reviewed journals and have been cited over 85,000 times.

I collaborate with neurologists from every continent. Among many other international activities, I co-organized two Congrès de Neurosciences du Mali à Bamako, and I lead a project in Shenzhen, China, assisting the development of advanced therapies for epilepsy and movement disorders. I initiated the WFN-Neurological Institute-Canadian Neurological Society Departmental Visit program for young South American neurologists. The MNI funds these visits and provides the training. We

are organizing a similar program for young African neurologists. As Canadian delegate to the WFN for six years, I know the organization well. In that role, I helped the CNS make a successful bid to host the 2023 WCN in Montreal. As WFN first vice president, I would be ideally positioned to contribute to the success of this upcoming congress.

I hope to increase the WFN's impact on the practice of international neurology. The advent of the internet, social networks as well as accelerated medical discoveries, bring rapid, constant change requiring that organizations regularly reassess their structures and modes of operation.

As first vice president, I would recommend establishing a task force to make recommendations about how to:

Modernize: Currently, the president is elected quadrennially. The past president has no official role, leading to a loss of experience and talent. To ensure continuity, most professional organizations have a president-elect, president, and past-president. This structure could be explored.

Democratize: We need to find ways to ensure that younger people are more engaged and better represented within the WFN. The WFN must be relevant to neurologists of all ages and professional stages. The gender balance and diversity in the WFN's leadership must also be improved.

Open: The impact of the open sharing of information is growing and has been accelerated by the COVID-19 pandemic. Sharing of information in medicine must become the norm. The WFN should adopt the open science ethos to allow equal access to information, ensure transparency, reproducibility, and equity. Under my leadership, the MNI has become a world leader in open science. Experience and methods developed there can help the WFN facilitate the spread of open science in the world of neurology.

On a personal level, I have spent nearly 40 years practicing neurology. I remain fascinated by the work we do, and I feel I still have much to contribute to our field. •



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CANDIDATE STATEMENT FOR PRESIDENT: RYUJI KAJI



Ryuji Kaji

For the cause of World Federation of Neurology (WFN) in this challenging time, it has been my privilege and pleasure to serve as the first vice president of the WFN during an unprecedented time of worldwide crisis caused by the pandemic, which has altered the way we conduct the business as the new normal. We are at a turning point in modernizing the structure and function of the federation to meet the new demands. I am proud to be nominated as a candidate for the office of president at this important juncture.

As a graduate from Kyoto University in 1979, I started my professional career as a neurologist studying in the U.S. as a clinical fellow at the University of Pennsylvania. After returning to Japan with my mentor, Prof. Jun Kimura, to teach at our alma mater, I first described the use of IVIG to reverse muscle atrophy in multifocal motor neuropathy, an ALS-like disease.

Encountering a patient with task-specific dystonia, while doing EMG, I became interested in movement disorders, and our group has found new genes causing dystonia. In 2000, I was elected as a member-at-large for the International

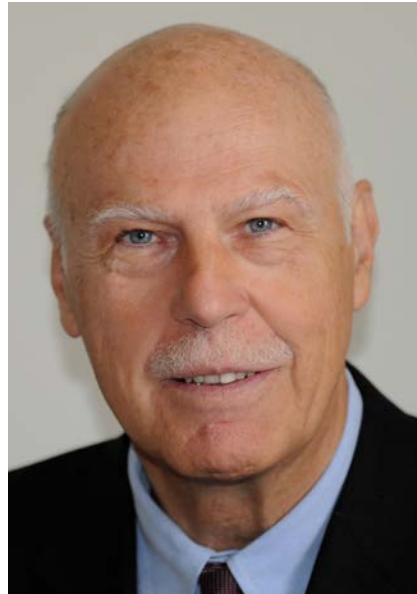
Federation of Clinical Neurophysiology (IFCN), which I served until 2006. I organized, with IFCN support, a symposium to develop a guideline for early diagnosis of ALS, now adopted as Awaji criteria (an island of Japan).

From 2006 until 2013, I was elected twice as a trustee of WFN under Prof. Aarli and Prof. Hachinski. First, I chaired the membership committee, successfully soliciting six new member societies. Second, I led Asia Initiative to vitalize Asian Oceanian Association of Neurology (AOAN), which now serves as a model of regional organizations in all continents with the help of Prof. Shakir. In 2017, I was elected as first vice president, and have since assisted Prof. Carroll in organizing the congresses and promoting the education of neurologists globally, a major thrust of WFN objectives.

If elected president, I would like to move forward on several initiatives. We must seek to achieve greater worldwide recognition of our discipline and make the prevention and treatment of neurologic conditions the No. 1 priority of governmental medical policies. Specifically, we should encourage and assist the education of young neurologists in developing countries. In undertaking these goals: I will abide by the basic mission of WFN to “foster quality neurology.” I will review the regional representations of trustees to make all the continents fairly represented with the best use of co-opted positions. I will make the regional liaisons stronger by closer contacts with the presidents and delegates of our member societies.

I have learned from the fellow trustees how to accomplish the best consensus with proper balance of assertion and compromise. I believe that it will take a team effort to successfully run an international organization. It is my sincere hope that together we can achieve our objectives and further improve the value and prestige of WFN. •

CANDIDATE STATEMENT FOR PRESIDENT: WOLFGANG GRISOLD



Wolfgang Grisold

I would like to apply for the position of the president of the WFN.

Having served as the secretary general of the WFN for the past eight years, I have gathered knowledge on all areas of current and previous activity. I designed and organized several initiatives, and made substantial contributions to WFN’s growth as a globally operating organization. Based on countless conversations with representatives and insights I have gained, I am convinced that my agenda for the presidency meets the needs of the WFN and its membership. My proposed agenda revolves around three key goals.

The first is to **intensify the collaboration** of all WFN members across countries and regions. Neurological diseases are becoming increasingly prevalent throughout the globe and neurologists are at the forefront to solve the great challenges of our time. As our members bring in distinct strengths and competencies, we can jointly advance the treatment of illnesses and our patients’ well-being. A cornerstone of my presidency will be to strengthen collaboration with WHO, the global neurology network, and scientific societies to successfully advance our initiatives.

My second goal is to **increase the impact** of the WFN. As per our mission, we strive

to enhance high-quality neurology and brain health worldwide. Our focus is to make neurology accessible in all parts of the world and for all patients in need. To this end, I see high-quality education as the backbone as it empowers regions to consolidate, advance and adapt their education and treatment strategies.

Among other activities, I intend to drive the development of training centers and department visits, integrating emerging opportunities of virtual education. I am confident we can increase our impact by training and empowering aspiring neurologists. My plan is to design a global training charter to establish standardized neurology training, and establish fellowship, advocacy, and leadership programs.

My third goal is to **ensure coherence and continuity**. The WFN has launched several successful initiatives targeting all aspects of brain health. One prominent example is World Brain Day, which has significantly helped raise public awareness about neurological diseases. We are fortunate to launch new initiatives and programs, but can only make a sustainable impact where there is continuity and coherence across projects.

One way to increase coherence and continuity is to smooth transitions between administrations. I envision the immediate past-president and president-elect serving in overlapping periods to ensure an efficient, transparent handover.

Importantly also, I will endeavor to balance the gender distribution in leadership roles and give patients a voice in WFN.

I am applying for the presidency of the WFN because I see many promising opportunities that we can achieve together over the next four years. At the heart of my agenda is the will to “strengthen the strengths” of our organizations and further improve outreach and impact of our programs for neurology and neurological patients.

It would be my sincere pleasure to work with you on these programs in the next four years. •

CANDIDATE STATEMENT FOR PRESIDENT: YOUSSEF AL-SAID



As the current Saudi Neurology Society President (SNS), it would give me great pleasure and be an honor to represent the World Federation of Neurology (WFN) and therefore am submitting my name as a nominee for the position of president.

As an experienced senior professional in neurology and epilepsy, administrative MBA graduate and the executive director of medical and clinical affairs at one of the leading hospitals in Saudi Arabia, I believe

I embody the vision and mission of WFN on a daily basis to raise professional and academic proficiency in neuroscience.

My goal is to always lead with movement to action through results-oriented execution. Using this kind of leadership, neuroscience will reach new heights within the kingdom and see real time results.

Neuroscience is not just my career; it is my passion, and I would like to continue to share my knowledge with

those entering in the field and contribute to the development of our youth as well as expand and improve the services throughout the kingdom and worldwide.

This year, 2021, is a year of inspiration as we transform to a new norm. Let’s go forward and try to reach a brighter future.

In closing, it would be a pleasure to be considered as the president so that I may help lead from the front as an action-centered leader for neuroscience.

I look forward to hearing from you. •



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HISTORY

continued from page 6

day and brings me in a mood of rather doing nothing.” Moray responded:

All your letters oblige me very much. However, your latest of the 21st does so even more than all previous ones. Writing me a long letter, full of nice things, while a headache tempts you not to do anything, well deserves to be estimated as a very special sign of extraordinary affection, it is therefore quite reasonable that I write a prompt and, as much as I can, satisfactory response.

And in 1692, in a letter to the German philosopher and mathematician Gottfried W. Leibniz (1646-1716), with whom he wrote on the mathematization of physics and on whom he had an important influence, he wrote: “I am very obliged for showing interest in my health, that since my last [letter] has suffered much from migraine during that long freeze.”

Mother and Sister Suffering Too

A hereditary factor may have played a role in Christiaan’s headache as his sister Susanna (1637-1725) wrote about her own migraine in 1680. “It is to my great regret, my dear brother, that I learn ... that you have been uncomfortable by pain and heat in the head ... I hope to learn soon that you will not complain anymore. I certainly have my part of migraine sometimes, and I complain more than anybody of those, who suffer of similar discomforts.” Christiaan and his sister may have inherited the affliction from their mother. She suffered from migraine and menstruation troubles, for which she had to be put a diet and was prescribed bleeding as well as purging.

Treatment With Water and Tea

In August 1654, Christiaan stayed in a spa in the mountains of the eastern part of the present Belgium. This was a well-known town with healing cold mineral springs since the 14th century that had resulted in the eponym spa. His father was staying there too and took water a couple of times. In one of the poems written for Mdm Emilia de Mérode-van Wassenaar during a stay, Constantijn Sr. wrote about migraine (1654):

Trouvez vous pas quelque migraine
Qui vous eschauffe le cerveau?
Si ma conjecture n’est vaine
Il vous reste tant soit peu d’eau

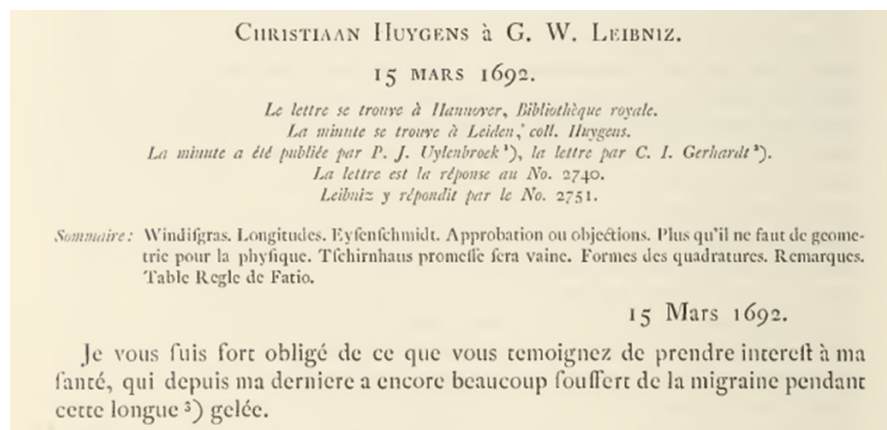
[Don’t you feel any migraine
That sets on fire your head?
If my diagnosis is right
Water is the only cure to save you]

Constantijn Sr. probably used the water more often than his son Christiaan, who was rather critical about its healing effects.

In the first half of the 17th century, tea was used as a remedy and reserved to high society. In the course of the century, however, it became more widespread and not just as a drug. Next to purging and bleeding, Christiaan indeed drank tea and apparently was satisfied about it. In 1663, still staying in Paris, he wrote to his brother Constantijn “If there is a way to send me ... a pound or a half of the good tea, you would do me a great pleasure, as, since some weeks, I have felt myself admirably well by only taking the leafs in the mouth, as soon as I feel myself indisposed by headache, because that cures me without fail.” Furthermore, water cures, as usual at the time,⁷ were attempted.

Migraine and the Use of Optical Instruments

During the 19th century, migraine, in particular migraine with aura, was associated with scientists, who were using



Letter by Huygens to Leibniz (1692) (from *Oeuvres Complètes* vol. 10, p. 268).

optical instruments. French physicist and astronomer Dominique François Jean Arago (1786-1853), Scottish physicist David Brewster (1781-1868), and British Astronomer Royal George Biddell Airy (1801-1892) are persons often referred to. Airy’s son, the physician Hubert Airy (1838-1903), who was also a victim to visual auras, believed it had its origin from their habits of accurate observation leading to intensive eye-work and brain-work, exposing them to the risk of impairment of the eyesight. He gave some striking descriptions of his own auras and added several figures of his experiences. The aura was emphasized rather than the headache. There is no indication that Huygens was suffering from auras.

Comorbid Depression

The recurrent episodes, some of which being clearly incapacitating, and familial occurrence suggest that Huygens was suffering from migraine, although some symptoms that would be expected were not described. Another aspect of his health was that he went through at least two periods of *melancholia hypochondrica*, notably in 1670 and 1676. Assuming we would diagnose this disease as a depressive disorder today, we know this is associated with migraine. And of course, melancholy

was considered the disease of scholars at least in the century that started a few years after Christiaan Huygens’ decease in 1695. •

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Eight Years of Experience in Training African Neurologists in Rabat

BY PROF. MUSTAPHA EL ALAQUI-FARIS,
WFN RABAT TRAINING CENTER

After the accreditation of the Rabat Training Center in September 2013, the WFN signed a contract with the Mohammed V University of Rabat to train neurologists from Sub-Saharan Africa in Morocco. It was decided to start with complementary training in clinical neurophysiology for neurologists who have already completed their studies. They receive a grant of 13,000 Euros from the WFN covering travel and living expenses in Rabat for 10 months. The internship includes training in the performance and interpretation of EMG and EEG and in the management of patients suffering from neuromuscular diseases or epilepsy.

During their training, neurologists participate in the various teaching activities of the Department of Neurology of Rabat and attend the meetings of the Moroccan Society of Neurology in Morocco and in the Maghreb. Neurologists from Burkina Faso, Chad, Guinea, Madagascar, Mali, and Senegal have benefited from this training, which has allowed them to consolidate their EMG and EEG practices. In this regard, I would like to thank Prof. Reda Ouazzani, head of the clinical neurophysiology department, and his team, in particular Prof. Nazha Birouk, for their commitment and their



MUSTAPHA EL ALAQUI-FARIS

availability during the African neurologists’ internship.

During the eight years of training for French-speaking African neurologists, the Rabat Center has received eight diligent trainees committed to expanding their knowledge and improving their expertise. They all have a good knowledge in general neurology, whatever their country of origin. This is due to the heritage of excellence of the French neurological school in these countries.

Currently, 14 French-speaking countries organize training of neurologists on-site, but due to lack of financial resources, they only train one to five neurologists per cohort.

At this rate and given the glaring lack of neurologists in sub-Saharan Africa (barely 0.03 neurologists per 100,000 inhabitants, whereas the WHO calls for 1/100,000), it would take decades to reach a sufficient number of neurologists in these countries.

It is therefore important to explore the different possibilities to increase the number of neurologists in sub-Saharan Africa, while being aware that the majority of African neurologists trained in Europe and North America do not return to their countries.

Currently, the WFN has four accredited training centers in Africa, each center receives approximately one neurologist per year, often for

see RABAT page 12

WFN COMMITTEES AND SPECIALTY GROUPS

Tour Through the WFN Continues

The Finance Committee and the Specialty Group on Neuroepidemiology

BY WOLFGANG GRISOLD

In this issue of World Neurology, we would like to continue to introduce you to one committee and one specialty group. The committee/specialty group is introduced by the respective chairs, who were asked to explain their tasks and activities to our membership. Further details, such as the list of committee/specialty group members can be found on the WFN website, as well as email addresses of the chairs and members, which will be helpful if you want additional information.



WOLFGANG GRISOLD

in the WFN over many years. He has a long experience in governance and leadership of scientific societies, including being president of the World Stroke Organization.

The Finance Committee has several experienced members with a global representation. The task of the WFN Finance Committee

is to regularly review the economic strategies and financial situation of the WFN, functioning as an independent body from the WFN executives. The Finance Committee identifies strengths, weaknesses, opportunities, and threats for the WFN, and tries to look into the future taking the global economic situation, and environmental and political issues into account.

The committee also considers the need for adaptations of WFN educational and training activities related to information technology issues, educational tools, and practical issues. The committee helps to ensure that the WFN has a strategy to maintain an economic corpus that is a sufficient reserve for any upcoming disruptions and other threats. In particular, it is essential to have a sustainable balance to support future core projects (fostering best neurological practices, education, and research) and maintaining reserves in case of a downturn in congress income in the future. For this purpose, the assets are composed of short- to medium-term working capital and a longer-term reserve fund. WFN finances and corporate structure are regularly audited.

Over the years, the views of the

Finance Committee and those of the trustees have been in excellent agreement. The committee acknowledges the careful strategic planning that has been in constant function at the WFN leadership over the past decades and continues into the future.



Carlos N. Ketzoian

Specialty Group on Neuroepidemiology

The Specialty Group on Neuroepidemiology is chaired by **Prof. Carlos N. Ketzoian**, neurologist, epidemiologist, and neurophysiologist from the Neuroepidemiology Section, Institute of Neurology, University Hospital, School of Medicine, Montevideo, Uruguay (carlosk@mednet.org.uy). He has been chairing and researching in several neuroepidemiology activities, is the past-president of the Pan American Society of Neuroepidemiology, and participates in national and international scientific activities. He is

also a member of the editorial board of neuroepidemiology.

The Specialty Group on Neuroepidemiology has a long history in the WFN. The proceedings of the group are oriented toward activities of teaching, research, and presentation of neuroepidemiologic results in academic activities, either in the congresses of the WFN or in congresses in different regions such as the Pan American Congresses of Neurology and Pre-Congress Symposia organized by the Pan American Society of Neuroepidemiology.

At the WCN 2021, a scientific session on neuroepidemiology will take place themed “The impact of socio-demographic, economic, and cultural factors on the epidemiology of neurological disorders (WFN Specialty Group on Neuroepidemiology)” on Oct. 6, 2021, in Rome, which is now a virtual meeting.

Research courses and projects have been developed for low- and middle-income as well as high-income countries, favoring a North-South interaction and collaboration. This has had a positive impact on the training of human resources in the area of neuroepidemiology.

Future projects will offer neuroepidemiology training activities in low-income countries. The II Latin American Neuroepidemiology Course scheduled for March 2020 has been postponed without a still-confirmed date of completion given the COVID-19 pandemic global situation. The current situation will need adaptation and virtual as well as hybrid courses will need to be implemented. •



Bo Norrving

The Finance Committee

The Finance Committee is chaired by **Prof. Bo Norrving**. He is senior professor in neurology and a consultant neurologist at Lund University Hospital in Sweden. He has been active in several functions

Prestigious WFN Medals Announced

These medals will be awarded at World Congress of Neurology 2021.

WFN Medal Service to International Neurology

Prof. Vladimir Hachinski

WFN Scientific Achievement in Neurology

Prof. Jerry Mendell

WFN Meritorious Service Medals

Prof. Donna Bergen and Keith Newton

Munsat Prize for Service to Education

Prof. Erich Schmutzhard

RABAT

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additional training. Alternatively, neurologists can be trained in their own countries with the possibility that the last year of training be done in a training center approved by the WFN in Africa. This might be cost-effective for French-speaking African countries with good neurology training centers and affordable costs of living.

At the Rabat Center, we are willing to provide full training in neurology (4 years), in addition to continuing the annual training in clinical neurophysiology sponsored by the WFN and by the ICNMD Congress.

To ensure continuing education of French-speaking neurologists, the WFN in collaboration with the

African Academy of Neurology (AFAN) can organize virtual courses in neurology in French. The courses could be made available on the WFN website. The lack of neurologists in Africa will not be filled any time soon, so it would be desirable in the era of video conferences that the WFN could provide education on “*neurology for non-neurologists*” for general practitioners in sub-Saharan Africa.

Finally, to accelerate the training of African neurologists, it would be desirable for the WFN to develop a true “Alliance for Neurology in Africa” by involving the AAN, the EAN, and other partners of the World Brain Alliance for its financing. This will improve the care of millions of African patients suffering from neurological disorders. •

A Neurology and Psychiatry Clinic in Central America

With Suggestions for Starting a Clinic

BY LAWRENCE ROBBINS, MD

Starting the Clinic: The clinic is located within an excellent rural medical center near the main city (Tegucigalpa). Associating with an established medical center has been ideal. Ninety-five percent of the population has no access to neurology or psychiatry. I decided that it was crucial to supply various neurology and psychiatry medications. Locating the clinic relatively close to a big city was important. Close access has allowed me to teach in the public hospital, bring in other physicians, and refer patients for tests, **Suggestion: Look for an established, well-run clinic, and locate within proximity to an international airport. This may not be feasible in all locations.**

Associating With an Organization: It is difficult to start a clinic completely independently. I have had a close association with a well-established organization that runs our medical center. They provide room and board, and also help with security, transportation, and hiring clinic personnel. **Suggestion: If possible, find community support. Establish close ties with an organization as there are many benefits.**

Funding: Alas, it takes money. Lots of it. The plan was to establish a not-for-profit, which I did. With more resources, I was able to build out infrastructure, supply additional medications, and hire extra staff. Fundraising is important, but is one of the most difficult aspects of the venture. I am lucky to have a number of generous donors. **Suggestion: If possible, start a nonprofit organization. This is vital for fundraising.**

Personnel: I began with myself, one chart, and one patient. Over time, we have added two psychiatrists and two neurologists, a nurse administrator, and a psychotherapist. We pay the staff approximately what they would make working in their own private practice. The Honduran physicians are young and idealistic. Networking in neurology and psychiatry circles within the country helped me to connect. Connecting with the local neurology/psychiatry societies has been helpful. Neurologists and psychiatrists are in relatively short supply. The Honduran physicians are excellent, but often underpaid. I occasionally bring in another physician from the United States with me. This is usually a rewarding experience. The nurse administrator is a major key to success. The nurse administrator handles recruitment of patients, scheduling, managing patients in the clinic, medications, and other

tasks. **Suggestion: An administrator, preferably a nurse, is an invaluable part of the team. The downside of bringing in other physicians, or other personnel from another country, is that you are (somewhat) responsible for their trip and safety.**

Charting: We are on paper charts, which is easy, and we keep a medication flow sheet. Our paperwork is minimal. Some notes are in English (mine), most are in Spanish. Since we treat each other's patients, it helps if we list our thoughts for future considerations. In the beginning, we did not need medication or diagnosis flow sheets, as there were only one or two notes to review. Over time, after 15 or 20 visits, the need for flow sheets becomes apparent. **Suggestion: Try to keep medication and diagnoses flow charts. It is beneficial to develop uniform charting, as multiple providers may be treating the patient.**

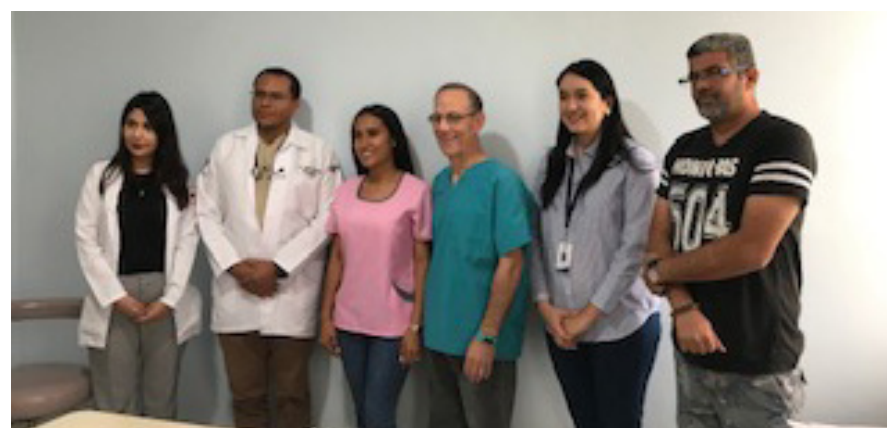
Clinic Infrastructure: We have built out a neurology and psychiatry suite, along with a small pharmacy. If our budget were smaller, we would share space with the medical center, and minimize testing. We have supplied computers, and installed internet capability. The internet (usually) works, allowing me to research various conditions that I encounter. Books are convenient to store on my phone or laptop. However, it is more efficient to actually have the physical book handy. **Suggestion: It is helpful to have a section of the pharmacy dedicated to the neurology clinic. Internet capability is extremely useful.**

Recruiting Patients: In our clinic, the nurse administrator is in charge of recruitment. We have informed various medical clinics of our existence. We also placed a number of public service ads on radio. The neurologists and psychiatrists in nearby cities refer patients. Eventually, word of mouth drives most of the new patients. We draw patients from the entire country and surrounding countries. **Suggestion: By alerting other clinics of your neurology clinic, word of mouth spreads quickly. It is helpful to let other physicians know about the existence of the clinic.**

Our Services: Our primary purpose is to provide diagnosis and treatment for the vast underserved population. In addition, we offer free medications. We provide free blood tests and EEGs as well. Much needed psychotherapy services are offered on a limited basis. Psychotherapists are difficult to come by. In some settings, a layperson may be trained to be an "active listener." We



Neurology/psychiatry clinic near Tegucigalpa, Honduras.



Staff of the neurology/psychiatry clinic.

have run into barriers with providing therapy services. These barriers include stigma, reluctance to divulge personal information in a rural community, and lack of therapists. We provide patients with a safe place and offer emotional support. We are usually patients' sole access to care. **Suggestion: If possible, supplying medications is invaluable. If therapists are not available, training lay people is a possibility.**

Medications and Pharmacy: The basic meds we provide include: antidepressants, anticonvulsants, mood stabilizers, migraine meds, and Parkinson's medications. I decided that levetiracetam would be a mainstay. It is safe and does not require blood tests.

Our small neurology/psychiatry pharmacy is kept locked at all times. **Suggestion: Choose medications that are relatively safe and do not require blood tests. If you purchase medications locally, you can often negotiate a better price.**

Telemedicine: Since we have equipped the clinic with internet access, we have been able to connect remotely. Technically, it is a bit cumbersome. I am in Chicago with an interpreter but no chart, and the patient sits in Honduras with a nurse. The lack of insurance (and other) paperwork

is helpful. These visits are not ideal, but better than no access at all. **Suggestion: Telemedicine can work if there is adequate internet access.**

Tests: Lab, MRI, EEG, etc: We do a limited number of blood tests. These tests are relatively expensive in Honduras. We are performing 20 EEGs on a monthly basis out of our clinic. This has been extremely helpful, as many epilepsy patients have not had an EEG, or any access to neurology. MRI/CT is expensive and not easy to obtain. However, many patients do pay for their MRI (about two weeks' salary) and they bring in the films. We try to use as little testing as is feasible. **Suggestion: Blood tests are important, and negotiating a better price is worthwhile. Diagnosis and treatment are often determined without advanced imaging.**

Emergencies: We occasionally have a patient in status epilepticus or other neurologic emergencies. I am available from the U.S. for advice. WhatsApp works the best for remote communication. We stock the Emergency Room with basic medications (eg, fosphenytoin and diazepam for seizures). There is a Public Hospital in the main city, but transporting patients there is an adventure. There is

CENTRAL AMERICA

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only one local ambulance, and we need permission to use it. **Suggestions: Neurologic advice often proves invaluable to the ER doctors. It helps to provide basic neurologic emergency medications.**

Teaching/Publications/Videos: I teach neurology and psychiatry residents in Tegucigalpa. We have written a manual in Spanish on management of headache. This manual was distributed to many of the Honduran physicians. **Suggestion: Teaching the local physicians is a rewarding experience. Articles document your experience and may spur others to follow your path. Videos of the clinic bring the clinic and patients to life. The videos can be instrumental for fundraising and promotion.**

Acknowledgements: It takes a number of people to make this clinic a success. Our incredible donors have provided the crucial funding. All of the personnel in SAN (Honduras) have provided vital support. The Honduras clinic staff and doctors are the mainstay. •

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INTERNATIONAL EDUCATIONAL ONLINE FORUM

Neurology Update in Kazakhstan 2021

BY AIDA KONDYBAYEVA, MD, PHD

The International Educational Online Forum: Neurology Update in Kazakhstan was held April 23-24, 2021. Forums of this scale in Kazakhstan are held every two years, and this forum was being held online for the first time. The event was attended by 985 doctors, including neurologists, internists, GPs, rehabilitation specialists, and intensive care specialists from Kazakhstan, Kyrgyzstan, Uzbekistan, Belarus, and Ukraine.

At the first day within the framework of the International Educational Online Forum: Neurology Update in Kazakhstan, the EAN-Day in Kazakhstan was held. This event was held with the joint work of the European Academy of Neurology, Kazakh National Association of Neurologist Neuroscience, and al-Farabi Kazakh National University.

Welcoming speeches to the participants were given by Prof. Saltanat Kamenova, president of KNANN; Nadezhda Petuhova, chair of the Public Council of the Ministry of Health of the Republic of Kazakhstan; Prof. Raushan Isayeva, director of High School of Medicine, Faculty of Medicine and

Health, al-Farabi Kazakh National University; and Mikhail Mazurchak, vice president of KNANN. They noted the special significance of the EAN-Day in Kazakhstan for all practicing doctors who took part in this event.

The speakers of the EAN-Day in Kazakhstan were Prof. Aksel Siva from the Department of Neurology of Istanbul University, Cerrahpaşa School of Medicine (Istanbul Turkey); Prof. Erik Taubøll from the Department of Neurology Oslo University Hospital (Oslo, Norway); and Prof. Maxwell Simon Damian, Department of Medicine, Cambridge University (Cambridge, UK).

The professors presented reports on the situation with MS, epilepsy, and neuromuscular diseases before and during the COVID-19 pandemic; these presentations aroused great interest among all participants of the event.

Luca Caffaro, the youngest speaker of this event, presented an interesting report on the work of the Residents and Research Fellows Section (RRFS) of the EAN, and on professional development opportunities for young neurologists



AIDA KONDYBAYEVA

and residents. EAN-Day in Kazakhstan received positive feedback from all registered participants of the event.

In the second half of the event, workshops were held, in which speakers presented analyses of difficult clinical cases and the possibilities of their resolution. The second day, the forum was no less

eventful, and included reports of doctors from Spain (Jerzy Krupinski-Bilecki), Afghanistan (Ayesha Khaideri), Ukraine (Sergey Moskovko), Russia (Dmitry Kasatkin, Evgeny Evdoshenko, and Natalia Khachanova), and Kazakhstan (Gulsum Duschanova, Saltanat Kamenova, Gulnar Kabdrakhmanova, Mikhail Mazurchak, Maksharip Martazanov, Karlygash Kuzhibayeva, Aida Kondybayeva, and Asel Aralbayeva). Topics including MS, pain, neuromuscular diseases, and epilepsy were discussed. •

Aida Kondybayeva, MD, PhD, is a neurologist and chair of the Educational Committee at Kazakhstan National Association of Neurologist "Neuroscience" Institutional Delegate of the European Academy of Neurology from Kazakhstan.

MUCORMYCOSIS

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(figure), and ischemic stroke.

The diagnosis is confirmed by demonstrating fungus with special stains in tissues obtained from nasal scraping or surgery.

Mucormycosis is a medical emergency, and treatment should start with antifungal drugs, surgical intervention, and correction of metabolic abnormalities or risk factors. Amphotericin B is the first-line drug of choice. Liposomal form of Amphotericin B (LAmPB) is preferred in view of a better side effect profile. The efficacy of conventional deoxycholate amphotericin B (dAmPB) is not inferior to the liposomal form but has more side effects. However, the cost of LAmPB

is 10 times more. Nephrotoxicity is the most common side effect of dAmPB.

Other drugs used in the treatment are posaconazole and isavuconazole. Oral medication can be used for longer duration. The duration of treatment is not known and has to be decided on a case-to-case basis. Ampho B is recommended for initial 4-6 weeks, which can be followed by posaconazole or isavuconazole for a few more weeks.

Surgical treatment includes debridement or excision of necrotic tissue. Depending on the site of involvement, an ENT surgeon, ophthalmologist, dental surgeon, and neurosurgeon should be part of the team. Surgical intervention at early stage improves the outcome. Functional endoscopic sinus surgery, paranasal sinus debridement, and orbital exenteration

The intriguing question is why there has been such a recent spurt of cases of mucor in India? Though mucormycosis is globally distributed, its estimated prevalence even before the COVID-19 pandemic was 70 times higher in India as compared to global data.

are commonly required surgical procedures in ROCM.

The major drawbacks in managing mucormycosis in India are a gap in treatment protocol and non-affordability of LAmPB due to financial constraints.

The mortality rate of mucormycosis in India is in the range of 28–52%, and it increases to 80% in intracranial extension of disease. High mortality is due to delays in seeking medical attention and diagnosing the disease and challenges in managing the advanced stage of infection. There is an urgent need to increase awareness among the general public and doctors for early diagnosis and treatment.

The intriguing question is why there has been such a recent spurt of cases of

mucor in India? Though mucormycosis is globally distributed, its estimated prevalence even before the COVID-19 pandemic was 70 times higher in India as compared to global data. The possible reason for the high prevalence is the abundant presence of Mucorales in the community and the hospital environment and the high prevalence of diabetes in the Indian population. The sudden spurt during the second wave might be due to a lowering of immunity by the new strain of COVID-19 making these patients susceptible for fungal infection. •

Chandrashekar Meshram is chair of the The Tropical and Geographical Neurology Specialty Group of the WFN.

The major drawbacks in managing mucormycosis in India are a gap in treatment protocol and non-affordability of LAmPB due to financial constraints.



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