



WORLD NEUROLOGY

THE OFFICIAL NEWSLETTER OF THE WORLD FEDERATION OF NEUROLOGY

WFN and WHO Update

Resolution WHA 73.10 for the Development of an Intersectoral Global Action Plan (IGAP) on Epilepsy and Other Neurological Disorders. 2022 – 2031.

BY KIMBERLY KARLSHOEJ ON BEHALF OF ALLA GUEKHT, WOLFGANG GRISOLD, SAM WIEBE, HELEN CROSS, JULIE HALL, MARTIN BRODIE, MARY SECCO, JO WILMHURST, MICHAEL BRAININ, CLAUDIA TRENKWALDER, DAVID DODICK, AND BILL CARROLL

It was a landmark event when on Nov. 12, 2020, the WHO Executive Board accepted the recommendation of the World Health Assembly (WHA) to adopt Resolution WHA73.10. This resolution called for the development of an Intersectoral Global Action Plan (IGAP) to tackle epilepsy and other neurological disorders through comprehensive actions to detect, prevent, care, treat, and rehabilitate people with epilepsy and other neurological disorders, as well as ensuring their social, economic, educational, and inclusion needs.

The WFN has long been involved with neurological activities with the WHO, which include a first edition of the Atlas: Country Resources for Neurological Disorders 2004, Neurological Disorders:

Public Health Challenges 2006 and the second edition of the Atlas: Country Resources for Neurological Disorders 2017, to mention a few. The resolution to develop an IGAP is also momentous in that neurological disorders are overtly recognized by the WHO Member States in line with the Global Burden of Neurological Disorders (2018) finding of them being the leading cause of disability-adjusted-life-years and the second leading cause of death.

The resolution is in large part due to the efforts of the International League Against Epilepsy (ILAE) and the International Bureau for Epilepsy (IBE) supported strongly by the WFN who, with several member states led by the Russian Ministry of Health, convinced the WHA that epilepsy was a public health emergency. In the lead up to Resolution WHA 73.10,



KIMBERLY KARLSHOEJ

member states recognized the burden of epilepsy and the synergies with many neurological conditions, especially access to both services and support for such conditions was insufficient, especially in low- and middle-income countries. The vote to address the problem with the call for the IGAP was unanimous. The WFN has a unique opportunity to contribute to the development of the IGAP.

As the first step, the WHO published a discussion paper. The WFN as a “non-state actor” (NSA) in official relations with WHO presented its comments on the draft discussion paper in both virtual and web-based consultations. To do this, the WFN first joined with the ILAE, IBE, and the International Child Neurology Association (ICNA) to formulate comments on epilepsy and other neurological disorders, both adult

and children, to match the intent of the IGAP draft discussion paper.

Second, the WFN formed a separate group with members of the Global Neurology Alliance (GNA) to advocate a stronger voice for neurological conditions. This group was selected by WFN President William Carroll to reflect the conditions that contributed most to the Global Burden of Neurological Disorders. The group comprised immediate past presidents of the International Headache Society (IHS: David Dodick), World Stroke Organization (WSO: Michael Brainin) and the current President of the Parkinson’s Disease and Movement Disorders Society (MDS: Claudia Trenkwalder) together with Alla Guekht, Wolfgang Grisold, and Kimberly Karlshoej from the WFN. Alla Guekht was indispensable in these meetings through her knowledge of the WHO. The WFN contributions to the

see UPDATE page 7

World Congress of Neurology XXV: It’s Here

The Rome World Congress of Neurology is upon us.

As we all know, this is our first virtual WCN.

Although not in Rome, it is significantly Rome-flavored. Attendees will enter the World Congress of Neurology through the colosseum. From the opening e-Spectacular of the Opening Ceremony, it is full of surprises. The mandatory welcome from the presidents of WCN, WFN, and SIN (Italian Neurology Society) recorded in one virtual room formed from green room studios in Milan and Perth is as realistic as if it were done in the one studio. The Opening Ceremony winds up with the outstanding singing



WILLIAM CARROLL, MD

voice of Maestro Andrea Bocelli, which he gave pro bono.

Welcome words offered by WCN President Antonio Federico praised those responsible for this virtual production, cited ancient, medieval, and recent Italian and Roman contributors to medicine and neurology. He also communicated an interpretation

of a letter of encouragement and hope from His Holiness, Pope Francis.

SIN President Gioacchino Tedeschi offered similar sentiments and acknowledged the enthusiastic support

for the WCN from members of SIN. My contribution as WFN president was to thank the Scientific Program and Teaching Course Committees and chairs for their outstanding program to be displayed over the ensuing five days.

I also welcomed the ground-breaking WHA 73.10 Resolution that will see the World Health Organization develop a Global Action Plan for Neurological Disorders, including Epilepsy, which is scheduled for completion by May 2022.

More than 4,000 registrants will join the World Congress of Neurology and hear 10 plenary lectures. They will choose from 77

see PRESIDENT’S COLUMN page 2

INSIDE

ESTIMATING SUBNATIONAL NEUROLOGICAL DISEASE BURDEN

PAGE 3

KINNIER WILSON AND THE EXTRAPYRAMIDAL SYSTEM

PAGE 4

BOOK REVIEW: ONE BY ONE BY ONE

PAGE 5

THE CONSTITUTION & BYLAWS COMMITTEE AND THE NEUROSONOLOGY SPECIALTY GROUP

PAGE 6



WORLD FEDERATION OF NEUROLOGY

Editors-in-Chief
Steven L. Lewis (Editor)
Walter Struhal (Co-editor)

WFN London Office
Chester House Fulham Green
81-83 Fulham High St., London SW6 3JA
United Kingdom
Tel.: +44 (0)20 3542 1657/1658
Fax: +44 (0)20 3 542 1301
info@wfneurology.org

WFN OFFICERS
President William Carroll (Australia)
First Vice President Ryuji Kaji (Japan)
Secretary General Wolfgang Grisold (Austria)
Treasurer Richard Stark (Australia)

ELECTED TRUSTEES
Morris Freedman (Canada)
Alla Guekht (Russia)
Steven L. Lewis (USA)

CO-OPTED TRUSTEE
Maged Abdel Naseer (Egypt)
Marianne de Visser (The Netherlands)

REGIONAL DIRECTORS
Maged Abdel Naseer (Pan-Arab)
Orly Avitzur (North America)
Claudio Bassetti (Europe)
Marco Tulio Medina (Latin America)
Beomseok Jeon (Asian-Oceania)
Foad Abd-Allah (Pan-Africa)

EDITOR OF THE JOURNAL OF THE NEUROLOGICAL SCIENCES
John England (USA)



WORLD NEUROLOGY, an official publication of the World Federation of Neurology, provides reports from the leadership of the WFN, its member societies, neurologists around the globe, and news from the cutting-edge of clinical neurology. Content for *World Neurology* is provided by the World Federation of Neurology and Ascend Integrated Media.

Disclaimer: Articles in *World Neurology* represent the authors' personal views and do not necessarily represent the opinions of the editors, trustees, or leadership of the World Federation of Neurology or the publisher. The World Federation of Neurology and Ascend Media will not assume responsibility for damages, loss, or claims of any kind arising from or related to the information contained in this publication, including any claims related to products, drugs, or services.

Editorial Correspondence: Send editorial correspondence to *World Neurology*, Dr. Lewis at Steven.L.Lewis@lvhn.org or Dr. Struhal at walter.struhal@akh.linz.at.

World Neurology, ISSN: 0899-9465, is published bimonthly by Ascend Media, 7171 W. 95th St., Suite 300, Overland Park, KS 66212
Phone +1-913-344-1300 Fax: +1-913-344-1497

©2021 World Federation of Neurology



PUBLISHING PARTNER
Ascend Media

President and CEO
Blair Johnson
Vice President of Content
Rhonda Wickham
Director of eMedia
Jena Brooks
Graphic Design
Tim Nord
Senior Project Director
Amanda Nevala

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 September/October 2021 issue of *World Neurology*. The issue begins with the President's column, where WFN President Prof. Bill Carroll discusses the upcoming WCN, opening within days of the publication, and the important role of the WCN in the WFN.

Next, Kimberly Karlshøj, WFN strategy and program director, and on behalf of multiple contributors, updates us on the Intersectoral Global Action Plan (IGAP) on Epilepsy and Other Neurological Disorders of the WHO.

Prof. Wolfgang Grisold provides another informative report on the WFN Committees and Specialty Groups, with



STEVEN L. LEWIS, MD



WALTER STRUHAL, MD

this issue's report providing us with an update on the Constitution & Bylaws Committee and the Neurosonology Specialty Group. Prof. Gagandeep Singh and colleagues then discuss their recent publication of the India State-Level Disease Burden Initiative, reporting on the trends of the burden of neurological diseases across the states of India from 1990 to 2019.

Dr. Imane Hajjaj, from Morocco,

provides us with a report of her successful and informative (pre-COVID-19) visit to Istanbul, Turkey, as part of the WFN Department Visit program. In this issue's History column, Prof. JMS Pearce discusses the development of the concept of the extrapyramidal system. Next, María Jimena Alemán, a medical student from Guatemala, reviews the book *One by One*, by Dr. Aaron Berkowitz, about the author's experience providing much-needed neurologic care in Haiti.

Finally, Dr. David Steinberg provides a heartfelt obituary, reprinted with permission from the *Journal of the Neurological Sciences*, on the life of Dr. George K. York III, neurologist and historian of neurology.

Thank you for your interest in *World Neurology*, and we look forward to "seeing" so many of you at the WCN2021, starting Oct. 3! •

IN MEMORIAM

George Kenneth York III

DAVID A. STEINBERG

George K. York III, neurologist, historian of neurology, and health care executive, died in Fiddletown, California, June 14, 2021, at the age of 70 after a protracted series of medical adversities.

York was a skilled clinician, world-renowned historian, creative writer, and expert in finance and audit. He was a concerned and empathetic physician who saw his clinical role primarily as a patient advocate.

His accomplishments in his parallel life as an academic historian of neurology included chairmanships of the history sections of the American Academy of Neurology and World Federation of Neurology, twice winner of the AAN's Lawrence McHenry Award, many invited international lectures, dozens of peer-reviewed publications, and memberships in the Royal Society of Medicine and Savile Club.

York's area of academic focus was the life and work of the founder of scientific neurology, John Hughlings Jackson, for which he was the acknowledged world's expert. His myriad academic accomplishments aside, York may have been most proud of his creative writing. His humorous commentary on health care issues and policies, called *The Termite*, was distributed every week for nearly 15 years to the Kaiser Medical Group.

He also was awarded the AAN's creative writing prize. Additionally, York was

blessed with a keen business acumen being a member of the AAN finance committee and chair of Kaiser's finance and audit committee for many years.

York was born in Palo Alto on Sept. 7, 1950, while his father was a graduate student at Stanford University and grew up in Davis, California. He attended college for a year at the University of San Francisco

and graduated from University of California, Riverside with a BS in chemistry.

While applying to medical schools, York did research in pulmonary physiology at the UC Davis Medical School and matriculated with the UC Davis Class of 1978. He did his internship in internal medicine at UCLA and completed his neurology residency at UC Davis.

After a research fellowship at UCSF, York opened a private practice in Placerville and Jackson in California's Gold Country. After two years, he was recruited to head the neurology department at Kaiser Stockton, and for nearly the rest of his clinical career, he was chair of the department and elected representative for Stockton on the Kaiser Board of Directors.

His intelligence, knowledge, incisive humor, and devotion to his friends and family will be sorely missed by all who knew him.

York is survived by his wife Pamela and his siblings, Judi Williams, Peter York, Jennifer Linzey, and Melissa Chase. •



This In Memoriam is reprinted with permission from the Journal of Neurological Sciences, June 2021.

PRESIDENT'S COLUMN

continued from page 1

scientific sessions and 45 teaching courses covering almost every aspect of modern neurology and delivered by 270 faculty. In addition, there will be a total of 31 sessions of free communications and six regional symposia. These will be available on the World Congress of Neurology website for three months after the Congress. Twenty-six teams of four neurologists will contest the Tournament of the Minds virtually. This has required appreciable innovation and care with the selection and incorporation of the questions to be answered by the contestants.

WFN medals and awards will be presented. These include the WFN Medal for Contribution to Neurology (Awardee: Prof. Jerry Mendell), the WFN Medal for Service to International Neurology (Awardee: Prof. Vladimir Hachinski) and the Munsat Award for Contribution to Education in Neurology offered by the AAN and WFN (Awardee: Prof. Erich Schmutzhard).

Two new WFN awards will be made. The inaugural recipients of the WFN Meritorious Service Awards are Keith Newton, BA (Hons), and Prof. Donna Bergen.

A World Congress of Neurology is a biennial event, and as such is two years in the making. A large number of people, committees, and meetings, combined with a unified purposeful intent are required. For the WFN, and to some extent for its professional conference organizer, Kenes International, the effort required was greater than usual.

All of those associated with the planning and implementation of this virtual XXV WCN wish all those attending an enjoyable, memorable, and above all, rewarding XXV WCN. On behalf of the WFN, I thank them for the outstanding product of their efforts. •

William Carroll
President, World Federation of Neurology

Estimating Subnational Neurological Disease Burden: A Worthwhile Mission

BY GAGANDEEP SINGH, MV PADMA, PRAMOD PAL, JEYARAJ PANDIAN, PN SYLAJA, SUVARNA ALLADI, AND LALIT DANDONA

The burden of neurological diseases as measured by disability adjusted life years (DALYs) and years of life lost is an invaluable piece of information for many. Among the many are health care policy makers, academic institutions, and neurological health care providers. The India State-Level Disease Burden Initiative recently published trends of the burden of neurological diseases across the states of India from 1990 to 2019¹.

India is seventh largest in terms of area among all countries in the world. It has a population of nearly 1.4 billion, second highest after China, and is slated to be the most populous nation in the world by 2025. The country is geographically divided into 28 states and eight union territories. The per capita gross domestic product of India is US\$ 2,100, with a ten-fold variation between the states and union territories. Arguably, therefore, considerable variation is expected in terms of socio-demographic standings, income, and cultural and ecological characteristics between the states of India. Inherent, e.g., genetic, differences are also likely to exist between different subpopulations within the country. Predictably, therefore, disease burdens including those of neurological disorders are likely to vary across the states.

The neurological diseases burden across the states of India, 1990-2019, not only underscores the geographical disparities across India but also the temporal trends in the burden of all neurological diseases combined and a range of neurological disorders¹. Overall, neurological disorders accounted for nearly a tenth of DALYs for all diseases

combined in India. This proportion increased somewhat between 1990 and 2019; from 8.3% to 9.9%. Remarkably, however, over the same time period, the point estimate of the contribution of non-communicable neurological disorders to DALYs from all causes increased from 4.0% to 8.2%, i.e., doubled.

As distinct from this trend, the proportion of communicable neurological disorders including meningitis, encephalitis and tetanus decreased from 4.1% to 1.1%, i.e., nearly four times. Aside from these two major subgroups of neurological disorders, the contribution of injury-related neurological disorders increased from 0.2% to 0.6%, representing a three-fold increase.

These data are testimony to the epidemiological transition taking place in the country. Over the decades since the Indian independence in 1947, it was assumed that communicable disorders, meaning thereby neurological infections, were the major predicament for Indian health care policy makers and care providers. This is changing and we need to be mindful of this evolution. The increase in injury related DALYs, likely a reflection of increasing use of vehicular transport, is also concerning as it is a largely preventable cause of enormous neurological morbidity and mortality.

The considerable variation in the neurological burden and of the incidence or prevalence and DALYs attributed thereof between the states of India is relevant as health is a state subject in India. Individual states, henceforth, need to prioritize their health care budgets, programmatic undertakings, and health care personnel training slots according to these data. The DALYs of communicable neurological disorders correlate

inversely and those of injury-related neurological disorders varied directly with socio-demographic development indices of various states, while there is no such correlation in the case of non-communicable disorders. Subnational or within-country variations in the neurological burden are perhaps relevant to low- and middle-income countries and among them, for the most part to countries with large land areas with multi-ethnic populations, for instance, India and China. In China, likewise, there are remarkable socio-demographic variations between the industrialized east and the agrarian west and these may plausibly impact disease burdens and health care.

How does the neurological disease burden data from India compare with global numbers and proportions? Globally, the top five neurological disorders in terms of proportional contribution are stroke, migraine, Alzheimer's and other dementias, meningitis, and epilepsy in that order². Distinct from this, the order in India is as follows: stroke, migraine, epilepsy, cerebral palsy, and encephalitis (Alzheimer's and other dementias and traumatic brain injuries closely follow encephalitis).

Encouraging to note, the incidence of, and age-standardized DALYs due to, stroke have somewhat declined between 1990 and 2019. This may reflect better preventative care implementation, leading to a reduced incidence and improved treatments in the form of specialist stroke units across the country. The age-standardized point estimates for the prevalence of epilepsies, cerebral palsy, Parkinson's disease, multiple sclerosis and motor neuron disease have increased markedly. This probably could be attributed to a closing diagnostic gap but also, in case of epilepsies and Parkinson's disease, increased longevity of the Indian population with time.

In comparison, the increase in prevalence for Alzheimer's and other dementias is relatively modest, indicating perhaps that a considerable diagnostic gap still exists for this disorder. Inconsistent with the increase in prevalence of epilepsies and Parkinson's disease, the age-standardized DALY rates attributed to these two neurological disorders have decreased over the past three decades. These surely signal progress in terms of closing the huge treatment gap and improved awareness for the two disorders.

Taken as a whole, the burden of neurological diseases across the states of India provides new information, which is both concerning and reassuring. These data call for a different level of preparedness to respond to the neurological disease burden in India. Moreover, the data call to attention subnational variations, and hence, should be a worthwhile exercise for neurological and epidemiological experts collectively in different nations constituting the membership of the World Federation of Neurology. •

References

1. India State-Level Disease Burden Initiative Neurological Disorders Collaborators. The burden of neurological disorders across the states of India: the Global Burden of Disease Study 1990-2019. *Lancet Glob Health*. 2021 Aug;9(8):e1129-e1144. doi: 10.1016/S2214-109X(21)00164-9.
2. GBD 2016 Neurology Collaborators. Global, regional, and national burden of neurological disorders, 1990-2016: a systematic analysis for the Global Burden of Disease Study 2016. *Lancet Neurol*. 2019 May;18(5):459-480. doi: 10.1016/S1474-4422(18)30499-X.

Gagandeep Singh, MD, DM, FAMS, FRCP is Professor & Head, Department of Neurology Dayanand Medical College Ludhiana, India & Hon. Assoc. Professor Department of Clinical & Experimental Epilepsy Institute of Neurology Queen Square, London.



GAGANDEEP SINGH

SAVE THE DATE
6 November 2021

WFN/AFAN e-Learning Day
Epilepsy Education Day

In association with

WORLD FEDERATION OF NEUROLOGY

AFAN

AMERICAN ACADEMY OF NEUROLOGY

ean

ILAE International League Against Epilepsy

HISTORY

Kinnier Wilson and the Extrapyramidal System: An ‘Unknown Centrifugal Pathway’

BY JMS PEARCE MD, FRCP

In his *De Humani Corporis Fabrica* (1543), anatomically Andreas Vesalius distinguished the subcortical nuclei of the corpus striatum from the cortex and white matter, but he neither named them nor suggested their possible functions.

and its efferent tracts, in 1870. David Ferrier’s (1843-1928) classical ablation/stimulation experiments extended the results of Fritsch and Hitzig. He showed that Faradic stimulation of the cerebral cortex could produce movements and fits, and that cerebral functions were localized in definable discrete areas, which he mapped as sensory and motor across several species, thus defining cerebral localization. Carpenter in 1874 ranked Ferrier’s cerebral localization “among the greatest advances in the physiology of the nervous system made in the last 50 years.”

As a concept, the extrapyramidal system (EPS) was first conceived indirectly by Johann Prus (of Lemberg, Galicia, now Lviv, Ukraine) in 1898. He discovered that experimental lesions in the pyramidal tracts failed to control induced cortical epilepsy. He unilaterally transected the pyramidal tract in dogs at the levels of the internal capsule, midbrain, pons, and medulla, and noted:

“Bilateral epileptic seizures occurred on stimulation of the cerebral cortex, on the same as well as the side opposite the operation... To explain the results of my experiments I had to assume that there is in the dog either bilaterally innervation in the cortex, and that excitation spreads to the other hemisphere by means of the commissure fibres when the pyramidal tract has been cut, or that *in this case conduction of cortical epilepsy takes place by means of a so far unknown centrifugal, i.e., motor pathway* (Italics by JMSP).”

He deduced the presence of an unknown centrifugal motor pathway. But it was Samuel Kinnier Alexander Wilson (1878-1937) who was first to use the term “extrapyramidal” in its modern sense. His term extrapyramidal was adopted to distinguish between the clinical effects produced by damage of the basal nuclear tracts and those caused by damage to the classic pyramidal pathway.

In his 1912 classic paper *Progressive Lenticular Degeneration* (Wilson’s disease), he described the autopsy of three patients with this disease where he observed pathology outside the pyramidal system and named them extrapyramidal tracts:

“In spite of the great degree of motor weakness and helplessness, in a pure case [of hepatolenticular degeneration] the abdominal reflexes are preserved and a double flexor response is obtained. ... the problem lay outside of the pyramidal system, “ in other words, this affection, where it occurs in an uncomplicated form, is an extrapyramidal motor disease. ... To distinguish these apparently motor pathways from pyramidal and pontine tracts we shall call them extrapyramidal tracts.”

Although he failed to define specific tracts anatomically, this was the first use of the term “extrapyramidal” in neurology literature. In this era, several others inferred a motor role for areas outside the pyramidal tract. (See Table 1.) The Swiss neurologist (of Russian descent) Constantin von Monakow (1853-1930) delineated a rubrospinal tract and the Austrian neuropsychiatrist Baron Constantin von Economo (1876-1931) proposed that the substantia nigra was involved with motor control of chewing and swallowing; lesions of the substantia nigra and red nucleus of cats and monkeys induced choreoathetosis. The Russian neurologist Vladimir Bechterew (1857-1927) stimulated the substantia nigra in dogs and noted swallowing, changes in respiration, ocular and pupillary changes, and contraction of neck muscles.⁹

Before Wilson’s paper, the confusion about sites of pathology in the several extrapyramidal disorders is evident in James Parkinson’s (1755-1824) account of the disease he discovered in 1817; he mistakenly guessed it originated in the “medulla spinalis.” The pathology was then unknown, but in 1894 while studying paralysis agitans, Hermann Oppenheim (1858-1919), the foremost Berlin clinical neurologist, provided sufficient clinical evidence to establish the duality of motor control, and to infer the existence of both pyramidal and extrapyramidal tracts in motor function. He wrote:

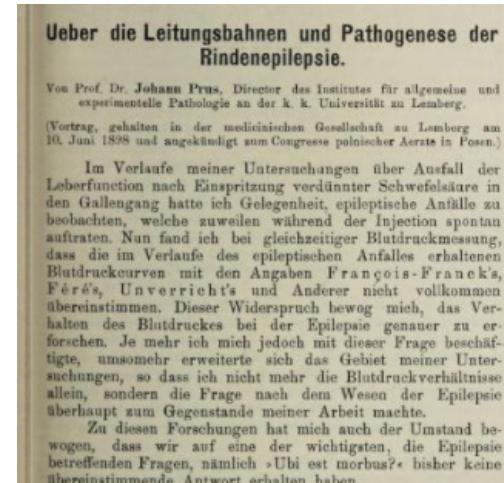
“Resistance to passive motion is always present in the later stages, and often before that time. It differs from spastic rigidity [of pyramidal tract disorders] in that it is not increased by passive motion, but is constant and regular . . .”

William Alexander Hammond (1828-1900), a founder of American Neurology in *A treatise on diseases of the nervous system* of 1871 recognized athetosis and suggested: “One probable seat of the morbid process is the corpus striatum.” The Austrian neuropsychiatrist Gabriel Anton (1858-1933) in 1896 indicated the basal nuclei could cause a motor disorder when in childhood double athetosis he reported hypermyelinated lesions in the putamen, later named *état marbré*,

Wilson’s long classic paper¹¹ pointed out that the EPS (extrapyramidal system) had a “steadying” influence on the anterior horn cells:

“the relation of the corpus striatum (basal ganglia) to the rest of the motor system is one of tone control, and of steadiness of innervation. . . . Remove its influence by disease, [then] tonic postures become overemphasized.”

His view of dual motor function, pyramidal and extrapyramidal, was



Prus's 1898 publication in the Wiener klinische Wochenschrift

quickly and widely accepted.

Extrapyramidal Disease

The term extrapyramidal disease now refers to a group of motor disorders associated with pathological alterations in the basal grey matter whose function is predominantly motor. Clinically, extrapyramidal disorders consist of one or a combination of the following phenomena:

1. abnormal involuntary movements
2. changes in tone of skeletal muscles with an increase or decrease in resistance to passive motion
3. poverty or excess of movement
4. alteration of automatic movements.

The two motor systems are linked both anatomically and functionally with extensive feedback loops.

Anatomically, the striatal EPS is polysynaptic and consists of nuclei and fibre tracts that receives projections from the cerebral cortex and sends efferent

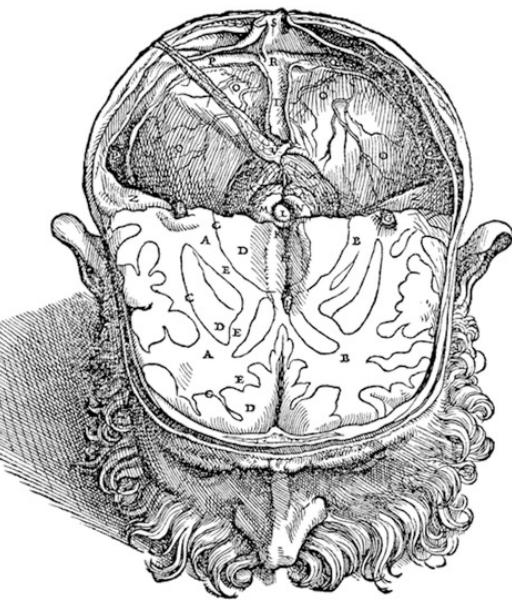


Plate VII, Book VII, Vesalius’s ‘De Fabrica’ from https://www.researchgate.net/figure/Andreas-Vesalius-depiction-of-the-basal-ganglia-This-reproduction-of-plate-VII-of-book_fig1_276048418

The corpus striatum was named by Thomas Willis (1621-1675), (whose birth quatercentenary we celebrate this year) in *Cerebri Anatome* (1664). He believed it was the source of motor functions, a view that persisted for almost 200 years.

The German anatomist and physiologist Karl Friedrich Burdach (1776-1847) provided more anatomical detail, but he had little idea about function, believing that the basal nuclei were responsible for sensory perception and consciousness. However, he differentiated the caudate nucleus (Streifenhügel) from the putamen (Schale). He also identified the substantia nigra (schwarzgraue), and the pale inner part of the lentiform nucleus that he called globus pallidus.

Before 1870, the motor function of the corticospinal pyramidal tract and the existence of an extrapyramidal system were not understood. The brain was simply the organ of consciousness, memory, and intelligence. The cortex was not known either to control or initiate motor function, not least because anatomists had not clearly delineated the anatomy or the physiology of the several descending tracts.

Electrophysiologically, Gustav Fritsch (1838-1927) and Eduard Hitzig (1838-1907) first showed the role of the pyramidal system, i.e. the motor cortex

Book Review: One by One by One

Aaron Berkowitz, MD, PhD

MARÍA JIMENA ALEMÁN

Over this past year, we have all come to wonder what we can do to make a difference in the face of problems that seem so overwhelming. When we think about the scope of the pandemic and other global health issues, the devastating numbers are heart breaking, and it's easy to lose sight of the individual people and stories behind the statistics. In Aaron Berkowitz's new book, "One by One by One," he shares with us the lessons he learned as he tried to make a small difference by helping one individual at a time amid suffering measured in billions.

As a young neurologist, Berkowitz travels with the NGO Partners in Health to Haiti. After the earthquake in 2010, Partners in Health had built the largest solar-powered hospital in a low-income country anywhere in the world as part of their mission to "bring the benefits of modern medical science to those most in need of them and to serve as an antidote to despair."¹

Aspiring to live up to these words, Berkowitz is eager to help his colleagues

in Haiti, who inspire him with their incredible devotion to caring for their patients under the most challenging circumstances. Through the book, we learn about the dire consequences of life and medical care in Haiti. Although Berkowitz was one of 100 neurologists at the Brigham and Women's Hospital in Boston, in Haiti, there was one neurologist for more than 10 million citizens.

There, he meets Janel, a 23-year-old man with the largest brain tumor he had ever seen. Working against impossible odds, Berkowitz tries to save Janel's life by arranging for him to have brain surgery back in Boston. As new challenges and unexpected events arise, we learn not only about Janel's journey, but also about Berkowitz's struggle to find the courage to do what is right despite many adversities.

"One by One by One" is a story of juxtapositions. Big problems and bigger ideals. Poverty and abundance. Naivete and hope. Triumphs and failures. Through a humble and honest view of global health inequities, Berkowitz takes us onto the front lines of working in global

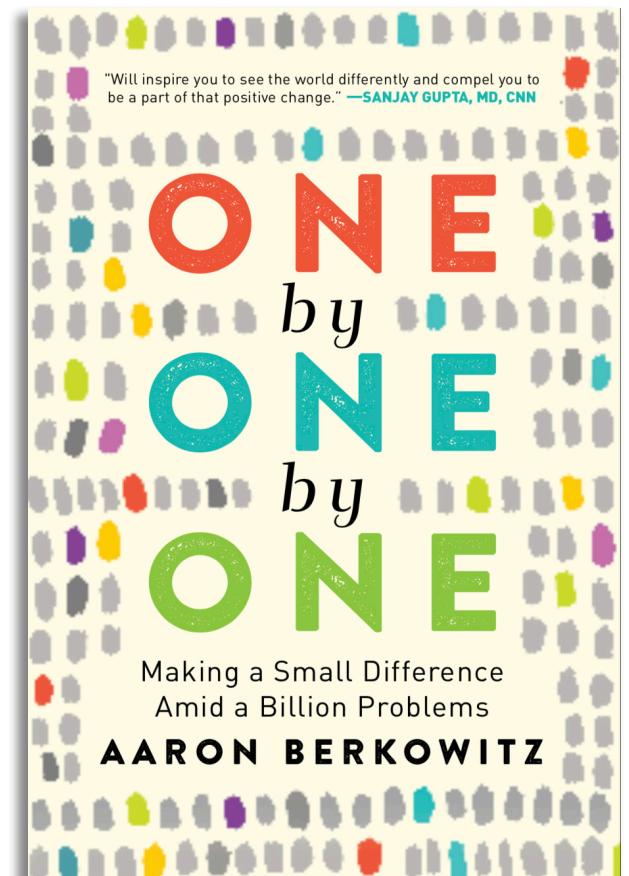
neurology from the field's life changing possibilities to its complex challenges. While he provides more questions than answers, his insightful and thought-provoking reflections on ethical dilemmas will widen your view of the world.

This story is set to become a favorite for readers who admire the work of Atul Gawande and Oliver Sacks. Filled with inspiring and humorous passages, it is a book that is as enjoyable as educational.

Written with moving and powerful Haitian Creole proverbs, such as *men anpil chay pa lou* (many hands make the burden lighter) and *tout moun se moun* (every person is a person), this story's teachings will undoubtedly resonate with you long after you've put the book down. •



MARÍA JIMENA ALEMÁN



Will inspire you to see the world differently and compel you to be a part of that positive change." —SANJAY GUPTA, MD, CNN

ONE
by
ONE
by
ONE

Making a Small Difference
Amid a Billion Problems
AARON BERKOWITZ

References

Our Mission at PIH. Partners In Health. (n.d.). <https://www.pih.org/our-mission>.

María Jimena Alemán is currently a medical student at Universidad Francisco Marroquín in Guatemala. She is interested in global neurology and health equity.

HISTORY

continued from page 4

subcortical pathways to the brainstem and cord. Extrapyramidal structures comprise the cerebellum, basal nuclei including the neostriatum — subcortical caudate nucleus and the putamen nuclei — plus the substantia nigra, red nucleus, and the subthalamic nucleus of Luys. From them

and substantia nigra. GABAergic in function, they are of several subtypes, and contain dopamine receptors and cholinergic and GABAergic interneurons. Both pyramidal and extrapyramidal systems project in the descending white matter tracts. (See Table 1.)

The extrapyramidal motor disorders are well recognized in basal nuclear diseases. They include Parkinson

disease, Huntington chorea, Sydenham chorea, multiple system atrophy, torsion dystonias, and progressive supranuclear palsy. Altered posture and tone generally accompany involuntary movements, both bradykinetic and hyperkinetic — recognizable as tics, tremors, myoclonus, ballistic movements, chorea, and athetosis. They often

show clinically characteristic individual patterns.

Exhaustive classifications (ICD-10 codes G20-G26 Chapter VI): contain 38 pages that include: acute dystonic reactions, blepharospasm, neuroleptic malignant syndrome, oculogyric crises, akathisia, drug-induced Parkinsonism, and various dyskinesias. •

JMS Pearce MD, FRCP, is Emeritus Consultant Neurologist at the Department of Neurology, Hull Royal Infirmary. E-mail: jms.pearce@me.com

References

- Parent A. The History of the Basal Ganglia: The Contribution of Karl Friedrich Burdach. *Neuroscience & Medicine* 2012;03: 374-379. 10.4236/nm.2012.34046.
- Quatercentenary of Thomas Willis's birth — Department of Physiology, Anatomy and Genetics (DPAG) (ox.ac.uk)
- Burdach KF. Vom Baue und Leben des Gehirns (Of Structure and Life of the Brain);1819 -1826. cited by Parent1
- Lanska DJ. Early Controversies over Athetosis: I. Clinical Features, Differentiation from other Movement Disorders, Associated Conditions, and Pathology. *Tremor Other Hyperkinet Mov (N Y)*. 2013;3:tre-03-132-2918-1.
- Pearce JMS. Sir David Ferrier MD, FRS. *J Neurol Neurosurg Psychiatry*. 2003 Jun;74(6):787.
- Ferrier D. The Functions of the Brain. London: Smith, Elder, 1876, pp. 163-196. [dedicated to Hughlings Jackson.]
- Carpenter W. On the Physiological Import of Dr. Ferrier's Experimental Investigations into the Functions of the Brain, *West Riding Lunatic Asylum Med Reports* 1874; 4: 1-23.
- Prus J. Ueber die Leitungsbahnen und Pathogenese der Rindenepilepsie [Pathways and pathogenesis of cortical epilepsy] *Wiener Klinische Wochenschrift*, 11 (1898), pp. 857-863 (Annotated translation by Willner & Kennard, 1948
- Louis ED. The Origins of the Term "Extrapyramidal" within the Context of Late Nineteenth- and Early Twentieth-Century Neurology, *Neurophysiology and Neuropathology. The Journal of the History of Medicine and Allied Sciences*, 1993. pp. 68-79
- Lee J, Muzio MR. Neuroanatomy, Extrapyramidal System. In: *StatPearls*. StatPearls Publishing, Treasure Island (FL); 2020.
- Wilson S.A.K., Progressive lenticular degeneration: A familial nervous disease associated with cirrhosis of the liver. *Brain*, 1912, 34, 296-509.
- von Monakow C. Der rote Kern, die Haube und die Regio hypothalamica bei einigen Säugetieren und beim Menschen. *Arb. Hirnanat, Inst. Zurich*, 1909, 3, 49—267.
- von Economo C J. Zur Physiologie und Anatomie des mittelhirns. *Arch. Psychiat. Nervenkr* 1910; 46, 275-356;
- Schiller F. The Vicissitudes Of The Basal Ganglia (Further Landmarks in Cerebral Nomenclature). *Bulletin of the History of Medicine* 1967;41:515-538.
- Oppenheim H. *Lehrbuch der Nervenkrankheiten*. Berlin S. Karger 1894. translated 2nd edn : *Textbook of Nervous Disease*. New York, G. E. Steckert, 1911.
- F. H. McDowd and J. M. Cedarbaum, in *Clinical Neurology*, eds. A. B. Baker and R. J. Joynt (Philadelphia:). B. Lippincott Company, 1990), pp. 1-97.
- Goetz T, Arslan A, Wisden W, Wulff P. GABA(A) receptors: structure and function in the basal ganglia. *Prog Brain Res*. 2007;160:21-41.
- Lanska DJ. Nhe history of movement disorders. *Handbook Clinical Neurology*. Chapter 33. 2010;95:501-46.

Table 1. DESCENDING WHITE MATTER TRACTS

Table 1. DESCENDING WHITE MATTER TRACTS		
PYRAMIDAL	Corticospinal	
	Corticobulbar	
EXTRAPYRAMIDAL	Basal Ganglia	
	Tectospinal	
	Rubrospinal	
	Reticulospinal	medial lateral
	Vestibulospinal	

arise subcortical extrapyramidal tracts that terminate in the spinal cord. The Tectospinal, rubrospinal, reticulospinal, and vestibulospinal tracts were described within the two decades 1890-1910.

Functionally, the EPS maintains posture and regulates involuntary postural tone and movement. It also has a role in behaviour, learning and cognition. Medium spiny neurons are the principal neurons of the striatum. They are the efferent cells, projecting to both segments of the globus pallidus, ventral pallidum,

WFN COMMITTEES AND SPECIALTY GROUPS

The WFN Inside, Continued: The Constitution & Bylaws Committee and the Neurosonology Specialty Group

WOLFGANG GRISOLD

In this issue, we will introduce the Constitution & Bylaws Committee, chaired by Anna Hege Aamodt

WOLFGANG
GRISOLD

(Norway). This committee ensures that the constitution and bylaws are correct and updated. Conversely, the trustees, often as requested by members, consider to implement changes, which are first scrutinized by this committee for feasibility

and practicalities before they are up for voting.

From the WFN Specialty groups, Prof. Kurt Niederkorn will report on the activities of the Neurosonology Specialty Group.

Anne Hege Aamodt is the chief physician at the Headache Clinic and senior consultant at the Stroke Unit at Oslo University Hospital, Norway. She has a broad interest in cerebrovascular and headache research and is the coordinating investigator of several international and national trials. She has organizational leadership, experience in national and international scientific organizations, and was the president of the Norwegian Neurological Association from 2014-2021.

WORLD FEDERATION OF NEUROLOGY, Constitution and Bylaws Committee

The Constitution and By-Laws Committee has members representing all regions. Anne Hege Aamodt is the chair of the committee, representing Europe and Norway. Akram Al-Mahdawi (Iraq) and Hani Aref Pan Arab (Egypt) represent the Pan Arab region, Gagandeep Singh (India) represents Asia-Oceania, Terrence Cascino from USA is represents North America, Fernando Gracia (Panama) represents Latin America, and Thérèse Sonan from Ivory Coast represent Africa.

With the representatives from the different regions, the bylaws committee



Anne Hege Aamodt

is well-prepared to work with its main tasks helping the Trustees with the evaluation of proposals for the revision and improvement of the bylaws. The committee aims at providing adaptation and improvement to improve the structure and the function of the Federation. Changes in the bylaws have to be carefully considered by the committee, before voted on by the Council of Delegates after discussion of a resolution presented by the Trustees.

The other task of the committee is to review and discuss any inquiry into matters pertaining to the organisation and functioning of the Federation, to help the Trustees with decisions in such matters.

The committee has been supporting the president with advice regarding the electronic voting. Electronic voting was planned before the pandemics to aid the number of people involved in making important decisions when it is not possible to meet physically.

Other points were the discussion of changing the Articles of Association to include a role for the immediate past president to ensure continuity and the length of time this would be required for. The conclusion of the committee was that this statutory position is not needed. Furthermore, the appointment of a non-executive trustee to comply with the rules of the charity commission

has been discussed, such as including people from other fields and to increase the breadth of knowledge and opinion. For instance, a lawyer, an economist, or a patient advocate has been discussed. Adding board members puts an additional strain on the WFN finances. However, we recommend that additional board member(s) advisors could be brought in as and when necessary.

For the time being, the committee is working on Standard Operating Procedures that outline areas of responsibly with updated charges, aims, and a protocol.

WFN Neurosonology Specialty Group

For the WFN Specialty groups, Prof. Niederkorn was so kind summarize the impressive activities of the WFN Neurosonology Specialty Group.

Prof. Kurt Niederkorn has been the Chairman of the Neurosonology Specialty Group/WFN since 2019. He has a long experience with neuro ultrasound, and has organized national (Austria) and international courses. He was the secretary of the Neurosonology Research Group/WFN 1993-2001. He works at Graz University, is a professor of Neurology since 1996 and was the vice chair until 2013 of the Dept. of Neurology Graz, Austria. From 2001-2019 he was the head of the Stroke Unit and Stroke Outpatient Service and Neurosonology Lab at the university clinic in Graz

The Specialty Group has a large membership, which can be found on the WCN website.

The Specialty Group was founded in 1977 and endorsed by the WFN in 1981. It is chaired by Kurt Niederkorn and its purpose is the promotion of science and research as well as education and training in the field of ultrasonic techniques (brain vessels and parenchyma and muscle, nerve). This has been a growing and expanding field and modern diagnostics of stroke need ultrasound equipment. In addition, the group also fosters the development of nerve and muscle



Kurt Niederkorn

ultrasound.

The Specialty Group organizes biannual meetings (2011 Beijing, 2013 Sofia, 2015 Chile, 4/2019 Linz/Austria- Joint meeting with ESNCH, around 300 participants); for 11/2022 a meeting is planned in Korea.

The Specialty Group organizes and co-sponsors international teaching courses and workshops (2014 Lima, 2015 Georgia, 2019 Kazakhstan).

The International Certification in Neurosonology (GM v Reutern/E. Bartels/S Horner, in cooperation with ESNCH) worldwide has been successfully passed by 180 applicants.

Presently, it has 415 members from 50 countries who contribute Euro 25/year for the society. The Specialty Group is constituted from different Chapters: Asia, Latin America, Bulgaria and Georgia.

It has a homepage at <https://www.nsr.org.net> (Content: meetings information and links, guidelines and recommendations). Applications for membership can be made to : alexander.razumovsky@specialtycare.net.

Both the Committees and the Specialty Groups contribute to the vital functions of the WFN.

For each issue of World Neurology, we will continue to introduce a WFN Committee and a Specialty Group. •

Wolfgang Grisold is Secretary-General of the WFN.



WORLD FEDERATION OF NEUROLOGY

<https://wfneurology.org/>



WFN DEPARTMENT VISIT REPORT

Report of Istanbul, Turkey Department Visit

BY DR. IMANE HAJJAJ

I was reading a regular newsletter from World Federation of Neurology, when I saw the announcement of “The Department Visit.” It stated that it was a one-month long visit, which suited me since it wasn’t possible for me to stay away from my country more than this period. Therefore, I decided to participate in and subsequently applied for the Turkey offer.

The choice included four cities (Istanbul, Konya, Ankara, and Izmir). All of these cities were interesting, although I had a preference for Istanbul.

My first objective for applying for this grant was to see how a neurology department looks like outside my country and see the difference concerning organization, systems, and logistics of the care of the neurological patient. Second, I was interested in having an idea about the most frequent diseases and their treatments. I had the answer, and it was a positive one. I booked my flight, and I went to Istanbul. Yes. It was the city I chose. My visit occurred from Dec. 10, 2019, to Jan. 8, 2020.

My accommodations were a 3-minute walk from my hotel to the “Cerrahpaşa Tıp Fakültesi” hospital. On the first day, I met the head of the neurology department, Prof. Sabahattin Saip, who welcomed me and told me that the hospital experienced some damage from a new earthquake, and they were obliged to build a temporary neurology department. Hence, it was a transition period. Then, I met the smiling and nice Prof. Derya Uluduz. With her, I saw for the first time a Doppler embolic shower. On the same first day, I met Prof. Melih Tütüncü and Prof. Aksel Silva. I assisted them at outpatient (poliklinik). It was a rich set of outpatient cases: CADASIL, MS, neurosarcoidosis, Fabry, Behcet, Lyme, spastic paraparesis, among others.

Neurology consultations (poliklinik

noroloji) are specialized. There are rooms devoted to MS, dementia, abnormal movements, neuropaediatrics, stroke, peripheral nerves, and others. The consultation rooms have computers with intranet and internet, and the neurologists often use them to fill in the patients’ files, do research and see the MRI images.

I spent most of the time of my traineeship between neuropaediatric outpatient and EEGs of children. During the child video-EEG lecture, discussions were rewarding and fruitful between neurology residents. Prof. Ahmet Veysi, Demirbilek and us saw many

types of seizures (interesting and rich bank of seizure types). Many times before giving the EEG report to a patient, we met the patient’s parents, and we obtained more information about his/her history and evolution under treatment. I noticed that there were many patients under treatment for years even if they were free of seizures. Moreover, Prof. Veysi loved to keep contact with his patients even when they grew up and were more than 16 years old and had to go to adult outpatient. In neuropaediatric consultation, more cases were of epilepsy and genetic disorders.

Other interesting outpatients included multiple sclerosis and other white matter disorders (with Prof. Silva and Prof. Melih). Many cases required reflection and discussion between these two teachers and sometimes the consultations ended around 7 p.m. The choice of MS medications is wide, the switch is often easy, and the MRIs are easy to perform on a regular basis. What I appreciated was the use of the CDs to see the images of the MRI (or on their smartphones). It was exceptional to see a patient bringing pictures with them, and on the other hand, we found with them their files containing their blood tests and medical reports.

I also attended the performance of EMGs with residents and attached



IMANE HAJJAJ



Photo taken on my last day in the neurology department (Istanbul). From left to right: Prof. Derya Uluduz (neurologist), Dr. Imane Hajjaj (author, neurologist), Dr. Zeynep Ece Kaya (resident in neurology), and Prof. Sabahattin Saip (head of neurology department).

neurologists. I appreciated the fact that they give sheets where we explain to patients what an EMG is and how to prepare it.

What drew my attention most was that the patients who brought self-adhesive labels containing their insurance code and their names, and doctors put this label on prescriptions and vouchers for checkups and imagery.

I had the opportunity to visit the neurology department side of the hospital, which was relocated because of the earthquake to the radiology and neurosurgery building. There was one patient per room and was accompanied by a family member. The room was adequately equipped with everything related to a neurological patient.

One of the things that I liked and appreciated was the daily midday meeting. It is a moment of meeting of all the neurological medical team (professors, attached neurologists, residents in neurology) that takes place from 12:30 p.m. to 1:30 p.m., and it is a time to have lunch as well. (It is often offered by the service but the doctors can bring their own lunches with them.) The team meets again to make a presentation, or discuss a clinical case or MRI image. Sometimes the team brings back a patient who describes his/her illness, and the doctors ask him/her questions, try to discuss the case,

make the right diagnosis, and offer the adequate therapy.

There is a beautiful atmosphere between residents, teachers, and paramedics. The entire department of neurology celebrated the New Year 2020 with a rich and varied buffet and a large cake. Another day, residents prepared a surprise for their teacher on the occasion of his birthday. Patients offer their doctors gifts to show their recognition and satisfaction. I thought I would have a language problem, but I met professors and residents who speak English or even French and who found it easy to translate and explain the cases of the patients to me.

My last day with the neurology team was focused on an article in English, and the discussion was rich and addressed the social and human side of medical practice.

My stay in Istanbul was an enriching experience for me, and I find that a month is a short period, but it is quite enough to have an idea about the functioning of a neurology service. Many thanks go to all Turkish neurologists I met. Thank you to the Turkish Society of Neurology and to the World Federation of Neurology, and a special thought to Burak Tokdemir and Miray Atacan. •

Dr. Imane Hajjaj is a neurologist in Agadir City, Morocco.

UPDATE

continued from page 1

WHO discussion plan were made jointly with the ILAE, IBE, and ICNA and jointly with the WSO, MDS, and IHS.

As social, biological, and environmental determinants mediate all experience, including responses to stress, and impact on brain development and brain health from pre-conception to end-of-life, the WFN emphasized in its submission the need for countries to prioritize brain health in their policies. New strategies for both brain health promotion and disease prevention across the life course need to be implemented at national levels.

Addressing the costs of health care, and reducing the current treatments gaps, especially in low resource settings was also emphasized.

Finally, the WFN stressed the importance of addressing stigma, exclusion, and discrimination of people with neurological disorders in its submission.

These general comments as well as many specific ones on the discussion paper were submitted to the WHO April 10 and were published with the other submissions as consolidated comments by WHO. The WHO then developed the first draft of the Intersectoral global action plan on epilepsy and other neurological disorders (IGAP) based on the input received. This

document outlines the scope, vision, goal, and strategic objectives as well as specific actions for Member States, the WHO Secretaria, and international and national partners.

Further consultation on this draft document began during July 2021, and the WFN worked with the same two groups: first, the ILAE and ICNA, and second, the WSO, IHS, and MDS. Central to these submissions was to make the first draft more evenly balanced in its intent. Instead of recommending epilepsy as the entry point for all interventions in the implementation of IGAP, essentially a hierarchical approach, the WFN joint submissions recommended that

implementation be undertaken with prioritisation determined by member states as either epilepsy with neurological disorder(s), neurological disorder(s) alone, or epilepsy alone depending on the member states needs and abilities. The WFN and its partners remained fully supportive of the need for a specific global action plan for epilepsy within IGAP. The outcomes of these consultations will serve as input for the WHO Secretariat to prepare a revised draft of IGAP that will be submitted for review at the 150th session of the Executive Board in May 2022. •

Kimberly Karlshoej is strategy and program director for the WFN.



WORLD FEDERATION
OF NEUROLOGY

IN PARTNERSHIP WITH

Sin
SOCIETÀ ITALIANA
DI NEUROLOGIA

WCN 2021

XXV WORLD CONGRESS
OF NEUROLOGY

VIRTUAL

OCTOBER 3-7, 2021

EARN 35
CME CREDITS

Inspired by
the past to build
the future of
Neurology



2021.wcn-neurology.com | [#WCN2021](https://twitter.com/WCN2021)