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COVID-19: A Neurologist's Perspective

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BY AVINDRA NATH AND B. JEANNE BILLIOUX

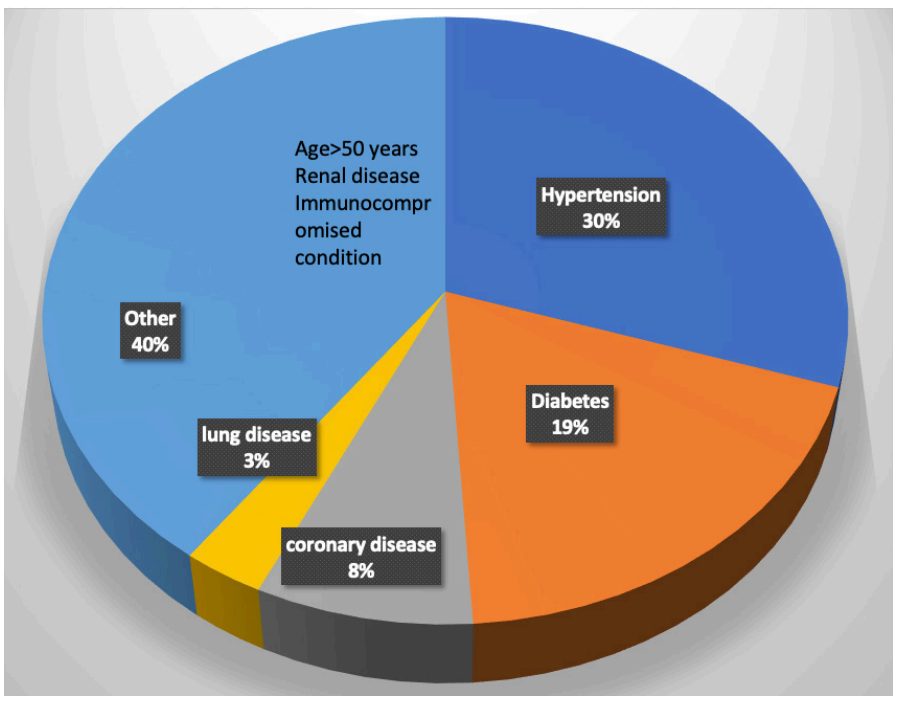

Figure 1. Distribution of comorbidities in patients requiring inpatient care due to COVID-19.

The crisis we are currently facing is unprecedented in every way. Just a few months ago, we were talking about developing targeted gene therapies for a spectrum of diseases, including ultrarare diseases. Only a few weeks later, the health care system finds itself overburdened and undersupplied to the point where we are talking about rationing health care[1]. Maintenance care has been pushed to telemedicine clinics and elective procedures have ground to a halt. Many patients sick with respiratory symptoms are being sent home to isolate themselves, and some are dying at home. There is an acute shortage of ventilators to the point that in some hospitals one ventilator is being shared by multiple patients[2]. Several basic medicines are in limited supply. Although many hospitals and institutions recognized the need to stockpile personal protective equipment, several hospitals have run out of masks and gowns due to a limited supply chain. This crisis has tested community-based ingenuity, and in some hospitals, personal protective equipment is being fashioned by staff and community volunteers out of plastic visors and trash bags. Many doctors on the front line have succumbed to the infection, and many others are quarantined, a sobering reminder of these dire circumstances. The words here just a few months prior would read as a work of fiction, but this is the unfortunate reality of the crisis we face – COVID-19. Nearly every country and every major city in the world has been affected by the infection. On April 12 alone, there were over 10,000 new infections and nearly 1,000 deaths in a single day in New York. What started in Wuhan in November 2019 has become a global pandemic necessitating drastic changes in our way of life.

About COVID-19

COVID-19 is caused by the virus SARS-CoV2, a single-stranded RNA virus. Merely 60 nm in size, the virus that can only be visualized by an electron microscope has caused massive devastation. Although many pandemics have occurred in the past several decades, SARS-CoV2 has an array of features that have made it incredibly effective in spreading through the population. Perhaps the most important among these features is that asymptomatic and pre-symptomatic hosts can spread it.

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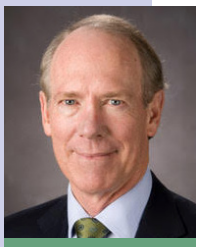
PRESIDENT'S COLUMN

It's All About COVID-19



WILLIAM CARROLL, MD

This is the most important event in the last century. Arguably, aside from the tragic loss of life, the widespread and virtually simultaneous shutdown of global and regional economies, and the restriction of individual movements and travel with the enforcement of social distancing has no precedent. Wars, nuclear bombs, AIDS, global financial crises, and the threat of global warming have not done so much, so rapidly, to so many. Countries, governments, peoples, and individuals are all learning, some the hard way, that without methods to prevent the mutation of new zoonotic viruses and vaccines to combat them, public health measures are all we have to reduce the toll of human lives and the economic consequences which, in turn, also impact human life and livelihoods. The constraints effected

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FROM THE EDITORS

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

STEVEN L. LEWIS, MD

WALTER STRUHAL, MD

We would like to welcome all neurologists from around the globe to this issue of World Neurology, and at the start would like to again wish you, your families, and your patients all the best of health and safety at this time.

Much of this issue is devoted to an update on COVID-19. We are honored that the cover story on this issue is written by Drs. Avindra Nath and B. Jeanne Billioux from the Section of Infections of the Nervous System at the United States National Institute of Neurological Disorders and Stroke (NINDS). They provide an up-to-the moment summary of the evolving knowledge about the interface of COVID-19 on neurology and our patients. In the President's column, Dr. William Carroll reminds us of the importance of the pandemic on our patients and the role the WFN plays in, among other important aspects, advocating for maintaining the highest standard of care for neurological patients worldwide. Dr. Carroll also updates us on the enhancements to the WFN website as a clearinghouse for accurate and up-to-date information about neurological involvement in COVID-19 as well as its effects on neurological societies and neurological patients and services worldwide.

Dr. John England, editor-in-chief of the *Journal of Neurological Sciences* (JNS), provides his Editor's Update on the journal, informing us of the efforts to invite and expeditiously publish the accepted papers in JNS relating to the neurological aspects of COVID-19. This issue also features an obituary, reprinted from JNS, of Prof. Alberto Portera-Sánchez, a pioneer of Spanish neurology and former vice president of the WFN, along with additional heartfelt words from Vladamir Hachinski, former president of the WFN.

Drs. Tissa Wijeratne, Claudia Trenkwalder, president of the International Parkinson and Movement Disorders Society (IPMDS), Wolfgang Grisold, and Dr. Carroll, announce and update us on the efforts and ongoing plans for this year's World Brain Day. This year's World Brain Day focuses on ending Parkinson's disease as a collaborative effort between the WFN and the IPMDS. Drs. Dafin Muresanu, Selevan Ovidiu, Cristian Andriescu, and Stefan Strilciuc, describe the history of neurological meetings in Transylvania, particularly the annual international events organized by the Society for the Study of Neuroprotection and Neuroplasticity (SSNN).

With this issue, we are also pleased to introduce a new column, written by WFN Secretary-General Wolfgang Grisold, who will update us with each issue about the many Committees of the WFN and their critical roles, beginning with the Standards and Evaluation Committee.

This issue also features a number of reports from the recipients of Junior Traveling Fellowships (JTFs) to attend the World Congress of Neurology (WCN) in October 2019 in Dubai, United Arab Emirates. These heartfelt reports are reminders of the wonderful "in person" congress that so recently occurred (and yet now seems so distant for many reasons). Equally importantly, these reports serve as a reminder of the upcoming WCN 2021 we are so actively planning and looking forward to attending in Rome, Italy in October 2021.

Finally, as Dr. Carroll reminds us in his column, the Annual General Meeting (AGM) of the WFN Council of Delegates (COD) remains scheduled for Sept. 9, 2020 during the ECTRIMS/ACTRIMS meeting in Washington. We look forward to seeing all of the delegates at this meeting, whether it is virtual or in person.

We hope you enjoy this issue of World Neurology, and look forward to receiving your contributions, especially updating all of our colleagues on how the current pandemic has (or has not) affected neurologists, our societies, and our patients around the globe. •

Message From the WFN President About World Brain Day 2020

World Brain Day is July 22, 2020. This year, we are excited to announce that the World Federation of Neurology is partnering with the International Parkinson and Movement Disorder Society to raise awareness for Parkinson's disease.

There are more than 7 million people of all age groups with Parkinson's disease worldwide, and the illness affects many more than this number through its impact on families and caregivers.

Parkinson's is a chronic, neurodegenerative whole-body disease that affects movement and almost all aspects of brain function. Its prevalence continues to rise at an alarming rate, making the actions of today vital to improving the lives of those who have been and will be diagnosed.

In order to meet our goal to diagnose earlier, treat more efficiently, and improve the lives of those living with this disease and of their caregivers, additional resources are needed to help better understand and treat Parkinson's.

COVID-19 is a dramatic reminder that health care is a global issue. Let us remember that Parkinson's disease is also a daily challenge faced by all ages and people, mainly by the elderly.

We hope you'll join us and help spread the word by following the World Federation of Neurology on Twitter and Facebook. •

Prof. William Carroll
WFN President

move together to end
parkinson's
disease

PRESIDENT

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by the implementation of public health restrictions and the unparalleled rise in the use and need for health, hospital, and ICU resources affects all aspects of health care globally and at all levels of socioeconomic standing.

In doing so, it increases the risk, both directly and indirectly, to those vulnerable and those not so vulnerable with varying levels of disability at all ages and to those who are in need of care, particularly neurological care. The dislocation of livelihoods and risk to health is greatest for the vulnerable. This also includes those who are in foreign countries for a variety of economic reasons, but usually to support themselves or their families in their home country as well as those seeking refuge from conflict and strife. I believe the WFN has a role to play at this time. As bad as the rapidity of infection and rise in the death toll have been to date, even worse is to contemplate the ravaging effects upon countries without the resources of Europe, North America, and the advanced nations of Asia. Africa, India, parts of central and east Asia, South America, and a host of smaller less-resourced countries around the world are at risk over the coming year or more.

The WFN Has an Important Role in This Pandemic.

First, we need to support the WHO. Despite being criticized for being slow to call COVID-19 a pandemic and for bias in its assessment of the situation in the Wuhan province of China early on, it is the only global public health organization. In its daily updates during the executive board meeting of the WHO in Geneva in February, which I attended, it was active, alert to the need for resources in Africa and in Iran, and successful in its procurement and deployment. It cannot mandate actions nor enter countries without permission. The WHO continues to operate amid a growing distrust of globalized intervention and previous criticism. Nevertheless, the advice from Geneva and the regional WHO bodies has been consistent and remains appropriate. Countries must institute and relax measures as they see fit for their particular circumstances.

Second, it is important to support national and regional endeavors through each of our national health services to both meet the impact of COVID-19 on health and life, control the rate of spread of the virus, and ensure patients with neurological disorders are not overlooked as well as endeavors to mitigate the economic burden of the pandemic. This is no easy task. Although principles to guide countries and populations are emerging, they will undoubtedly require local and national interpretation to fit the circumstances. It is clear that different countries will have different tolls at different times and some, if not all, will experience similar differences with successive waves of the infection.

Third, the WFN and its members have a dual role neurologically over and above assisting health services to meet the pandemic. First, as I have already mentioned, the importance of maintaining the high standard of neurological care for those with neurological illnesses and the mitigation wherever possible of the effects of the pandemic on them, whether it be on support services, infusion centers, clinics, or diagnostic services. It is also important to be alert to the possibility of neurological injury caused by COVID-19 and to papers and publications claiming the same prematurely and creating unnecessary alarm. In this time of fear and heightened sensitivity, it behoves us all to analyze carefully reports purporting to identify neurological injury as part of the pandemic. While the SARS-CoV-2 virus has not been proven to be neurotropic, there have been several letters and reports, some in reputable journals, of small series of SARS-CoV-2 patients with severe infections having neurological signs and deficits. To my knowledge, many of these reports to date have not involved trained neurologists nor have they adequately assessed the effects of comorbidities or been followed up. Furthermore, there have been none claiming neurological disease from those with milder infections. At this time, there have been at least two reports totaling a handful of cases with Guillain Barre Syndrome in association with COVID-19 infection (including one who tested negative for COVID-19 after the onset of neuropathy) and two of acute necrotizing encephalopathy, neither of which could be described as a significant risk for COVID-19 patients. It is up to us to see clearly in this "fog of war."

The WFN has adopted the policy on its website to post material only from peer-reviewed journals and if it has not been peer-reviewed optimally to warn readers to assess the material even more carefully. The WFN is alert to the need for all neurologists to be vigilant and to look for evidence of neurological injury during this pandemic. All of us are aware of the Von Economo-Cruchet disease of encephalitis lethargica described in 1917 and merging then among the 1918-1919 "Spanish flu" pandemic. The WFN has supported its Environmental Neurology Specialty Group chaired by Prof. Gustavo Roman to establish a registry of WFN member societies who are collecting country-wide or center-based data and is aware of moves to establish a "COVID-19 Neuro Research Coalition." On a more individual note, the WFN now has a bulletin board on its COVID-19 page for member societies to post brief reports (c-19@wfneurology.org) on the situation in general or on specific aspects in their country or region to apprise the federation and the membership. It goes without saying that such sharing has a number of advantages, not the least in maintaining the feeling of community while we are all separated.

Effects of COVID-19 on the WFN

Briefly, I should address the WFN timetable in this new world. First, you will have seen the cancellation of many important meetings already and the possibly optimistic postponement of others. The Annual General meeting of the WFN Council of Delegates remains scheduled for 9 a.m. to Noon, Sept. 9, during the ECTRIMS/ACTRIMS meeting in Washington. But it may well be changed to a virtual meeting. The WFN was already moving to enhance its electronic activities for a number of reasons before the pandemic so it will have two new video productions available shortly on its website. The first is about the WFN now and the second about the 2021 World Congress of Neurology in Rome. The World Brain Day program on Parkinson's disease and shared with the International Parkinson Disease and Movement Disorders Society is proceeding well, and a new initiative on brain health will run in parallel. I will have more to say on both in my next column.

Finally, on behalf of the Trustees and staff of the WFN, I wish you and your members and their families all safe passage through this crisis. •

William Carroll
WFN President

The Annual General meeting of the WFN Council of Delegates remains scheduled for 9 a.m. to Noon, Sept. 9, during the ECTRIMS/ACTRIMS meeting in Washington. But it may well be changed to a virtual meeting.

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These asymptomatic carriers can infect large populations without knowing that they are infected with the virus. In fact, every time we speak, we release droplets into the air that can carry the virus a few feet.[3] This property is the reason that distancing of at least six feet from one another and use of masks even made of cloth by the general public can be effective at lowering the degree of spread. Evidence suggests the virus can be easily inactivated by a wide variety of cleansing and disinfecting agents, including proper use of soap and water[4].

Since the virus is spread through the respiratory passages, it manifests predominantly with respiratory symptoms. Most patients develop fever, dry cough, and fatigue/malaise, with many also reporting headache, myalgias, rhinorrhea, and anosmia with ageusia. Gastrointestinal symptoms occur in some patients. The symptoms may last for one to two weeks with nearly full recovery. Some symptoms such as fatigue may take longer to recover. However, nearly 20% to 30% patients may develop much more severe pulmonary symptoms. Toward the end of the first or second week, when other symptoms are improving, these patients develop dyspnea due to massive inflammation in the lungs caused by a viral pneumonia resulting in an acute respiratory distress syndrome. These patients require ventilatory support, and mortality rates are high. However, those patients who manage to survive the ordeal can recover with few residual symptoms, although the long-term consequences of the pulmonary damage are currently not known[5]. Patients who require hospitalization shed virus for an average of 20 days (range 8 to 37 days) from the time of symptom onset. The possibility that the virus may get reactivated has been raised. The Korean CDC is following 51 such patients who were thought to be cured but became positive again after leaving quarantine. If the virus is capable of reactivation, and whether reactivated virus is capable of infection, remains an open question. However, the findings in the Korean patients are likely related to false negative PCR testing.

Complications and Risk Factors

Multiple systemic complications may occur in patients who have severe respiratory symptoms. This may include myocarditis, which can be fatal in nearly 50% of those who develop it. A coagulopathy may occur in others resulting in both venous and/or arterial occlusions. Renal failure is a late complication of the disease.

Several risk factors have been identified for the severe manifestations of the illness. (See Figure 1). Interestingly, children only develop a mild illness and generally recover fully. Older adults have the highest risk. The complications seem to be more common in males. Hypertension

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and diabetes are also major risk factors which account for nearly 50% of the comorbidities in hospitalized patients[6]. The reasons for this are not entirely clear. One hypothesis suggests that since angiotensin converting enzyme 2 (ACE2) is the receptor for SARS-CoV-2, the use of ACE inhibitors to treat hypertension or diabetes can induce the expression of the receptor making the cells more vulnerable to infection with the virus. Clinical studies are underway to test this hypothesis. Current recommendations are to keep patients who are already on ACE inhibitors and ACE receptor blockers on their medications, as the risk of adverse events of discontinuing these medications may outweigh the minimization of risk for COVID-19.

As neurologists, we worry about our patients who have a chronic neurological illness. Can the illness itself or the medications that they are on put our patients at greater risk of severe illness? These questions are particularly important in the context of nursing homes, where neurologic comorbidities are common, and the virus has displayed rapid spread. Most certainly, patients with diseases such as Parkinson's disease, stroke, myasthenia gravis, or other diseases that can impair mobility may also impair lung function. Patients with immune-mediated disorders such as multiple sclerosis, neuromyelitis optica, and myasthenia gravis who are on immunosuppressant drugs may be at risk for more severe complications of the illness. Various organizations such the National Multiple Sclerosis Society are collecting data on patients who develop COVID-19. These data repositories are going to be helpful in determining what medications pose greater risk of complications from the infection. In the meantime, recommendations and guidelines are emerging from various societies based on our current knowledge for the management of patients with stroke[7], multiple sclerosis (nationalmssociety.org), epilepsy (ilae.org) and myasthenia gravis[8].

Neurological complications are rare but are being increasingly recognized[9]. These complications can involve the entire neuro-axis. They may occur during active viral infection and as a post-viral syndrome. (See Table 1). Some patients may present with altered mental status in the absence of respiratory or other typical COVID-19 symptoms as their sole initial presenting feature of SARS-CoV2 infection[10]. Anosmia is a common symptom of any upper respiratory tract infection. But anosmia with COVID-19 has received special attention. It seems to be one of the most common symptoms and often occurs in the absence of rhinorrhea. This suggests involvement of the olfactory nerve or pathway by the virus. As the majority of patients with anosmia recover their sense of smell and taste after the acute phase of the illness, the nerve endings or the cells surrounding the nerves may be affected, allowing for regeneration to occur. In a case report of a patient with sudden anosmia due to COVID-19, it was found that the olfactory clefts were inflamed, with relative sparing of the olfactory bulb[11]. In a mouse model of coronavirus infection, the virus can be transmitted via olfactory pathways trans-synaptically to the brain and to the brainstem[12]. This has raised concern about the potential long term consequences of anosmia in COVID-19. However, the mouse coronavirus uses a different receptor and hence may not replicate the human disease. Nevertheless, it is important to prospectively monitor the patients to make sure they do not develop any long-term sequelae since we know that anosmia is a recognized early symptom of neurodegenerative diseases such as Parkinson's disease and Alzheimer's disease.

Myalgia frequently accompanies the illness. Most viral illnesses can cause body aches and pains. However, in some patients with COVID-19, the muscle aches can be quite severe. Muscle tenderness may last for several days after all other symptoms have resolved. They can involve the back muscles. A case of rhabdomyolysis[13] was reported similar to what was also seen with the SARS[14], although this patient was also on lopinavir/ritonavir which may have contributed to the myolysis. Since the onset of these symptoms is early in the course of the illness, it is possible that the virus invades the muscle to cause myositis, however, pathological findings have not yet been described. Importantly, these patients need proper hydration to prevent kidney damage. Also, it should be noted that potential medications used in the treatment of COVID-19 (including some protease inhibitors) may cause patients to be predisposed to muscle damage.

Meningitis and encephalitis are rare. Dull headaches are common and typically occur at the onset of the illness and resolve within a few days. They are not accompanied by any signs of meningeal irritation. However, a classical presentation of a viral meningitis has been described with COVID-19 and virus can be detected in the CSF. Encephalitis is harder to diagnose. Most patients who become comatose do so after development of ARDS and multi-organ failure, hence the CNS symptoms are attributed to hypoxia and metabolic abnormalities. Fever itself can cause delirium. However, a few cases of encephalitis where patients developed generalized seizure and coma are now being described. In one such patient from Japan, the patient had mild pleocytosis and detectable virus in the CSF. An MRI showed lesions in the temporal lobe and adjacent ventriculitis[15]. Few neuropathological findings have been published, but one study found low levels of SARS-CoV-2 RNA in the brain by PCR of 4 different COVID-19 patients at autopsy[15a]. Another case study found evidence of betacoronaviral infection of the brain with postmortem electron microscopic evaluation[15b]. From the earlier SARS epidemic in 2003, autopsy findings showed that the virus could be detected in the brain by multiple techniques in all patients evaluated (n=8)[16]. Spread of SARS-CoV-2 into the brain could involve an array of mechanisms. The virus can spread via the vasculature and enter the brain carried by infected leukocytes. Transneuronal spread has been hypothesized to also occur from the lung via the vagal nerve or from the nasal passages via the olfactory nerve.

Strokes are being increasingly recognized in this population and occur as the presenting symptom of the infection or any time during the illness. (See Table 2.) In a study from China, 5% (n=11) of 211 patients admitted with COVID-19 had acute ischemic strokes, 0.5% (n=1) had cerebral venous thrombosis, and 0.5% (n=1) had cerebral hemorrhage[17]. While most often these patients have underlying vascular risk factors, there are several patients where nothing other than the SARS-CoV-2 infection can be identified as a cause of the stroke. The virus is known to invade endothelial cells and can also cause a coagulopathy. Elevated D-dimer levels and increased PT and activated PTT have been described. Antiphospholipid antibodies have also been detected[18]. Some may develop disseminated intravascular coagulation. The virus can also cause a cardiac myositis[19] which could also cause a stroke by hypoperfusion or embolism. Some patients may simultaneously develop deep vein thrombosis or vascular occlusions in other organs.

Atypical Acute Respiratory Distress Syndrome is the major cause of death in patients with COVID-19. What is atypical is that these patients have severe hypoxemia even when the lung capacity and mechanics are well preserved[20]. Even when the pCO2 is rising the patients are not hyperventilating and lose their respiratory drive. They develop what seems like an Ondine's Curse. However, these patients do not have any other brainstem signs so the pathophysiology of this condition remains unclear at the present time. However, it is critical that these patients be treated with oxygen, and prone positioning also seems to help. Early ventilatory support should also be considered.

Post-viral syndromes occur when the patient is seemingly improving from the viral syndrome at about a week to three weeks after the onset of the viral prodrome. An isolated case of acute necrotizing hemorrhagic encephalopathy has been described[21]. This patient had bilateral thalamic lesions and other lesions in the temporal lobes which are typical of the syndrome. It is thought to be mediated by cytokine storm. A patient with *transverse myelitis* with quadriparesis, a sensory level and bowel and bladder involvement has been described[22]. However, MRI or CSF evaluation was not reported. A single case of *Guillain Barre Syndrome* (GBS) has been published in a patient from China[23]. A case series from Italy of five COVID-19 patients who developed GBS

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NEUROLOGICAL COMPLICATIONS OF COVID-19

Clinical Syndrome	Potential Pathophysiology
Parainfectious manifestations	
Anosmia	Infection of olfactory epithelium or nerve
Myalgia/rhabdomyolysis	Infection of muscle, medication effects, metabolic derangements
Meningitis/encephalitis	CNS infection
Encephalopathy	Hypoxia, multiorgan failure, medication effects
Seizures	Fever, metabolic derangements, viral encephalitis, stroke
Atypical acute respiratory distress syndrome/Ondine's Curse	Unknown
Post-viral syndromes	
Acute disseminated encephalomyelitis	T cell mediated
Transverse myelitis	Immune cell mediated
Guillain Barre syndrome	Antibody mediated
Acute necrotizing hemorrhagic encephalopathy	Cytokine mediated

Table 1.

STROKES WITH COVID-19

PRESENTATION

Venous sinus thrombosis

Ischemic strokes in multiple arterial distributions

Small blood vessel occlusions

Watershed Infarcts

PATHOPHYSIOLOGY

Coagulopathy: elevated D-dimer, PT, aPTT

Antiphospholipid antibodies

Cardioembolic

Hypoperfusion

Risk factors

Myocarditis

Known vascular risk factors

ARDS and multiorgan impairment

Table 2.

ANTIVIRAL AGENTS BEING CONSIDERED FOR TREATMENT OF COVID-19

Favipiravir	Selective and potent inhibitor of the RNA-dependent RNA polymerase of RNA viruses.
Remdesivir	A nucleotide analog inhibitor of RdRp. Inhibits SARS-CoV-2 in vitro. Multicenter placebo controlled study underway
Chloroquine or hydroxychloquine	An antimalarial agent. Inhibits autophagy and toll-like receptors (TLRs). Inhibits SARS-CoV-2 in vitro.
Saquinavir	HIV protease inhibitor
Nelfinavir	HIV-1 protease inhibitor
Carfilzomib	An irreversible proteasome inhibitor
Zanamivir	An influenza viral neuraminidase inhibitor
Ribavirin	An antiviral agent against a broad spectrum of viruses including hepatitis C, HIV, and respiratory syncytial virus
Ivermectin	A parasitic agent with broad antiviral effects of unknown mechanism
Antisense oligonucleotides	Specifically targets the virus and degrades the viral RNA
Convalescent serum	Blocks viral entry into susceptible cells

Table 3.

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described three patients with an axonal form of GBS and two with a demyelinating process[24]. We recently communicated with a patient who had a sensory variant of GBS. The illness was self-limiting and did not require intervention. Acute disseminated encephalomyelitis has been recently described in an adult patient with SARS-CoV-2[24a]; similarly, several cases have been described with the human coronavirus-OC43[25] and with MERS[26].

However, multiple challenges in the evaluation of patients with neurological complications exist. It is difficult to get neuroimaging when patients are acutely infected for fear of contamination of the scanners. Performing surgery or autopsies are also challenging due to the production of aerosols and lack of proper safety measures.

Therapeutic Debate

Anti-virals: Even though currently there is no proven antiviral therapy for the human coronaviruses, several drugs are being considered for clinical trials and empirical treatment of patients. (See Table 3.) There are 287 studies on coronavirus registered on www.clinicaltrials.gov. In vitro studies have shown some efficacy with chloroquine and hydroxychloroquine. These drugs cause acidification of the endosome-lysosomes and prevent viral replication. They have an anti-inflammatory effect. However, it requires pretreatment of cells prior to infection and has only a minimal effect post infection. While clinical trial results remain unpublished, these drugs have been utilized in clinic off-label in COVID-19 patients at several institutions. Well-controlled studies are necessary to know whether these drugs are efficacious against the virus. There is now a scarcity of the drug, and some countries have banned its export. Several HIV protease inhibitors have been shown to bind to the SARS-CoV-2 protease but clinical experience in small numbers of humans infected with the virus have failed to show clinical efficacy with lopinavir/ritonavir combination. Many clinical trials are currently underway that include nucleoside analogs such as remdesivir, and convalescent serum or intravenous immunoglobulin. Although the ability of most of these agents to enter the CNS is unknown, animal studies of remdesivir (GS-5734) have shown evidence of CNS penetrance, albeit at lower levels than other tissues[27]. Interestingly, a few drugs used to treat patients with multiple sclerosis such as teriflunomide and beta-interferons are considered to have anti-viral effects. But their effect on SARS-CoV-2 is still unknown.

Anti-inflammatory drugs: The most common cause of death is the massive immune response in the lungs leading to consolidation of the lungs with inflammatory infiltrates. Several immune suppressive medications are being used empirically. These include corticosteroids and IL-6 blockers. A case for the use of methotrexate has been made due to its broad anti-inflammatory properties and good CNS penetration.

What the Future Holds

As we continue to face the ongoing crisis, early results show reasons for optimism. In several states in the U.S., exponential growth trends have tapered. Distancing and preventive measures seem to be effective in flattening of the curve and helping institutions lower concomitant caseloads. The number of new infections and deaths are not rising as rapidly. Optimistically, we will soon face a new challenge of when and how to reopen our clinics and operating rooms. But what will this clinical environment look like? Social distancing is likely to play a role, and providers may see patients and enter any public spaces with masks on and maintain a distance of six feet from each other. Telemedicine will likely continue to play a much larger role in routine health care. A safe and effective vaccine could solve many of these issues, though development and testing of such a vaccine prior to administration to the general populace will take significant time. Another possibility is host adaptation. Most viruses are cyclical in nature. Mutations may occur that make the virus less virulent. Early signals suggest this might be the case with SARS-CoV-2. A 382 nucleotide deletion in open reading frame 8 has been identified in some circulating strains. A similar deletion also emerged in the SARS virus in 2003 that was associated with poor replication fitness[28]. However, until then, we will continue to see patients with COVID-19, and as neurologists we need to be vigilant for potential complications that require our attention and intervention. It is our duty to protect and advocate for the most vulnerable. •

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References

1. Emanuel EJ, Persad G, Upshur R, et al. Fair Allocation of Scarce Medical Resources in the Time of Covid-19. *N Engl J Med* 2020.
2. Truog RD, Mitchell C, Daley GQ. The Toughest Triage - Allocating Ventilators in a Pandemic. *N Engl J Med* 2020.
3. Lewis D. Is the coronavirus airborne? Experts can't agree. *Nature* 2020;580:175.
4. Kampf G, Todt D, Pfaender S, Steinmann E. Persistence of coronaviruses on inanimate surfaces and their inactivation with biocidal agents. *J Hosp Infect* 2020;104:246-251.
5. Guan WJ, Ni ZY, Hu Y, et al. Clinical Characteristics of Coronavirus Disease 2019 in China. *N Engl J Med* 2020.
6. Zhou F, Yu T, Du R, et al. Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study. *Lancet* 2020;395:1054-1062.
7. Leadership AASC. Temporary Emergency Guidance to US Stroke Centers During the COVID-19 Pandemic. *Stroke* 2020.
8. International MGC-WG, Jacob S, Muppidi S, et al. Guidance for the management of myasthenia gravis (MG) and Lambert-Eaton myasthenic syndrome (LEMS) during the COVID-19 pandemic. *J Neurol Sci* 2020;412:116803.
9. Mao L, Jin H, Wang M, et al. Neurologic Manifestations of Hospitalized Patients With Coronavirus Disease 2019 in Wuhan, China. *JAMA* Neurol 2020.
10. Filatov A SP, Hindi F, et al. . Neurological Complications of Coronavirus Disease (COVID-19): Encephalopathy. *Cureus* 2020;12:e7352. doi:7310.7759/cureus.7352.
11. Eliezer M, Hautefort C, Hamel AL, et al. Sudden and Complete Olfactory Loss Function as a Possible Symptom of COVID-19. *JAMA* Otolaryngol Head Neck Surg 2020.
12. Dube M, Le Coupanec A, Wong AHM, Rini JM, Desforges M, Talbot PJ. Axonal Transport Enables Neuron-to-Neuron Propagation of Human Coronavirus OC43. *J Virol* 2018;92.
13. Jin M, Tong Q. Rhabdomyolysis as Potential Late Complication Associated with COVID-19. *Emerg Infect Dis* 2020; 26.
14. Tsai LK, Hsieh ST, Chang YC. Neurological manifestations in severe acute respiratory syndrome. Acta Neurol Taiwan 2005;14:113-119.
15. Moriguchi T, Harii N, Goto J, et al. A first Case of Meningitis/Encephalitis associated with SARS-Coronavirus-2. *Int J Infect Dis* 2020.
15a. Menter, JD; Haslbauer, R; Nienhold, S, et. al. Post-morten examination of COVID-19 patients reveals diffuse alveolar damage with severe capillary congestion and variegated findings of lungs and other organs suggesting vascular dysfunction. *Histopathology*. 2020 May 4.
15b. Paniz-Mondolfi A, Bryce C, Grimes Z, et al. Central Nervous System Involvement by Severe Acute Respiratory Syndrome Coronavirus -2 (SARS-CoV-2). *J Med Virol*. 2020 Apr 21.
16. Gu J, Gong E, Zhang B, et al. Multiple organ infection and the pathogenesis of SARS. *J Exp Med* 2005;202:415-424.
17. Li YW, W.; Zhou, Y.; et al., . Acute Cerebrovascular Disease Following COVID-19: A Single Center, Retrospective, Observational Study. *Lancet* 2020:https://ssrn.com/abstract=3550025.
18. Zhang Y, Xiao M, Zhang S, et al. Coagulopathy and Antiphospholipid Antibodies in Patients with Covid-19. *N Engl J Med* 2020.
19. Kim IC, Kim JY, Kim HA, Han S. COVID-19-related myocarditis in a 21-year-old female patient. *Eur Heart J* 2020.
20. Gattinoni L, Coppola S, Cressoni M, Busana M, Rossi S, Chiumello D. Covid-19 Does Not Lead to a "Typical" Acute Respiratory Distress Syndrome. *Am J Respir Crit Care Med* 2020.
21. Poyiadji N, Shahin G, Noujaim D, Stone M, Patel S, Griffith B. COVID-19-associated Acute Hemorrhagic Necrotizing Encephalopathy: CT and MRI Features. *Radiology* 2020:201187.
22. Zhou KH, J.; Dai, D.; Feng, Y.; Liu, L.; Nie, S. Acute myelitis after SARS-CoV-2 infection: a case report. https://wwwmedrxivorg/content/101101/2020031620035105v1fullpdf 2020.
23. Zhao H, Shen D, Zhou H, Liu J, Chen S. Guillain-Barre syndrome associated with SARS-CoV-2 infection: causality or coincidence? *Lancet Neurol* 2020.
24. Toscano G, Palmerini F, Ravaglia S, et al. Guillain-Barre Syndrome Associated with SARS-CoV-2. *N Engl J Med* 2020.
24a. Zhang T, Rodricks MB, Hirsh E. COVID-19-Associated Acute Disseminated Encephalomyelitis: A Case Report. *medRxiv* 2020.04.16.20068148; doi: https://doi.org/10.1101/2020.04.16.20068148
25. Yeh EA, Collins A, Cohen ME, Duffner PK, Faden H. Detection of coronavirus in the central nervous system of a child with acute disseminated encephalomyelitis. *Pediatrics* 2004;113:e73-76.
26. Arabi YM, Harthi A, Hussein J, et al. Severe neurologic syndrome associated with Middle East respiratory syndrome corona virus (MERS-CoV). *Infection* 2015;43:495-501.
27. Warren TK, Jordan R, Lo MK, et al. Therapeutic efficacy of the small molecule GS-5734 against Ebola virus in rhesus monkeys. *Nature* 2016;531:381-385.
28. Su YCF, Anderson, D. E., Barnaby, Y. E, et al.,. Discovery of a 382-nt deletion during the early evolution of SARS-CoV-2. Biorxiv 2020; https://doi.org/10.1101/2020.03.11.987222.

IN MEMORIAM

Alberto Portera-Sánchez, Pioneer of Modern Spanish Neurology

FÉLIX BERMEJO-PAREJ, LUIS CALANDRE, TEODORO DEL SER

Prof. Alberto Portera-Sánchez died on November 30, 2019, in Madrid at the age of 91. He was born in Caspe, Saragossa, Spain. He graduated in medicine in 1950 in Spain and then he obtained the specialization in pediatrics and neurology in Paris and in the U.S. (at the Universities of Georgetown in Washington and in Maryland). In 1960, he returned to Spain and worked as a clinical neurologist in Madrid in several hospitals (private and public), mainly in the Clínico de San Carlos Hospital, where his neurological clinical sessions were successful and crowded with colleagues and medical students. In 1973, he gained the position of head of the Department of Neurology in the Hospital 1 de Octubre of Madrid, later called University Hospital 12 de Octubre (UH12O). From the beginning, his department was an exponent of the modern neurological organization of medical neurology in Spain.

Historical Perspective

It is necessary to comment briefly on the precarious situation of neurology practice during the 1950s and 1960s in Madrid (and in general in Spain, perhaps only with the exception of Catalonia). After the Spanish Civil War, many famous neurologists of the Madrid Neuroscientific School with foreign-based medical training and Republican ideology had to go into exile. This school was a renowned school with well-known neuropsychiatrists and neurohistologists, such as P. Rio Hortega, G. R. Lafora, and others that went from Madrid into exile and, in addition, the Cajal Institute disappeared[1]. During this time, the Spanish medical establishment had the neurologists as assistants to the neurosurgeons and medical internists that were the heads of Neurosurgery and Medicine departments respectively with rare exceptions. The few existing neurologists' practice was undertaken without beds in their charge. There were no academic posts for neurologists and neuropsychiatrists, with scarce knowledge of clinical neurology, attended the neurological outpatients care in the Spanish public health Service

This situation was analogous in other countries[2], but in Spain, and specifically in Madrid, it was extreme because the heads of neurology and neuropsychiatry had gone away.

Bearing this situation in mind, it is easy to understand the dramatic change that Portera-Sánchez made. He received a new department in a new and very large hospital (about 1,000 beds), which was modern and well equipped with current medical technology. He was able to select his collaborators and to organize the neurological service. He went for a large department, in accordance with the recommendations of the American neurology style. (He was a member of the American Academy of Neurology.) Long before, the NINDS had indicated the benefits of neurological sub-specialties and the importance of adequate training for future neurological staff[2]. The neurologists in his department practiced clinical neurology and all sub-specialties of neurology, that is to say, general neurology, child neurology, and clinical electrophysiology (EEG and EMG), including the study of muscle disorders. Additionally, every day a clinical neurologist was on duty in the emergency department of the UH12O to attend to acute neurological disorders (stroke, meningitis, head trauma, and so on). Furthermore, his neurologists had neuroradiology knowledge, although the official report came from the Neuroradiology Department. This organization was an exception in neurological care at this time in Spain and an example for the Spanish neurological service.

Career Highlights

The Consulting Section (Comisión Nacional de la Especialidad de Neurología) of the Spanish Ministry of Health named Portera-Sánchez as the president of this section that advised this ministry on the organization of the numbers and programs of the Residency in Neurology in Spain. In this position, he was able to introduce the rules to expand this modern (for Spain) model of neurology practice, and changed the previous model of neurologist as only assistants of internal medicine and neurosurgery. The Ministry of Health accepted these first recommendations and the following Consulting Sections prolonged this model. This increased the number of clinical neurologists and decreased the number of neurophysiologists in order to adopt an American model of neurological assistance with a great number of neurologists who were able to undertake all neurology sub-specialties. Gradually,

Alberto Portera-Sánchez when he was around seventy years old.

Spanish neurology began to have services all over Spain, academic posts, and the number of neurologists increased greatly with young neurologists. Neurological care is now present in all medium-sized and large hospitals, and it works as an outpatient specialty because the Spanish National Health Service would like to include the main medical specialties near the population. This is the only point that Portera-Sánchez did not like. He thought that neurology should be practiced mainly in hospitals and probably for the progress of scientific practice it would be true[3]. Many young Spanish neurologists (now more than 3,500) do not know the precarious beginning of Spanish neurology in the third part of the last century.

Portera-Sánchez was not only an organizer of the neurological service of the UH12O, he was a brilliant clinical neurologist and an untiring "neurological business man" who made contacts all over the neurology world. He invited to his department many prestigious neurologists to give lectures, such as Carleton Gajdusek, when he was Nobel laureate, Vladimir Hachinski, Luigi Amaducci, David Marsden, and many others. It is worth remembering that Bruce Schoenberg, when he was chief of the Neuroepidemiology Branch in the NINDS of the National Institutes of Health, visited our neurology department at UH12O and gave a course on neuroepidemiology, and then designed a community study of the main neurological diseases in Madrid[4]. This interest for Neuroepidemiology continued in his department. At the end of the 1980s, Portera-Sánchez and his team formed part of the Age-Associated Dementia Project of the World Health Organization consortium (AAD SPRA-WHO) that would implement a dementia study in six countries (Canada, Chile, Malta, Spain, and in black populations of the U.S. and Nigeria). Luigi Amaducci, standing neuroepidemiologist, directed the Coordinating Center of this WHO study in Florence, Italy, and took as advisors leaders of the dementia field such as Z. Khachaturian, R. Katzman, and others. The study did a panel concordance in the diagnosis of dementia[5] and a validation of the main screening

see **PORTERA-SÁNCHEZ** *page 8*

PORTERA-SÁNCHEZ: LEADER, HUMANIST, FRIEND

Early in the 20th century, Spanish neuroscience had a high international profile, personified by Santiago Ramon y Cajal. He was a winner of the Nobel Prize in Physiology and Medicine and last year his publications were cited 1,559 times, 85 years after his death. The Spanish Civil War (1936-1939) proved disastrous for neuroscience because of the exile of some of the most eminent and many promising scientists. Pio Rio Hortega, discoverer of microglia, ended up in Argentina, and the physiologist August Pi Suñer in Venezuela and then Mexico. They are but two of the many exiles. Neuroscience and neurology entered a long penumbra under the Francisco Franco regime.

Portera-Sanchez did part of his training in the United States and gained a faculty position. However, he returned to Spain to become the founder of modern Spanish neurology. He linked it internationally as demonstrated by his role in the World Federation of Neurology and the symposia that he organized, including a pioneering and memorable one on neuroplasticity. He was also leader in trying to link the brain with the arts and humanities. He organized a series of colloquia on "El cerebero en si mismo" (roughly translated "The brain in itself") that featured a neuroscientist and an eminent artist or humanist. One example was a neuroscientist specializing in vision and a leading Spanish artist. I was paired with Cristobal Halffter, a Spanish leading composer on the topic "Music and the brain." The presentations and commentaries were published as booklets.

He was a respected art collector and critic. He recognized talented young artists early in their careers and bought their paintings when they were affordable. He often wrote and commented on art, including publishing a book on the subject.

He had many pupils, admirers, and friends. He hosted innumerable international guests at his country home with his gracious wife Catherine.

At meetings, one could spot Portera-Sanchez easily. He was the person with the most people gathered around him.

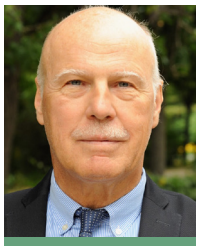
Portera-Sanchez will continue to live in our memories and through his deeds and teachings, multiplied by his many pupils. •

Vladimir Hachinski
Past President, World Federation of Neurology

World Brain Day 2020 Moves to End Parkinson's Disease

A World Federation of Neurology and International Parkinson and Movement Disorders Society Collaboration


TISSA WIJERATNE, MD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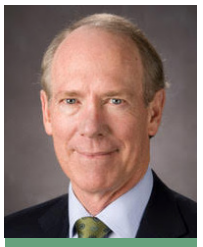
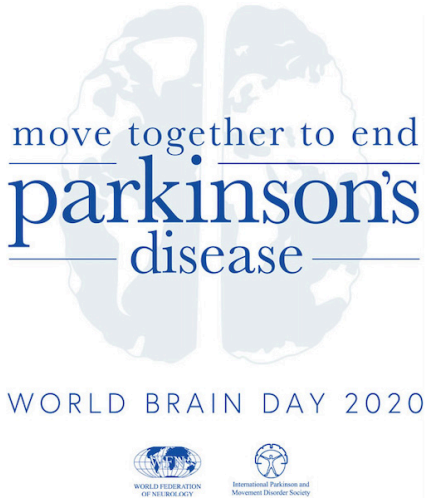

WILLIAM CARROLL, MD



BY TISSA WIJERATNE, MD, WOLFGANG GRISOLD,MD, CLAUDIA TRENKWALDER, MD, WILLIAM CARROLL, MD

World Brain Day was launched in 2014. Since then, the WFN, jointly with other international societies such as International League Against Epilepsy, World Stroke Organization, and the International Headache Society, chooses a topic with a view to drive home the importance of brain health and promote better neurological care globally.

Based on this background, the WFN chose the topic of Parkinson's disease jointly with the International Parkinson and Movement Disorders Society (IPMDS) as the topic for World Brain Day 2020. As in preceding World Brain Day events, the aim of World Brain Day 2020 is to alert not only its member societies, but also the public on critical neurological issues. The member societies of the WFN will receive a "toolkit" of templates for press releases and also educational PowerPoint presentation sets to assist in their local activity to promote World Brain Day and advocate for patients with Parkinson's disease and their caregivers.

Local press conferences and press coverage, including print, electronic, radio, TV, and YouTube are strongly encouraged to reach the public.

Let us spread the key messages from World Brain Day 2020 "Move Together to End Parkinson's Disease" through mainstream media, social media platforms, and local, regional, national, and international meetings throughout the year. Please see and share our new logo, the web banners, social media images, and other educational material in your country. We invite our readers to rally around World Brain Day 2020 "Move Together to End Parkinson's Disease."

Please make the World Brain Day 2020 campaign an important priority. The educational and promotional material from the WFN and IPMDS collaboration will help you to be the best advocates for your patients with Parkinson's disease and their caregivers. •

Prof. Tissa Wijeratne is chair of World Brain Day and chair of neurology at Western Health in Melbourne, Australia.

Prof. Claudia Trenkwalder is president of the IPMDS and professor for Movement Disorders at University Medical Center in Goettingen, Germany and medical director of Paracelsus-Elena Klinik, the largest hospital for Parkinson and Movement Disorders in Kassel, Germany.

Please make the World Brain Day 2020 campaign an important priority. The educational and promotional material from the WFN and IPMDS collaboration will help you to be the best advocates for your patients with Parkinson's disease and their caregivers.

WORLD BRAIN DAY 2020 KEY MESSAGES

- World Brain Day 2020 is a joint collaboration between the World Federation of Neurology and the International Parkinson and Movement Disorders Society (IPMDS).
- Get on board today. Spread the news through mainstream media, social media platforms, national, and international meetings throughout the year.
- Arrange virtual education and advocacy activities around the World Brain Day "Move Together to End Parkinson's Disease" campaign in your community, hospital, village, city, or region throughout the year.
- For ongoing support, contact Prof. Tissa Wijeratne, World Brain Day chair, at Tissa.Wijeratne@wfneurology.org.
- Access the educational and promotional material created by the WFN and IPMDS to help you advocate for your patients with Parkinson's disease.
- Move Together to End Parkinson's Disease

ABOUT PARKINSON'S DISEASE

- **Prevalence:** Parkinson's disease is a chronic neurodegenerative brain disease that affects more than 7 million people of all ages worldwide, and its prevalence continues to increase.
- **Disability:** Parkinson's disease is a whole-body disease that affects the mind, movement, and almost all aspects of brain function, with symptoms worsening over time.
- **Standard of Care:** Access to quality neurological care, life-changing treatments, and essential medication is unavailable in many parts of the world.
- **Research:** Additional resources are needed to help unlock the cause, onset, progression, and treatment of this disease across all ages.
- **Advocacy:** It's important to work together to diagnose earlier, treat more effectively, and improve the lives of those living with Parkinson's disease and their caregivers.

The 2016 Global Burden of Disease of Parkinson's disease studied its global burden between 1996 and 2016 to identify trends and to enable necessary public health, scientific, and medical responses in 2018[1]. Over the past generation, the global burden of Parkinson's disease has more than doubled with potential longer disease duration and environmental factors[1]. We can expect that the trend will continue in the next few decades with the possibility of 12 million patients with Parkinson's disease worldwide by about 2050[2].

The comorbid diagnosis itself has not emerged as a specific risk factor for poor outcomes of COVID-19[3]. The hidden sorrows (potential medication supply issues, disruption to research, and clinical trials), and emerging opportunities (telemedicine, how the pandemic influences the course of Parkinson's disease, and taking advantages of technology, such as wearable technology) have been visible during the COVID-19 pandemic[3,4].

Parkinson's disease is a complex disease process of the human brain that results in a broad spectrum of clinical features encompassing all aspects of human function. These primarily motor dysfunctions as well as non-motor symptoms can significantly limit the patient's ability to take part in typical day-to-day activities with poor quality of life

It is indeed essential to understand the caregiving aspects and burden in Parkinson's disease. Findings from a published meta-analysis indicate that motor symptoms and dependence in activities of daily living have a moderate relationship with caregiver distress[5]. Non-motor symptoms such as impaired cognitive function, including hallucinations, confusion, and affective disorders such as depression and anxiety, have a significant effect on caregiver strain. It is the hours spent on caregiving activities and sleepless nights that are strongly associated with caregiver burden[6].

References:

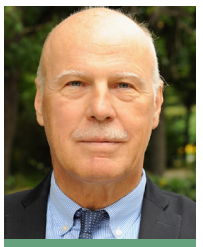
1. Collaborators, G.B.D.P.s.D., *Global, regional, and national burden of Parkinson's disease, 1990-2016: a systematic analysis for the Global Burden of Disease Study 2016. Lancet Neurol*, 2018. **17**(11): p. 939-953.
2. Rocca, W.A., *The burden of Parkinson's disease: a worldwide perspective. Lancet Neurol*, 2018. **17**(11): p. 928-929.
3. Papa, SM, et al., *Impact of the COVID-19 Pandemic on Parkinson's Disease and Movement Disorders.* Mov Disord, 2020.
4. Helmich, R.C. and B.R. Bloem, *The Impact of the COVID-19 Pandemic on Parkinson's Disease: Hidden Sorrows and Emerging Opportunities.* J Parkinsons Dis, 2020. **10**(2): p. 351-354.
5. Lau, K.-M. and A. Au, *Correlates of Informal Caregiver Distress in Parkinson's Disease: A Meta-Analysis. Clinical Gerontologist,* 2011. **34**(2): p. 117-131.
6. Bhimani, R., *Understanding the Burden on Caregivers of People with Parkinson's: A Scoping Review of the Literature. Rehabil Res Pract*, 2014. **2014**: p. 718527.

Committees of the WFN

WOLFGANG GRISOLD,
SECRETARY GENERAL, WFN

The committees of the WFN contribute greatly to the work of the WFN. The chairs are appointed by the trustees, and the committee is composed of members of the regions.

The present composition and membership can be seen on the WFN website and are listed in Table 1.


WOLFGANG GRISOLD

The task of the committees is to work on specific issues, and within their defined task they are of great value not only for the leadership of the WFN, but to the whole organization. This new column will introduce the committees in the next issues of World Neurology, starting with the Standards and Evaluation Committee in this issue.

Standards and Evaluation Committee

The most recently appointed chair is Prof. László Vécsei, head of Neuroscience Research Group, the department of neurology, University of Szeged, Hungary. He has much experience in educational matters, nationally, within the former European Federation of Neurological societies (EFNS- now EAN) and the Danube group of neurology.

This committee receives applications for meetings and also enduring materials. In the future, there will be an increasing need to endorse also webinars and virtual meetings.

The task of the committee is to scrutinize the event/material for scientific content, quality of speakers, and also make sure that the event is independent from industry or other influences. Once the event or material is endorsed, it is allowed to bear the WFN logo, as a sign of quality, and will be announced on the WFN website.

As Continuing Medical Education (CME)/ Continuous professional development (CPD) is subject to local and national regulations, the recognition of CME /CPD needs to be made locally, by the respective responsible body.

If you are planning a meeting or any other kind of virtual or enduring material, which is in English and of interest for our WFN community, please consider to have your event/material endorsed by the WFN. The WFN is free of charge and meant as a service for neurology. Details on the endorsement process, and also downloadable material for the application are on the WFN website.

Public Awareness and Advocacy Committee

This committee is chaired by Prof. Tissa Wijnerate from Australia. Its aim is to promote and enhance brain health and the visibility of the WFN. It has successfully organized previous World Brain Days. For a summary of 2019, organized with the International Headache Society, see the webinar of World Brain Day 2019.

This year's World Brain Day is jointly organized with the International Parkinson and Movement Disorder Society. The motto is "Move Together to End Parkinson's Disease" and will highlight the importance of treating patients with movement disorders and also support careers. See the associated article in this issue.

COVID-19 and the WFN

The WFN has set up website space for the present COVID-19 crisis. We are all concerned about the neurological effects as well as recommendations to handle this crisis.

As guidelines vary in subdisciplines and regions and countries, we have inserted a list of the websites of the global neurology alliance (GNA) as well as the WFN specialty groups. Some of them have specific guidelines and advice on their website, or could be directly asked.

WFN COMMITTEES

- Congress
- Constitution and bylaws
- e-communications
- Education
- Finance
- Grants
- Membership
- Nominating
- Public awareness and Advocacy
- Publications
- Regional liaison
- Specialty groups
- Standards and Evaluation

Table 1.

The journals are presently overwhelmed with reports and observations of neurological involvement in COVID-19, and it is difficult to select peer reviewed and high quality articles. The WFN has appointed our three WFN editors (*Journal of the Neurological Sciences*, John England; eNeurological Sciences, Walter Struhal; and World Neurology, Steven Lewis) to go through suggested articles and give recommendations. You will find these selected articles on our website.

The Specialty Group on the Environment has published a letter in *Lancet Neurology*, encouraging all societies to establish databases and registries and look at neurological effects of COVID-19 (THELANCETNEUROLOGY-D-20-00339 S1474-4422(20)30148-4.)

We are also interested in suggestions and opinions concerning our committees. Please contact us via the London office (Jade), or my email at wolfgang.Grisold@wfneurology.org. •

PORTERA-SÁNCHEZ

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tools[6] for the future study. However, the Canadian team had advanced its own study (Canadian Study of Health and Aging) and declined to participate in the new study as well as the Nigeria-U.S. (African Americans and Yoruba-Nigerians) study, which had designed a complex investigation. The only study that continued with the validated methodology was the NEDICES in Spain funded by the official Spanish Research Agency (FIS).

Portera-Sánchez had an interest in many fields of neurology, but mainly in dementias and edited the first dementia book in Spain[7]. Additionally, he had great interest in cerebrovascular disorder[8,9]. Moreover, he and his neurological team of the UH12O worked in other neurological fields, such as peripheral neuritis, brain infections, neuroimaging, and others.

The International Stage

We must underline his international neurological affairs. He was elected as vice president of the World Federation of Neurology (WFN) from 1989 to 1993. In addition, he formed part of the WFN Education Committee[10], the education committee of the Federation of Neurological Societies[11], and was an honorary member of the American Academy of Neurology in 2003.

In Spain, after many years of being professor of neurology, he obtained the first chair in neurology in Madrid in the Complutense University (UCM) in 1996. Previously, in 1993, he was elected to membership of the select Spanish Royal Academy of Medicine.

Supporting the Arts

This remembering of his life would fall short if we omitted an important part of his life. Portera-Sánchez was a man of vast culture and love for the arts. He was a friend of many famous contemporary painters such as Chillida, Guerrero, Millares, Mompó, Saura, and others. Additionally, filmmakers and other well-known artists formed part of his frequent social gatherings, where it was possible to find neurologists, scientists, and people from the arts. In fact, Portera-Sánchez was an art (paintings) collector, and his love for painting was a passion throughout his life, which he passed on to one of his sons[12]. To recognize this dedication to art works, he was rewarded as corresponding academic of the Royal Fine Arts Academy of San Fernando and member of the Patronage of the National Museum of the Queen Reina Sofia in Madrid.

Finally, the community of Spanish neurologists is grateful to Portera-Sánchez for his contribution to the development of clinical neurology in our country. In addition, as his pupils, we rend our gratitude for having shared with us his neurological skills, his brilliant teaching, his spirit open to the culture and to the scientific innovations, and his permanent cordial, warm, and human manners. •

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References

1. J.S. Dosil, The footprint in Mexican neurosciencee of Spanish exile, a legacy of Cajal overseas, *Neurosci. Hist.* 1 (2013) 154–161 (http://nah.sen.es/es/100-revistas/ vol1/ numero-4/158; ISSN: 2254–6146).
2. H.H. Merritt, Influences of the national institute of neurological and communicative disorders and stroke on clinical neurology, in: D.B. Tower (Ed.), The Nervous System, Vol. 2 Raven Press, NY, 1975, pp. 1–3 (ISBN: 0–89004-076-I).
3. F. Bermejo-Pareja, Neurology and neurologists in Spain: the consolidation of the family neurologist? *Neurología* 22 (2007) 221–235 17492516.
4. M.C. Gutierrez-del-Olmo, B.S. Schoenberg, A. Portera-Sánchez, Prevalence of neurological diseases in Madrid, Spain, *Neuroepidemiology* 8 (1989) 43–47, https://doi.org/10.1159/000110164.
5. M. Baldereschi, M.P. Amato, P. Nencini, et al., Cross-national interrater agreement on the clinical diagnostic criteria for dementia, *Neurology* 44 (1994) 239–242, https://doi.org/10.1212/wnl.44.2.239.
6. M. Baldereschi, F. Meneghini, P. Quiroga, et al., Cognitive versus functional screening for dementia across different countries: cross-cultural validation of the mini-mental state examination (MMSE) and the Pfeffer activities questionnaire (PFAQ) against the standardized clinical diagnosis of dementia, *Neurology* 44 (Suppl. 2) (1994) A365.
7. Dementias, A. Portera, F. Bermejo (Eds.), Asociación Española de Neuropsiquiatría, Mayoría, Madrid, 1980(ISBN: 84–85.300-11-4).
8. A. Portera-Sánchez, L. Calandre, Evaluation of the patient with suspected cerebrovascular disease, in: P.J. Vinken, G.W. Bruyn, H.L. Klawans, J.F. Tool (Eds.), Handbook of Clinical Neurology, Vol. 53 Elsevier Sci. Pub., Amsterdam, 1988, pp. 175–199 (ISBN: 0-444-90404-2).
9. T. del Ser, F. Bermejo, A. Portera, J.M. Arredondo, C. Bouras, J. Constantinidis, Vascular dementia. A clinicopathological study, *J. Neurol. Sci.* 96 (1990) 1–17, https://doi.org/10.1016/0022-510x(90)90052-o.
10. M.T. Medina, T. Munsat, A. Portera-Sánchez, et al., Developing a neurology training program in Honduras: a joint project of neurologists in Honduras and the world Federation of Neurology, *J. Neurol. Sci.* 253 (2007) 7–17, **https://doi.org/10.1016/** j.jns.2006.07.005.
11. W. Grisold, Z. Ambler, A. Hopkins, et al., FENS task force for continuing medical education (CME). European Federation of Neurological Societies (EFNS) – approval (co-sponsorship) of continuing medical education (CME) meetings, Eur. J. Neurol. 6 (1999) 259–265 10210904.
12. A. Portera Sánchez, Abstract painting, a mental esthetic construction without exact correspondence with reality (José Guerrero: manual and corporal expressions in his paintings), An R Acad. Nac. Med. (Madr) 123 (2006) 543–550 17451097. Félix Bermejo-Parejaa,b, Luis Calandreb, Teodoro del Serb,c*
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Prof. Dafin F Muresanu, MD, congress chair, president of the European Federation of Neurorehabilitation Societies (EFNR)

From left to right. Prof.Gunther Deuschl, MD, past president of the EAN, Prof. Raad Shakir, MD, past president of the WFN, and Prof. Ovidiu Bajenaru, MD, past president of the Romanian Society of Neurology

Neurological Meetings in Transylvania

BY DAFIN MURESANU, SELEJAN OVIDIU, CRISTIAN ANDRIESCU, AND STEFAN STRILCIUC

Over the past 15 years, there have been three annual international events in the field of neurology organized by the Society for the Study of Neuroprotection and Neuroplasticity (SSNN). The society was established in 2005 by an international group of clinicians and basic researchers at the initiative of Prof. Dafin F. Muresanu, MD, Romania, with the scope of promoting a strong collaboration platform for translational medicine, in an attempt to strengthen stronger collaboration between the academics and clinicians. Hence, there is dual focus on basic and clinical research. The organization's aim is to create a discussion forum for better understanding of endogenous basic biological processes, consequently leading to the development of pharmacological and non-pharmacological strategies for positive manipulation of neuroprotection, neuroplasticity, and neurogenesis.

Soon after its establishment, SSNN became a member of the Global College of Neuroprotection and Neuroregeneration (GCNN). The SSNN continues to grow its network, by establishing scientific and academic relations with European and international institutions such as the World Federation of Neurology (WFN), the European Academy of Neurology (EAN), the European Federation of Neurorehabilitation Societies (EFNR), the World Federation of Neurorehabilitation Societies (WFNR), the IuIiu Haţieganu University of Medicine and Pharmacy, Cluj-Napoca, Romania, the Tel Aviv University, Israel, the Danube University Krems, Austria, the Foundation of the *Journal Journal of Medicine and Life*, and the RoNeuro Institute for Neurological Research and Diagnostic in Cluj-Napoca, Romania.

International Summer School of Neurology

The mission of the International Summer School of Neurology is to provide a platform in which a select class of young neurologists-in-training can interact with an international faculty recognized for its expertise in both basic and clinical neurosciences.

The idea for the event dates back to 2005, being initiated by Muresanu, Prof. Natan Bornstein, MD, Israel, and Prof. Ovidiu Bajenaru, MD, Romania. The founders understood the young specialists' and practitioners' need to be connected with the latest developments in the complex field of neurosciences, hence developing a dynamic environment for this symbiosis to take place. After almost a year of preparations, the first edition of the International Summer School of Neurology opened its doors to participants on July 9, 2006. International experts covered current topics like blood-brain barrier research, secondary stroke prevention, the latest advances in neuroimaging and stroke, epilepsy, neurodegenerative disorders, and movement disorders.

Its community reach defines the success of the International Summer School of Neurology. At Poiana Brasov, Romania, 200 participants from eight different countries and 26 illustrious speakers joined together to participate in the 14th Summer School.

In addition to the educational program presented, SSNN also organizes the European Teaching Course on Neurorehabilitation and the EAN Task Force on Rare Neurological Disorders Teaching Course.

European Teaching Course on Neurorehabilitation

One of SSNN's most prestigious academic projects is the European Teaching Course on Neurorehabilitation. Since its first edition in 2011, the organization joined forces with the educational architect of this program – the European Federation of Neurorehabilitation Societies (EFNR). The teaching course also benefits from the support and endorsement of the international organization in the field of neurorehabilitation, namely the World Federation of Neurorehabilitation Societies (WFNR).

The teaching courses' objectives are (1) to advance the development and improve the quality of neurorehabilitation in Europe; (2) to stimulate the collaboration between clinicians and other disciplines of the neurorehabilitation team; (3) to facilitate the exchange of knowledge and scientific research between clinicians with an interest in neurological rehabilitation, and (4) to contribute to the development of cooperation and communication networks between National Neurorehabilitation Societies. Having these principles in mind, the SSNN and its collaborators have developed a comprehensive and up-to-date teaching course which addresses the pressing needs that reside in the field of neurorehabilitation year by year.

Neurorehabilitation societies are not the only stakeholders that actively contribute to the development of the teaching course. Many other international academic institutions have pledged support and active contribution, including the Foundation of the *Journal of Medicine and Life*; IuIiu Haţieganu University of Medicine and Pharmacy, Cluj-Napoca, Romania; Tel Aviv University, Israel; Danube University Krems, Austria; and the RoNeuro Institute for Neurological Research and Diagnostic, Cluj-Napoca, Romania. In 2017, the EAN endorsed the European Neurorehabilitation Teaching Course.

This year, the European Teaching Course on Neurorehabilitation reached its 9th edition. The event set the stage for two days of intensive talks and debates between 150 participants from seven countries, on a broad range of challenges in neurorehabilitation and neuroscience, promoting the integration of new scientific information via keynote lectures. A rich and diverse audience of health care professionals interested in this steadily expanding and multidisciplinary field attended the event, including physicians, nurses, therapists, public health experts, and clinical researchers.

EAN Task Force on Rare Neurological Diseases Teaching Course

The most recent educational project proposed by the EAN Task Force on Rare Neurological Diseases (EAN TF RND) to the international scientific community is developed together with the SSNN. From a neuroepidemiological perspective, rare diseases have significant public health impact due to their collective large number and diversity. The task of providing care for over 5,000 documented diseases that are considered to be rare worldwide is a daunting experience. While significant progress has been made in recent years with understanding and mapping rare diseases, providing early diagnosis and valid treatment options for patients with such afflictions is still a great challenge.

Rare neurologic diseases (RNDs) are vastly underdiagnosed and effective treatment is often lacking. The EAN Scientific Committee has established the task force intending to help patients with RNDs and their families, through strategies to facilitate earlier diagnosis, timely management and coordinating research. The Task Force members are experienced scientists, experts in the complex field of rare neurological diseases, who work together to raise awareness and improve knowledge, aiming for earlier diagnosis and specific research programs to identify disease mechanisms and lead to possible therapies.

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TRANSYLVANIA

continued from page 9

The Task Force and the SSNN have developed a teaching course aimed to address all the open issues presented. The first edition of this event was hosted by Iuliu Hatieganu University of Medicine and Pharmacy, Cluj-Napoca in 2017. Around 170 physicians, nurses, therapists, public health experts, clinical researchers, and students attended the educational event, along with 12 speakers, experts in the field of RNDs. The meeting in 2019 was the third edition of the EAN Task Force for Rare Neurological Diseases Teaching Course. Through the two-day teaching course, a wide range of topics on rare neurological diseases were approached, such as a detailed overview of rare neurologic disorders in the context of the most studied rare causes of stroke, dominant and episodic ataxias, oligodendrocyte dysfunction, neurometabolic genetic diseases, mitochondrial encephalomyopathies, rare diseases and their relationship with the neurodegenerative diseases, dystonias, transthyretin amyloidosis neuropathy, Huntington's disease, and many others.

SSNN continues to develop a wide range of activities and educational projects in collaboration with its international multidisciplinary partners to achieve our vision to meet ever-demanding patient needs and to bridge the gap between science and education in the medical community.

For details about the events organized by SSNN, please follow this link. •

Department of Neurosciences, Iuliu Haţieganu University of Medicine and Pharmacy, Cluj Napoca, Romania.

14th International Summer School of Neurology. Presidential Session

JOURNAL OF THE NEUROLOGICAL SCIENCES

Editor's Update for the *Journal of the Neurological Sciences* Regarding COVID-19

BY JOHN D. ENGLAND, MD

JOHN D. ENGLAND, MD

The COVID-19 pandemic has created an unprecedented medical, social, and economic crisis. Although the respiratory system is the major site of infection with SARS-CoV-2, many other complications are now recognized. Although not initially suspected, neurological features of COVID-19 do occur. In fact, for patients who recover from the respiratory disease, neurological complications may be one of the severe lasting features of COVID-19. New information on COVID-19 becomes available very quickly, often on a daily basis.

To facilitate rapid dissemination of new results and observations on COVID-19, the *Journal of the Neurological Sciences* and its companion journal, eNeurologicalSci have agreed to review rapidly all manuscripts relevant to COVID-19 and to publish expeditiously all accepted papers. Additionally, all such articles are freely available upon publication. To facilitate ease of access to COVID-19 articles and guidelines, Elsevier and the World Federation of Neurology have both developed new platforms specific to COVID-19. These sites are refreshed regularly as new research, guidelines, and commentary become available.

If you are interested in learning what articles and resources are available, please access the following sites: COVID-19 Health care Hub (covid-19.elsevier.health) and World Federation of Neurology. •

John D. England, MD, is editor-in-chief of the *Journal of the Neurological Sciences*, the official journal of the WFN.

JUNIOR TRAVELING FELLOWSHIP REPORTS FROM THE 24TH WORLD CONGRESS OF NEUROLOGY

ANDINA WIRATHMAWATI, MD, NEUROLOGY RESIDENT BRAWIJAYA UNIVERSITY, MALANG, INDONESIA

The 24th World Congress of Neurology was held held Oct. 26-Nov. 1, 2019, in Dubai, United Arab Emirates.

Many topics were presented by well-known experts worldwide. Formal and informal meetings in the congress gave an excellent opportunity to greet and meet or to share an exchange of knowledge and ideas, even on ongoing research projects to enhance and collaborate. This event was the best opportunity for new networking and contact with others.

It was a great honor given to me by the WFN to attend the congress as a poster presenter. I received many questions during my poster session as well as remarks from colleagues. This includes Prof. Reilly from the University College London, who had abundant questions about my poster. Overall, this congress gave me a boost to gain a better experience for further development as young neurologist.

My attendance at the congress was kindly supported by the WFN with support from the WFN Junior Traveling fellowship. I wish to express my gratitude and happiness for this great opportunity. Great thanks to all members of the WFN. •

Andina Wirathmawati, MD

Hamada Zehry

Emmanuel Iwuozo, MBBS, Msc, FMCP

EMMANUEL IWUOZO, MBBS, MSC, FMCP

As one of the privileged recipients of the WFN Junior Traveling fellowship 2019 Award, I attended the World Congress Neurology 2019, Oct. 27-31 at the World Trade Centre in Dubai, United Arab Emirates.

The registration for the congress, visa, flight, and accommodations were all free. I also had two of my abstracts accepted for poster presentation, which I uploaded before the congress.

The setting of the conference – the World Trade Centre – was excellent. I participated in the plenary sessions, teaching courses, botulinum toxin workshop, and tournament of the mind. The exhibition stand and congress abstract viewing sessions were equally enlightening.

This conference will remain the memorable one as it gave me opportunity to meet new friends and colleagues.

I remain grateful to the World Federation Neurology for support. Accept my kind regards. •

MOSTAFA ABDELMOMEN

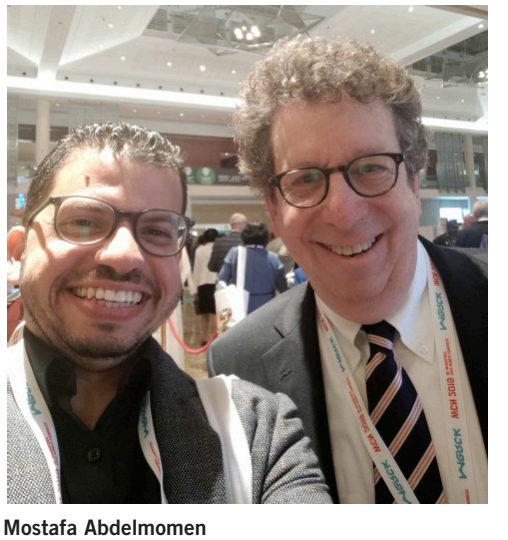
I am very happy to write this report after finishing the World Congress of Neurology 2019 in Dubai. This wonderful scientific event in all fields of neurology over five days covered each branch of neurology, with very informative teaching courses and a large number of posters with new fields of research.

In addition to all of the scientific aspects of the congress, I participated in the social network event in Bab Al Shams, which is a wonderful place with historic style for old Arabian life, and the horse and camel show.

Lastly, I would like to thank the WFN committee that helped me to attend this important event. Special thanks Prof. Steven Lewis and Jade Levy for their efforts on my behalf. •

HAMADA ZEHRY

I want to thank the WFN for helping me to attend the WCN 2019 in Dubai, United Arab Emirates. I was very satisfied with all the lectures, especially those concerning epilepsy and movement disorders. The congress provided the most up-to-date scientific content. Thank you. •



Mostafa Abdelmomen