WCNR 2020 CONGRESS REPORT

Successful 1st digital WFNR Congress

WCNR 2020, held this October, was the WFNR's first digital Congress.

The 11th World Congress for Neurorehabilitation was scheduled to take place in Lyon, France, but was moved online because of the ongoing coronavirus pandemic. With over 2100 registrants from all neurorehabilitation disciplines, ranging from students to professors, the Congress, held jointly with the 35th Congress of the French Society of Physical and Rehabilitation Medicine, was a great success.

The theme flowing through the Congress was the importance, not of the 'abstract' individual with a neurological condition that is often the subject of science, but of the real person, with real life goals, and individual rehabilitation intervention requirements.

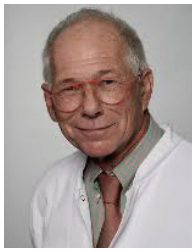
The Congress programme encompassed plenary lectures, symposia, oral communications, posters, teaching courses, industry sessions, and even a social programme.

WCNR 2020 Key facts

- 2100 participants from over 90 countries
- 6 plenary lectures
- 4 round tables
- 40 symposia
- 8 joint symposia
- 100 oral communications
- 19 seminars
- 200 invited speakers from over 30 countries
- Over 1000 abstracts
- More than 1000 e-posters
- 25 industrial partners

In his opening address **Leonard Li**, (Hong Kong), WFNR President said: "We now have more than 5000 members, 42 National Societies and 37 Special Interest Groups. Before Covid-19 the WFNR had been very active supporting neurorehabilitation meetings around the world, activities supported by a generous donation from Mr Lui for which we are extremely grateful".

Leonard acknowledged the activities of the WFNR Flying Faculty and the recently published book 'Clinical Pathways in Stroke Rehabilitation' edited by **Thomas Platz** (Germany), Chair of the WFNR Education Committee. The WFNR is now a member of two global organisations, the Global Rehabilitation Alliance (formed in 2017 after Rehabilitation 2030, the World Health Organisation meeting), and Cochrane Rehabilitation. Leonard concluded: "The WFNR has travelled far and our journey continues".



Future WFNR World Congresses have changed dates in order to accommodate a 'physical' return to Lyon in 2022. "With all the problems arising from coronavirus we have learnt a lot about holding digital conferences but we mustn't jeopardise the benefits of face-to-face meetings and networking opportunities" said **Volker Hömberg** (Germany), WFNR Secretary General.

Isabelle Laffont (France), President of SOFMER was joined by the Host Congress Chairs Gilles Rode (France) and Dominic Pérennou (France) and thanked everyone for a "high level Congress".

David Good (USA), the newly-appointed WFNR President, closed the ceremony and said: "The digital format was successful. The science has been excellent. We had submissions from young scientists in the form of posters and oral communications which is really encouraging. And the industry support from companies including Allergan, Ipsen and Medtronic was very much appreciated. We look forward to seeing you all in 2022".

WFNR FRANZ GERSTENBRAND AWARD

Closing date 31 December 2020

Worth £3000 to the winner, the Award recognises and rewards a neurorehabilitation project that has benefitted patients. Entries are welcome from WFNR members and non-members worldwide.

For further information and an application form please visit: http://wfnr.co.uk/education-and-research/wfnr-award

PLENARY SPEAKER OVERVIEW: Developments in science and technology

Dafin Muresanu (Romania), Professor of Neurology at the "Iuliu Hatieganu" University of Medicine and Pharmacy in Cluj-Napoca, delivered the meeting's first plenary lecture on the need for a new philosophy in NR. Dafin said: "Without science we can do nothing.

We need strong theory and basic research in all fields of neurosciences. We need to test it in an evidence-base way, validate it, and look at effectiveness and safety. But remember we are dealing with real life".

He discussed the capacity of the brain to recover but emphasised the knowledge gap in recovery prediction. Theory and basic research can improve this gap by employing biologically relevant and valid interventions, but are these interventions being used correctly? Dafin said: "It is important to consider the individual's biological reserve; the best intervention in a person with no biological reserve will achieve nothing".

Stephanie Clark (Switzerland) is Professor and Head of the Neuropsychology and Neurorehabilitation Clinic at the University Hospital in Lausanne. Stephanie looked at the complex phenomenon of neural plasticity and the remodelling of neural networks. She discussed the malleability of cortical representations e.g. in the phantom limb and the use of prism adaptation in neglect.

Jean Paysant (France), Professor of Physical Rehabilitation and Medicine at the Regional Institute of Readaptation in Nancy discussed the advanced technology for intelligent neuroprosthetics. The last 100 years has seen huge technological developments in prosthetics but no real change in how they are controlled by the user in terms of the decision and action process.

Jean discussed the development of intelligent prostheses for upper and lower limb amputees, where the control is managed by sensors resulting in the automatic movement of the prosthesis. This automatic system reduces task time, reduces user engagement, mental burden and increases the use of prosthetic joints. "This is the way forward" said Jean.

Surjo Soekader (Germany) is Einstein Professor of Clinical Neurotechnology at the Charité University Medicine in Berlin. Surjo presented an overview of the state-of-the-art in brain-machine (computer) interfaces (BMI), invasive and non-invasive approaches, and also addressed whether or not BMI technology is ready for NR. Assistive and restorative BMIs are effective clinical tools to improve living conditions for individuals with paralysis. The repeated use of BMI technology can lead to functional and structural plasticity of neural circuits and trigger neurorestoration, however, the variability in clinical efficacy is high. Instead of a one-size-fits-all approach, stratification and personalisation are key. Surjo concluded: "Using neural exoskeletons as a technical aid in physiotherapy may be the best way to broaden BMI use".

Barbara Wilson (UK), a Clinical neuropsychologist who has worked in brain injury rehabilitation for 42 years, delivered the Michael Barnes Lecture on cognitive rehabilitation and neuropsychology: where are we, where should we be? Barbara looked at the history of neuropsychology and its role in brain injury rehabilitation. The importance of goals was emphasised; the negotiation between patient, family and staff and their relevance to everyday life. Barbara said: "Goals need to be collaborative, improve real life functioning and applicable to real life problems". Holistic rehabilitation is also important encompassing the cognitive, social and emotional aspects together, as well as compensatory skills and vocational counselling. Barbara advocated the use of Single Case Experimental Design as an alternative to randomised controlled trials.

Michael Thaut (Canada), Professor of Music at Toronto University with cross appointments in rehabilitation science and neuroscience delivered the final plenary session. The role of music in NR has changed and evolved significantly over last 20 years. Michael said: "We now have a better grasp of how to use the auditory system to induce brain plasticity, and change clinical functions". Music is a biologically hard-wired language of the human brain, however, to be effective, it has to be practised strongly, repetitively and in the care-giver environment.

WFNR news round-up

David Good is the new WFNR President

The traditional President's 'Purple Bag' was 'handed' to David Good the new WFNR President, by Leonard Li the outgoing WFNR President. Leonard said: "This bag contains the history of WFNR and I leave it in David's very capable hands".

David thanked Leonard for his strong leadership and all that he has achieved during his WFNR tenure as President. The goals of the new WFNR President include increased communication between the WFNR Presidium and its membership, to increase the roles of the Special interest groups (SIGs) with more involvement in WFNR educational activities, to continue and expand relationships with other organisations and to support research.

Changes to WFNR Presidium announced

With the announcement of a new President, Volker Hömberg, currently Secretary-General now becomes President-Elect, and Caterina Pistarini (Italy) takes up the role of Secretary-General. Leonard Li remains on the Presidium as Past-President.

New WFNR Members at Large appointed

Three new Members at Large were appointed; Izumi Kondo (Japan), Matilde Leonardi (Italy) and Nirmal Surya (India). WFNR President David Good thanked the outgoing Members at Large Caterina Pistarini and Nam-Jong Paik (Korea) who have completed the two terms of office.

Changes agreed to WFNR constitution

Two key changes to the WFNR Constitution were agreed at its Council meeting. Firstly, the number of Members at Large is increased to seven, and secondly, corporate and institutional membership are now added to the list of membership categories. The new categories of membership have no voting rights.

Clinical pathways in stroke rehabilitation

Publication of the 'Clinical Pathways in Stroke Rehabilitation', produced by the Education Committee, under the leadership of Thomas Platz is expected by the end of 2020. Translations of the evidence-based recommendations are being considered.

WFNR membership grows

The WFNR continues to grow and now has over 5000 worldwide members.

New dementia SIG

Joining the 37 WFNR Special Interest Groups (SIGs) is the Dementia SIG which will be chaired by Arseny Sokolov (Switzerland).

WCNR 2022 goes to Lyon

The 12th World Congress for Neurorehabilitation will take place from the 1-5 November 2022 in Lyon.

South Korea to host WCNR 2026

Following bids by Abu Dhabi (United Arab Emirates), Brisbane (Australia) and Daegu (South Korea) at the WFNR Federation Council meeting, Diaegu won the vote. The 14th World Congress for Neurorehabilitation will take place in October 2026.

WCNR 2024 to be held in Vancouver

The 13th World Congress for Neurorehabilitation will take place in Vancouver, Canada in 2024; the date has not yet been confirmed.

Neurorehabilitation (NR) journey continues

A panel discussion, chaired by Mike Barnes (UK), looked at how far NR has come since the WFNR was established in 1996.

Neurorehabilitation achievements to date

- Globally accepted field of medicine
- Delivered according to guidelines and pathways
- Good quality clinical studies are published in high level journals
- Evidence for brain plasticity turned rehabilitation into a science
- Technology developments e.g. artificial intelligence, neuroengineering and virtual reality devices have all helped corroborate the evidence-base
- Rehabilitation centres are established worldwide
- Education for therapy teams is standard practice
- Neurologists and neurology societies now recognise neurorehabilitation as an important part of their Congresses
- Public awareness and demand for services is increasing

Looking to the future, the panel agreed that the delivery of NR services will take different forms depending on the availability of professionals and the economic status of the country. As a result of Covid-19 there has been an increase in the use of telemedicine and telerehabilitation and this needs to continue. Every individual is different and there is a need for personalised or precision medicine. New methodologies are required to measure effectiveness; these may be non-interventional studies but still have a high value from the evidence-base perspective. The ability to translate basic discoveries about neural repair into human therapies is crucial but slow. Understanding biological reserve will facilitate the understanding of patient recovery. BMI are exciting but they need to be portable and usable in everyday life. Continued NR education and training is crucial, and in an ageing society NR has huge potential for elderly care but requires modification and industry involvement. “With the increase in neurological disease the potential for NR continues to be huge – there’s a lot of work still to do” concluded Mike.

Widespread interest in telerehabilitation across the globe

Covid-19 has changed the world and highlighted the valuable role of telemedicine and telerehabilitation (TR) as innovative approaches to delivering neurorehabilitation (NR) services in the community. TR has proved to be convenient for users, their families and service providers.

In a special session on Covid-19, Caterina Pistarini emphasised the importance of rehabilitation, beginning in the critical care setting and continuing into the community through the use of TR. There are new TR devices being developed and Pablo Celnik (USA) described several new systems where the patient comes into the hospital, is trained to use the device, and then sent home with it. Annie Hill (Australia) discussed the delivery of speech therapy using TR across a number of Australian states with training and resources available for clinicians.

Chaired by Alessandro Giustini (Italy) and **Nirmal Surya** (India), the Developing World Forum and Community-based NR (CBR) WFNR Special Interest Groups joined together to discuss just some of the issues facing the developing countries and the use of CBR. In the developing world CBR is a strong power to deliver services in countries where NR is not perceived to be a priority and costly, therapists are not available and services inaccessible to millions of people, especially those living in rural areas.

Nirmal said: “We have a need to upscale neurorehabilitation. Telerehabilitation is an acceptable and affordable means to deliver increased services to remote locations”.

In Mexico, where 50% of the population live in poverty, Covid-19 exposed many deficiencies in its healthcare structure but presented an opportunity for CBR. **Jorge Hernandez Franco** (Mexico) said: “It gave us an opportunity to change existing practice”. A community health intervention model has been implemented to facilitate integrated rehabilitation services especially in rural areas and a platform developed for telemedicine.

The geography of the Philippines with its numerous islands and mountainous areas has resulted in problems for patients accessing NR but as Carl Leochico (Philippines) said: “Since Covid-19 telerehabilitation has enabled services to be delivered successfully, although guidelines and medical training are at an early stage”. Sabrina Intan (Malaysia) described TR as a value-added tool that ensures continuity of care.

However, TR is not without its issues in the developing countries where data breaches, medical liability, lack of knowledge, technical skills and understanding and low bandwidth in rural areas are some of the many problems to be addressed. However, despite the issues, Nirmal concluded: “Telerehabilitation and family involvement is most definitely the way forward in many countries”.

Robots and NR – the debate continues

Robots have been used for the last 20 years; the evidence-base for their use after stroke is now substantial but not without controversy. Alberto Esquenazi (USA) looked at the clinical applications of rehabilitation robotics and Hermano Igo Krebs (USA) focussed on the economic perspective. Jan Mehrholz (Germany) gave a comprehensive overview of their use in NR and discussed the high quality evidence for stroke rehabilitation with upper and lower limb robotic training.

However, the questions of patient selection, which machine should be used, and is the effect stable are all questions that present the clinician with challenges.

Volker Hömberg said: "Robots clearly open a therapeutic window and have a key role for those individuals requiring intensive NR therapy". He advocated robots with minimal therapist involvement, and highlighted the patient boredom factor. He said: "We need small, bedside, usable devices that are more compelling. We have neglected the entire problem of patient motivation in rehabilitation but technology has the ability to change this". Dylan James Edwards (USA) discussed different forms of patient motivation including music and transcranial direct current stimulation (tDCS).

Neurological conditions impact on driving ability

Driving is one of the most complex activities of daily living. The seminar 'Driving-evidence-based practice in driver screening, assessment and intervention' featured seven speakers who reviewed succinctly different neurological conditions and their impact on the individual's ability to drive.

All the conditions discussed including Parkinson's disease, Multiple sclerosis, Traumatic brain injury, stroke, dementia, spinal cord injury and concussion have an impact on the individual's ability to drive either immediately after the event, or for many, much longer-term, as their condition deteriorates. Even a mild concussion impacts on driving skills with a recommendation not to drive for at least 48 hours.

Individuals will often consider their driving skills to be satisfactory despite having cognitive, functional and visual issues. Driving assessment is clearly essential for all these conditions and there is a range of tools available. However, as the chair of the seminar Carol Hawley (UK) concluded: "The diversity of neurological conditions demands approaching the assessment from different perspectives and guidelines are required for each condition".

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