

EEG IN NEONATES

Dr. Armin Delgado

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Congress

Neurovirtual Highlights Innovations at Epilepsy Events

eurovirtual participated in the 13th Latin American Epilepsy Congress, held in Santo Domingo, Dominican Republic, from June 15 to 18, 2024. The event provided a unique opportunity to exchange knowledge on epilepsy diagnosis and treatment, covering social, pharmacological aspects, alternative therapies, and the application of medical devices. The congress included courses, workshops, and lectures presented by renowned experts. Notable sessions included "EEG Contributions to the Topographic Diagnosis of Focal Seizures in Children" by Loreto Ríos-Pohl from Chile, and "Al for Automated Interpretation of Routine EEG?" by Sándor Beniczky from Denmark.

During the congress, Neurovirtual showcased its advanced BWIII EEG Plus ICU Brain Monitor, which generated significant interest among attendees.



This innovative device enables precise and efficient diagnostics, which are essential for patient care. Visitors to Neurovirtual's booth had the chance to explore the device's features and discuss clinical applications with specialists.

attended Additionally, Neurovirtual the XLVI Annual Meeting of the Mexican Chapter of the International League Against Epilepsy (CAMELICE) in Monterrey, Nuevo León. This event featured important discussions on "Perspectives on EEG Diagnosis in Epilepsy," "Epilepsy in the Pediatric Population," and the "Symposium on Advances in Neurotechnology and Its Impact on Epilepsy Management." Neurovirtual presented both the BWIII EEG Plus ICU Brain Monitor and the BWMini Ambulatory EEG, cutting-edge technologies for epilepsy diagnosis, and welcomed experts like Dr. Rodolfo César Callejas, Dr. Daniel San Juan, and Dr. Ana Luisa Velasco Monroy, the CAMELICE president, who visited their booth.



Congress Neurovirtual at SLEEP 2024

eurovirtual proudly participated in the SLEEP 2024 conference, held from June 1-5, 2024, in Houston, TX. The event, themed "Transform Your Practice and Research at SLEEP 2024," brought together leading experts and professionals in sleep medicine. Representing Neurovirtual, Sergio Solis (National Account Manager), Felipe Lerida (Customer Support), and Paolo Frigo (National Account Executive Neurovirtual Canada) showcased the company's latest advancements in sleep technology.

Attendees showed particular interest in the BWIII PSG Plus, featuring 50 channels, and the HST Compass, a stateof-the-art Home Sleep Testing device. These innovative products demonstrate Neurovirtual's commitment to advancing sleep diagnostics and improving patient outcomes.

Among the many visitors to Neurovirtual's booth was Dr. Christopher Hope, the Medical Director for the Sleep Program at East Alabama Medical Center and a current customer. His presence highlighted the trust and satisfaction experienced by professionals using Neurovirtual's equipment. The conference provided a valuable platform for networking, learning, and exploring the latest trends in sleep research and practice. Neurovirtual invites all interested professionals to request a demonstration of their cuttingedge sleep diagnostic tools, reinforcing their mission to enhance the quality of sleep medicine worldwide. pronged approach: "Sleep Medicine Knowledge Review" and "Evolution of Sleep Technology in Wisconsin: Past, Present, and Future." Our National Account Manager, Sergio Solis, was there representing Neurovirtual, connecting with attendees, and showcasing our latest advancements in sleep technology.

One of the highlights was the BWIII PSG PLUS amplifier. This state-of-the-art 50-channel system offers a powerful

Neurovirtual at the 2024 Wisconsin Sleep Society Conference

The 2024 Wisconsin Sleep Society Annual Conference was a success, and Neurovirtual was proud to be a part of it! Held on Friday, May 10th, at the Marriott Milwaukee West in Waukesha, the conference brought together a diverse audience of sleep medicine professionals—Physicians, Dentists, NPs, PAs, Nurses, Advanced Level PSG Techs, and Beginner Techs—for a day of learning and collaboration.

This year's theme focused on a two-

combination of comprehensive PSG and EEG monitoring, providing a complete picture of sleep health for your patients.

The conference fostered valuable discussions on the latest trends in sleep medicine and the ever-increasing role technology plays in this critical field. We were honored to be part of these conversations and connect with sleep specialists dedicated to improving patient outcomes.

Congress

Neurovirtual at the São Paulo Sleep Medicine Congress

he Neurovirtual team made a significant impact at the 2024 Paulista Congress of Sleep Medicine, held in São Paulo, Brazil, from May 17-18. The congress, themed "Sleep Medicine in Practice," brought together sleep specialists, researchers, and industry experts to discuss the latest advancements in sleep medicine and their practical applications. Notable highlights included





the presentations "The Challenges of CPAP Telemonitoring: How to Improve Adherence?" by Dr. Maurício Bagnato and "Short Sleepers: Do They Exist?" by Dr. Maira Honorato.

Neurovirtual, a leading provider of sleep diagnostic solutions, has actively participated in the congress since 2014. This year, the company showcased its

latest innovations in sleep technology, including the BWAnalysis Sleep Diagnostic software and the BWIII PSG Plus.

The BWAnalysis Sleep Diagnostic software is a comprehensive tool that meets all the requirements of the latest version of the American Academy of Sleep Medicine (AASM) scoring manual. It provides clinicians with a powerful and user-friendly platform for analyzing sleep data and making informed diagnostic decisions.

The BWIII PSG Plus polysomnograph is a versatile system allowing users to perform EEG and polysomnography recordings. With its 50 channels, it provides the flexibility to capture a wide range of physiological data, making it ideal for research and clinical applications.

Neurovirtual Participates in the Colombian Neurology Congress

Neurovirtual participated in the 2024 Colombian Neurology Congress, held in Barranquilla, Colombia, from May 30 to June 2. The event, themed "Brain Revolution: Integration between AI and Neurology," which gathered neurology experts to discuss cutting-edge advancements and emerging trends.



the congress, Neurovirtual At had the pleasure of engaging with prominent figures in neurology, including Dr. Luiz Carlos Mayor (Neurologist-Epileptologist), Dr. Diana Marcela Mejia Araujo (Neurologist), and Dr. Luis Jose Fernandez (Neurologist). Representing Neurovirtual, Angie Medellin and Carolina Piñeros Fonseca showcased the company's latest technologies, particularly the Electroencephalograph BWIII EEG Plus ICU Brain Monitor and BWIII EEG Plus. These innovative devices

support precise and efficient diagnostics, enabling healthcare providers to make better-informed clinical decisions. As a leading provider of neurodiagnostic technology, Neurovirtual continues to establish itself as a key player in the field, offering tools that enhance patient care.

Participation in this prestigious congress highlights Neurovirtual's commitment to advancing neuroscience and innovation in Latin America. Additionally, Neurovirtual took part in the XXIX Peruvian Congress of Neurology from July 4-6, 2024, at the Hotel Palacio del Inca in Cusco. Organized by the Peruvian Society of Neurology, the event attracted distinguished specialists, including epileptologist Dr. Walter de la Cruz, who visited Neurovirtual's stand. Team members Angie Medellín and engineer Natalia Barón conducted live equipment demonstrations, focusing on the BWIII EEG Plus ICU Brain Monitor and BWMini Ambulatory EEG.

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Interview

EEG IN NEONATES

- Dr. Armin Delgado



Read the full interview:





Dr. Armin Delgado Salinas is a neurologist and specialist in pediatric neurophysiology. He currently leads the Neurophysiology Department at the National Essalud Hospital "Edgardo Rebagliati Martins," where he conducts electroencephalography studies on neonates and children. His focus is on diagnosing neurological disorders through the evaluation of brain activity.

eurovirtual news: Hello Dr. Armin Delgado, could you start by introducing yourself?

Dr. Armin Delgado: My name is Armin Delgado, and I am a neurologist. I am in charge of the neurophysiology department at the National Essalud Hospital Edgardo Rebagliati Martins, specifically in the pediatric area. In this unit, we conduct electroencephalography studies on neonates and children up to 14 years old.

NN: What are the main clinical indications for performing an EEG in neonates?

Dr. Armin Delgado: The main clinical indications for performing an electroencephalogram in neonates are to rule out epileptic processes or metabolic disorders that could affect the brain function of a newborn. It can also be used to determine gestational age and in hypothermia protocols. These are the three most clinically relevant areas.

NN: What specific electrophysiological differences are observed in neonatal EEGs compared to adults? How does this influence clinical interpretation?

Dr. Armin Delgado: The difference between a neonatal EEG and a nonpediatric one is significant. Starting with the fact that EEGs performed on neonates use what we call extracerebral electrodes. That is, we not only place electrodes on the brain but also on the eyes, chin, a respiratory band, and we record responses using what we call an electrocardiogram.

Why do we do this? Because, during the early neonatal period, it is often difficult to differentiate the baby's state—whether they are awake, in active sleep, or in passive sleep. This differs from older children, such as those one or two years old, where we generally only place electrodes on the brain.

This has a direct clinical implication because the baseline tracing of the EEG, in terms of age-specific graphoelements, is very different in neonates or newborns. The weekly differences set a standard for electrical maturity compared to what we see in children older than two months. Furthermore, global sleep classifications indicate that starting from two months of age, there is a resemblance to classifications used for older children or adults.

For this reason, in children under two months, we use a different classification. Having a tool like the electroencephalogram helps us, among other things, to evaluate what I previously mentioned: brain maturity.

turn off their cell phones because the electrical signal from these devices generates significant interference in the tracing. In essence, we understand that recording a good neonatal EEG is a challenge, but through effort and experience, we have managed to

NN: What are the main technical challenges you face when performing EEGs in neonates, and how do you overcome them?

Dr. Armin Delgado: Well, performing a neonatal electroencephalogram is genuinely difficult. Our nurse, who has been trained in this area for over 15

years, has always faced technical challenges. For us, interpreting a neonatal EEG is very different from a pediatric EEG, which represents a significant challenge.

Usually, the babies we see are in complex areas like the pediatric ICU or neonatal unit, which are routinely surrounded by numerous electrical devices. This means **the electrical field in these settings is challenging.** The presence of numerous electrical fields generates noise or, colloquially, artifacts. These external interferences, which are not brain-originated, affect the signal tracings.

However, over the years, we have learned to manage these difficulties better. Besides thoroughly cleaning the scalp and using suitable materials, we have discovered that conducting studies with battery- operated equipment, instead of devices plugged into the wall, helps us obtain a more accurate tracing free from external electrical field influences.

In this sense, when we perform EEGs in pediatric or neonatal areas, we always aim to achieve a clean signal. The technical characteristics of the equipment we use have significantly contributed to minimizing or eliminating these external artifacts. We have also learned that distancing equipment from areas with high concentrations of electrical devices improves the quality of the recordings. For instance, in neonatal units with premature babies, where infants are often in incubators or connected to large devices, we have achieved better results by temporarily unplugging these devices for a few minutes. With practice, we have also found certain filters helpful in reducing interference. Likewise, we minimize nearby movements, avoiding electrical devices or frequent personnel circulation around the recording area.

Additionally, **we have learned to handle other interference sources, such as personal devices.** For example, if a close relative (like a mother or father) is nearby, we ask them to completely



obtain more accurate recordings that faithfully reflect brain waves.

NN: What pathological conditions are most frequently identified in neonatal EEGs? How do you determine the need for subsequent interventions?

Dr. Armin Delgado: Here in our

neuropediatrics unit, where we have had the most support, it is mainly in the epileptic area. We have seen children who developed epilepsy from an early stage, and this has been one of the conditions that have most often required us to turn to this neurophysiological study.

The other area is metabolic issues, which also cause problems in newborns presenting conditions specific to their age, often associated with other conditions.

A third condition is neonatal asphyxia. These cases may be associated with the hypothermia protocol since decisions are needed to initiate this protocol. **Hypoxia-related encephalopathy can be very severe and cause significant complications in the patient.**

For this reason, the clinical implications of the electroencephalogram are crucial for initiating this protocol. As I mentioned, the hypothermia protocol has proven to be one of the treatments that can provide significant solutions for patients with this type of diagnosis, such as cerebral hypoxia.

NN: Do you recommend using Neurovirtual equipment for performing neonatal EEGs?

Dr. Armin Delgado: Yes, I would recommend Neurovirtual equipment. I have experience with these devices, and as I mentioned earlier, neonatal electroencephalographic electrodes always require the addition of extracerebral electrodes.

It is necessary to add electrodes at the ocular level, which we call electrooculogram; on the chin, corresponding to an electromyography; the respiratory band on the chest; oxygen saturation measurement; and also an electrocardiogram.

These additional setups can be used with Neurovirtual equipment, integrating them into the baseline electroencephalographic setup to obtain a complete recording of the neonatal condition. Neurovirtual participates, on average, in 20 to 30 congresses and conferences in different countries around the globe. Taking our goal to humanize the diagnostic, we pride ourselves on being part of this community and being able to give our contribution to clinicians and patients.

Below you will find the list of events for 2025 where Neurovirtual will be presenting its solutions to make neurology and sleep diagnostics more human! We hope to see you there!

CANADA		Согомвіа
Canadian Sleep Society March 14 - 16, 2025	16th International Congress of Sleep Medicine March 20 - 23, 2025	16th National Congress of Sleep Medicine March 26 - 29, 2025
♥ Montreal	♀ Monterrey	♥ Bogotá
BRAZIL	USA	USA
15th Paulista Congress of Neurology	Sleep 2025	OSU Sleep Symposium
June 4–7, 2025	June 7 - 8, 2025	September, 2025
♥ São Paulo	♀ Seattle	♀ Columbus

Request Information







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