

INSIGHTS


Innovation, commitment, and humanity in brain-aware care: the legacy of Dr. Alfredo García-Alix in neonatal neurology

Juan Arnaez ^{1,2,3}✉, Miriam Martínez-Biarge⁴, Gemma Arca^{1,5}, Ana Alarcón ^{6,7}, Thais Agut^{1,6}, Fermín García-Muñoz Rodrigo ^{8,9}, María Teresa Montes Bueno ^{1,2,10} and Nuria Herranz-Rubia ^{1,6}

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Neurological disorders acquired during the perinatal period are a leading cause of long-term childhood disability and constitute a significant portion of the global disease burden. Despite progress in reducing neonatal mortality, neurological morbidity remains a major challenge. Neonatal neurology, a relatively new subspecialty, aims to improve outcomes for affected infants through advances in understanding neurological injury mechanisms, developing assessment tools, and implementing preventive and therapeutic strategies. In Spain, neonatal neurology has significantly progressed over the past three decades, largely due to the contributions of Dr. Alfredo García-Alix. Recognized as a pioneer in the field, he played a crucial role in establishing neonatal neurological care services and fostering education and research. After training at Washington University in St. Louis, he introduced comprehensive neonatal neurology programs in Spain and co-founded the NeNe Foundation to advance education in the field. He also led the creation of the 'Spanish Neonatal Brain Group' and contributed extensively to neonatal neurology research. Dr. García-Alix was an advocate for holistic, multidisciplinary neonatal care, emphasizing early intervention, neuroprotective strategies, and parental involvement. His work significantly influenced neonatal care models in Spain and Latin America, and his legacy continues to shape the field through his teachings, research, and clinical contributions.

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Neurological disorders acquired during the perinatal period are the leading cause of long-term disability in childhood worldwide and represent a significant proportion of the disease burden. Although the exact prevalence of these disorders in neonatal units remains unclear, it has been reported that at least 30% of neonates admitted to neonatal intensive care units (NICU) present with primary neurological pathology or other conditions that affect brain development.¹ This underscores the importance of reducing their incidence and improving neuroprotective care to mitigate their impact on the brain. Furthermore, while global neonatal mortality rates have declined, this trend has not yet extended to neurological morbidity; reducing these rates remains one of the primary challenges for neonatal medicine in the coming years.^{2,3}

Neonatal neurology is a relatively new subspecialty devoted to meeting the needs of neonates with neurological conditions or those at risk of neurological impairment. Its overarching goal is to achieve better functional outcomes and an improved quality of life for these infants and their families. Over the past decades, neonatal neurology has evolved into a dedicated area of expertise, propelled by significant advances in three critical aspects: 1) greater understanding of the pathogenic mechanisms underlying neurological injury; 2) the development of novel tools to assess

the severity of damage and predict neurodevelopmental outcomes; and 3) the implementation of new preventive and therapeutic interventions.

In parallel with developments in other European countries, North America and Australia, neonatal neurology in Spain has made remarkable progress over the last three decades. Today there is a well-established community of neonatologists and neuropaediatricians in Spain who demonstrate a special interest, training and commitment to neonatal neurology, both in clinical care and research. This achievement is largely attributed to the work and dedication of Dr. Alfredo García-Alix, who sadly passed away in September 2024. Considered the “father of neonatal neurology” in Spain, he also played a pivotal role in the emergence of this subspecialty in South America.⁴ (Fig. 1)

After specialising in paediatrics and neonatal medicine, Dr García-Alix completed a fellowship in neonatal neurology at Washington University in St. Louis, Missouri, USA (1989–1990), under the mentorship of Professor Joseph Volpe.⁵ Upon returning to Spain, he spent the next three decades establishing a comprehensive care service for newborns with neurological disorders, the first of its kind in the country.

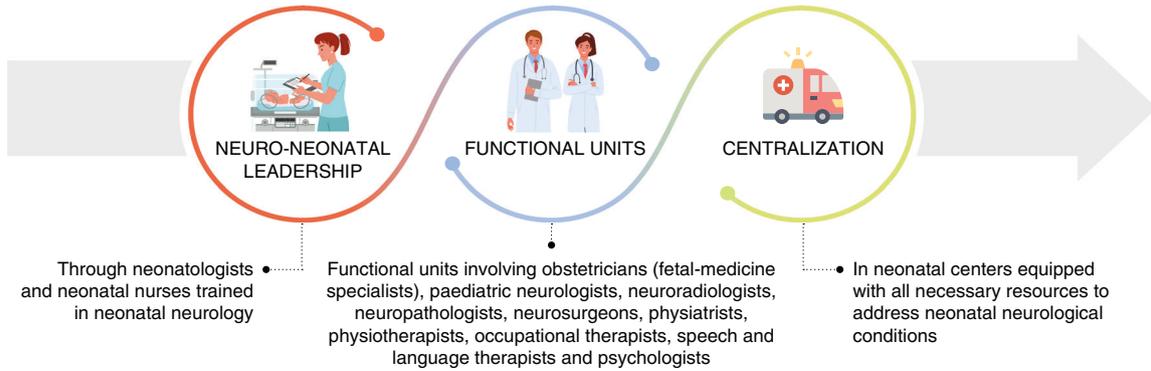
Dr. García-Alix served in various institutions, including Hospital La Paz in Madrid (1990–1996 and 2001–2009), Hospital

¹NeNe Foundation, Madrid, Spain. ²Ibero-American Society of Neonatology (SIBEN), Trenton, NJ, USA. ³Neonatal Unit, Complejo Asistencial Universitario de Burgos, Burgos, Spain. ⁴Department of Paediatrics, Imperial College Healthcare NHS Trust, London, UK. ⁵Department of Neonatology, Hospital Clinic, IDIBAPS, Barcelona, Spain. ⁶Department of Neonatology, Hospital Sant Joan de Déu and Hospital Clinic; BCNatal (Barcelona Centre for Maternal, Foetal and Neonatal Medicine); Institut de Recerca Sant Joan de Déu, Barcelona, Spain. ⁷Department of Surgery and Medical-Surgical Specialties, Faculty of Medicine and Health Sciences, Universitat de Barcelona, Barcelona, Spain. ⁸Division of Neonatology, Complejo Hospitalario Universitario Insular-Materno-Infantil, Las Palmas, Spain. ⁹Universidad de las Palmas de Gran Canaria, Las Palmas, Spain. ¹⁰Department of Neonatology, Hospital Universitario La Paz, Madrid, Spain. ✉email: juanarnaez@neurologianeonatal.org

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Brain-aware care is a comprehensive approach that emphasizes protecting and fostering the infant's developing brain from the earliest stages. It includes monitoring for neurological risk factors, implementing targeted interventions to support neurodevelopment, and engaging a multidisciplinary team to provide coordinated, family-centered care. By minimizing potential brain injuries and optimizing developmental outcomes, it lays the groundwork for a healthier life trajectory for at-risk neonates and their families.



Holistic neurology for the newborn: principles of a family-centered multidisciplinary approach

- Clinical observation and thorough patient assessment
- Comprehensive diagnostic workup anchored in detail and perseverance
- The neuro-neonatal specialist as the leader of the multidisciplinary care team
- In-depth neurological and neonatal pathophysiology knowledge
- Specialized training in neonatal neurology
- Care strategies aligned with the developing neonatal brain
- Recognition and empowerment of the nursing role
- Comprehensive family support and compassionate care
- Continuity of care after hospital discharge
- Commitment to teaching and research activities

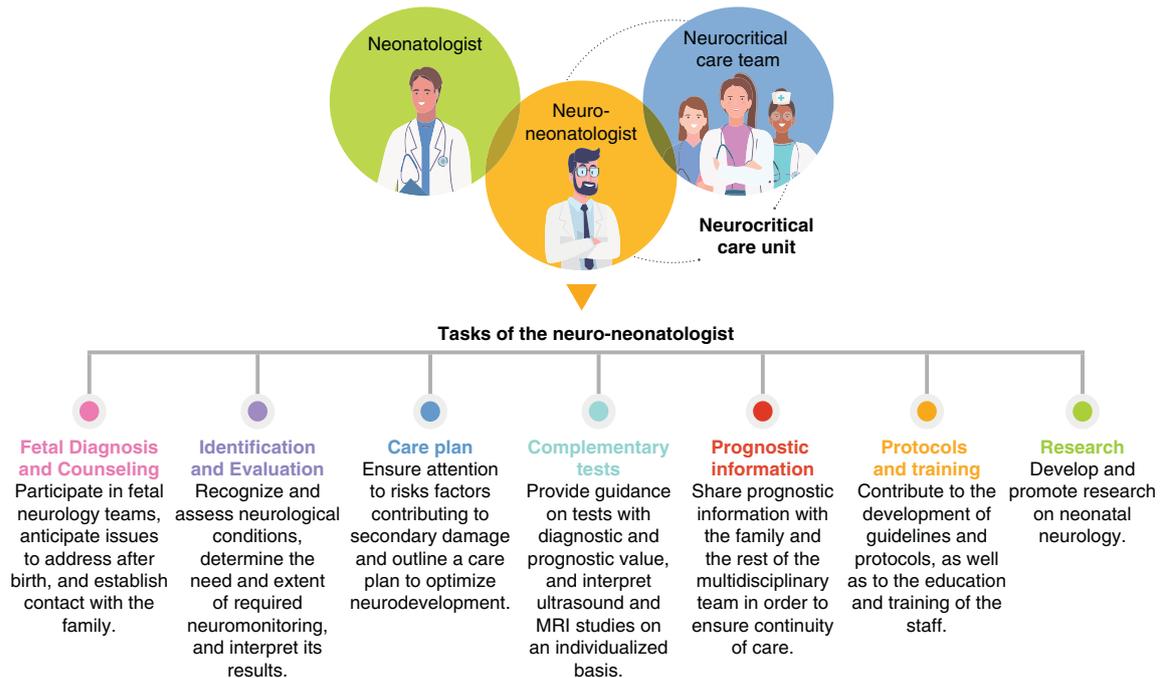


Fig. 1 The philosophy of brain-aware care and the principles of holistic neurological care for the neonate and their family.

Universitario Materno-Infantil de Las Palmas de Gran Canaria (1996–2000), and Hospital Sant Joan de Déu in Barcelona (2009–2019). In 2015, together with Dr Juan Arnaez, he founded the NeNe Foundation, a Spanish non-profit organisation dedicated to advancing education in neonatal neurology. He also led the

creation of the ‘Spanish Neonatal Brain Group’ in 2017, a collaborative team of neonatologists, neuropaediatricians, and neonatal nurses from across Spain, united by their focus on neonatal neurology. As an Advisory Member and Honorary Professor of the Ibero-American Society of Neonatology (SIBEN),



Fig. 2 Dr García-Alix in his clinical, educational, and research capacities.

he spent the last two decades of his life teaching neonatal neurology throughout South America, delivering formal lectures as well as devoting extensive time working alongside healthcare professionals in neonatal units.

Over the course of his career, Dr. García-Alix led numerous research projects that contributed greatly to neonatal neurology, particularly in the areas of neonatal encephalopathy, neonatal stroke and biochemical markers of brain damage. He also authored several essential books in the field, including 'Neurological Evaluation of the Newborn', 'Neonatal Neurology at a Glance', 'The General Movements of the Newborn and the Infant', 'Genetics for Neurologists', 'Mercè Leonhardt Optotype Battery for the visual assessment of infants' and '60 Clinical Cases in Neonatal Neurology'.

For those of us who knew him and had the privilege of training under him, Alfredo was far more than a pioneer in neonatal neurology. Above all, he was a clinician deeply committed to providing the highest quality of care for neonates with neurological problems and their families. He advocated for a holistic approach to neonatology that extended to parents and emphasised the importance of neonatal neurology as a subspecialty led by neonatologists, working in close partnership with a multidisciplinary team. Alfredo was notably critical of confining neonatal neurology to "neurocritical care" alone, as well as relying exclusively on one-time assessments or single-domain specialists. His tireless efforts aimed to ensure that care for neonates was integrative, continuous, and inclusive of family involvement.

His expertise in neonatal neurology was broad and profound, encompassing neonatal and infant neurological examination, neurodevelopment, and the full spectrum of diagnostic and prognostic tools, including cerebral ultrasound, brain magnetic resonance imaging (MRI), amplitude-integrated electroencephalography (aEEG), evoked potentials, muscle biopsy, fundoscopy and biochemical markers of brain injury. He firmly believed that an accurate neurological diagnosis should always begin with a thorough medical history, that includes family antecedents, followed by a systematic neurological examination. We often recall his words: 'A good neurological examination does not automatically ensure sound clinical reasoning, but the latter is limited, if not impossible, without a proper neurological examination'.

Armed with this comprehensive information and the results of supplementary tests, he would formulate a diagnosis, prognosis, and an individually tailored follow-up plan, which he meticulously documented in the discharge report to facilitate continuity of care by other professionals. He strongly opposed a 'wait-and-see' approach, advocating instead for the use of all available data, preferably supported by published evidence, to guide

prognostication, anticipate potential complications, and initiate early intervention.

Alfredo recognized nurses as pivotal members of the healthcare team, given their close interactions with infants and families. He emphasized their responsibility in championing family rights, promoting parent-infant bonding by actively involving them in overall care, and providing the necessary knowledge, support, and guidance. At a time when such practices were still uncommon in Spain, he pioneered the inclusion of nurses in clinical discussions, medical rounds, and end-of-life decision-making processes. He collaborated closely with nursing staff to develop evidence-based protocols and structured training to ensure their effective implementation.

Alfredo also displayed a profound sensitivity to parental distress, combining honesty with empathy, respect, and compassion, without underestimating the gravity of the situation. When an infant was at the end of life, he was always present to offer emotional support and comfort to the family. His leadership was instrumental in shaping the first neonatal palliative care protocols in Spain.

Although he lectured at numerous universities, Alfredo was never motivated by academic prestige. His primary aspiration lay in sharing his knowledge and vision, and guiding other professionals. It was common to see him surrounded by students, and he generously supervised many doctoral theses, investing both time and rigour in each. This fervent dedication and humility naturally established him as a master in his field, ultimately "creating a school". The phrase "creating a school" refers to the transformative impact of an individual or group in a particular domain, establishing new paradigms, methods, or perspectives that others subsequently adopt. A person who "creates a school" remains a role model who not only becomes a benchmark, but also serves as a pathway and a bridge for future generations. The care model that Alfredo introduced and fostered is now practised in multiple neonatal units throughout Spain (Fig. 2).

While the term "master" is often ascribed to individuals who attain exceptional knowledge, skill, and experience in a given field - and who possess the ability to effectively transmit that knowledge to others - a true master may be defined as one who teaches from the soul, imparting not only expertise but also empathy, respect, and sincere care for others. Without question, Dr. García-Alix exemplified the essence of a true master.

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AUTHOR CONTRIBUTIONS

Juan Arnaez, Miriam Martínez-Biarge, Gemma Arca contributed to the conception of the idea, drafting of the manuscript, critical revision, and approval of the final version. Ana Alarcón, Thais Agut, Fermín García-Muñoz, María Teresa Montes, Nuria Herranz-Rubia participated in the critical revision of the draft and approved the final version of the manuscript.

COMPETING INTERESTS

The authors declare no competing interests.

ADDITIONAL INFORMATION

Correspondence and requests for materials should be addressed to Juan Arnaez.

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