

Advances in paediatric neurology: Emerging therapies and innovations.

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Introduction

Advances in pediatric neurology have significantly enhanced our ability to diagnose, treat, and manage neurological disorders in children [1]. As research continues to evolve, new therapies and innovations are transforming the landscape of pediatric care, offering hope for better outcomes in conditions that were once considered untreatable [2].

One of the most promising areas of progress in pediatric neurology is the development of targeted therapies [3]. In conditions like epilepsy, new antiepileptic drugs (AEDs) and advanced surgical interventions are improving seizure control in children [4]. For example, the use of responsive neurostimulation (RNS) systems has enabled real-time intervention for seizures, minimizing the need for invasive surgery and reducing seizure frequency in some patients [5]. Additionally, genetic therapies are showing potential in treating inherited neurological conditions such as spinal muscular atrophy (SMA) [6]. The approval of gene therapies like nusinersen (Spinraza) has provided a groundbreaking treatment for SMA, altering the course of the disease by targeting the genetic mutation responsible for the condition [7].

Another critical innovation is the growing application of neurogenetic testing. This technology allows for earlier and more accurate diagnoses of a wide range of neurological disorders, such as neurogenetic syndromes and neurodegenerative diseases [8]. Early diagnosis enables timely interventions, improving the long-term prognosis for many children [9]. For instance, advancements in genetic screening can help identify conditions like Rett syndrome and fragile X syndrome, leading to personalized treatment plans that better address the specific needs of each patient [10].

Conclusion

Moreover, neuroplasticity—the brain's ability to reorganize itself in response to injury or disease—has become a focal point in pediatric neurology. Research into promoting neuroplasticity through rehabilitation therapies, stem cell treatments, and other regenerative approaches is opening new frontiers in pediatric neurology. These innovations are paving the way for treatments that can not only manage symptoms

but potentially repair and restore function, offering new hope to children with neurological conditions.

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