

Guest Editorial

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I am delighted to share with you a novel set of papers focusing upon neuroimaging within a broad scope of pediatric white matter disorders. Pediatric white matter disorders include inherited and acquired conditions, both of which may feature disruptions in the formation, maintenance, and/or demyelination of brain white matter. Neuroimaging of pediatric white matter disorders can be diagnostically challenging, due to the evolving background of maturation and myelination coupled with disease progression. A variety of conventional and advanced magnetic resonance imaging techniques are now readily available at most imaging centers to assist in narrowing differential diagnoses, suggesting a possible etiology, monitoring disease progression and when available, the patient response to therapeutics. This issue begins with an article to provide the reader with the key properties of magnetic resonance imaging (MRI) techniques employed in this special issue.

In crafting the thematic concepts of this issue, I purposefully included traditional and non-traditional topics. In the traditional sense, my colleague Diana Lindquist and I prepared two articles on primary leukodystrophies, as well as lysosomal and peroxisomal disorders primarily altering white matter. Jan-Mendel Tillema, Sarah Hopkins, Moses Rodriguez and James Leach reviewed the imaging of multiple sclerosis and related acquired demyelinating disorders in childhood. For the non-traditional contributions,

Beth Kline-Fath, Stephanie Merhar, and Jean Tkach report imaging and pathophysiology of the beginning of life with premature white matter disease in very low birth weight infants. Laura Hayes and I provided a unique look at the impact of toxicants, including environmental chemicals, prescribed and abused medications, on pediatric white matter. In a topic of increasing international significance, Susan Palasis focused the reader to the primary and secondary effects of traumatic brain injury on white matter with conventional and advanced MRI techniques. Travis Beckwith and I offered a review of the white matter changes associated with infectious and inflammatory disorders. Psychiatric disorders adversely affect an increasing number of individuals, families, communities and society in general. By taking an early look with an emphasis on pediatric white matter abnormalities, additional research may yield new approaches to care for those affected with these conditions. Diana Lindquist highlighted what is currently known in how the white matter is affected in psychiatric diseases. Finally, Weihong Yuan, James McAllister and Francesco Mangano share with the reader how diffusion tensor imaging yields novel insight into hydrocephalus. I hope you find this issue informative to the care of your patients. Furthermore, I believe you will see the relative dearth of knowledge in many of these disorders and become inspired to report your observations in the literature for these pediatric conditions.

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