INTRODUCTION: Functional Neurological Disorder in Children and Adolescents: A Medical Chameleon

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Functional neurological disorder (FND) is a complex illness consisting of varied neurologic symptoms without a structural or anatomic basis. It is a disorder frequently encountered in both pediatric and adult medical settings. Over time, there have been shifts in nomenclature, etiologic theories, professional interest, affected populations, and symptomatology.

FND was originally thought of as a subset of an older diagnosis, hysteria, with written reference as early as BC times. The term hysteria is attributed to Hippocrates and his writings dating from 400 BC, though earlier descriptions of neurologic and psychiatric illness are found in Assyrian and Babylonian records from the second and first millennium BC.[1] The use of "hysteria" to describe functional illness continued well into the 20th century with diagnostic modifiers including "hysterical paralysis," "hysterical convulsions," and "hysterical conversion," to name a few. As etiologic theories continued to evolve, so did diagnostic terminology with a shift from hysteria to conversion disorder to the current DSM-5-TR designation of functional neurological symptom disorder, often truncated to functional neurological disorder or FND. Accompanying currently accepted terminology and avoiding stigmatizing language, disorder subtypes have also shifted, such as the transition from psychogenic seizure or non-epileptic seizure to functional seizure.

Paralleling nomenclature shifts, etiologic theories have also evolved over time. Assyrians and Babylonians (BC), described as great observers of behavior, had no conceptual awareness of the brain and attributed illness to the supernatural.[1] Alternate theories around the origin of hysteria existed for centuries and included religion or magic, uterine dysfunction, witchcraft, sorcery, and animal spirits. This is despite Galen's concept "that the mental faculties follow the bodily constitution," introducing conceptually the influence of emotions in the second century.[1] With the evolution of neurology as a specialty, the brain became the organ of focus with understanding that emotions were relevant, supported by 17th-century physicians, including Willis, Sydenham and Lepois. These brain-based theories laid the foundation for 19th-century concepts that multi-organ symptoms could exist, with Charcot (often identified as the father of modern neurology) suggesting hysteria was due to "dynamic or functional" neurologic disease.[2] Freud, a student of Charcot, elaborated further and introduced the concept of repressed sexual desire (in childhood) leading to converting psychological issues into physical symptoms. With renewed diagnostic interest from psychiatry and neurology, evolution of research and neuroimaging in the late 20th century, etiologic thinking has advanced in identifying the complex nature of the illness with complex mind-body connections at play,[2] and more recent focus on distress tolerance, reactivity of the body's stress response system (Hypothalamic Pituitary Adrenal axis), and complex imbalance in neurocircuitry.

As nomenclature and etiologic theories evolved and broadened, affected patient populations also expanded. Initially felt to be a solely female disorder linked to etiologic uterine theories, males were next to be included in those affected, with juvenile hysteria later identified in children. Lepois was credited with the first description of hysteria in children in the early 17th century, though others felt "it dates from antiquity, as witness the children's crusades, the epidemics of chorea magna and the tale of the Pied Piper of Hamlin."[3] In the late 1800s, it was generally accepted as "not rare," with one-fifth of all hysteria cases attributed to children.[4] Hecht's 1907 article highlights ambivalent acceptance and emerging understanding of juvenile hysteria, categorizing it as a "functional disorder akin to that appearing in adult life."[4] Additional early writings describe stressful triggers, precipitating organic illness, and better outcomes in children than adults.[3-5]

In this special edition of the *Rhode Island Medical Journal* (RIMJ), we introduce a series of articles from professionals experienced in the treatment of FND in pediatrics. Authors combine existing evidence with clinical experience treating this population at Hasbro Children's Hospital's medical-psychiatric programs: the Hasbro Children's Partial Hospital Program (HCPHP) and the Selya 6 Medical Psychiatric Inpatient Program. The HCPHP is a day treatment program that uses a family systems-oriented approach to treat children with a wide range of pediatric illnesses that have been refractory to standard treatment. Primary presenting problems include medical illnesses complicated by psychological factors, psychiatric illnesses complicated by physical factors, or both. Common types of presenting problems include functional neurological disorder, eating disorders, elimination disorders, medical treatment non-adherence, and pain disorders. Children, ages 6 to 18 years old, attend the program five days

a week, eight hours a day, for an average length of stay of 6–8 weeks. The HCPHP has a multidisciplinary staff, including psychologists, pediatricians, child psychiatrists, pediatric nurses, nutritionists, teachers, and milieu therapists, who collaborate with primary care providers, subspecialists, and school systems. For children needing a higher level of care, admission to the Hasbro Children's Inpatient Medical/Psychiatric Program (Selya 6) is an option. The treatment framework, multidisciplinary team, and diagnostic presentations at the inpatient level of care is similar to that of HCPHP. Both programs serve a patient population that varies across race, ethnicity, religion, socioeconomic status, sexuality, and gender identity. Our goal in this special RIMJ edition is to optimize awareness, understanding, and offer clinical pearls applicable to the outpatient or inpatient setting with key concepts of diagnostic clarity, psychoeducation, and multidisciplinary treatment that includes the family.

In the opening article, **"Functional Neurological Disorder in Pediatrics: Diagnostic Considerations,"** Haley Moulton et al provide a diagnostic overview, discuss current DSM-5-TR criteria, and review signs/symptoms that make FND a rule-in diagnosis versus one of exclusion. This article demonstrates that physicians of today are educated, informed, and aware of FND versus their 1800s' counterparts who were described as "woefully ignorant regarding it."[5]

In Rebecca Laptook's article on psychological treatment titled **"The Importance of Language and Messaging in Psychological Treatment for Functional Neurological Disorder in Children and Adolescents,"** she reviews key therapeutic concepts in the context of existing evidence. Dr. Laptook highlights the importance of language, validation, and prescriptive involvement of family in treatment. These current concepts contradict some early theories on treatment such as "removal to the country…for a prompt cure,"[3] "strict confinement in bed," and "separation from (her) family,"[6] while echoing others that identify "this powerful but susceptible enemy of the human family."[5]

Research continues to show the importance of rehabilitation services for management of FND. In Jessica Gore et al's article **"The Rehabilitation Therapist's Role in Treatment of Functional Neurological Disorder in Children and Adolescents,"** they share their expertise and unique approach in treating pediatric patients with FND, highlight rehabilitation guidelines created to meet the need for psychologically-informed and consistent rehab services, and review the potential role for each rehab service translatable to the outpatient setting. Emphasizing collaboration with a multidisciplinary team, the article emphasizes global functioning over focused dysfunction and illustrates this through examples, case study, and a ladder approach. No longer is "the rest cure" or "to isolate patients…to make them desire activity"[7] recommended treatments of choice.

In the article **"Considerations in Prescribing and De-Prescribing in Pediatric Functional Neurological Disorders,"** Jamie Gainor DiPietro et al review the limited evidence in prescribing specifically for FND, emphasize the importance of discontinuing medications as diagnostic clarity evolves, and discuss guiding principles of treatment including medication management of co-morbid psychiatric conditions. This article highlights progress in pharmacologic management, shifting away from 19th-century experimentation with "copper salts, gold, sodium chlorid, the valerianates, sumbul, tuperntin."[3]

Kelsey Borner et al provide guidance on school integration in their article **"Supporting Children and Adolescents with Functional Neurological Disorder in the School Setting."** They review guidelines and recommendations to support optimal functioning of children with FND in their academic environment, which is a critical setting for development, socialization, and education. Borner et al highlight returning to the school setting as a vital component of treatment and echo early theories that school stress may be a factor, though inclusion versus isolation is recommended.[3]

Andrew Sucov et al end the series with their article **"Functional Neurological Disorder in Adults,"** illustrating unique elements encountered in management of the adult patient with FND. The complexity and chronicity of adult illness with lower remission rates underscores the benefit of early identification and treatment, especially if presenting in childhood.

We hope you enjoy this series of articles highlighting the complexity of diagnosis, treatment, and multidisciplinary management of FND, a medical chameleon that has evolved over centuries. Our intent is to educate the medical community by bridging our experience in treating FND at Hasbro's inpatient and partial hospital treatment programs and sharing concepts that can be applied in the outpatient setting.

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