

The Rehabilitation Therapist's Role in the Treatment of Functional Neurological Disorder in Children and Adolescents

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ABSTRACT

Functional Neurological Disorder (FND) is a common condition encountered by rehabilitation therapists (physical therapists-PT, occupational therapists-OT, and speech and language pathologists-SLP) in pediatric practice. In an effort to bridge the knowledge and experience gap, PT, OT and SLP experts have published consensus recommendations for the rehab therapist's treatment of FND¹⁻³ with additional research emphasizing a psychologically informed^{4,5} and wellness approach.⁶ This article highlights the unique role of each rehab discipline in treating FND, reviews functional diagnoses specific to PT, OT and SLP, and introduces a unique stepwise or ladder approach to treatment that can be utilized in the inpatient or outpatient setting.

KEYWORDS: Functional Neurological Disorder, FND, Rehabilitation, Functional Seizures

CASE

BH and her family started individual and family therapy with ongoing psychoeducation of FND diagnosis, and a referral for rehab services was recommended. BH's current functional impairments include use of wheelchair for ambulation, child-like regressed speech and loss of independence with activities of daily living including bathing, dressing and self-care.

- Which rehab disciplines should be considered for referral?
- How might they approach this patient?

INTRODUCTION

Rehabilitation services are important components in treating a child or adolescent with functional neurological disorder (FND). These services may include physical therapy (PT), occupational therapy (OT), and/or speech and language pathologists (SLP), depending on the presenting functional symptom(s). Although the rehab therapist is not the professional formally giving the diagnosis, they may have suspicion of a functional diagnosis in a referred patient and are key partners in treatment and education once a diagnosis has been made. The PT, OT and SLP are experts in

movement, sensory systems, and communication/swallowing, respectively, and are qualified to assess and treat pathology in these areas. Functional gait disorders, functional weakness, functional tremors, functional dystonia, functional seizures, and functional communication and swallowing disorders, all classified under the FND umbrella, are conditions encountered by the rehabilitation specialist. In recent years, utilizing "rule-in" signs for diagnosis, rather than treating the condition as a diagnosis of exclusion, has been recommended.⁷ With clarity in FND diagnosis, intensive education¹ and parental acceptance of FND diagnosis as important positive prognostic indicators,⁸ rehab therapists are well positioned to be effective treatment partners while reinforcing each of these elements.

Rehab professionals are trained and skilled in providing patient and caregiver education. PT, OT and SLP each provide assessment of a patient's impairments and limitations. Based on this assessment, the rehab therapist will design individualized treatment strategies, home exercise programs (HEP) for treatment carryover, and reinforce use of strategies/HEP in other settings (home, school) to maximize functioning. As the professional within the treatment team seeing the child/family with high frequency, it is vital for the rehab therapist to have a good understanding of FND, both conceptually and in practice, to provide education, answer questions, and develop effective treatment.

APPROACH

As previously described, multi-disciplinary treatment (MDT) is the gold standard in the treatment of FND.^{1,4,9-11} As MDT programs for children are not widely available, referral to a rehab specialist who is 1) experienced with functional illness, 2) who utilizes a psychologically informed approach and 3) collaborates with the wider care team (patient, family, primary care provider, psychologist, psychiatrist) is essential for treatment in outpatient and inpatient settings.

EXPERIENCE

The acceptance of PT, in addition to psychotherapy, as first-line treatment for functional motor symptoms in FND has been well established.^{1,9,12,13} The rehab therapist must establish a strong therapeutic relationship with the patient that

is built on trust and encourages engagement using individualized motivating factors. In the OT literature, the concept of “therapeutic use of self” is described as using common interests to build alliance and rapport with the patient.^{14,15} Adapting the therapeutic approach, tools for motivation, conversation topics and distraction techniques to the patient’s needs and preferences builds on this concept and in turn improves patient engagement. Increased patient engagement and motivation is well established as a positive indicator of improved motor control, motor learning, and overall rehabilitation treatment success.¹⁶

Research has shown that traditional rehab techniques are ineffective in treating the symptoms of FND, and, equally important, traditional techniques have been found to exacerbate symptoms.⁶ The rehab therapist must understand that directly addressing a problem at the impairment level (the weakness of a limb for example) is not an effective strategy for management of FND. Instead, they must indirectly involve the impaired body part or system by providing an external focus that removes the patient’s attention from their impairment. Pediatric rehab therapists are experts in this technique as a core concept of treating young patients. The use of fun, patient-preferred games and activities maximize engagement and motivation while indirectly targeting a treatment goal. For example, utilizing a recreational activity such as tap dancing or soccer will target motor control, coordination, balance, strength and endurance without focusing on the use of the impaired body part. Another example is having the patient balance a pool noodle in their hand while walking across the room as indirect treatment of functional gait impairment. If attention is placed externally on balancing the noodle, the patient will likely demonstrate less functional gait deviation as focus is directed away from their gait pattern.

PSYCHOLOGICALLY-INFORMED THERAPY

Numerous studies have highlighted that biopsychosocial factors can predispose, precipitate, and perpetuate FND symptoms.^{1,4,9} Additional exploration of the neurobiology of pediatric FND includes understanding the role that physical and/or psychological stress has on FND presentation, with stress thought to disrupt the sensory, motor and/or pain processing regions of the brain.¹⁷ An understanding of the biopsychosocial model and the neurobiology of FND is an important foundation in providing psychologically informed care. Examples of this approach differing from traditional care have been previously mentioned and/or will be discussed in PT, OT and SLP considerations. Topics include intentional and consistent language, therapeutic use of self, maximizing external focus and distraction heavy activities, and careful communication and collaboration with the team.

COLLABORATION

Emphasizing collaboration and communication with a patient’s care team fosters psychologically informed treatment and is a key element in consistency in messaging and function across settings. Coordination with the patient’s pediatrician, mental health provider (psychiatry, psychology, social work, etc.), other rehab therapists, the child’s teacher or principal and the child’s family assures that everyone is providing consistent, unified messaging and structure in management strategies. Communication and collaboration can be complex and time consuming, often occurring outside a skilled rehab therapy session. As the complexity of treatment and communication increases, an alternate level of MDT care may need to be considered (i.e., Hasbro inpatient or partial med-psych program) as an efficient and effective way to maximize functional progress and consistency.

TREATMENT STRATEGY: THE FUNCTIONAL REHAB GOAL LADDER

Use of a tiered system in treatment planning, or ladder approach, was developed to foster functional progression, optimize patient-centered goals and motivation, and reinforce consistent functional expectations across settings and within rehab therapy sessions. This approach uses small, incremental goals like the steps on a ladder, with positive reinforcement as goals are achieved (Table 1). Using the patient’s preferred recreational or functional activities maximizes interest, motivation, and fun while diverting attention from limitations and symptoms. The ladder provides a visual tool for the patient as they “climb the steps” in their physical recovery.

The visual architecture places the patient’s long-term recreational goal at the top, short-term goals as incremental steps or rungs of the ladder and the most easily attainable goal as the bottom rung or starting point. Each rehab discipline can create their own ladder pertinent to a specific functional goal. As part of treatment planning, a ladder step may be initiated first during a rehab session, then transitioned to the home setting once successful with the rehab therapist. For example, the patient could be on Step 5 with PT, on Step 4 during their program day, and on Step 3 with their caregivers.

REHAB SERVICES

Physical Therapy Considerations

In 2015, *Physiotherapy for Functional Motor Disorders: a Consensus Recommendation*, was published by Glen Nielson et al, out of the UK.¹ Though this statement was published with the adult population in mind, there are many points applicable to treatment of pediatric patients with FND. Important treatment principles include: limiting ‘hands on’ treatment by facilitating mobility and movement rather

Table 1. Example Rehab Ladder for BH

Long-term Goal: Sit upright in the car for 1.5 hour drive home
Short-term Goal: Transfer into car with min. assist from parent
Step 24: BH will transfer into car with parent and drive home for the weekend!!
Step 23: BH will transfer into car w/ parent and go on "driving field trip" w/ parent x 60 mins
Step 22: BH will transfer into car w/ parent and go on "driving field trip" w/ parent x 30 mins
Step 21: BH will sit upright in car with seat belt while engaged in game x 90 minutes
REWARD of BH choice! "Fun session" vs. other
Step 20: BH will sit upright in car with seat belt while engaged in game x 75 minutes
Step 19: BH will sit upright in car with seat belt while engaged in game x 60 minutes
Step 18: BH will sit upright in car with seat belt while engaged in game x 45 minutes
Step 17: BH will sit upright in car with seat belt while engaged in game x 30 minutes
Step 16: BH will sit upright in car with seat belt while engaged in game x 20 minutes
Step 15: BH will sit upright in car with seat belt while engaged in game x 15 minutes
Step 14: BH will sit upright in car with seat belt while engaged in game x 10 minutes
Step 13: BH will sit upright in car with seat belt while engaged in game x 5 minutes
Step 12: BH will complete stand pivot transfer into car with min assist at hips (Parent)
Step 11: BH will complete stand pivot transfer into car with mod assist at hips (Parent)
REWARD of BH choice! "Fun session" vs. other
Step 10: BH will demo complete stand pivot transfer into car with max assist at hips (Parent)
Step 9: BH will complete stand pivot transfer into car with min assist at hips (PT)
Step 8: BH will complete stand pivot transfer into car with mod assist at hips (PT)
Step 7: BH will complete stand pivot transfer into car with max assist at hips (PT)
Step 6: BH will keep head/trunk up for entire w/c bowling game
Step 5: BH will keep head/trunk up for half of w/c bowling game
Step 4: BH will keep head/trunk up for 1 minute while playing w/c bowling
Step 3: BH will lift head x 10 seconds while taking turn in game
Step 2: BH will lift head x 1–2 seconds while taking turn in game
Step 1: BH will lift head briefly to take turn in game while sitting in wheelchair

than providing full support or assistance, emphasizing early weight bearing, avoiding the use of splints and devices that immobilize joints, limiting the use of assistive devices (or utilizing the least restrictive device required to maximize functional participation), minimizing attention and reinforcement of abnormal movement or gait, fostering independence and self-management, and utilizing goal-directed rehab that focuses on function and automatic movement rather than impairment level ('attention-full') movement.¹ To illustrate a few of these principles, consider a patient who displays functional weakness or muscle tightness of an upper extremity, passive range of motion (ROM) and stretching would not be emphasized to avoid impairment level interventions and hands on treatment. Instead, preferred activities and games to distract and encourage independent functional movement would be utilized. For example, painting or coloring and board games are strategies used to indirectly target the weakness and lack of active movement of the upper extremity.

Occupational Therapy Considerations

In 2020, *Occupational Therapy Consensus Recommendations for Functional Neurological Disorder* was published by Clare Nicholson et al, a group of experts in the field of FND, highlighting the role of occupational therapy when working with this population.³ Though written for adults with FND, similar concepts of OT treatment can be applied to the pediatric population. The OT statement highlights basic tenets of FND treatment including flexible goal setting, education for improved patient "buy in," avoidance of splinting and adaptive devices whenever possible, and focus on independent function in motivating occupation-based tasks rather than remediation of individual physical deficits.

Occupational therapists are skilled at addressing a wide variety of symptoms and subsets of FND. First, OTs address functional movement disorders (e.g., hypotonia, hypertonia, tremors), functional cognitive disorders (e.g., functional memory loss), and functional visual impairments (e.g., functional blindness), that contribute to decreased independence in all areas of occupation, especially ADLs (activities of daily living), IADLs (instrumental activities of daily living), and leisure participation. OT principles that guide treatment include focusing on "skills for the job of living," which, in the pediatric pop-

ulation, include skills needed to function at school, meet expectations at home, and support social functioning. To maximize independence in daily activities, an occupational therapist utilizes the principle of task analysis to sequence daily tasks (e.g., taking a shower) into small, measurable, and achievable steps, while considering the patient's individual strengths and functional deficits (e.g., functional upper extremity dystonia) to provide the "just right challenge" and ensure patient success.¹⁸ Occupational therapy treatment also utilizes preferred, meaningful leisure activities (e.g., coloring, dancing) to indirectly target desired motor movements (e.g., improved upper extremity movement).

Additionally, occupational therapists treat functional sensory impairments including onset of over or under responsivity to sensory stimuli within the environment. Treatment approaches may include gradually increasing exposure to aversive sensory input (e.g., tolerating public spaces with progressively increasing noise level), minimizing use of compensatory strategies (e.g., headphones), and

reinforcing participation in meaningful occupations (e.g., school participation).

Finally, OT has a distinct role in treating functional seizures (or psychogenic non-epileptic seizures, PNES) by working to heighten the patient's awareness of their own episode triggers and warning signs and developing sensory-informed strategies aimed at mitigating episode frequency and duration over time. For example, OTs can utilize their training in sensory processing treatment to identify calming coping skills to utilize throughout the day to maintain a calm state of arousal (e.g., listening to music, reading a book) in addition to identifying alerting sensory strategies to utilize "in the moment" immediately prior to the onset of an episode to promote increased body awareness (e.g., sour candies, essential oils, cold drink).

Speech Language Pathology Considerations

In 2021, *Management of Functional Communication, Swallowing, Cough and Related Disorders: Consensus Recommendations for Speech and Language Therapy* was published by Baker et al, exploring the pivotal role of speech language pathologists (SLPs) in the management of functional communication and swallowing disorders.² Functional communication disorders can affect all areas of communication including expressive and receptive language, voice, speech sound production, speech fluency (i.e., natural flow of speech production), and cognitive communication (e.g., memory, attention, or executive functioning). Common presenting subtypes of functional communication disorders include functional stuttering, functional foreign accent syndrome, infantile speech, puberphonia (i.e., habitual use of high-pitched voice), and functional aphonia (i.e., inability to phonate/produce voice).¹⁹ Functional swallowing disorders most often manifest as disruptions in the sensory and/or motor aspects of oral, pharyngeal, and/or esophageal aspects of swallowing. Common sensory-based symptoms include chronic cough and globus sensation (i.e., sensation of a constant "lump" in the throat) without dysphagia, gastroesophageal reflux disease, or esophageal motility disorder. SLPs provide strategies to facilitate natural movements or increase volitional control of disrupted motor functioning in the voice or swallowing mechanism. For example, an SLP may facilitate reflexive tasks such as gargling, gentle throat clearing, phonation on kazoo, or sighing to improve laryngeal dysfunction with gradual progression to functional patient-centered targets of communication. While research continues to grow in SLPs role in FND, studies have found excellent potential for patient improvement through the behavioral and psychotherapeutically informed treatment approaches a SLP trained in FND treatment can provide.¹⁹

CONCLUSION

As described above, rehab therapists have a vital role in the multi-disciplinary treatment of the patient with FND. The

use of psychologically informed practice, expert consensus recommendations, knowledge of current literature, and nontraditional approach to rehab strategies are essential elements to optimize treatment outcomes. As familiarity with FND as a diagnosis continues to grow, rehab therapists in most pediatric settings will encounter this complex population, and in turn must be prepared to provide the best care possible.

CASE UPDATE

BH worked with PT, OT and SLP to improve functionality through techniques described above.

PT

BH demonstrated significant weakness and muscle tightness with passive range of motion and stretching avoided. As psychological and emotional progress was made, BH showed signs of active movement abilities that could be utilized indirectly in sessions. Once it was identified that a major motivating factor was progressing to the next level of care (inpatient med/psych unit to outpatient partial hospitalization), with an added incentive of weekend trips home, essential functioning for this step was identified and incorporated into her rehab ladders (see **Table 1**). For example, BH was required to sit upright enough in the car to be seat belted safely for a 1.5-hour drive to take trips home. She met this expectation with practice in PT sessions including sitting more upright with preferred activities and games as a distraction, and car transfer practice. Once it was established that BH could sit upright in a car for the required time, this became the catalyst for improvement in many other areas of mobility and functioning. She was more ready to progress with more traditional FND treatment techniques including utilizing games, sports, obstacle courses, and dance to indirectly engage her impaired body parts, by providing a fun and engaging external focus, slowly increasing her functional abilities.

OT

BH presented initially with hypotonia of both upper extremities, making her dependent for all ADL tasks, such as showering or dressing, as well as inhibiting her participation in meaningful leisure activities, such as swimming or dancing. Occupational therapy treatment initially focused on game play using her arms, with progressively reduced assistance provided over time to improve her independent participation. As BH improved and regained upper extremity functioning, OT treatment shifted to target improved independence with daily tasks using a stepwise approach. For example, when working with showering, BH was initially encouraged to use a shower chair and complete only portions of the shower independently (e.g. washing arms only), with the assist of others for the rest. As her standing tolerance and upper extremity functioning improved, she

was encouraged to complete additional steps of showering and stand for longer periods of time. OT also emphasized caregiver training to ensure that her parents were providing the “just right challenge” when supporting her ADL participation at home. At the conclusion of treatment, BH was completing all areas of occupation independently.

SLP

BH presented with infantile speech pattern as compared to her baseline, including “child-like” speech sound substitutions and omissions (e.g., producing the sound “w” for “r”). Speech therapy targeted modifying her speech pattern with patient producing different accents/dialects, varying prosody (i.e., pitch and/or intonation), and singing to demonstrate the ability to produce alternative speech patterns while discussing patient-centered topics. This method was used to re-establish volitional control of the disrupted motor function (i.e., speech production). Patient-friendly language was used to connect FND’s impact on her speech production during treatment. Once more volitional control was established, distraction in the context of patient-preferred games/tasks was used to gradually progress BH to producing more age-appropriate speaking patterns. Caregiver education was provided for staff to communicate with BH as they would someone her age and not how she presented verbally. With these modifications and focused treatment, BH restored speech production to age-appropriate functioning.

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Disclosure

Authors have no conflicts of interest relevant to this article to disclose.

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