

## Review Article

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# Intensive rehabilitation for functional motor disorders (FMD) in the United States: A review

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### Abstract.

**BACKGROUND:** Higher levels of care in the form of intensive rehabilitation may be appropriate for select patients with a diagnosis of functional motor disorder (FMD). Intensive rehabilitation, as delivered through an outpatient day program or through admission to an inpatient rehabilitation facility, can offer a greater frequency and variety of integrated clinical services than most lower levels of care.

**OBJECTIVE:** Higher levels of rehabilitation for FMD have not yet been well characterized in the literature. In this article, we will focus on the population of FMD patients who begin receiving care in the outpatient setting.

**METHOD:** In this review, we describe a range of options for higher levels of FMD care, evaluate the supporting literature, and weigh the pros and cons of each approach. Several specific examples of intensive rehabilitation programs in the United States will be described. Finally, we will consider existing health systems barriers to each of these outpatient and inpatient higher levels of care.

**RESULTS:** Within a stepped model of care, intensive outpatient day-programs and inpatient rehabilitation may be considered for individuals who present with complex, refractory motor deficits from FMD. For appropriately selected patients, a growing body of literature suggests that time-limited, goal-oriented intensive rehabilitation may provide an effective treatment avenue.

**CONCLUSION:** It remains to be determined whether treatment in intensive care settings, while more costly in the short term, could lead to greater cost savings in the long term. The prospect of telemedicine rehabilitation for FMD in terms of efficacy and cost also remains to be determined.

Keywords: Functional neurological disorder, rehabilitation, multidisciplinary

## 1. Introduction

Functional motor disorder (FMD) is a common neurological condition that may involve a range of disabling motor or sensory symptoms (e.g. weakness, tremor, gait disturbance, dystonia, dizziness) (Espay et al., 2018; Stone et al., 2010). While one large systematic review suggested a relatively poor

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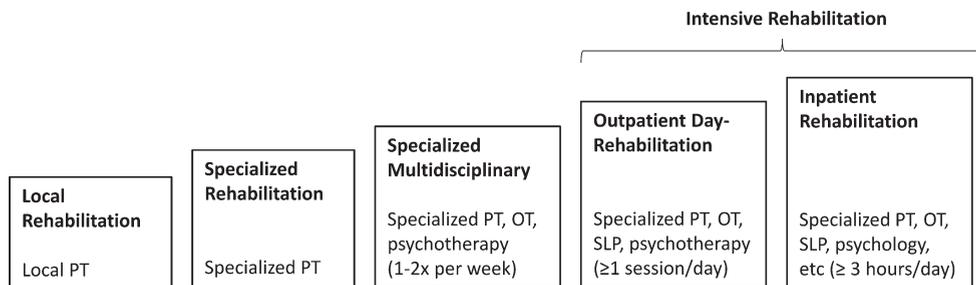


Fig. 1. Examples of increasingly higher levels of rehabilitation care for FMD. A greater number and variety of therapies may be offered at increasingly higher levels of rehabilitation care for FMD. PT, physical therapy; OT, occupational therapy; SLP, speech and language pathology.

long-term prognosis for many diagnosed with FMD (Gelauff et al., 2014), clinical trials involving a variety of treatment interventions have generally yielded more encouraging outcomes (Nielsen et al., 2013).

To best match clinical services to care needs, a stepped care model for FMD has been proposed (“Stepped Care for Functional Neurological Symptoms,” 2012), whereby lower, more economical levels of care (fewer disciplines, less frequent visits) are trialed before treatment is escalated to higher, more costly levels (greater number of disciplines, more frequent visits). According to this model, some patients may respond to psychoeducation alone (e.g., explanation of the FND diagnosis, why the diagnosis fits the patient’s clinical presentation, possible etiological factors), while others may benefit from a brief intervention with psychotherapy, physical therapy (PT), occupational therapy (OT), or speech and language pathology (SLP). If this treatment is not sufficient, specialized care within a multidisciplinary care team including a subspecialized neurologist, psychiatrist, neuropsychiatrist, psychologist, PT, OT, or SLP may be pursued (Aybek et al., 2020; O’Neal et al., 2021).

A comprehensive patient assessment (Jacob, Smith, et al., 2018) that would take into account symptom severity, functional impairments and psychiatric comorbidities is important to determine the level of care needs and services for each patient. Intensive rehabilitation programs for FMD could be defined as providing greater frequency or variety of clinical services or provision of care in a more structured environment. In practice, this may include time-limited participation in an intensive outpatient day-rehabilitation program or an inpatient rehabilitation stay. Given the relatively greater cost and resources involved, intensive rehabilitation is generally reserved for individuals with the more severe,

complex, or refractory symptoms. Figure 1 outlines examples of sequentially higher levels of FMD rehabilitation care.

While lower versus higher levels of FMD rehabilitation have yet to be directly compared in clinical trials, one may “consider potential” added benefits of the latter. For example, more intensive rehabilitation may provide a greater frequency of therapies (e.g., multiple therapy sessions on a given day) or more seamless delivery of collaborative and customized care. Further benefit may be derived through providing a reprieve from what may be a stressful or negatively reinforcing home environment (Gilmour et al., 2020). Non-specific benefits may play a role as well. The mere existence of a specialized program staffed by clinical experts in FMD may raise patients’ confidence and overall positive expectancy with regards to their capacity to recover.

Higher levels of rehabilitation for FMD have not yet been well characterized in the literature. In this article, we will focus on the population of FMD patients who begin receiving care in the outpatient setting—as opposed to those who first receive their diagnosis after an acute presentation to the inpatient neurology ward. For this population of FMD outpatients, we will discuss approaches to patient selection for intensive rehabilitation, review literature on intensive outpatient and inpatient rehabilitation for FMD and describe structured examples. We will last consider some of the primary health systems barriers to each of these levels in the United States.

## 2. Appropriateness for specialist intensive rehabilitation

Most FMD patients will have received some type of outpatient treatment for functional symptoms before

Table 1  
Assessing appropriateness for intensive FMD rehabilitation

Factors that may not support intensive treatment	Factors that may warrant more intensive rehabilitation
Limiting pain, fatigue, depression, anxiety	Improvement in symptoms followed by regression between sessions
Lack of diagnostic agreement	Difficulty “unlearning” problematic motor patterns
Major psychosocial stressors	Lack of treatment expertise for FMD with lower levels of outpatient care
Concern that a patient’s motivation for improvement is low or compromised	Greater integration of psychological and rehabilitative services required

Abbreviation: FMD, functional motor disorder.

being considered for intensive rehabilitation. However, not all patients who have failed to respond to lower levels of care would necessarily be suitable for a higher level of care. To make best use of limited resources, one should carefully consider factors for or against referring an FMD patient for a higher level of rehabilitation care. Both clinical and psychosocial factors may affect one’s likelihood of benefitting from more intensive rehabilitation. Several factors that would be worth exploring when considering intensive rehabilitation for FMD are indicated in Table 1.

### 2.1. *Circumstances in which intensive FMD rehabilitation may not be beneficial*

Significant comorbidities, such as chronic pain, fatigue or untreated/unstable depression that impede lower levels of FMD care, would likely interfere with higher levels of care as well. For instance, patients experiencing high levels of pain may be unable to participate to a sufficient degree in rehabilitative therapies without exacerbating symptoms. Patients experiencing severe fatigue may be unable to comply with a home exercise program. Severely depressed patients may not be able to maintain motivation to consistently engage in rehabilitation. In these cases, rather than intensifying rehabilitation for FMD, it may be necessary to shift treatment efforts to primarily address chronic pain, fatigue or unstable mood symptoms.

Extenuating psychosocial circumstances may be another reason for limited responsiveness to treatment for FMD and are unlikely to be resolved by advancement to a higher level of care. Such factors could include instability in basic needs (housing, safety) interfering with therapy adherence. Assessing patients’ “readiness for change” can also provide valuable insights into potential treatment barriers. Lack of readiness to engage in treatment (Prochaska et al., 2009) could present as patients or family members openly opposing or questioning the diagnosis or treatment plan. In such cases, motivational interview-

ing may help resolve ambivalence toward treatment and strengthen commitment to behavioral changes (Tolchin et al., 2019).

Careful consideration also needs to be given to potential secondary gain as a patient may be reluctant to return to an undesirable work situation or disability benefits may be at stake. Pending litigation may be another significant barrier, especially in cases where recovery may compromise receipt of financial benefits. All such factors need to be explored as part of treatment. In these cases, rather than recommending a higher level of care, a clinician may wish instead to address psychosocial barriers to whatever extent is possible or invite a patient to take a break from FMD treatment and return at a later time.

Outside of clinical practice, triaging of patients is commonly used in rehabilitation intervention studies. Exclusion criteria for FMD treatment trials have included unstable psychiatric disorders (depression, anxiety), functional seizures, predominant pain or fatigue, lack of diagnostic agreement, or disability that is too mild or too severe (Nielsen et al., 2015, 2017; Petrochilos et al., 2020). In one research study, after applying screening criteria similar to that listed above, only 32% met criteria for study participation (Nielsen et al., 2017). Similar to the research setting, adequate outpatient clinical triage that considers patients’ symptom severity, readiness for treatment and important comorbidities is thought to improve therapy outcomes and patient satisfaction.

### 2.2. *Cases that may warrant higher levels of care*

Identifying patients with a greater likelihood of benefiting from higher levels of care may become less apparent after excluding the “red flags” described above. Nevertheless, certain patterns of disability or treatment responsiveness may indicate the need for more intensive therapy.

One such example would be patients who appear to improve during rehabilitation and/or psychological

therapies but nonetheless regress between sessions. In these cases, one may hypothesize that there could be an added benefit from more intensive treatment. Another situation may be the FMD patient who appears to have difficulty “unlearning” problematic movement patterns—using normal movement patterns during clinical encounters—but returns to dysfunctional movement patterns in the home environment. Here, a more intense or rigid motor retraining protocol could help a patient gain therapeutic momentum and more efficiently progress in recovery.

Another example would be the patient who fails to progress in less intensive treatment settings without obvious obstacles. Here, a more integrated clinical service involving greater crosstalk between rehabilitation and psychotherapy experts highly experienced in FMD treatment could help identify and generate novel approaches for targeting barriers or perpetuating factors.

### 3. Intensive outpatient rehabilitation

We will now describe specific avenues for higher levels of FMD care, beginning with intensive outpatient day programs. Typically, outpatient rehabilitation care involves seeing rehabilitation specialists (PT, OT, SLP) and/or psychotherapy 1-2 times a week. Day-programs can vary in range of therapy services, frequency of visits, and program duration. Generally, a day-program would provide substantially greater intensity than that otherwise obtained through typical outpatient care, with multiple therapeutic sessions taking place each day.

#### 3.1. Literature review of day-treatment programs for FMD

Clinical trials on day-rehabilitation programs for FMD have generally documented promising results. In one of the earliest day-rehabilitation studies, 60 chronic FMD patients completed a one-week intensive outpatient rehabilitation program with psychoeducation, PT/OT+/- SLP. By the end of the program, 73.5% showed marked improvement, returned to near normal or experienced symptom remission. At longer-term follow-up a mean of 2 years later, this degree of improvement was present in 60.4% of individuals versus 21.9% of age- and sex-matched controls (Czarnecki et al., 2012).

In another study, 67 patients with chronic FMD completed a five-day intensive program involving meeting a neurologist and participating in up to eight sessions of PT after which 65% rated their symptoms as “much improved” or “very much improved,” and 55% rated their improvement as high at 3 month follow-up (Nielsen et al., 2015). Sixty additional patients were included in a follow-up randomized feasibility trial of the five-day intervention, and six months later, 72% of the treatment group rated their symptoms as improved compared with 18% in the control group (Nielsen et al., 2017).

Another study on day-rehabilitation took place in a multidisciplinary neuropsychiatry clinic and involved psychoeducation, neuropsychiatry, cognitive-behavioral therapy, PT, OT, and a family session delivered over the course of 5 weeks (Petrochilos et al., 2020). Improvements at discharge and six-month follow-up were seen for somatic symptoms, depression, anxiety, and functionality.

One final study involving patients with FMD and comorbid severe, debilitating pain evaluated the efficacy of a day-treatment program for chronic pain. The chronic pain-oriented day-treatment program in this study involved education, medication management, individual and group therapy, biofeedback/relaxation training, PT and OT. At the end of 3-4 weeks, FMD participants not only reported improvements in pain related disability, anxiety, depression and stress, but also in several functional mobility tasks (Jimenez et al., 2019).

#### 3.2. Present examples of outpatient FMD day-programs in the United States

Aside from the data reviewed above, relatively little has been written on day-rehabilitation programs for FMD. Here we provide case examples of current FMD day-programs in the United States, comparing and contrasting multiple variables, including screening mechanisms, duration of treatment, multidisciplinary team members, team communication, clinical assessments and discharge considerations. Examples of day-rehabilitation programs in three cities (Rochester, Minnesota; Chicago, Illinois; Seattle, Washington) are described in Table 2.

#### 3.3. Discussion

Overall, the three day-rehabilitation programs for FMD highlighted above were considerably similar. Each is regionally based, taking primarily internal

Table 2  
Three examples of day-treatment programs for chronic FMD

Location	Rochester	Chicago	Seattle
Pre-screening	For outside referrals, pre-screening with PMR, PT, OT	Comprehensive assessment in a 3-hour clinic visit including neurology, psychology, PT/OT/SLP	Pre-screening with PMR, rehab psych, PT, OT; may contact original referring clinician
Exclusion criteria	Predominant functional seizures or sensory symptoms, chronic pain, severe psychiatric symptoms	Predominant functional seizures, chronic pain or fatigue, severe/unstable psychiatric symptoms	Ongoing neurological work-up, predominant pain, fatigue, psychiatrically unstable (untreated substance use disorder, psychosis), more general somatization, undergoing opioid or benzodiazepine wean
Duration	5 days (Monday-Friday)	5 days (Monday-Friday)	8–12 treatment days spread over 3 weeks (Monday-Friday)
Clinical offerings	PMR screening; PT (2xdaily), OT (2xdaily), SLP (daily if needed), psychologist (once)	PT (daily), OT (daily), SLP (daily if needed), psychologist (daily)	PMR (beginning and end), rehab psych (6x), PT (4x/week), OT (3x/week), SLP (2x/week), patient care coordinator
Team communication	PT and OT communicate daily	PT/OT/SLP communicate daily, mid-week team communication with neurologist and psychologist	Pre-admission huddle; daily communication via electronic “chat” in medical record software
Discharge planning	Provided with “toolkit” of strategies at discharge. Review with referring neurologist	Individualized plan for self-guided exercise and relapse strategies, referral for additional psychotherapy as needed, continue to follow with neurology	Provided with relapse prevention strategies, OT and PT exercises. Meeting with PMR and Rehab Psychology at 1 month post-treatment, re-referral to PT/OT for booster visits as needed

Abbreviations: FMD, functional motor disorder; OT, occupational therapy; PMR, physical medicine and rehabilitation; PT, physical therapy; SLP, speech and language pathology.

and on some occasions external (including out-of-state) referrals. Prior to admittance, each program includes a triaging step to screen for admission criteria, provide patient education and set treatment expectations. Each program runs daily (Monday-Friday). The Rochester and Chicago programs last one week and the Seattle program lasts three weeks. These day-rehabilitation programs all employ a multidisciplinary team including a physician (physiatrist or neurologist), PT, OT, SLP and psychologist. The frequency or intensity of rehabilitation visits vary according to overall length of stay. The two single-week programs involve daily PT, OT, and/or SLP; whereas for the three-week program, rehabilitation therapies only occur 2–4 times a week.

There was variability in the role of the psychologist and the frequency of psychology visits. In the Seattle program, a rehabilitation psychologist partners with a physiatrist to direct and coordinate the program. The psychologist then meets with the patient up to 6 times during their treatment course to provide psychoeducation regarding FMD, and to address stress management, activity pacing, return to valued activities, and any reinforcement factors. At least one

psychology visit is required with family present. The psychologist also helps to coordinate post-discharge referrals to community providers to address comorbid diagnoses requiring treatment (e.g., PTSD or major depression). In the Chicago program, the psychologist provides an initial neuropsychological assessment that helps to inform treatment triage. During the treatment week, a daily psychotherapy session is provided and follows a cognitive behavioral therapy-based model, providing patient psychoeducation, identification of trigger factors, and practical steps towards improved control of motor symptoms. Referrals for additional individual or family psychotherapy are made as needed. In the Rochester program, there is one visit with a psychologist primarily due to limited scheduling availability. During the visit, the psychologist addresses comorbid diagnoses such as anxiety and/or depression, and if present, makes recommendations for ongoing care.

Efforts for multidisciplinary discussion were made amongst all groups, in the form of communication between therapists, team meetings, or electronic communication through the medical record. For discharge planning, each group also prepares documents

that summarize “strategies” or a toolkit for self-management. Two of the programs also aim to support the transition to less intensive, outpatient follow-up care.

#### 4. Telemedicine

As access to telemedicine continues to grow in the United States, virtual visits may become an increasingly viable platform for delivering outpatient care for those with FMD. Telemedicine visits may help mitigate some degree of the time and travel burden for patients receiving higher levels of care. Here, certain disciplines may be more suitable for telemedicine than others. For example, an initial physician visit as part of a day-rehabilitation program, which includes a careful physical exam, would generally be preferably conducted as an in-person visit. In contrast, it may be quite easy in the majority of instances to convert psychotherapeutic care to virtual care (Chun et al., 2020). In some cases, even rehabilitation therapies may be able to be at least partly converted to telemedicine. Again, although in-person rehabilitation therapy visits may be optimal in the initial evaluation and treatment-planning sessions, a proportion of subsequent visits could potentially be converted to virtual visits. An emerging literature supporting the efficacy of tele-rehabilitation or a hybridized model of in-person and virtual visits is now emerging for both FMD (Demartini et al., 2020) and the neurorehabilitation population at large (Lum et al., 2006).

#### 5. Inpatient rehabilitation for FMD

In the United States, an inpatient rehabilitation setting for FMD may include either an acute inpatient rehabilitation facility (IRF) or a skilled nursing facility (SNF). Both are well established levels of care already in wide existence across the country. The general infrastructure for providing multidisciplinary rehabilitation is already in place when a patient with FMD presents to these settings, set forth by national post-acute care guidelines.

##### 5.1. Literature review of inpatient rehabilitation for FMD

Numerous publications have evaluated the impact of multidisciplinary inpatient rehabilitation for individuals with FMD (Delargy et al., 1986; Hardin &

Carson, 2019; Hebert et al., 2021; Heruti et al., 2002; Jacob, Kaelin, et al., 2018; Jacob, Smith, et al., 2018; Jordbru et al., 2014; Kanarek et al., 2013; Kompoliti et al., 2018; Matthews et al., 2016; McCormack et al., 2014; Shapiro, 1997; Shapiro & Teasell, 2004; Speed, 1996; Watanabe et al., 1998; Withrington & Wynn Parry, 1985; Yam et al., 2015). According to one large review on inpatient rehabilitation for FMD, symptom duration prior to admission was  $5.8 \pm 6.4$  years, with an average length of stay of 20.3 days (Gilmour et al., 2020). In reviewing this literature, it appears that all published cases took place at an IRF. To our knowledge, no studies have yet evaluated the efficacy of inpatient FMD rehabilitation at a SNF, though it is likely that a sizeable proportion of FMD patients present for care at these institutions.

The literature on the effectiveness of IRF stays on FMD is on the whole quite encouraging, with the majority of studies showing partial or complete resolution of symptoms in many patients (Gilmour & Jenkins, 2021; Williams et al., 2016). Some studies have even demonstrated longer-lasting benefits, continuing months to years after an inpatient stay (Delargy et al., 1986; Demartini et al., 2014; Hebert et al., 2021; Jacob, Kaelin, et al., 2018; Jordbru et al., 2014; Saifee et al., 2012; Speed, 1996; Withrington & Wynn Parry, 1985).

There are also many limitations to this literature as well as caveats deserving further consideration. For one, the vast majority of studies are small and rely on retrospective chart review. At present, there has only been one prospective randomized clinical trial, which did show a significant benefit of inpatient rehabilitation over a waitlist control (Jordbru et al., 2014). Furthermore, in the literature on inpatient rehabilitation for FMD, studies do not always clearly differentiate between two divergent referral streams—patients transferred following acute inpatient hospital admissions versus those presenting for elective admission from home following lack of progression with lower levels of outpatient care (Williams et al., 2016).

In this literature, inpatient rehabilitation conducted outside of the United States occasionally took place in inpatient neuropsychiatry units, a setting that in addition to offering rehabilitation, it may be able to provide mental health services above and beyond those delivered in a typical American IRF. Generally these studies on care delivered in the neuropsychiatric unit have, similar to studies in the IRF setting, yielded encouraging results (Demartini et al., 2014; Saifee et al., 2012).

FMD patients have also been shown to benefit from treatment during inpatient psychiatric stays (Moene et al., 2002). Those cared for in the inpatient psychiatric ward tend to have longer lengths of stay—89.8 days for inpatient psychiatric stays versus 20.3 days for inpatient rehabilitation stays—and overall were less likely to improve or more likely to worsen compared with those admitted for inpatient rehabilitation (Gilmour & Jenkins, 2021). Rather than reflecting the effects of the content of the treatment, the differences of outcomes between inpatient rehabilitation versus inpatient psychiatric setting may instead reflect population-based differences. Patients admitted to inpatient psychiatric facilities likely have substantially higher baseline psychiatric disease burden.

## 6. Systems level barriers

Review of the FMD treatment literature suggests that intensive rehabilitation in the form of a day-treatment program or inpatient rehabilitation stay will benefit most patients with FMD, following adequate triage considerations. While theoretically an encouraging message, connecting patients to higher levels of specialized treatment services remains a major challenge in practice. In this final section, we will review multiple systems-levels barriers regarding access to and payment for intensive FMD rehabilitation.

### 6.1. Barriers for day-rehabilitation programs

The two primary barriers for intensive day-rehabilitation programs include access and cost. Intensive outpatient day-rehabilitation programs for FMD are rare. Day-rehabilitation programs for FMD only exist in a few locations where dedicated teams treating FMD have created such programs. Most of these programs primarily serve internal, in-network referrals, taking external referrals less regularly. As such, in most regions of the United States, knowledge about and access to such programs is limited. In the absence of a national organization to systemically provide information about treatment programs, FND Hope, a patient-led non-profit organization ([www.fndhope.org](http://www.fndhope.org)), has organized a provider registry. However, this registry is not externally validated.

Because FMD is associated with high levels of healthcare utilization (Stephen et al., 2021), treatment costs and payment remain a second major barrier. Pre-approval from an insurance company is typi-

cally required prior to acceptance into a day-program. What precisely an insurance company chooses to reimburse can vary by insurance and by patient. As a best-case scenario, an insurance company may reimburse an entire program, leaving the patient with only a single daily co-pay as the out-of-pocket expense. As a worst-case scenario, an insurance company may completely deny access to the program, leading the patient to face exorbitant out-of-pocket costs. As a reference point, per-patient cost for attending an intensive outpatient chronic pain rehabilitation program may range from \$13,000 to \$30,000 (Chen, 2006).

Not infrequently, patients are left somewhere between these extremes. An insurance company may “approve” the short-term program, but the patient may still face high out-of-pocket costs, due to plan deductibles or per-session co-pays. For a patient seeing a physician, PT, OT, SLP, and psychologist over a week or more through an intensive program, this could mean three to five copays daily, ranging from \$10–45 each. Out-of-pocket payments can easily reach hundreds or even thousands of dollars in such cases. Further costs may be associated with transport and accommodations for patients traveling far to attend these programs.

### 6.2. Barriers for inpatient rehabilitation

While inpatient rehabilitation facilities are in much greater abundance than FMD day-rehabilitation centers, access to these facilities may be even more difficult. Gaining admission to inpatient rehabilitation from the outpatient setting is not common in FMD nor for other neurological conditions in the United States.

Admission to inpatient rehabilitation in the United States generally requires: 1) meeting formal, established, insurance-based criteria and 2) acceptance on behalf of the receiving facility. IRFs, for one, have stringent rules and standards for admission to ensure receipt of payment for their services. For example, for Medicare to cover a patient’s IRF stay (Centers for Medicare & Medicaid Services, “Chapter 1 - Inpatient Hospital Services Covered Under Part A,” 2017), the patient must:

- Require active and ongoing interventions from multiple therapies (e.g., PT, OT, SLP)
- Require intensive rehabilitation (three hours of therapy per day or at least 15 hours of therapy per week)

- Be expected to actively participate and meaningfully benefit from intensive rehabilitation
- Require supervision by a rehabilitation physician (at least every three days)
- Require an intensive and coordinated team of rehabilitation providers

Deviation from these criteria could result in denial of payments by an insurance company. For this reason, IRFs tightly adhere to these regulations. Some of these criteria are easier met than others. For instance, although many patients with FMD will be willing and able to participate in three hours of therapy a day and would benefit from coordinated care team, the need for frequent physician visits may less easily be justified. At times, this latter criterion is met based on the need to titrate pharmacotherapy to address comorbid psychiatric or pain conditions.

If these criteria have the potential of being met, to initiate the pre-approval process, advocacy from a patient's team is often necessary. This would at minimum include an outpatient neurologist or physiatrist, along with potential involvement of PT, OT, and/or SLP, who would communicate with representatives at the insurance company in the form of written letters or by phone. After hearing the case put forth by the team, and considering whether IRF criteria are met, the insurance company may then decide to approve or deny the admission.

Cost is substantial for an inpatient rehabilitation stay. For Medicare patients, IRF payment rates are mandated by the IRF Prospective Payment System (IRF PPS) and are generally based on a base payment modified by variables relating to a patient's overall status (age, diagnostic condition, functional and cognitive status) as well as market area wages (Worsowicz & Singh, 2019). In fiscal year 2018, the base rate payment was \$15,838 per admission (Medpac, 2017). One concern that we have anecdotally observed is that institutions admitting patients with chronic FMD for inpatient rehabilitation have subsequently been denied payment based on various technicalities. Specifically, we have witnessed insurance companies to have initially pre-approved a FMD admission, only to later deny IRF reimbursement after a patient's stay, newly citing that the admission was inappropriate because FMD is considered a "psychiatric" rather than "rehabilitation" diagnosis.

As mentioned, the second criterion necessary for admittance to IRF level of care requires approval from the IRF itself. Despite insurance pre-approval, an

admission could still be denied by the IRF. This may be due to many factors, including payment concerns described above, because even a single experience of non-reimbursement after pre-approval can erode an institution's willingness to admit future FMD patients. In addition, the clinicians working at an IRF may not always prefer to take on an FMD case due to lack of expertise or stigma (Rommelfanger et al., 2017; Stewart, 1983), and a denial could thus stem from institution-specific physician-level decision-making as well.

## 7. Conclusions

Within a stepped model of care, intensive outpatient day-programs and inpatient rehabilitation may be considered for individuals who present with complex, refractory motor deficits from FMD. For appropriately selected patients, a growing body of literature suggests that time-limited, goal-oriented intensive rehabilitation may provide an effective treatment avenue. Despite an encouraging literature on the potential benefit for intensive rehabilitation, long-term outcomes in this population have not been well characterized, nor have trials to date directly compared higher versus lower levels of care. It thus remains to be determined whether treatment in intensive care settings, while more costly in the short term, could lead to greater cost savings in the long term. The prospect of telemedicine rehabilitation for FMD in terms of efficacy and cost also remains to be determined.

FMD is a disabling condition that disproportionately affects adults in the prime of their work lives. Until further research is conducted, uncertainties regarding comparative efficacy and cost-effectiveness are likely to continue to be reflected in the reticence of insurance companies to consistently support reimbursement for intensive FMD rehabilitation.

## Conflict of interest

K. L. has received a honorarium for CME activities on the topic of FMD by the American Academy of Neurology (AAN) and the Movement Disorder Society (MDS), and has received research funding by the Ayers Foundation. None of the other authors have any conflicts of interest to disclose.

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