BMJ Best Practice

Functional neurologic and somatic symptom disorders

Straight to the point of care

Last updated: Nov 28, 2023

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Summary

Functional neurologic disorder (previously termed conversion disorder) and somatic symptom disorder are both characterized by somatic symptoms associated with significant distress or impairment.

The underlying cause is not fully understood. Although psychological stressors can be important risk factors and may perpetuate symptoms, they are not necessary to make the diagnosis.

Functional neurologic disorder can be diagnosed on the basis of positive "rule in" features on neurologic examination - it is no longer considered a diagnosis of exclusion.

Good therapeutic alliance, validation of the patient's suffering, and shared clinician-patient understanding of the condition are essential for effective management.

Treatment includes cognitive behavioral therapy, physical therapy, and avoiding unnecessary medicines, tests, and procedures. Diagnosis and treatment of associated comorbid psychiatric conditions can benefit overall functioning and recovery.

Definition

This topic describes diagnosis and management of functional neurologic disorder and somatic symptom disorder in adults only; diagnosis and management in children is beyond its scope.

Functional neurologic disorder (previously termed conversion disorder) and somatic symptom disorder are (neuro)psychiatric conditions that fall under the somatic symptom and related disorders category of the Diagnostic and Statistical Manual of Mental Disorders, 5th edition, text revision (DSM-5-TR) (previously termed somatoform disorders). Somatic symptom and related disorders are those with prominent physical symptoms associated with significant distress and impairment of function.

Functional neurologic disorder is characterized by motor or sensory function deficits that suggest neurologic or medical conditions associated with characteristic "rule in" features on neurologic examination and clinically significant distress or social/occupational impairment. Somatic symptom disorder is characterized by one or more somatic symptoms that are distressing or result in significant disruption of daily life. To meet DSM-5-TR criteria, these patients must have excessive thoughts, feelings, or behaviors related to the somatic symptoms or associated health concerns as manifested by at least one of the following: disproportionate and persistent thoughts about the seriousness of one's symptoms; persistently high levels of anxiety about health or symptoms; excessive time or energy devoted to these symptoms or health concerns. Importantly, even if any one somatic symptom is not continuously present, the state of being symptomatic is persistent (typically more than 6 months).

Epidemiology

A strong female predominance (about 75%) is consistently observed for both somatic symptom and functional neurologic disorder.[5] [12] [13] [14] A large proportion of patients (both male and female) also meet criteria for a coexisting psychiatric disorder.

Functional neurologic disorder

- Functional neurologic disorder is common; incidence has been estimated at 4-12 per 100,000 in general US and European populations.[15]
- Evidence from the US and UK suggests that about 10% of patients referred to general neurology outpatient clinics have medically unexplained symptoms; that functional tremor, dystonia, myoclonus, and parkinsonism occurs in 2% to 3% of patients evaluated in specialty neurology clinics; that about 20% of patients with intractable epilepsy have functional seizures; that functional seizures have a US prevalence of 2-33 per 100,000; and that up to 18% of patients with epilepsy have coexisting functional seizures.[16] [17] [18] [19]
- Symptoms can develop at any age, with early to middle adulthood being most common. Although the disorder is generally thought to be rare in the pediatric age group, a national surveillance study from Australia reported an incidence of 2.3 to 4.2 per 100,000 in children <16 years of age.[20]
- Evidence suggests that only about 4% of patients with a diagnosis of functional neurologic disorder go on to develop nonfunctional neurologic disease.[21]

Somatic symptom disorder

- Prevalence is unclear as it was only introduced as a diagnosis in 2013; therefore, estimates are typically derived from research on somatoform disorders.
- Estimates of prevalence in the general population range from around 4% to 17%; note that some of these figures are derived from self-report questionnaires, which may lead to an overestimation of prevalence.[2] [7] [22] [23] [24]
- 10% to 17% of primary care patients have multiple unexplained symptoms that are present for >2 years.[25] [26]
- The female-to-male ratio is approximately 10:1.[27]
- Can occur in childhood, adolescence, or adulthood.[27]
- Early symptoms may begin in childhood, with full criteria for somatic symptom disorder being met in adolescence.[28] [29]

Etiology

Functional neurologic disorder

Risk factors are heterogenous and nonspecific, and the underlying cause is still not fully understood. Although psychological stressors can be important risk factors and may perpetuate symptoms, patients may present without identifiable stressors.[30] In some patients, symptoms are triggered by physical injury, surgery, or another neurologic disorder (e.g., migraine).[31] [32]

Historically the etiology has been explained as physical symptoms being a manifestation of psychological distress; however, there is ongoing debate about the extent to which psychologic/psychiatric stressors act as drivers for both conditions.[33] [34][35] Empirical data on causation is currently insufficient. See Pathophysiology.

The biopsychosocial model (with consideration of predisposing vulnerabilities, acute precipitants, and perpetuating factors) is a useful framework to consider with respect to etiology, and can assist with treatment planning. Factors to consider include pain, fatigue, psychiatric comorbidity, active psychosocial stressors, unhelpful illness beliefs, and unhelpful behavioral responses to symptoms.[3]

Somatic symptom disorder

Etiology is unclear; somatic symptom disorder occurs due to heightened awareness of bodily sensations, in association with interpretation of sensations as denoting medical illness.

Risk factors are heterogenous and include:[23] [27] [36] [37]

- History of childhood illness
- Family history of chronic illness
- History of emotional trauma, including sexual abuse
- Female sex
- Health anxiety
- Concurrent psychiatric disorder (e.g., depression or anxiety).

Pathophysiology

Functional neurologic disorder

The pathophysiology of functional neurologic disorder is the subject of intense study. Relevant processes include:[38] [39] [40] [41] [42] [43]

- Selective/biased attention
- Dissociation
- Abnormalities in sense of agency (subjective sense of control) for self-generated movements
- Abnormalities in interoception (perception of sensations from inside the body)
- Emotional dysregulation
- Alexithymia (difficulty in identifying one's own emotions)
- Differences in connectivity between the limbic system and motor cortex.

Functional neurologic disorder involves abnormalities within several brain networks. The mechanism is not fully established, but functional neuroimaging studies suggest there is disruption in neural circuits linking volition, movement, and perception.[44] [45] [46] There is evidence to suggest dysfunction affecting preconscious aspects of motor planning; in particular, there is a strengthened connection between the (emotionally oriented) limbic system and motor networks.[42] Greater functional connectivity of limbic regions with motor preparatory regions in patients with functional neurologic disorder may explain why physiologic or psychological stress can trigger functional neurologic symptoms.[47] [48] There is evidence to suggest that the brain may involuntarily generate faulty predictions about the body, which override genuine incoming sensory information.[41] However, one caveat to highlight is that the above studies looking at changes in brain structure/function in functional neurologic disorder include healthy controls (and not people with psychiatric conditions) as the control group. Consequently it is not possible to definitively establish based on the current literature whether the changes seen within the studies are specific to functional neurologic disorder, or are instead related to changes seen in the brain in people with psychiatric conditions/psychological distress.

Somatic symptom disorder

- May arise from generalized sensory amplifications of bodily symptoms involving the insula.[49] Preliminary neuroimaging evidence suggests increased activity of limbic regions in response to painful stimuli.[50]
- Somatic amplification may occur when previously sensitized brain cytokine systems are reactivated by infectious or noninfectious trauma.[51]
- Cytokines acting on the brain are likely to be involved in a variety of sickness behaviors.[52] Chronic activation of the immune system in response to stress may sensitize the cytokine response.
- Central sensitization may play an important role in symptom production and may be a useful pathophysiologic model for how symptoms develop.[53]

Classification

Functional neurologic (symptom) disorder (previously conversion disorder)

Although "la belle indifference" (exhibition of apparent lack of concern about symptoms) is classically described, often the symptoms are distressing to the patient, as well as physically, socially, and occupationally disabling.[1] Functional neurologic disorder often presents with discrete neurologic symptoms to neurology specialty clinics; clinical findings provide evidence of incompatibility between the symptom and recognized neurologic or medical conditions.[2]

Can be classified according to the type of symptoms present, such as:

- Functional limb weakness
- Functional movement disorder (e.g., dystonia, tremor)
- Functional sensory signs
- Functional seizures
- Functional cognitive disorder.
- Persistent postural perceptual dizziness.

Note that mixed functional motor symptoms are common (50% to 75%).[3]

Somatic symptom disorder

Somatic symptom disorder occurs due to heightened awareness of bodily sensations, in association with interpretation of sensations as denoting medical illness. It is represented by physical symptoms that are persistent and can affect any organ system. Patients with somatic symptom disorder often seek treatment from primary care providers.

Other specified somatic symptom and related disorder

Applies to "presentations in which symptoms characteristic of a somatic symptom and related disorder that cause clinically significant distress or impairment in social, occupational, or other areas of functioning predominate but do not meet full criteria for any of the disorders in the somatic symptom and related disorders diagnostic class."[2]

Unspecified somatic symptom and related disorder

In this category, "symptoms characteristic of a somatic symptom and related disorder that cause clinically significant distress or impairment in other areas of functioning predominate but do not meet full criteria for

any of the disorders in the somatic symptom and related disorders diagnostic class. The unspecified somatic symptom and related disorder category should not be used unless there are decidedly unusual situations where there is insufficient information to make a more specific diagnosis."[2]

Comorbidities

Typical comorbid diagnoses for both functional neurologic disorder and somatic symptom disorder include mood disorders, panic disorder, generalized anxiety disorder, post-traumatic stress disorder, dissociative disorders, social or specific phobias, obsessive-compulsive disorders, and personality disorders.[4] [5] [6] [7] Near relatives with psychiatric illness or severe somatic disease are also common.[4]

Case history

Case history #1

A 21-year-old woman presents to the emergency department with acute onset of left-sided body twitching after a minor accident in which she hit her head. An eyewitness to the event reports that these symptoms lasted for 20 minutes, during which time her eyes were tightly closed, and her breathing was rapid. Physical exam, laboratory investigations, and imaging studies are normal. Over the next several weeks, she begins experiencing episodes of full-body movements with side-to-side head shaking lasting 5-10 minutes. In the week before the initial symptom onset, her boyfriend (for whom she also worked) broke up with her, and she had a conflict with her parents. She and her boyfriend have since reconciled. There is no reported history of abuse, but there is a family dynamic of high expectations of the patient. Neurologic exam and electroencephalogram during a typical episode are normal.

Case history #2

A 35-year-old woman seeks treatment for pelvic pain. On review of systems, she reports several years of various symptoms, including gastrointestinal (GI) problems (constipation, abdominal pain, nausea, and vomiting); headaches; vulvodynia; fatigue; all-over body pains; paresthesias; and several sensitivities to environmental factors and medications. She has visited the emergency department on several occasions and has been previously admitted to the hospital for persistent GI symptoms. Extensive GI workup, laboratory studies, and laparoscopy to rule out endometriosis have been unrevealing. In spite of this, she remains extremely concerned that the pelvic pain indicates that "something is seriously wrong"; she is struggling to manage her responsibilities at work currently due to intrusive thoughts and worries about her pain and about her health in general. She reports a traumatic childhood, with an alcohol-dependent father and sexual abuse by her grandfather.

Other presentations

Although not formally recognized as part of DSM-5-TR criteria, functional cognitive disorder and postural perceptual dizziness are other clinically recognized subtypes of functional neurologic disorder.

Male, middle-aged, and older patients are also seen with functional neurologic disorder and somatic symptom and related disorders, although this is less common. Importantly, these disorders can coexist with other medical and neurologic conditions, such as Parkinson disease, multiple sclerosis, and

epilepsy.[8] [9] [10] Previous health-related traumatic experiences (e.g., myocardial infarction, cancer) in a patient with high illness anxiety is associated with development of somatic symptom disorder.[11]

Approach

Both conditions may present for the first time to emergency and acute medical settings, as well as to primary care. It is important to establish rapport with patients by showing genuine interest and concern; thorough physical and neurologic exam is vital. Assess for associated comorbid psychiatric conditions, as treatment of such comorbidities benefits overall functioning and recovery. Consider the complete differential diagnosis, including biologic, psychological, and social explanations. Include functional neurologic or somatic symptom disorders in the differential diagnosis before proceeding with the workup, rather than after medical exam to rule out other medical problems.[64]

Use medical tests judiciously, but at initial presentation, patients should have laboratory testing to rule out a reasonably broad differential diagnosis. Explain that normal test results do not mean that nothing is wrong, but that specific other worrisome illnesses in the differential diagnosis have been excluded, or that sometimes abnormalities may be found that are clinically insignificant. Neuropsychological evaluation typically includes both cognitive and personality testing, but it is not necessary for all patients.

History

Being attentive to how patients report their histories will help guide diagnosis and point to common risk factors of alexithymia (difficulty identifying and describing feelings) and neuroticism (lifelong tendencies to experience negative affect and distress).[60] [61] [62] Emotional processing problems are typical in both disorders, either due to an inability to be aware of emotions or a tendency to suppress and avoid emotions, or due to high neuroticism and emotional reactivity.

- The clinician should consider whether patients describe specific symptoms in detail, or whether they focus on how their symptoms have affected their quality of life.
- Presentation of somatizing patients may appear vague, dramatic, or odd.[63]

Functional neurologic disorder

Risk factors for functional neurologic disorder are heterogenous and nonspecific, and the underlying cause is still not fully understood. Although recent and remote psychological stressors can be important risk factors and may perpetuate symptoms, patients may present without identifiable stressors.[30] In some patients, symptoms are triggered by physical injury, surgery, or another neurologic disorder such as migraine.[31]

Use the biopsychosocial model as a framework for identifying predisposing vulnerabilities, acute precipitants, and perpetuating factors; pay particular attention to factors with prognostic and treatment implications, such as:[3]

- Comorbid pain and fatigue
- Psychiatric comorbidities
- Active psychosocial stressors
- Unhelpful behavioral responses
- Unhelpful illness beliefs.

Acutely stressful life events that may precede onset include family/relationship problems and health problems.[32] [65] More remote adverse life events (often in childhood) include physical and sexual abuse, as well as emotional neglect.[30] Although asking about adverse life events may help with treatment planning, be sensitive to the fact that it may cause distress and can be perceived as intrusive

and inappropriate, especially if there is a history of previous interactions with healthcare professions that explored this and which were viewed negatively by the patient. Follow the patient's cues, and proceed sensitively; consider whether it may be better for this discussion to wait until a follow-up visit.[66]

Somatic symptom disorder

Somatic symptom disorder may begin without any single precipitant, and patients exhibit multiple illness behaviors. This includes behavior in response to feeling ill that is intended to relieve the illness symptoms and results in focusing attention on the illness: for example, going to the doctor or emergency department, avoiding perceived environmental triggers for the illness, and adjusting lifestyle to anticipate the illness. There is excessive time and energy devoted to somatic symptoms or health concerns. Although any one somatic symptom may not be continuously present, the state of being symptomatic is persistent (typically >6 months). A subset of somatic symptom disorder patients have predominantly pain symptoms (previously designated as pain disorder).

Other clues to the diagnosis of somatic symptom disorder on history-taking include:[2]

- History of illness may be vague and/or inconsistent
- Worries are not alleviated in spite of high utilization of medical care/reassuring investigation results
- Patient describes frequently checking their own body
- Patient attributes normal sensations to medical illness.

Many patients with somatic symptom or functional neurologic disorder also have cognitive complaints: for example, forgetting whole conversations, unintentionally using the wrong words, forgetting how to do basic activities or tasks that they should know, being unable to multitask, and having short-term memory problems. Patients with functional cognitive disorder may be misdiagnosed as having the early stages of a neurodegenerative disorder.[67] [68] [69]

Evaluating for comorbidities (in conjunction with relevant diagnostic criteria) is also necessary.[2] Typical comorbid diagnoses include mood disorders, panic disorder, generalized anxiety disorder, post-traumatic stress disorder, dissociative disorders, social or specific phobias, obsessive-compulsive disorders, and personality disorders.[4] [5] [6] Affective and anxiety disorders can present with somatic symptoms. Near relatives with psychiatric illness or severe somatic disease are also common.[4]

Throughout the history, it is important for physicians to acknowledge the reality of the patient's symptoms, and if relevant explain that presence of a psychiatric or neuropsychiatric disorder would not negate the reality of their physical and emotional suffering.[70]

Examination

In the first instance, carry out a full neurologic exam for patients with suspected functional neurologic disorder, and a full medical/neurologic/psychiatric exam for patients with suspected somatic symptom disorder. Expert consensus is that the formal diagnostic assessment for functional neurologic disorder should include a neurologist/neuropsychiatrist and/or another physician with neurologic exam expertise; therefore, specialist referral is typically required following an initial assessment in primary care.[3] [71]

Functional neurologic disorder

Functional neurologic disorder is diagnosed based on positive clinical features that demonstrate impaired voluntary movement or sensation in the presence of intact automatic movement or sensation. In some cases, there is incongruency with pathophysiologic disease.[66] In general, functional movement

disorders reveal variability in amplitude and frequency of movements, inconsistent movements, variable direction and pattern to the movements, suggestibility, distractibility, suppressibility, and active resistance to passive movement.[72]

Diagnosis of functional neurologic disorder is often based on one or more (often a combination) of positive physical clinical features, such as:[66]

Functional limb weakness

- Hoover sign; weakness of hip extension returns temporarily to normal during contralateral hip flexion against resistance.
- Hip abductor sign; weakness of unilateral hip abduction returns to normal with attempt at bilateral hip abduction.

a) Hoover sign; hip extension is weak on direct testing (left) but strength becomes normal when there is contralateral hip flexion against resistance; b) Hip abductor sign; hip abduction is weak on direct testing (left) but strength becomes normal when there is contralateral hip abduction against resistance (right)

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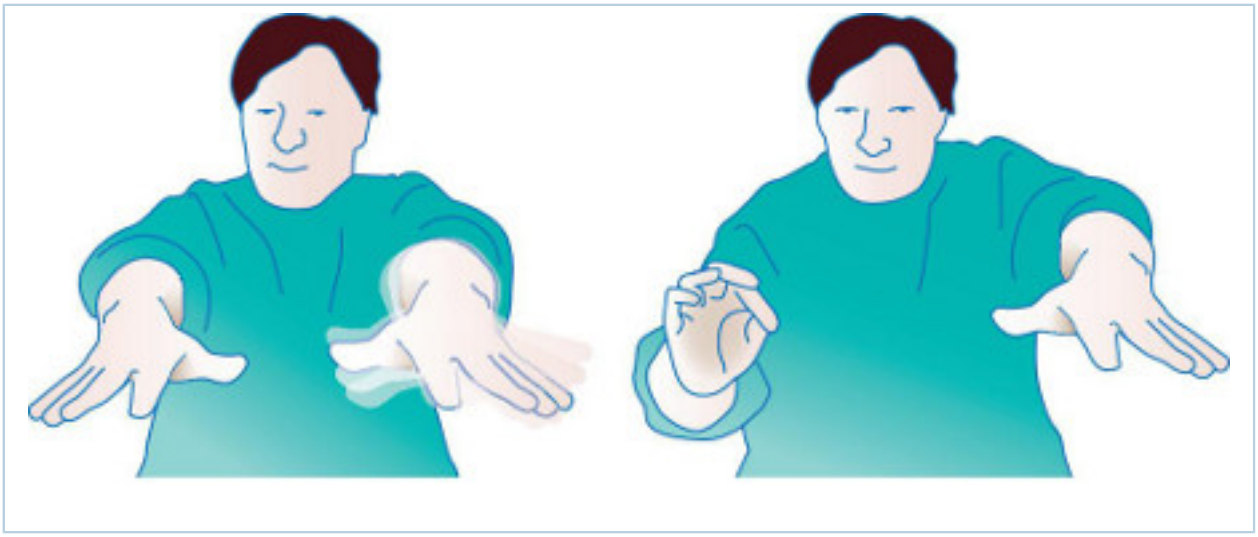
Functional tremor

- Look for evidence of distractibility and/or entrainment with the "entrainment test." Ask the patient to copy rhythmic movements of varying speed made by the examiner between the thumb and forefinger using one hand, and then watch the response in the other hand. Suspect a functional tremor If the tremor in the other hand stops during the test, or if the tremor "entrains" to the same rhythmic pattern, or if the patient is unable to copy the movement.



Entrainment test": watch the other (patient's left) hand while the patient copies the examiner's rhythmic pincer movements with their right hand; the functional tremor in the left hand stops during the task

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Functional dystonia

- Usually presents as a fixed position, usually a clenched fist or inverted ankle (in contrast to other types of dystonia, which are usually mobile).
- Functional facial dystonia usually presents with episodic contraction of the platysma or orbicularis.

Functional dystonia; orange shading shows typical areas of fixed muscular contraction in functional dystonia

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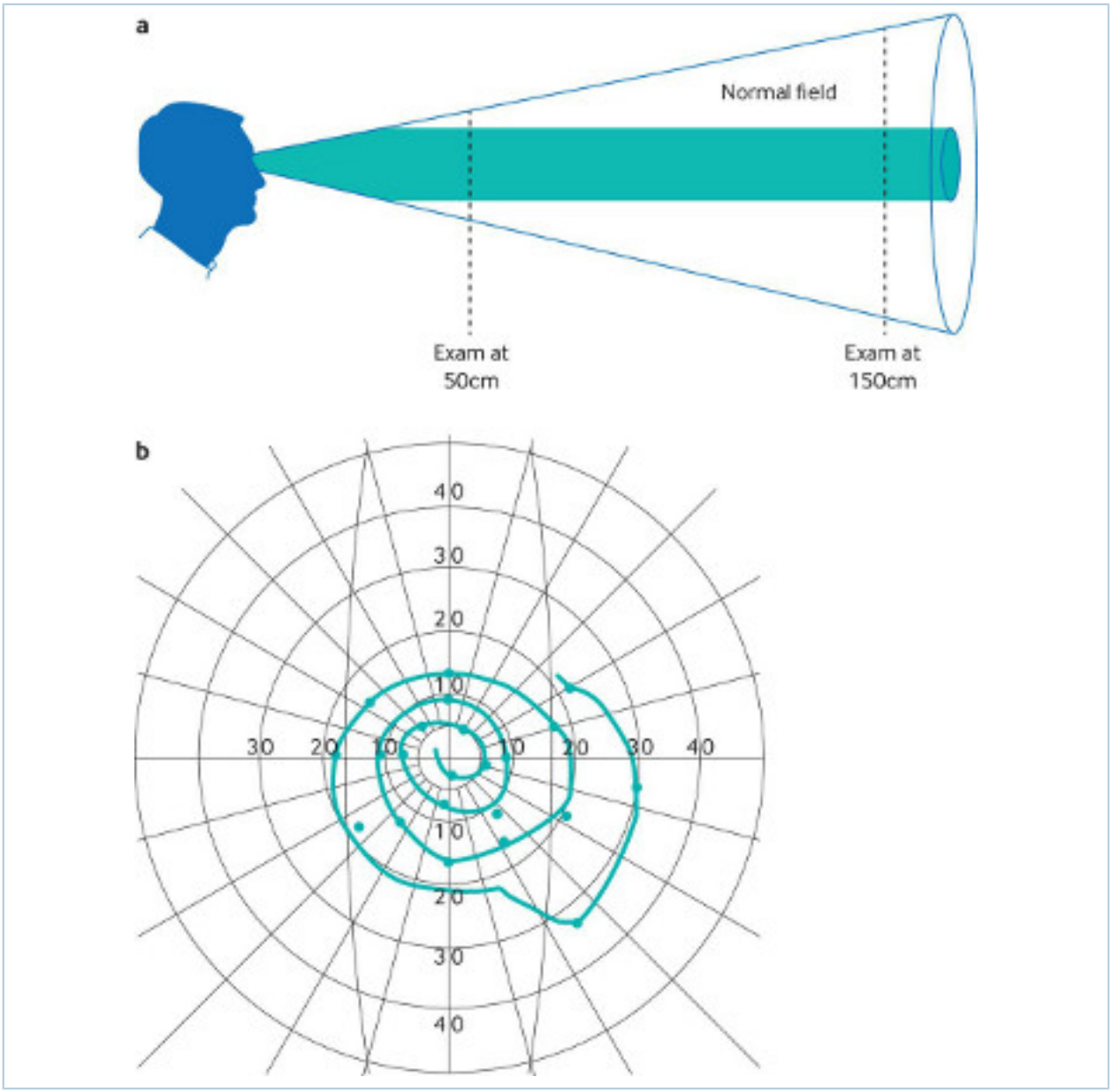
Functional visual loss

- Suggestive features include tubular (as opposed to conical) vision; this means that the visual field at 150 cm distance is the same width as at 50 cm (whereas it would be expected to increase conically with distance).
- Patients may also have "spiraling" on Goldmann perimetry, meaning that the longer the test goes on, the more constricted their visual field becomes.



a) A tubular visual field defect at 150cm which is the same width as at 50cm; b) "Spiralling" on Goldmann perimetry

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Functional seizures[73] [74] [75] [76]

Suggestive features include:

- Typically spells have prolonged duration (>5 minutes)
- Eyes may be tightly closed
- Tearfulness
- Hyperventilation during a seizure
- Side-to-side head shaking
- Can be asynchronous with stop/start quality
- May involve back arching, pelvic thrusting, stuttering, flailing motor movements, and speaking in a whisper or baby voice

- There may be an emotional or pain trigger.

A smartphone video taken by a friend or family member may help in diagnosis. Continuous video-electroencephalogram (EEG) monitoring can be useful in establishing a diagnosis of functional seizures when typical spells are captured.

Other general clues to a functional neurologic etiology across a variety of different symptoms include:[2] [66]

- Distribution of motor or sensory deficits that does not conform to any nerve, root, truncal, or central distribution (e.g., sharp demarcation at the shoulder or groin, "splitting the midline")
- Give-way weakness (when testing motor strength there is sudden collapse after several seconds of full resistance)
- Inconsistent examination findings (e.g., severe leg weakness on strength testing in patients who are ambulatory, or patients who describe symptoms of visual impairment but who can avoid obstacles when walking)
- Paradoxical sensory findings (midline sensory split and lateralization of the tuning fork)
- Pseudoclonus
- Convergence spasm
- Distractible symptoms
- Generalized seizure-like motor movements without loss of awareness
- Astasia-abasia (paradoxical ability to use the legs normally except when standing or walking)
- Cognitive complaints that are out of proportion for the possible neurologic or medical explanation of symptoms
- Dissociative symptoms, such as depersonalization, derealization, and dissociative amnesia, especially at symptom onset or during attacks.

Functional neurologic disorder and neurologic disorders frequently coexist; examples include Parkinson disease, multiple sclerosis, and epilepsy.[8] [9] [10] Patients diagnosed with functional neurologic disorder can also later develop neurologic disorders. Therefore, if new symptoms arise, repeated neurologic exams are necessary. Likewise, in somatic symptom disorder, brief, regularly scheduled visits with the same primary physician are preferred to unnecessary workups and interventions.

Somatic symptom disorder

The aims of the physical exam are to assess for any general medical illness, and to monitor any changes over time. It may also provide the patient with reassurance that their concerns are being taken seriously.

Laboratory tests

When patients initially present with new physical symptoms, laboratory testing may be indicated to rule out potential medical or neurologic conditions. If the laboratory tests have already been done and there is no change in the symptoms it is usually not necessary to repeat them.

In established functional neurologic disorder or somatic symptom disorder, it is not necessary to repeat and exhaust all medical evaluations when there is clear evidence of functional neurologic or functional somatic symptoms (and no other indication of neurologic conditions) on neurologic exam. However, as neurologic disorders can coexist or develop later, when new symptoms arise, repeat laboratory evaluations may be necessary.[74] In somatic symptom disorder, unnecessary workups and interventions should also be avoided.

Screening instruments

The Patient Health Questionnaire (PHQ)-9, the Generalized Anxiety Disorder Assessment (GAD)-7, and the PHQ-15 are brief, well-validated measures for detecting and monitoring depression, anxiety, and somatization.[77]

There are also multiple focused symptom inventories designed to objectively capture specific psychological symptoms or constructs. These include the Beck Depression Inventory-2 (BDI-2), the Beck Anxiety Inventory (BAI), and the Toronto Alexithymia Scale (TAS).[78] [79] [80] These are brief self-report questionnaires designed to capture details of experiences of single psychological constructs, such as depression, anxiety, or alexithymia. The Levels of Emotional Awareness Scale (LEAS) is designed to measure a person's ability and capacity for emotional awareness.[81]

Psychological and personality testing

If physicians are interested in obtaining personality profiles for their patients, or if the need to refer for psychiatric evaluation is uncertain, psychological testing can be requested. This can reveal psychopathology or psychological traits that may be contributing to symptoms or that would be helpful to address in treatment. It can support the diagnosis of a somatic symptom or related disorder, although diagnosis cannot be made purely on the basis of psychological testing. Consultation with a psychologist or neuropsychologist is necessary for psychological and personality testing. Although these tests cannot confirm the diagnosis, they can be helpful in formulating positive hypotheses about the potential psychological or personality contributors to the development of somatic symptom or functional neurologic disorder. Standardized psychological testing provides descriptive information about specific personality features that may be helpful in treatment, the presence or absence of psychopathology (e.g., depression, anxiety), and current levels of cognitive functioning.

Comprehensive neuropsychological evaluation is helpful when patients present with cognitive complaints and there is uncertainty about whether psychological factors are contributing to symptoms (e.g., where there is suspected functional cognitive disorder).[67] [68] [69] It is also useful if there is concern about a differential diagnosis (e.g., epilepsy) that can have cognitive findings. Comprehensive neuropsychological assessment provides detailed evaluation of current cognitive abilities, comparison of abilities in reference to age-adjusted normal control groups, and information on cognitive strengths and weaknesses. Typical findings are either normal cognitive functioning or patterns of nonspecific cognitive abnormalities that differ from neurologic disease.[82] These cognitive findings may be related to multiple factors, including any relevant neurologic history (e.g., history of head injury, learning disability, or attention-deficit disorder), psychopathology or psychological distress, medication effects, and even level of task engagement during the evaluation itself.[82] [83] [84]

Personality assessment tools commonly used by psychologists include the Minnesota Multiphasic Personality Inventory-2 (MMPI-2), Personality Assessment Inventory (PAI), and Millon Clinical Multiaxial Inventory-III (MCMI-III).[85] [86] [87] These are self-report questionnaires completed by patients and interpreted by psychologists with training in standardized assessment. Such assessments should be seen as complements to a comprehensive clinical psychiatric interview and other medical and historical information, as no indicator is 100% sensitive or 100% specific for functional neurologic or somatic symptom disorder.[88]

History and exam

Key diagnostic factors

unconventional behavior during history (common)

- Presentation of patients with somatic symptom disorder may be vague, dramatic, or odd.[63]

emotional processing problems (common)

- Typical in both disorders, either due to an inability to be aware of emotions or tendency to suppress and avoid emotions, or due to high neuroticism and emotional reactivity. Evidence suggests links between somatization and alexithymia (difficulty identifying and describing feelings); somatization and deficits in affective theory of mind (the ability to know the emotional contents of someone else's mind); and somatization and neuroticism (lifelong tendencies to experience negative affect and distress).[60] [61] [62] [89]

recent psychological or physical stressors (common)

- Acutely stressful life events may precede onset of both disorders and include family/relationship problems and health problems.[32] [65] In some patients, symptoms of functional neurologic disorder are triggered by physical injury, surgery, or another neurologic disorder such as migraine.[31] Note that patients may present without identifiable stressors.[30]

remote life stressors (common)

- Typical risk factors for both disorders, and sometimes are precipitating factors. Examples include history of sexual/physical abuse, and history of unstable childhood (witnessing domestic violence, exposure to verbal aggression, family dysfunction).[30] [54] [55] [56] [57] [58] [59] Note that patients may present without identifiable stressors.[30]

multiple illness behaviors (common)

- Patients exhibit behavior in response to feeling ill that is intended to relieve the illness symptoms and results in focusing attention on the illness (e.g., going to the doctor or emergency department, avoiding perceived environmental triggers for the illness, adjusting lifestyle to anticipate the illness).

unusual neurologic deficits (common)

- Distribution of motor or sensory deficits that do not conform to any nerve, root, truncal, or central distribution (e.g., sharp demarcation at the shoulder or groin, "splitting the midline") can suggest functional neurologic disorder.

give-way weakness (common)

- When testing motor strength, sudden collapse after several seconds of full resistance can suggest functional neurologic disorder.

inconsistent examination findings (common)

- For example, severe leg weakness on strength testing in patients who are ambulatory; patients claiming to be blind who are able to avoid obstacles when walking. Can suggest functional neurologic disorder. Weakness that varies from moment to moment, particularly when spontaneous activity is better than that performed during exam, can suggest functional neurologic disorder.

paradoxical sensory findings (common)

- Some present as anesthesia, paresthesia, blindness, tunnel vision, diplopia, triplopia, olfactory distortions, deafness, midline sensory split, and lateralization of the tuning fork. Can suggest functional neurologic disorder.

distractible symptoms (common)

- Symptoms that abate during the examination when attention is drawn elsewhere (e.g., a tremor that stops when the patient is asked to walk or perform a cognitive task) can suggest functional neurologic disorder.

generalized seizure-like motor movements without loss of awareness (common)

- Features most suggestive of functional seizures include prolonged duration (>5 minutes), eyes tightly closed, tearfulness, hyperventilation, and side-to-side head shaking.[73] Functional seizures can be asynchronous with stop/start quality, and may involve back arching, pelvic thrusting, stuttering, flailing motor movements, and speaking in a whisper or baby voice.[75] There is often an emotional or pain trigger and paradoxical worsening with anticonvulsant medications. Events may be either never witnessed or occur only in the presence of an audience.

gait disorders (common)

- Diagnosis of functional gait disorders is challenging as no single walking pattern is pathognomonic, and there is considerable overlap with other causes of gait disorders.[90] Astasia-abasia (paradoxical ability to use the legs normally except when standing or walking), collapsing gait, and noneconomical gait can suggest functional neurologic disorder. Other suggestive features may include an antalgic, buckling, or waddling gait.[90]

functional movement disorders (common)

- Apparent fixed dystonias that have variability in amplitude and frequency of movements; inconsistent movements; variable direction and pattern to the movements; suggestibility; distractibility; suppressibility; and active resistance to passive movement. Tremors and tics are also suggestive of functional neurologic disorder.[72]

Other diagnostic factors

cognitive complaints (common)

- Many patients with somatic symptom or functional neurologic disorder also commonly forget whole conversations, unintentionally use the wrong words, forget how to do basic activities or tasks that they should know, lose the ability to multitask, and experience short-term memory problems.[67] [68] [69]

Hoover sign (common)

- Involuntary extension of the seemingly weak leg when the unaffected leg is flexing against resistance can suggest functional neurologic disorder.

speech disturbance (common)

- Aphonia, dysphonia, stuttering, and foreign accent syndrome can suggest functional neurologic disorder.[91]

swallowing disturbance (common)

- People with functional neurologic disorder may have globus pharyngeus or globus sensation (a painless sensation of fullness in the neck or difficulty swallowing).[92]

pseudoclonus (uncommon)

- Irregular, erratic flexion and extension at the ankle, unlike typical clonus, can suggest functional neurologic disorder.

convergence spasm (uncommon)

- Intermittent or excessive convergence of the eyes when patients are asked to stare at an object can suggest functional neurologic disorder.

Risk factors

Strong

history of sexual or physical abuse

- Frequently reported for both functional neurologic disorder and somatic symptom disorder (50% to 75% of patients), often occurring in childhood.[7] [54] [55] [56]

adverse childhood events

- Childhood traumatization has been associated with somatic symptom and functional neurologic disorders.[30] [55] [56] [57] Witnessing domestic violence can be developmentally deleterious to later mental health stability, and exposure to verbal aggression may even be associated with abnormalities in white matter tract integrity.[58] [59] Evidence from one study also suggests that, among functional neurologic disorder patients, greater cognitive and somatic dissociative symptoms are associated with maternal (but not paternal) dysfunction.[55]

history of trauma-related disorders

- Post-traumatic stress disorder, dissociative disorder, and acute stress disorder are associated with functional neurologic disorder and somatic symptom disorder.

female sex

- For both somatic symptom disorder and functional neurologic disorder, a strong female predominance (about 75%) is consistently observed.[5] [12] [13] [14]

alexithymia

- Evidence suggests a link between somatization and difficulty identifying and describing feelings.[60] [61]

neuroticism

- Evidence suggests a link between somatization and a lifelong tendency to experience negative affect and distress.[7] [62]

Weak

previously poor doctor-patient relationships

- Physicians who show lack of empathy or understanding by being overly dismissive, or, on the other hand, contribute to alarm over symptoms by overinterpreting test results or suggesting new symptoms, can perpetuate or increase symptoms.[63]

Investigations

1st test to order

Test	Result
laboratory testing • At initial presentation, all patients should have laboratory testing to rule out potential medical or neurologic conditions. Repeat laboratory evaluations may be necessary when new symptoms arise. • In established functional neurologic and somatic symptom disorders, it is not necessary to repeat and exhaust all medical evaluations when there is clear evidence of ongoing functional neurologic or functional somatic disorder (and no other indication of neurologic conditions) on neurologic exam. Clinicians should nonetheless remain vigilant for the development of any new medical/neurologic comorbidity warranting additional evaluation.	**normal**
electroencephalogram (EEG) • Continuous video-EEG monitoring can be useful in establishing a diagnosis of functional seizures when typical spells are captured.	**normal; however, note that functional seizures and epileptic seizures may coexist in some people**

Other tests to consider

Test	Result
comprehensive neuropsychological testing • Provides detailed evaluation of current cognitive abilities, comparison of abilities in reference to age-adjusted normal control groups, and information on cognitive strengths and weaknesses. Typical findings are either normal cognitive functioning or patterns of nonspecific cognitive abnormalities that differ from neurologic disease.[82] These may be related to multiple factors, including any relevant neurologic history (e.g., history of head injury, learning disability, attention-deficit disorder), psychopathology or psychological distress, medication effects, and even level of task engagement during the evaluation itself.[82] [83] [84]	**normal cognitive function or nonspecific cognitive abnormalities**
standardized personality testing • Provides descriptive information about specific personality features that may be helpful to target treatment and objectively measures presence or absence of psychopathology (e.g., depression, anxiety). • Personality assessment tools commonly used by psychologists include Minnesota Multiphasic Personality Inventory-2 (MMPI-2), Personality Assessment Inventory (PAI), and Millon Clinical Multiaxial Inventory-III (MCMI-III).[85] [86] [87] These are self-report questionnaires completed by patients and interpreted by psychologists with training in standardized assessment. Such assessments complement comprehensive clinical psychiatric interview and other medical and historic information, as no indicator is 100% sensitive or 100% specific for functional neurologic or somatic symptom disorder.[88]	**mental illness trait, personality disorder trait, hypochondriasis, depression, hysteria, anxiety, somatization, pain disorder, or health concern**
focused symptom inventories • Designed to objectively capture specific psychological, cognitive, or physical symptoms or constructs. Include: Beck Depression Inventory-2 (BDI-2), Beck Anxiety Inventory (BAI), Toronto Alexithymia Scale (TAS), Patient Health Questionnaire (PHQ)-9, Generalized Anxiety Disorder Assessment (GAD)-7, PHQ-15.[77] [78] [79] [80] These are brief self-report questionnaires designed to capture details of experiences of single psychological constructs, such as depression, anxiety, somatic focus, or alexithymia. The Levels of Emotional Awareness Scale (LEAS) is designed to measure a person's ability and capacity for emotional awareness.[81]	**may be features of co-occurring psychiatric illness/symptoms such as depression, anxiety, or alexithymia**

Differentials

Condition	Differentiating signs / symptoms	Differentiating tests
Illness anxiety disorder	• At least 6 months of preoccupation with having or acquiring a serious disease, often based on misinterpretation of bodily symptoms. Although the fear usually persists despite reassurance, these patients either seek reassurance or avoid medical care, whereas those with somatic symptom disorder seek confirmation of illness. Unlike somatic symptom disorder, somatic symptoms are either not present or only mild in intensity. If another medical condition (or risk for a medical condition) is present, the preoccupation with illness is excessive or disproportionate.	• Structured clinical interview. The Health Anxiety Inventory.[93]
Body dysmorphic disorder	• Preoccupation with physical appearance; patients have strong belief that they have an abnormality or defect in appearance about which they are overly self-conscious; often undergo cosmetic procedures with little satisfaction.	• Structured clinical interview.
Factitious disorder	• Patients feign, deliberately produce, or exaggerate their physical symptoms. It may be with the intent to assume the sick role, but the deceptive behavior is evident even in the absence of external rewards.	• Structured clinical interview. Evidence of patient actually feigning, falsifying, or willfully producing the illness.[94] [95]
Malingering	• Patients consciously fabricate or exaggerate the symptoms of mental or physical disorders for secondary gain (e.g., financial compensation, avoiding work or military service, obtaining drugs, getting out of going to school, or attracting attention	• Structured clinical interview. Neuropsychological battery such as computerized assessment of response bias and test of memory malingering. There is significant discrepancy between claimed illness and appearance or behavior outside of physician's office.

Condition	Differentiating signs / symptoms	Differentiating tests
	or sympathy). Unlike patients with somatic symptom and related disorders, they often lack cooperation during diagnostic evaluation. Often associated with antisocial personality disorder.	
Dissociative disorder	• Although functional neurologic disorder can be conceptualized as a form of dissociation, a dissociative disorder can also include periods of detachment from self or surroundings experienced as "unreal" or "outside" of self; periods of time that the patient cannot recall; fugue states; or ≥2 distinct personality states.	• Structured clinical interview.
Major depressive disorder	• Depression often presents with somatic complaints, particularly in cultures in which mental illness carries a strong stigma. Typical symptoms include dizziness, fatigue, pain, and feelings of inner pressure. A depressive disorder should be considered if these somatic complaints are in the context of other symptoms of depression such as sleep and appetite disturbance, poor concentration, lack of interest or motivation, and/or thoughts of suicide. Psychotic depression can also include somatic delusions, which should be differentiated from a primary somatic symptom disorder.	• Structured clinical interview.
Epilepsy	• Positive family history. Previous central nervous system infection or trauma. Prior seizure events. Focal neurologic symptoms (before or after seizure). Focal neurologic deficit. Premonitory sensation or experience. Temporary hemiparesis. Temporary aphasia.	• Electroencephalogram (EEG): epileptiform activity or focal, localizing abnormality. • CT/MRI: may reveal evidence of a structural lesion or other process that has caused the seizure. Note that functional seizures and epilepsy may coexist in some people.[10]

Condition	Differentiating signs / symptoms	Differentiating tests
Spasmodic dysphonia	• Strained or breathy speech. Vocal fatigue.	• Fiberoptic laryngoscopy: abnormal delay between onset of electrical and acoustic activity. • Stroboscopy: involuntary vocal fold adduction or abduction during connected speech.
Dystonia	• Functional dystonia, in contrast to other types of dystonia, usually presents as a fixed position, usually a clenched fist or inverted ankle (whereas other types of dystonia are usually mobile). Functional facial dystonia usually presents with episodic contraction of the platysma or orbicularis. [66]	• Levodopa responsiveness: positive if clinical improvement.
Parkinson disease	• Manifestations of functional parkinsonism may be similar to those of Parkinson disease, with rest tremor, bradykinesia, rigidity, and postural instability. However, there may be associated features suggesting a functional origin, including the presence of other functional signs and symptoms.[96] • Note that Parkinson disease and functional neurologic disease may coexist in some people.[8]	• Dopaminergic agent trial: improvement in symptoms. • Olfactory testing: hyposmia or anosmia. • Electrophysiologic testing: may distinguish between functional tremor and Parkinson disease tremor. • FP-CIT single photon emission computed tomography: may show loss of dopamine transporters in Parkinson disease.
Parkinsonism	• Manifestations of functional parkinsonism may be similar to those of nonfunctional parkinsonism, with rest tremor, bradykinesia, rigidity, and postural instability. However, there may be associated features suggesting a functional origin, including the presence of other functional signs and symptoms.[96]	• Improvement with removal of medication with potential extrapyramidal adverse effects.
Multiple sclerosis	• Visual disturbance in one eye. Peculiar sensory phenomena. Foot dragging	• MRI brain: hyperintensities in the periventricular white matter, most-sensitive

Condition	Differentiating signs / symptoms	Differentiating tests
	or slapping. Leg cramping. Fatigue. Urinary frequency. • Note that multiple sclerosis and functional neurologic disorder may coexist in some people.[9]	images are sagittal fluid-attenuated inversion recovery (FLAIR). • MRI spinal cord: demyelinating lesions in the spinal cord, particularly the cervical spinal cord; detection of alternate diagnosis, such as cervical spondylosis.
Stroke	• Sudden onset of unilateral numbness, weakness, or confusion or visual changes.	• MRI/CT brain: ischemic or hemorrhagic changes.
Dementia	• Progressive loss of cognitive functioning, often in multiple domains, which can impair daily activities of living. Occasionally, patients with dementia can also have somatic delusions.	• Neuropsychometric testing: dementia-related cognitive changes, and cognitive dysfunction patterns. • CT/MRI brain: cerebrovascular lesion with vascular dementia.

Criteria

Diagnostic and statistical manual of mental disorders, 5th ed, text revision (DSM-5-TR) criteria for the diagnosis of functional neurologic (symptom) disorder (conversion disorder)[2]

A. The patient has ≥1 symptoms of altered voluntary motor or sensory function.

B. Clinical findings provide evidence of incompatibility between the symptom and recognized neurologic or medical conditions.

C. The symptom or deficit is not better explained by another medical or mental disorder.

D. The symptom or deficit causes clinically significant distress or impairment in social, occupational, or other important areas of functioning or warrants medical evaluation.

Specify type of symptom or deficit as:

- With weakness or paralysis
- With abnormal movement (e.g., tremor, dystonic movement, myoclonus, gait disorder)
- With swallowing symptoms
- With speech symptoms (e.g., dysphonia, slurred speech)
- With attacks or seizures
- With anesthesia or sensory loss
- With special sensory symptom (e.g., visual, olfactory, or hearing disturbance)
- With mixed symptoms.

Specify if:

- Acute episode: symptoms present for less than 6 months
- Persistent: symptoms present for 6 months or more.

Specify if:

- With psychological stressor (specify stressor)
- Without psychological stressor.

DSM-5-TR criteria for the diagnosis of somatic symptom disorder[2]

A. The patient has one or more somatic symptoms that are distressing or result in significant disruption of daily life.

B. Excessive thoughts, feelings, or behaviors related to the somatic symptoms or associated health concerns as manifested by at least one of the following:

1. Disproportionate and persistent thoughts about the seriousness of one's symptoms
2. Persistently high levels of anxiety about health or symptoms
3. Excessive time and energy devoted to these symptoms or health concerns.

C. Although any one somatic symptom may not be continuously present, the state of being symptomatic is persistent (typically more than 6 months).

Specify if

- With predominant pain (previously pain disorder): this specifier is for individuals whose somatic symptoms predominantly involve pain.

Specify if

- Persistent: a persistent course is characterized by severe symptoms, marked impairment, and long duration (more than 6 months).

Specify current severity

- Mild: only one of the symptoms in criterion B is fulfilled.
- Moderate: two or more of the symptoms specified in criterion B are fulfilled.
- Severe: two or more of the symptoms specified in criterion B are fulfilled. Plus there are multiple somatic complaints (or one very severe somatic symptom).

Approach

Primary care physicians should take a patient-centered and stepped-care treatment approach in the delivery of care, depending on the patient's risk profile.[98] [99] Education and explanation of the diagnosis is the first step of management for both conditions. It is important to acknowledge the reality of the patient's symptoms and of their physical and emotional suffering. Take sufficient time, give the name of the condition, and provide further reading and support information.[100] An empathetic approach is key, but note that even when the diagnosis is presented with care, some people will respond with anger, humiliation, or distress. Follow-up explanations by other members of the multidisciplinary team in primary and secondary care may be useful.[71]

Functional neurologic disorder and somatic symptom disorder management often involves referral to consultative liaison psychiatrists or psychotherapists; referral to physical, occupational, or speech therapists as needed; and, when indicated, judicious use of somatic, depressive, or anxiety treatments. An integrative, multidisciplinary approach is necessary for all patients. Regular brief visits with primary care physicians (for somatic symptom disorder) and neurologists (for functional neurologic disorder) should be scheduled to assess progress, maintain therapeutic relationships, avoid abandonment, and prevent excessive tests and procedures. After the initial diagnosis, psychiatric consultation followed by weekly phone contact may also improve quality of life.[101] Although often ultimately the goal of treatment may be good management rather than cure, it may nonetheless be helpful to emphasize to patients from the offset that complete resolution of symptoms is possible.

Functional neurologic disorder without comorbid anxiety and depression: stepped care management model

Step 1: Communication of the diagnosis and patient education

The diagnosis should be made and explained by a neurologist, a neuropsychiatrist, and/or another clinician with expertise in neurologic examination.[3] They should demonstrate positive clinical signs to illustrate the underlying mechanisms involved.[102] The aim is to provide validation of the patient's symptoms, and to offer a confident diagnosis that negates the need to seek an alternative medical opinion.

Useful phrases to adapt may include:[71]

"Functional neurologic disorder is a problem with the functioning of the nervous system. It's a problem with the software rather than the hardware."

If this explanation is not fully understood, an alternative may be: "It's like a piano that's out of tune; not broken, just not working properly."

A useful way to describe prognosis could be: "This is not an easy problem to put right, but it does have the potential to improve, and many people do make a good recovery."

Regarding the need for psychological or psychiatric input: "It's common in functional neurologic disorder for people to have problems like anxiety and depression. For some, there are things that have happened which may explain why your brain is vulnerable to going wrong in this way and could be worth exploring. I think a psychiatric/psychological assessment could be helpful. What do you think?"

It is important to develop a sense of partnership between patient and clinician, and an understanding of the likely next steps in management (including psychological treatment).[74]

Internet resources to signpost to include:

- [FND Hope] (https://fndhope.org)
- [neurosymptoms.org: FND guide] (https://www.neurosymptoms.org/en)

Step 2: Brief rehabilitation plus psychological therapy

If problematic symptoms persist following explanation of the diagnosis, the next step is usually to offer a brief rehabilitation intervention directed toward specific symptoms, in combination with psychological therapy (e.g., cognitive behavioral therapy).

For example, those with motor or gait disturbance may benefit from physical therapy, whereas speech and language therapy is recommended for those with speech and swallowing disturbance.[92] [103] Occupational therapy may be more generally applicable for improving function and engagement with everyday activities.[104] For patients with functional seizures, general principles of management include helping the patient to recognize triggers and warning symptoms in order to avert episodes, and to learn and challenge safety or avoidance behaviors around episodes.[74]

The evidence base for rehabilitation treatments for functional neurologic disorder is growing, and there is now good evidence (predominantly from randomized controlled trials) in particular for physical therapy for motor symptoms.[103] [105] [106] [107] [108] Successful programs incorporate physical therapy delivered by a therapist with experience of functional neurologic disorder, delivered within a psychologically informed framework (e.g., incorporating psychoeducation and stress reduction techniques). The aim is to focus on function and automatic movement rather than on individual components of the movement and symptoms (e.g., weakness). Counterproductive thinking styles and behaviors should be addressed during physical therapy, such as avoidance of particular movements in an attempt to avoid damage.[74] [105]

Psychological therapy (e.g., cognitive behavioral therapy [CBT]) is a key aspect of treatment for most patients, ideally delivered by a therapist with experience in managing functional neurologic disorder.[109]

According to one Cochrane review there is insufficient evidence overall to recommend any particular psychological intervention for functional neurologic disorder.[110] However, several other individual studies and systematic reviews suggest benefit with CBT, CBT-based guided self-help, CBT-group training, mindfulness therapy, short-term dynamic psychotherapy, reattribution training, and augmented psychodynamic interpersonal psychotherapy.[109] [111] [112] [113] [114][115] [116] [117] [118] [119] [120] [121] In practice, eclectic psychotherapeutic approaches are often used, but evidence is limited and more randomized controlled trials of longer duration (>12 months) are needed.[122] [123] [124] Eclectic psychotherapy includes a combination of CBT, mindfulness, interpersonal psychotherapy, short-term dynamic psychotherapy, and general psychotherapy.

Patients with functional neurologic disorder may benefit from learning self-hypnosis as one tool to control symptoms, and so hypnosis may be considered as an adjunctive treatment.[125] [126]

Eclectic psychotherapy involves:

- Insight into psychological mechanisms and patterns (e.g., between the physical and emotional; and between current or past relationships and symptoms)
- Understanding and recognizing problematic interpersonal relationships

- Developing ways to express and process emotions effectively
- Developing a new relationship with symptoms that involves acceptance, nonjudgmental awareness of symptoms and symptom dynamics, and self-compassion, rather than trying to control the somatic symptoms
- Creating strategies to recognize and resolve conflicts
- Using cognitive and behavioral strategies such as changing maladaptive thinking, relaxation strategies, and managing symptoms (the type of CBT varies for each group).

Step 3: Further psychological therapy

Patients who do not respond to initial therapies (brief rehabilitation intervention in combination with psychological therapy [e.g., CBT]) may benefit from further psychological therapy.

Further psychological therapy involves:

- Administering psychodynamic psychotherapy
- Administering family therapy - recognizing unspeakable dilemmas (the suppression of a conflict arising from family, social, or political events due to the belief that it must remain concealed from key persons involved), and interrupting spousal reinforcement of illness behaviors[127] [128]
- Administering group therapy
- Administering dialectical behavioral therapy - using in vivo coaching, homework assignments, and skills groups to help patients cope with rapidly shifting emotions and problematic reactions to emotional stimuli (particularly with comorbid borderline personality disorder or trauma)[129]
- Administering paradoxical intention therapy (encourages the patient to deliberately engage in the unwanted behavior)
- Administering eye-movement desensitization-reprocessing (particularly with comorbid post-traumatic stress disorder).

Biofeedback training may be considered as an adjunct to further psychotherapy.[74] This helps patients influence automatic, involuntary bodily functions (e.g., brain waves, blood pressure, heart rate, muscle tension, skin temperature, sweat gland activity) and better understand the mind-body connection by measuring bodily functions, using information about how bodily functions contribute to bodily tension and stress, and incorporating relaxation training; it is unlikely to cure patients of functional neurologic disorder if other treatment modalities are not used conjunctively.

Step 4: Specialized multidisciplinary therapy

Patients with problematic symptoms in spite of steps 1-3 (e.g., those with complex symptom presentations and/or high levels of disability) may benefit from specialized multidisciplinary therapy conducted in an outpatient or inpatient setting. This approach has shown positive results in single-center studies.[130] [131] [132] [133] [134]

Functional neurologic disorder with comorbid anxiety and depression: stepped care model

Steps 1-4: Usual management plus adjunctive pharmacotherapy

Management follows the same stepped care model as above, but with the addition of adjunctive pharmacologic treatment directed toward symptoms of depression and anxiety.[74] Specialist input is typically required (e.g., from a medical psychologist or psychiatry attending).

Pharmacologic treatment options for comorbid depression or anxiety include selective serotonin-reuptake inhibitors (SSRIs), particularly for anxiety disorders; serotonin-norepinephrine reuptake inhibitors (SNRIs), particularly for coexistent pain syndromes; tricyclic antidepressants; mirtazapine; or bupropion.

Patients who do not benefit from eclectic psychotherapy (including CBT) and antidepressant therapy may be treated with further psychological therapies.

Steps 5 and 6: Additional options

If the above management is not effective, atypical antipsychotics may be tried. If augmentation strategies are not effective, electroconvulsive therapy (ECT) or repetitive transcranial magnetic stimulation (rTMS) may be considered. Evidence supporting the use of atypical antipsychotics, ECT, or rTMS for functional neurologic disorder is limited.[135] [136] [137] [138] [139] [140] [141] [142] [143] [144] [145] However, when mood or anxiety disorders are present these treatments may have added value for treating the comorbid condition.

Somatic symptom disorder without comorbid anxiety or depressive disorder: stepped care management model

Step 1: Communication of the diagnosis and patient education

Patient education including careful delivery of the diagnosis is the first step of management. Before delivering a diagnosis of somatic symptom disorder, carefully explore what the patient thinks is wrong, and tailor the explanation accordingly.[146] One approach to giving the diagnosis is to explain that there is no evidence of a serious or life-threatening illness, and to emphasize that this is positive news. The explanation may include: "You have a condition that is common but not yet fully understood, which we know to cause the group of symptoms you are experiencing."

Initial management usually takes place within primary care, with regular follow-up visits scheduled (e.g., every 4-8 weeks) that are not dependent on symptoms.[147] Evidence on treatment is limited, but a practical approach to initial primary care management based on expert opinion and several review articles includes:[98] [146] [147] [148]

- Exploration of symptoms, including patient's thoughts and emotions in response to these, including impact on functioning
- Conducting brief physical exams focusing on areas of discomfort at each visit
- Establishing a therapeutic alliance, acknowledging that the patient's symptoms are real
- Limiting tests and referrals unless symptoms change
- Communication with specialists treating the patient
- Gradual discontinuation of unnecessary medications
- Psychoeducation (e.g., explaining that the body may generate symptoms in the absence of disease)
- Mutually agreed realistic and incremental goals for improvement of functioning.

If no medical cause of symptoms has been identified, note that it is not possible to completely exclude the presence of an underlying medical condition via negative investigation results, although the probability of falsely reassuring results is low. By acknowledging this uncertainty to patients, clinicians can avoid offering facile reassurance, which may exacerbate fears. Advise patients to report any changing, worsening, or new symptoms, as they may warrant reassessment.[149]

Step 2: Psychological therapy

Psychological therapy may be beneficial as the next step. Discussion with a psychiatrist may also be helpful to cover a review of initial management, to ensure this has been appropriate, and verification of the diagnosis. It is important to explain this sensitively, as patients may consider the involvement of psychiatric clinicians as evidence that their symptoms are believed to be "all in their head."

In practice, psychological therapy may include eclectic psychotherapy (including CBT, mindfulness, and/or short-term dynamic psychotherapy).[113] [119] [150] [151]

CBT in this group involves:

- Reducing physiologic arousal through relaxation techniques
- Enhancing activity regulation through increased exercise, and pleasurable and meaningful activities
- Pacing activities
- Increasing awareness of emotions
- Modifying dysfunctional beliefs
- Enhancing communication of thoughts and emotions
- Reducing spousal reinforcement of illness behavior.

Patients being treated with eclectic psychotherapy (including CBT) may also benefit from the following adjunctive treatments:

- Graded physical exercise (GET): patients are gently introduced to exercise by only gradually increasing the amount of daily exertions; the aim is to begin with very short periods of exercise, such as walking or swimming, just to the point of toleration, and then each week to attempt to increase the amount of exercise with the goal of increasing tolerance and capacity for exercise.[152] [153] The rationale for offering graded exercise is based on its use in other conditions with overlapping symptoms, such as myalgic encephalomyelitis/chronic fatigue syndrome (ME/CFS); note that there have been serious concerns expressed regarding the potential for iatrogenic harm with GET in ME/CFS, and its use is no longer recommended in ME/CFS by the National Institute for Health and Care Excellence (NICE) in the UK for this reason.[154] It is important to acknowledge that this is a topic of polarized discussion; the current evidence base concerning the possibility of iatrogenic harm with GET is hindered by methodologic shortcomings, and there a lack of widespread consensus among experts regarding the balance between its risks and benefits.
- Biofeedback training: the goal is to better understand the mind-body connection and to learn ways to use relaxation training; any patient may potentially benefit, especially those with genitourinary and/or gastrointestinal (GI) complaints who will learn to relax those organ systems. The rationale for considering biofeedback is based on its use in pain syndromes and other mind-body disorders.

Step 3: Referral to a psychiatrist

For patients whose symptoms have not responded adequately to steps 1-2, psychiatric referral is the next recommended step, with continued regular input in primary care. In order to avoid engendering feelings of abandonment, it can be helpful to emphasize that you will continue to help the patient, but that you are seeking input from a colleague to better help you do this. There is evidence that even a single visit with a psychiatrist may improve outcomes.[151]

Evidence on pharmacologic treatment is limited, low-quality, and often indirect.[155] [156] [157] [158] A specialist may consider offering antidepressant therapy (with tricyclic antidepressants, SNRIs, SSRIs, mirtazapine, or bupropion), particularly in cases of pain syndromes or cyclic vomiting.[156] Even if pain

or cyclic vomiting are not the primary target symptoms, there is low-quality evidence for pharmacologic therapies being effective compared with placebo in treating medically unexplained symptoms, with no one class of antidepressant or natural supplement being superior to another; benefits thus need to be weighed against their adverse effects.[155]

Step 4: Further psychotherapy

Patients who do not respond to initial therapies (eclectic psychotherapy and/or pharmacotherapy) may benefit from further psychotherapy, including psychodynamic psychotherapy; family therapy (recognizing unspeakable dilemmas and interrupting spousal reinforcement of illness behaviors); group therapy; dialectical behavioral therapy (particularly with comorbid borderline personality disorder or trauma); paradoxical intention therapy (encourages the patient to deliberately engage in the unwanted behavior); and eye-movement desensitization-reprocessing (particularly with comorbid post-traumatic stress disorder).[128] [129]

Somatic symptom disorder with comorbid depressive or anxiety disorder: stepped care model

Steps 1-4: Usual management plus adjunctive pharmacotherapy

Management follows the same stepped care model as above, but with the addition of adjunctive pharmacologic treatment directed toward symptoms of depression and anxiety. Specialist input is typically required (e.g., from a psychiatry attending).[149]

Pharmacologic treatment options for comorbid depression or anxiety include SSRIs (particularly for anxiety disorders); SNRIs (particularly with predominant pain); tricyclic antidepressants; mirtazapine; or bupropion.

Step 5: Atypical antipsychotic

Atypical antipsychotic medication can be offered by a specialist to patients who do not respond to further psychotherapy. When mood or anxiety disorders are present it may have added value for treating the comorbid condition. Consult a specialist for guidance on dose and choice of medication.

Treatment algorithm overview

Please note that formulations/routes and doses may differ between drug names and brands, drug formularies, or locations. Treatment recommendations are specific to patient groups: see disclaimer

Acute (summary)

functional neurologic disorder

without comorbid anxiety or depressive disorder	**1st**	**patient education**
	2nd	**brief rehabilitation intervention**
	plus	**psychological therapy**
	adjunct	**hypnosis**
	3rd	**further psychological therapy**
	adjunct	**biofeedback training**
	4th	**intensive multidisciplinary therapy**
with comorbid anxiety or depressive disorder	**1st**	**patient education**
	plus	**antidepressant**
	2nd	**brief rehabilitation intervention**
	plus	**antidepressant**
	plus	**psychological therapy**
	adjunct	**hypnosis**
	3rd	**further psychological therapy**
	plus	**antidepressant**
	adjunct	**biofeedback training**
	4th	**intensive multidisciplinary therapy**
	plus	**antidepressant**
	5th	**atypical antipsychotic**
	6th	**electroconvulsive therapy (ECT) or repetitive transcranial magnetic stimulation (rTMS)**

somatic symptom disorder

without comorbid anxiety or depressive disorder	**1st**	**patient education**
	2nd	**psychological therapy**
	adjunct	**graded physical exercise (GET)**

Acute (summary)

	adjunct	biofeedback training
	3rd	referral to a psychiatrist
	adjunct	antidepressant
	4th	further psychotherapy
with comorbid anxiety or depressive disorder	1st	patient education
	plus	antidepressant
	2nd	psychological therapy
	plus	antidepressant
	adjunct	graded physical exercise
	adjunct	biofeedback training
	3rd	referral to a psychiatrist
	plus	antidepressant
	4th	further psychotherapy
	plus	antidepressant
	5th	atypical antipsychotic

Treatment algorithm

Please note that formulations/routes and doses may differ between drug names and brands, drug formularies, or locations. Treatment recommendations are specific to patient groups: see disclaimer

Acute

functional neurologic disorder

without comorbid anxiety or depressive disorder

1st **patient education**

» Education and explanation of the diagnosis is the first step of management. The diagnosis should be made and explained by a neurologist, a neuropsychiatrist, and/or another clinician with expertise in neurologic examination.[3]

» The aims are to:[66] [74]

» Demonstrate positive clinical signs to illustrate underlying mechanisms involved

» Validate patients' symptoms

» Offer a confident diagnosis that negates the need to seek an alternative medical opinion

» Develop a sense of partnership between patient and clinician

» Outline likely next steps in management (including rationale for psychological treatment).

2nd **brief rehabilitation intervention**

» If problematic symptoms persist following explanation and demonstration of diagnosis, the next step is usually a brief rehabilitation intervention, guided by the specific subtype of functional neurologic disorder, such as:

» Physical therapy; for those with motor or gait disturbance[103] [105] [106] [107] [108]

» Speech and language therapy; for those with speech and swallowing disturbance[92] [103]

» Occupational therapy; this may be more generally applicable for improving function.[104]

» The evidence base for rehabilitation treatments for functional neurologic disorder is growing, particularly for physical therapy for motor symptoms.[103] [105] [106] [107] [108] Successful programs incorporate treatment delivered by a practitioner with experience of functional neurologic disorders, delivered within a psychologically informed framework. Counterproductive thinking styles and behaviors

Acute

are addressed, such as avoidance of particular movements in an attempt to avoid damage.[74] [105]

plus **psychological therapy**

Treatment recommended for ALL patients in selected patient group

» Psychological therapy typically incorporates elements of cognitive behavioral therapy (CBT).[74] In practice, eclectic psychotherapeutic approaches are often used. This includes a combination of CBT, mindfulness, interpersonal psychotherapy, and general psychotherapy. CBT for this group involves psychoeducation about mind-body connection and attribution of psychiatric or psychological causes rather than purely neurologic or medical causes for symptoms; learning to identify mood-cognition-environment connections, automatic thoughts, catastrophic thinking, and somatic misinterpretations; recognizing triggers associated with physical symptoms; training in healthy communication and support seeking; recognizing emotions and ways to cope with them; relaxation training; coping with external life stresses; and coping with internal stress and conflict.[114][157] [159] [160]

adjunct **hypnosis**

Treatment recommended for SOME patients in selected patient group

» Patients with functional neurologic disorder may benefit from learning self-hypnosis as one tool to control symptoms.[125] [126]

3rd **further psychological therapy**

» Patients who do not respond to initial therapies may benefit from further psychological therapy, including psychodynamic psychotherapy; family therapy (recognizing unspeakable dilemmas and interrupting spousal reinforcement of illness behaviors); group therapy; dialectical behavioral therapy (particularly with comorbid borderline personality disorder or trauma); paradoxical intention therapy (encourages the patient to deliberately engage in the unwanted behavior); and eye-movement desensitization-reprocessing (particularly with comorbid post-traumatic stress disorder).[128] [129] Alternatively, there is some evidence for the benefit of drug interviews to facilitate abreaction in treatment-resistant functional neurologic disorder.[161]

adjunct **biofeedback training**

Acute

Treatment recommended for SOME patients in selected patient group

» Helps patients influence automatic, involuntary bodily functions (e.g., brain waves, blood pressure, heart rate, muscle tension, skin temperature, sweat gland activity) and better understand the mind-body connection by measuring bodily functions, using information about how bodily functions contribute to bodily tension and stress, and incorporating relaxation training. Unlikely to cure patients of functional neurologic disorder symptoms if other treatment modalities are not used conjunctively.

4th **intensive multidisciplinary therapy**

» Patients with complex and treatment-refractory functional neurologic disorder may benefit from specialized multidisciplinary therapy conducted in an outpatient or inpatient setting. This approach has shown positive results in single-center studies.[130] [131] [132] [133] [134]

with comorbid anxiety or depressive disorder

1st **patient education**

» Education and explanation of the diagnosis is the first step of management. The diagnosis should be made and explained by a neurologist, a neuropsychiatrist, and/or another clinician with expertise in neurologic examination.[3]

» The aims are to:[66] [74]

» Demonstrate positive clinical signs to illustrate underlying mechanisms involved

» Validate patients' symptoms

» Offer a confident diagnosis that negates the need to seek an alternative medical opinion

» Develop a sense of partnership between patient and clinician

» Outline likely next steps in management (including rationale for psychological treatment).

plus **antidepressant**

Treatment recommended for ALL patients in selected patient group

» Specialist input is typically required (e.g., from a medical psychologist or psychiatry attending).

» Pharmacologic options for comorbid depression or anxiety include selective serotonin-reuptake inhibitors (SSRIs), particularly for anxiety disorders; serotonin-norepinephrine reuptake inhibitors (SNRIs),

Acute

particularly for coexistent pain syndromes; tricyclic antidepressants (TCAs); mirtazapine; or bupropion.

» SSRIs include sertraline, citalopram, fluoxetine, paroxetine, escitalopram, and fluvoxamine.

» SNRIs include venlafaxine, desvenlafaxine, and duloxetine.

» TCAs include nortriptyline, amitriptyline, desipramine, imipramine, and doxepin.

» Doses should be started low and increased gradually according to response.

» See Depression in adults .

» See also Generalized anxiety disorder .

2nd **brief rehabilitation intervention**

» If problematic symptoms persist following explanation and demonstration of diagnosis, the next step is usually a brief rehabilitation intervention, guided by the specific subtype of functional neurologic disorder, such as:

» Physical therapy; for those with motor or gait disturbance[103] [105] [106] [107] [108]

» Speech and language therapy; for those with speech and swallowing disturbance[92] [103]

» Occupational therapy; this may be more generally applicable for improving function.[104]

» The evidence base for rehabilitation treatments for functional neurologic disorder is growing, particularly for physical therapy for motor symptoms.[103] [105] [106] [107] [108] Successful programs incorporate treatment delivered by a practitioner with experience of functional neurologic disorders, delivered within a psychologically informed framework. Counterproductive thinking styles and behaviors are addressed, such as avoidance of particular movements in an attempt to avoid damage.[74] [105]

plus **antidepressant**

Treatment recommended for ALL patients in selected patient group

» Specialist input is typically required (e.g., from a medical psychologist or psychiatry attending).

» Pharmacologic options for comorbid depression or anxiety include selective

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serotonin-reuptake inhibitors (SSRIs), particularly for anxiety disorders; serotonin-norepinephrine reuptake inhibitors (SNRIs), particularly for coexistent pain syndromes; tricyclic antidepressants (TCAs); mirtazapine; or bupropion.

» SSRIs include sertraline, citalopram, fluoxetine, paroxetine, escitalopram, and fluvoxamine.

» SNRIs include venlafaxine, desvenlafaxine, and duloxetine.

» TCAs include nortriptyline, amitriptyline, desipramine, imipramine, and doxepin.

» Doses should be started low and increased gradually according to response.

» See Depression in adults .

» See also Generalized anxiety disorder .

plus **psychological therapy**

Treatment recommended for ALL patients in selected patient group

» Psychological therapy typically incorporates elements of cognitive behavioral therapy (CBT).[74] In practice, eclectic psychotherapeutic approaches are often used. This includes a combination of CBT, mindfulness, interpersonal psychotherapy, and general psychotherapy. CBT for this group involves psychoeducation about mind-body connection and attribution of psychiatric or psychological causes rather than purely neurologic or medical causes for symptoms; learning to identify mood-cognition-environment connections, automatic thoughts, catastrophic thinking, and somatic misinterpretations; recognizing triggers associated with physical symptoms; training in healthy communication and support seeking; recognizing emotions and ways to cope with them; relaxation training; coping with external life stresses; and coping with internal stress and conflict.[114] [157] [159] [160]

adjunct **hypnosis**

Treatment recommended for SOME patients in selected patient group

» Patients with functional neurologic disorder may benefit from learning self-hypnosis as one tool to control symptoms.[125] [126]

3rd **further psychological therapy**

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» Patients who do not respond to initial therapies may benefit from further psychological therapy, including psychodynamic psychotherapy; family therapy (recognizing unspeakable dilemmas and interrupting spousal reinforcement of illness behaviors); group therapy; dialectical behavioral therapy (particularly with comorbid borderline personality disorder or trauma); paradoxical intention therapy (encourages the patient to deliberately engage in the unwanted behavior); and eye-movement desensitization-reprocessing (particularly with comorbid post-traumatic stress disorder).[128] [129]

plus **antidepressant**

Treatment recommended for ALL patients in selected patient group

» Specialist input is typically required (e.g., from a medical psychologist or psychiatry attending).

» Pharmacologic options for comorbid depression or anxiety include selective serotonin-reuptake inhibitors (SSRIs), particularly for anxiety disorders; serotonin-norepinephrine reuptake inhibitors (SNRIs), particularly for coexistent pain syndromes; tricyclic antidepressants (TCAs); mirtazapine; or bupropion.

» SSRIs include sertraline, citalopram, fluoxetine, paroxetine, escitalopram, and fluvoxamine.

» SNRIs include venlafaxine, desvenlafaxine, and duloxetine.

» TCAs include nortriptyline, amitriptyline, desipramine, imipramine, and doxepin.

» Doses should be started low and increased gradually according to response.

» See Depression in adults .

» See also Generalized anxiety disorder .

adjunct **biofeedback training**

Treatment recommended for SOME patients in selected patient group

» Helps patients influence automatic, involuntary bodily functions (e.g., brain waves, blood pressure, heart rate, muscle tension, skin temperature, sweat gland activity) and better understand the mind-body connection by measuring bodily functions, using information about how bodily functions contribute to bodily tension and stress, and incorporating relaxation

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training. Unlikely to cure patients of functional neurologic disorder symptoms if other treatment modalities are not used conjunctively.

4th **intensive multidisciplinary therapy**

» Patients with complex and treatment-refractory functional neurologic disorder may benefit from specialized multidisciplinary therapy conducted in an outpatient or inpatient setting. This approach has shown positive results in single-center studies.[130] [131] [132] [133] [134]

plus **antidepressant**

Treatment recommended for ALL patients in selected patient group

» Specialist input is typically required (e.g., from a medical psychologist or psychiatry attending).

» Pharmacologic options for comorbid depression or anxiety include selective serotonin-reuptake inhibitors (SSRIs), particularly for anxiety disorders; serotonin-norepinephrine reuptake inhibitors (SNRIs), particularly for coexistent pain syndromes; tricyclic antidepressants (TCAs); mirtazapine; or bupropion.

» SSRIs include sertraline, citalopram, fluoxetine, paroxetine, escitalopram, and fluvoxamine.

» SNRIs include venlafaxine, desvenlafaxine, and duloxetine.

» TCAs include nortriptyline, amitriptyline, desipramine, imipramine, and doxepin.

» Doses should be started low and increased gradually according to response.

» See Depression in adults .

» See also Generalized anxiety disorder .

5th **atypical antipsychotic**

Primary options

» aripiprazole: 2 mg orally once daily initially, increase according to response, maximum 15 mg/day

OR

» ziprasidone: 20 mg orally twice daily initially, increase according to response, maximum 160 mg/day

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OR

» quetiapine: 25 mg orally (immediate-release) once daily initially, increase according to response, maximum 400 mg/day given in 1-3 divided doses

Secondary options

» olanzapine: 2.5 mg orally once daily initially, increase according to response, maximum 10 mg/day

OR

» risperidone: 0.5 mg orally once daily initially, increase according to response, maximum 4 mg/day given in 1-2 divided doses

» May be used by a specialist if psychotherapeutic and antidepressant measures are not effective. If insomnia is prominent, a more sedating agent such as quetiapine at bedtime may be selected. If weight gain is a concern, aripiprazole or ziprasidone may be preferred.

» Doses should be started low and increased gradually according to response.

6th **electroconvulsive therapy (ECT) or repetitive transcranial magnetic stimulation (rTMS)**

» If augmentation strategies are not effective, ECT or rTMS may be considered. Evidence supporting the use of ECT or rTMS for functional neurologic disorder is limited.[139] [140] [141] [142] [143] [144] [145]

» However, when mood or anxiety disorders are present these treatments may have added value for treating the comorbid condition.

somatic symptom disorder

without comorbid anxiety or depressive disorder

1st **patient education**

» Education and explanation of the diagnosis is the first step of management.

» Initial management usually takes place within primary care, with regular follow-up visits scheduled (e.g., every 4-8 weeks) that are not dependent on symptoms.[147]

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» Before delivering the diagnosis, explore what the patient thinks is wrong, and tailor the explanation accordingly.[146]

» Explain that there is no evidence of a serious or life-threatening illness, and emphasize that this is positive news. The explanation may include: "You have a condition that is common but not yet fully understood, which we know to cause the group of symptoms you are experiencing."

» Evidence on treatment is limited, but a practical approach to the primary care consultation includes the following:[98] [146] [147] [148]

» Exploring symptoms, including patients' thoughts and emotions in response

» Exploring impact on functioning

» Conducting brief physical exams focusing on areas of discomfort at each visit

» Establishing a therapeutic alliance

» Acknowledging that symptoms are real

» Limiting tests and referrals unless symptoms change

» Communicating with any specialists involved

» Gradually discontinuing unnecessary medications

» Psychoeducation, explaining that the body may generate symptoms in the absence of disease

» Developing mutually agreed realistic and incremental goals for improvement of functioning.

» Note that it is not possible to completely exclude the presence of an underlying medical condition via negative investigation results, although the probability of falsely reassuring results is low. Acknowledge this uncertainty to avoid offering facile reassurance, which may exacerbate fears. Advise patients to report any changing, worsening, or new symptoms, as they may warrant reassessment.[149]

2nd **psychological therapy**

» May include a combination of cognitive behavioral therapy (CBT), mindfulness, and/or short-term dynamic psychotherapy, interpersonal psychotherapy, reattribution training, and general

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psychotherapy.[113] [119] [150] [151] CBT for this group involves reducing physiologic arousal through relaxation techniques; enhancing activity regulation through increased exercise, and pleasurable and meaningful activities; pacing activities; increasing awareness of emotions; modifying dysfunctional beliefs; enhancing communication of thoughts and emotions; and reducing spousal reinforcement of illness behavior.

» Discussion with a psychiatrist may be warranted to review initial management and verify the diagnosis. Explain this sensitively, as patients may consider the involvement of psychiatric clinicians as evidence that their symptoms are believed to be "all in their head."

adjunct **graded physical exercise (GET)**

Treatment recommended for SOME patients in selected patient group

» Patients are gently introduced to exercise by gradually increasing the amount of daily exertions; the aim is to begin with very short periods of exercise, such as walking or swimming, just to the point of toleration, and then each week attempt to increase the amount of exercise with the goal of increasing tolerance and capacity for exercise. Any patient may potentially benefit.[152] [153]

» Note that the rationale for offering GET is based on its use in other conditions with overlapping symptoms, such as myalgic encephalomyelitis/chronic fatigue (ME/CFS). There have been serious concerns expressed regarding the potential for iatrogenic harm with graded exercise in ME/CFS, and its use is no longer recommended in ME/CFS by the National Institute for Health and Care Excellence (NICE) in the UK for this reason.[154] However, it is important to acknowledge that this is a topic of polarized discussion; the current evidence base concerning the possibility of iatrogenic harm with GET is hindered by methodologic shortcomings, and there a lack of widespread consensus among experts regarding the balance between its risks and benefits.

adjunct **biofeedback training**

Treatment recommended for SOME patients in selected patient group

» The goal is to better understand the mind-body connection and to learn ways to use relaxation training. Any patient may potentially benefit, especially those with genitourinary and/

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or gastrointestinal complaints who will learn to relax those organ systems. The rationale for considering biofeedback is based on its use in pain syndromes and other mind-body disorders.

3rd **referral to a psychiatrist**

» For patients whose symptoms have not responded adequately to previous measures, psychiatric referral is indicated, with continuing regular primary care input. Even a single visit with a psychiatrist may improve outcomes.[151] A sensitive explanation of the rationale for psychiatric input is key. It can be helpful to emphasize that you will continue to care for the patient, but that you are seeking input from a colleague to better help you do this.

adjunct **antidepressant**

Treatment recommended for SOME patients in selected patient group

» Evidence on pharmacologic treatment is limited, low-quality, and often indirect.[155][156] [157] [158]

» A specialist (e.g., a psychiatrist experienced in managing complex and treatment-refractory somatic symptom disorder) may consider offering antidepressant therapy to selected patients independently of the presence of depressive symptoms, particularly in cases of pain syndromes or cyclic vomiting.[156]

» Serotonin-norepinephrine reuptake inhibitors (SNRIs), nortriptyline, and amitriptyline are used as first line in order to target chronic pain symptoms.

» Selective serotonin-reuptake inhibitors (SSRIs) include sertraline, citalopram, fluoxetine, paroxetine, escitalopram, and fluvoxamine.

» SNRIs include venlafaxine, desvenlafaxine, and duloxetine.

» Tricyclic antidepressants (TCAs) include nortriptyline, amitriptyline, desipramine, imipramine, and doxepin.

» Doses should be started low and increased gradually according to response.

4th **further psychotherapy**

» Patients who do not respond to initial therapies (eclectic psychotherapy and/or pharmacotherapy) may benefit from further psychotherapy, including psychodynamic psychotherapy; family therapy (recognizing

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unspeakable dilemmas and interrupting spousal reinforcement of illness behaviors); group therapy; dialectical behavioral therapy (particularly with comorbid borderline personality disorder or trauma); paradoxical intention therapy (encourages the patient to deliberately engage in the unwanted behavior); and eye-movement desensitization-reprocessing (particularly with comorbid post-traumatic stress disorder).[128] [129]

with comorbid anxiety or depressive disorder — **1st**

patient education

» Education and explanation of the diagnosis is the first step of management.

» Initial management usually takes place within primary care, with regular follow-up visits scheduled (e.g., every 4-8 weeks) that are not dependent on symptoms.[147]

» Before delivering the diagnosis, explore what the patient thinks is wrong, and tailor the explanation accordingly.[146]

» Explain that there is no evidence of a serious or life-threatening illness, and emphasize that this is positive news. The explanation may include: "You have a condition that is common but not yet fully understood, which we know to cause the group of symptoms you are experiencing."

» Evidence on treatment is limited, but a practical approach to the primary care consultation includes the following:[98] [146] [147] [148]

» Exploring symptoms, including patients' thoughts and emotions in response

» Exploring impact on functioning

» Conducting brief physical exams focusing on areas of discomfort at each visit

» Establishing a therapeutic alliance

» Acknowledging that symptoms are real

» Limiting tests and referrals unless symptoms change

» Communicating with any specialists involved

» Gradually discontinuing unnecessary medications

» Psychoeducation, explaining that the body may generate symptoms in the absence of disease

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» Developing mutually agreed realistic and incremental goals for improvement of functioning.

» Note that it is not possible to completely exclude the presence of an underlying medical condition via negative investigation results, although the probability of falsely reassuring results is low. Acknowledge this uncertainty to avoid offering facile reassurance, which may exacerbate fears. Advise patients to report any changing, worsening, or new symptoms, as they may warrant reassessment.[149]

plus **antidepressant**

Treatment recommended for ALL patients in selected patient group

» Specialist input is typically required (e.g., from a psychiatry attending).[149]

» Pharmacologic options for comorbid depression or anxiety include selective serotonin-reuptake inhibitors (SSRIs), particularly for anxiety disorders; serotonin-norepinephrine reuptake inhibitors (SNRIs), particularly for coexistent pain syndromes; tricyclic antidepressants (TCAs); mirtazapine; or bupropion.

» SSRIs include sertraline, citalopram, fluoxetine, paroxetine, fluvoxamine, and escitalopram.

» SNRIs include venlafaxine, desvenlafaxine, and duloxetine.

» TCAs include nortriptyline, amitriptyline, desipramine, imipramine, and doxepin.

» Doses should be started low and increased gradually according to response.

» See Depression in adults .

» See also Generalized anxiety disorder .

2nd **psychological therapy**

» May include a combination of cognitive behavioral therapy (CBT), mindfulness, and/or short-term dynamic psychotherapy, interpersonal psychotherapy, reattribution training, and general psychotherapy.[113] [119] [150] [151] CBT for this group involves reducing physiologic arousal through relaxation techniques; enhancing activity regulation through increased exercise, and pleasurable and meaningful activities; pacing activities; increasing awareness of emotions;

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modifying dysfunctional beliefs; enhancing communication of thoughts and emotions; and reducing spousal reinforcement of illness behavior.

» Discussion with a psychiatrist may be warranted to review initial management and verify the diagnosis. Explain this sensitively, as patients may consider the involvement of psychiatric clinicians as evidence that their symptoms are believed to be "all in their head."

plus **antidepressant**

Treatment recommended for ALL patients in selected patient group

» Specialist input is typically required (e.g., from a psychiatry attending).[149]

» Pharmacologic options for comorbid depression or anxiety include selective serotonin-reuptake inhibitors (SSRIs), particularly for anxiety disorders; serotonin-norepinephrine reuptake inhibitors (SNRIs), particularly for coexistent pain syndromes; tricyclic antidepressants (TCAs); mirtazapine; or bupropion.

» SSRIs include sertraline, citalopram, fluoxetine, paroxetine, fluvoxamine, and escitalopram.

» SNRIs include venlafaxine, desvenlafaxine, and duloxetine.

» TCAs include nortriptyline, amitriptyline, desipramine, imipramine, and doxepin.

» Doses should be started low and increased gradually according to response.

» See Depression in adults .

» See also Generalized anxiety disorder .

adjunct **graded physical exercise**

Treatment recommended for SOME patients in selected patient group

» Patients are gently introduced to exercise by gradually increasing the amount of daily exertions; the aim is to begin with very short periods of exercise, such as walking or swimming, just to the point of toleration, and then each week attempt to increase the amount of exercise with the goal of increasing tolerance and capacity for exercise. Any patient may potentially benefit.[152] [153]

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» Note that the rationale for offering graded exercise is based on its use in other conditions with overlapping symptoms, such as myalgic encephalomyelitis/chronic fatigue (ME/CFS). There have been serious concerns expressed regarding the potential for iatrogenic harm with graded exercise in ME/CFS, and its use is no longer recommended in ME/CFS by the National Institute for Health and Care Excellence (NICE) in the UK for this reason.[154]

adjunct **biofeedback training**

Treatment recommended for SOME patients in selected patient group

» The goal is to better understand the mind-body connection and to learn ways to use relaxation training. Any patient may potentially benefit, especially those with genitourinary and/or gastrointestinal complaints who will learn to relax those organ systems. There is added benefit for patients with anxiety or depression in helping to control anxiety symptoms or insomnia. The rationale for considering biofeedback is based on its use in pain syndromes and other mind-body disorders.

3rd **referral to a psychiatrist**

» For patients whose symptoms have not responded adequately to previous measures, psychiatric referral is indicated (if not received already), with continuing regular primary care input. Even a single visit with a psychiatrist may improve outcomes.[151] A sensitive explanation of the rationale for psychiatric input is key. It can be helpful to emphasize that you will continue to care for the patient, but that you are seeking input from a colleague to better help you do this.

plus **antidepressant**

Treatment recommended for ALL patients in selected patient group

» Specialist input is typically required (e.g., from a psychiatry attending).[149]

» Pharmacologic options for comorbid depression or anxiety include selective serotonin-reuptake inhibitors (SSRIs), particularly for anxiety disorders; serotonin-norepinephrine reuptake inhibitors (SNRIs), particularly for coexistent pain syndromes; tricyclic antidepressants (TCAs); mirtazapine; or bupropion.

» SSRIs include sertraline, citalopram, fluoxetine, paroxetine, fluvoxamine, and escitalopram.

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» SNRIs include venlafaxine, desvenlafaxine, and duloxetine.

» TCAs include nortriptyline, amitriptyline, desipramine, imipramine, and doxepin.

» Doses should be started low and increased gradually according to response.

» See Depression in adults .

» See also Generalized anxiety disorder .

4th **further psychotherapy**

» Patients who do not respond to initial therapies (eclectic psychotherapy and/or pharmacotherapy) may benefit from further psychotherapy, including psychodynamic psychotherapy; family therapy (recognizing unspeakable dilemmas and interrupting spousal reinforcement of illness behaviors); group therapy; dialectical behavioral therapy (particularly with comorbid borderline personality disorder or trauma); paradoxical intention therapy (encourages the patient to deliberately engage in the unwanted behavior); and eye-movement desensitization-reprocessing (particularly with comorbid post-traumatic stress disorder).[128] [129]

plus **antidepressant**

Treatment recommended for ALL patients in selected patient group

» Specialist input is typically required (e.g., from a psychiatry attending).[149]

» Pharmacologic options for comorbid depression or anxiety include selective serotonin-reuptake inhibitors (SSRIs), particularly for anxiety disorders; serotonin-norepinephrine reuptake inhibitors (SNRIs), particularly for coexistent pain syndromes; tricyclic antidepressants (TCAs); mirtazapine; or bupropion.

» SSRIs include sertraline, citalopram, fluoxetine, paroxetine, and fluvoxamine.

» SNRIs include venlafaxine and duloxetine.

» TCAs include nortriptyline, amitriptyline, desipramine, imipramine, and doxepin.

» Doses should be started low and increased gradually according to response.

» See Depression in adults .

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	» See also Generalized anxiety disorder .
5th	**atypical antipsychotic** » Can be offered by a specialist for patients who do not respond to further psychotherapy. When mood or anxiety disorders are present it may have added value for treating the comorbid condition. Consult specialist for guidance on dose and choice of medication.

Primary prevention

There are no demonstrated primary prevention measures. However, preventing child abuse and developmental trauma would eliminate a key known environmental risk factor for somatic symptom disorder and functional neurologic disorder. Likewise, secure attachment, validation of suffering, and facilitating emotional awareness and processing skills during childhood may be protective against both conditions.

Secondary prevention

Includes:

- Limiting tests and procedures
- Encouraging graded physical exercise
- Encouraging a gradual increased participation in general activities of daily living (work, home, and/or school)
- Encouraging good sleep hygiene.

Patient discussions

Education and explanation of the diagnosis is the first step of management for both conditions. It is important to acknowledge the reality of the patient's symptoms and of their physical and emotional suffering. Take sufficient time, give the name of the condition, and provide further reading and support information. An empathetic approach is key, but note that even when the diagnosis is presented with care, some patients will respond with anger, humiliation, or distress. Follow-up explanations by other members of the multidisciplinary team in primary and secondary care may be useful.

For functional neurologic disorder, demonstrate positive clinical signs to illustrate the underlying mechanisms involved.[102] The aim is to provide validation of the patient's symptoms, and to offer a confident diagnosis that negates the need to seek an alternative medical opinion.

When giving a diagnosis of functional neurologic disorder, useful phrases to adapt may include:[71]

"Functional neurologic disorder is a problem with the functioning of the nervous system. It's a problem with the software rather than the hardware."

If this explanation is not fully understood, an alternative may be: "It's like a piano that's out of tune; not broken, just not working properly."

Although often ultimately the goal of treatment may be good management rather than cure, it may nonetheless be helpful to emphasize to patients from the offset that complete resolution of symptoms is possible. A useful way to describe prognosis could be: "This is not an easy problem to put right, but it does have the potential to improve, and many people do make a good recovery."

Before delivering a diagnosis of somatic symptom disorder, carefully explore what the patient thinks is wrong, and tailor the explanation accordingly.[146] One approach to giving the diagnosis is to explain that there is no evidence of a serious or life-threatening illness, and to emphasize that this is positive news. The explanation may include: "You have a condition that is common but not yet fully understood, which we know to cause the group of symptoms you are experiencing."

When presenting the diagnosis to patients, explain that stress and psychological factors are known to influence physiologic changes and physical symptoms. Although asking about adverse life events may help with treatment planning, be sensitive to the fact that it may cause distress and can be perceived as intrusive and inappropriate, especially if there is a history of previous interactions with healthcare professionals that explored this and which were viewed negatively by the patient. Follow the patient's cues, and proceed sensitively; consider whether it may be better for this discussion to wait until a follow-up visit.[66]

Emphasize the importance of adherence to psychotherapeutic and pharmacotherapeutic management. Self-help workbooks used alongside guidance from the care-provider can be beneficial.[109] [167] Direct patients to appropriate support websites. [neurosymptoms.org: FND guide] (https://www.neurosymptoms.org/en) [FND Hope] (https://fndhope.org)

Monitoring

Monitoring

An integrative, multidisciplinary approach is necessary for all patients. Regular brief visits with primary care physicians (for somatic symptom disorder) and neurologists (for functional neurologic disorder) should be scheduled to assess progress, maintain therapeutic relationships, avoid abandonment, and prevent excessive tests and procedures. It is important to maintain a supportive and therapeutic stance, as well as to monitor for suicidal ideation in response to the persisting symptoms for which there is no medical diagnosis or in response to the new diagnosis.

Complications

Complications	Timeframe	Likelihood
depression	**variable**	**high**
A common comorbidity of functional neurologic and somatic symptom disorders.[166]		
anxiety	**variable**	**high**
A common comorbidity of functional neurologic and somatic symptom disorders.		
suicidal ideation	**variable**	**medium**
Effective treatment of mental disorder plays an important role in suicide prevention. It is important to maintain a supportive and therapeutic stance, and to monitor for suicidal ideation in response to the persisting symptoms for which there is no medical diagnosis, or in response to the new diagnosis.		
substance use/misuse	**variable**	**medium**
Substance misuse or dependence may develop when patients attempt to manage their symptoms (particularly pain). Examples include use of prescription opioid pain medications to control pain, and use of alcohol to cope with chronic symptoms or to suppress emotions.		

Prognosis

Functional neurologic disorder

- Between 50% and 90% of patients with functional neurologic disorder exhibit short-term resolution of symptoms after reassurance, but up to 25% of these responders relapse or develop new conversion symptoms over time.[162]
- After the acute stressors resolve, some functional neurologic disorder patients have a good prognosis.[163]

- Despite their reputation for being relatively treatment resistant, prognosis can be good when using the suggested approaches and tenacious care as is outlined in this topic.
- Favorable prognostic indicators for patients with functional neurologic disorder include acute onset of symptoms, precipitation by a well-defined stressful event, good premorbid health, and absence of psychiatric or neurologic comorbidities.
- Patients with personality disorders, concomitant somatic diseases, psychiatric comorbidity, subacute presentation, and tremor or functional seizures subtypes have a poorer prognosis.

Somatic symptom disorder

- Reported remission rates range from very low (<10%) to a 50% recovery within 1 year.[164] [165]
- Patients with many somatic symptoms, anxiety or depression, and old age or marked impairment were more likely to have persistent symptoms.[165]

Undiagnosed patients

Patients who remain undiagnosed may undergo excessive and unnecessary medical tests, procedures, or hospital admissions. They may also receive excessive and unnecessary medication and experience any adverse effects needlessly.

Nonadherent patients

Nonadherence to management strategies is a risk, including ambivalence toward mental health referral and failure to use psychotherapeutic treatments. If mental health referral is declined, the focus should be on supportive care, which limits tests and procedures and encourages rehabilitation, with attribution of symptoms to stress-related causes.

Long-term management

Long-term management involves interrupting perpetuating factors, minimizing unnecessary tests and procedures, avoiding "doctor shopping," and encouraging higher levels of emotional processing.

Diagnostic guidelines

International

A review and expert opinion on the neuropsychiatric assessment of motor functional neurological disorders (https://neuro.psychiatryonline.org/doi/10.1176/appi.neuropsych.19120357) [3]

Published by: American Neuropsychiatric Association Committee on Research **Last published:** 2020

Evidence-based practice for the clinical assessment of psychogenic nonepileptic seizures (https://neuro.psychiatryonline.org/doi/10.1176/appi.neuropsych.19120354) [97]

Published by: American Neuropsychiatric Association Committee on Research **Last published:** 2020

Online resources

1. FND Hope (https://fndhope.org) *(external link)*

2. neurosymptoms.org: FND guide (https://www.neurosymptoms.org/en) *(external link)*

Key articles

- Perez DL, Aybek S, Popkirov S, et al; American Neuropsychiatric Association Committee on Research. A review and expert opinion on the neuropsychiatric assessment of motor functional neurological disorders. J Neuropsychiatry Clin Neurosci. 2021 Winter;33(1):14-26. Full text (https://neuro.psychiatryonline.org/doi/10.1176/appi.neuropsych.19120357) Abstract (http://www.ncbi.nlm.nih.gov/pubmed/32778007?tool=bestpractice.bmj.com)

- Löwe B, Levenson J, Depping M, et al. Somatic symptom disorder: a scoping review on the empirical evidence of a new diagnosis. Psychol Med. 2022 Mar;52(4):632-48. Full text (https://www.cambridge.org/core/journals/psychological-medicine/article/somatic-symptom-disorder-a-scoping-review-on-the-empirical-evidence-of-a-new-diagnosis/25B7921C514E9B42280B6A7376289729) Abstract (http://www.ncbi.nlm.nih.gov/pubmed/34776017?tool=bestpractice.bmj.com)

- Stone J, Burton C, Carson A. Recognising and explaining functional neurological disorder. BMJ. 2020 Oct 21;371:m3745.

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Images

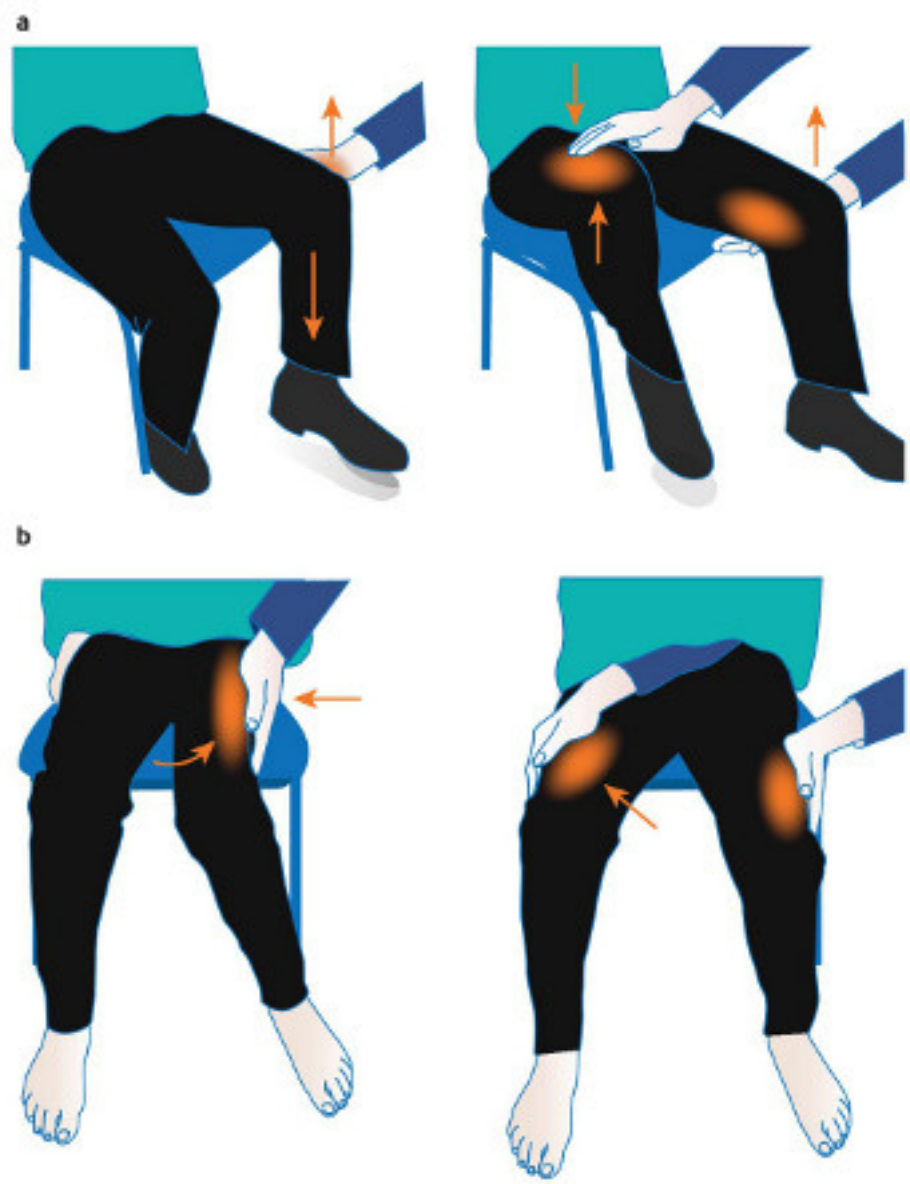

Figure 1: a) Hoover sign; hip extension is weak on direct testing (left) but strength becomes normal when there is contralateral hip flexion against resistance; b) Hip abductor sign; hip abduction is weak on direct testing (left) but strength becomes normal when there is contralateral hip abduction against resistance (right)

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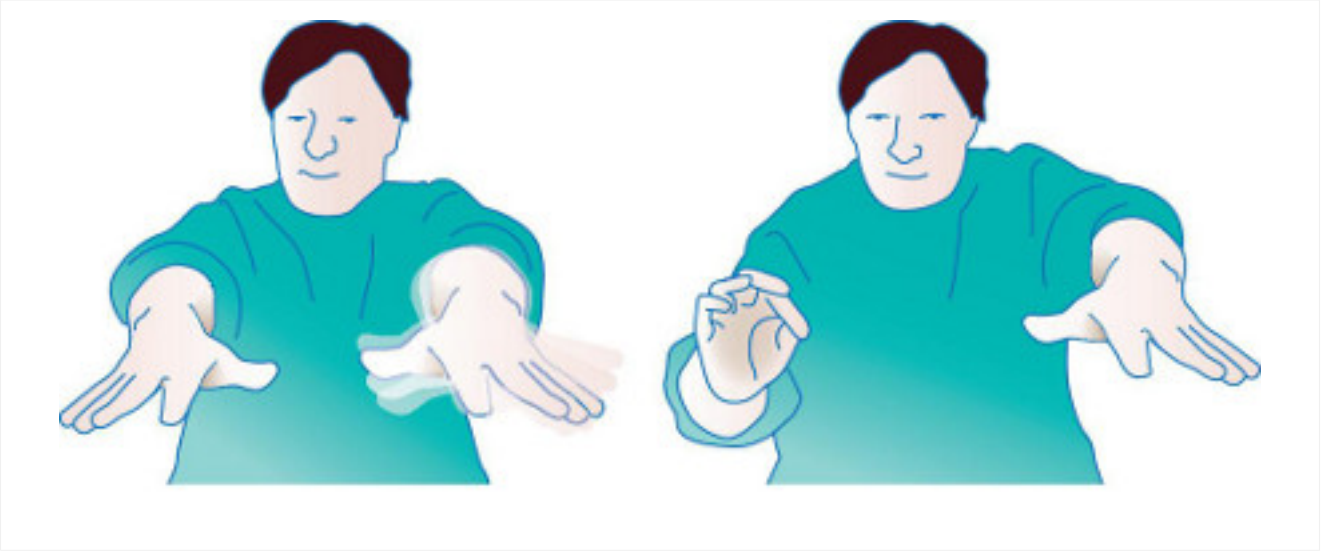

Figure 2: Entrainment test": watch the other (patient's left) hand while the patient copies the examiner's rhythmic pincer movements with their right hand; the functional tremor in the left hand stops during the task

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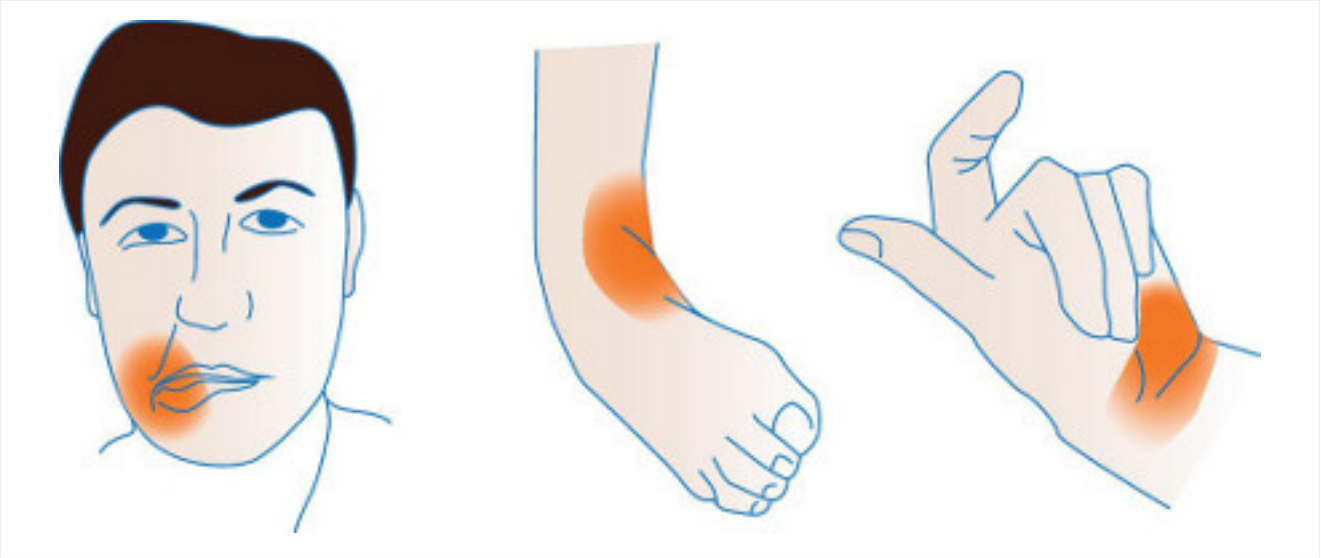

Figure 3: Functional dystonia; orange shading shows typical areas of fixed muscular contraction in functional dystonia

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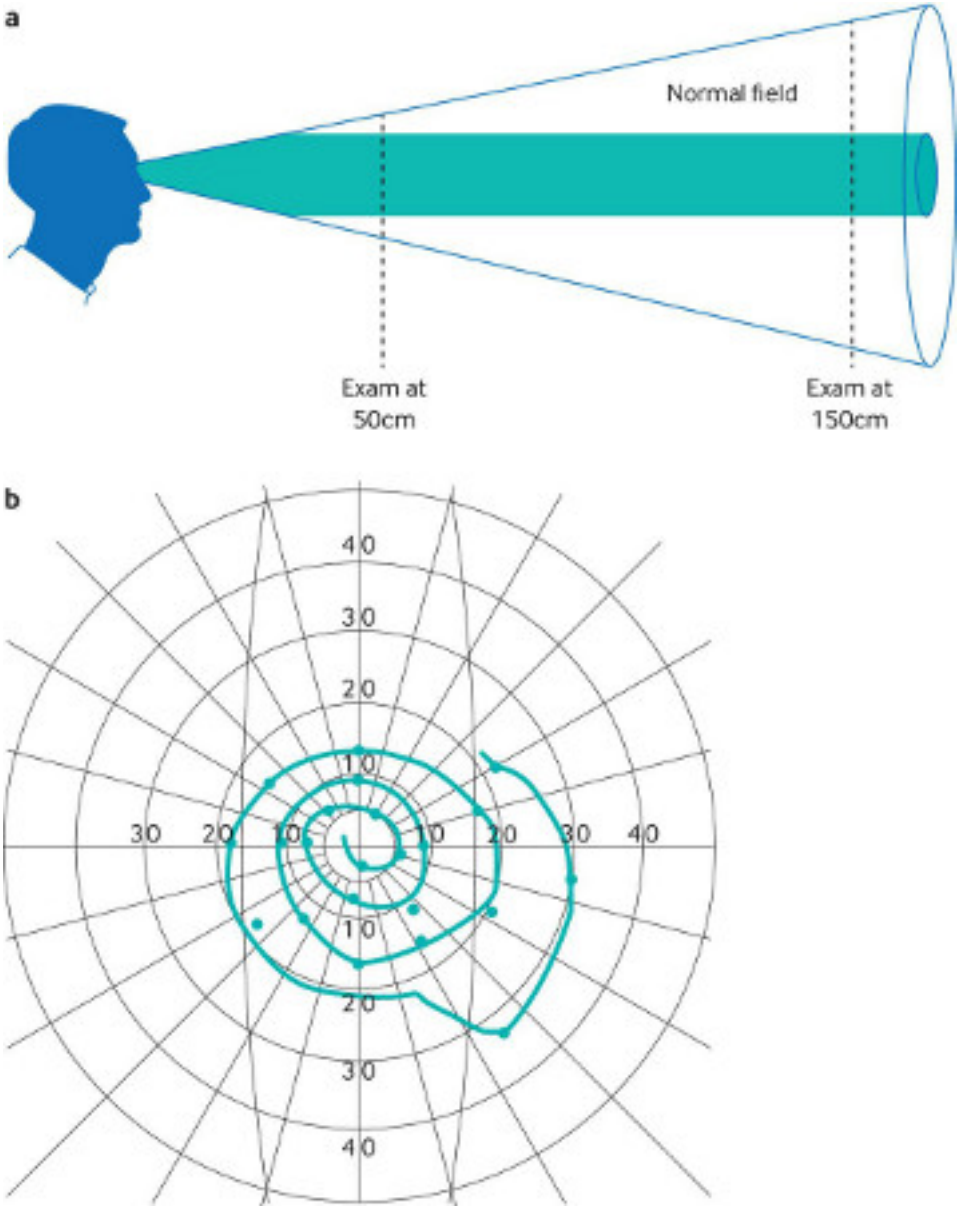

Figure 4: a) A tubular visual field defect at 150cm which is the same width as at 50cm; b) "Spiralling" on Goldmann perimetry

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Please note that recommended formulations and doses may differ between drug databases drug names and brands, drug formularies, or locations. A local drug formulary should always be consulted for full prescribing information.

Treatment recommendations in BMJ Best Practice are specific to patient groups. Care is advised when selecting the integrated drug formulary as some treatment recommendations are for adults only, and external links to a paediatric formulary do not necessarily advocate use in children (and vice-versa). Always check that you have selected the correct drug formulary for your patient.

Where your version of BMJ Best Practice does not integrate with a local drug formulary, you should consult a local pharmaceutical database for comprehensive drug information including contraindications, drug interactions, and alternative dosing before prescribing.

Interpretation of numbers

Regardless of the language in which the content is displayed, numerals are displayed according to the original English-language numerical separator standard. For example 4 digit numbers shall not include a comma nor a decimal point; numbers of 5 or more digits shall include commas; and numbers stated to be less than 1 shall be depicted using decimal points. See Figure 1 below for an explanatory table.

BMJ accepts no responsibility for misinterpretation of numbers which comply with this stated numerical separator standard.

This approach is in line with the guidance of the International Bureau of Weights and Measures Service.

Figure 1 – BMJ Best Practice Numeral Style

5-digit numerals: 10,000

4-digit numerals: 1000

numerals < 1: 0.25

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