FUNCTIONAL NEUROLOGICAL DISORDERS

Elizabeth Loftus, SPT

UNC Division of Physical Therapy

LEARNING OBJECTIVES

1. Learner will be able to describe functional neurological disorder.
2. Given a patient with FND, the learner will be able to identify signs and symptoms of FND.
3. Given a patient with FND, the learner will be able to develop a plan of care.

BACKGROUND ON FND[1,2,3]

- A functionally disabling disorder characterized by neurological symptoms that are not due to a neurological/medical condition or structural pathology
  - These symptoms are very real for the patient and are not just "in their head" and they're not faking it
- Other Names: functional neurological symptom disorder, functional movement disorder, conversion disorder, psychogenic disorders

Motor	Sensory	Speech	Cognitive	Others
• weakness • gait disorders • tremors • dystonia • fixed postures • jerks • tics • myoclonus	• visual changes • paresthesia • hearing loss • tinnitus	• stuttering • speech arrests • foreign accent syndrome • hypophonia • dysphonia	• memory related symptoms • cognitive fog	• Psychogenic nonepileptic seizures • Persistent postural perceptual dizziness • Functional urinary symptoms • Functional dysphagia and globus sensation

EPIDEMIOLOGY[4,5]

- 22 per 100,000 patients per year
- 1-9% of admissions to neuro units
- More common in women than men
- Age of Onset
  - Adults – median onset 34-50
  - Children/Adolescents – median onset 8-14

ETIOLOGY[1,6]

- Psychodynamic Model – symptoms of FND are result of emotional conflict
- Cognitive Behavioral Model – representation of symptoms in memory is activated by patient worrying about or looking for signs/symptoms

- Integrated Biopsychosocial Model

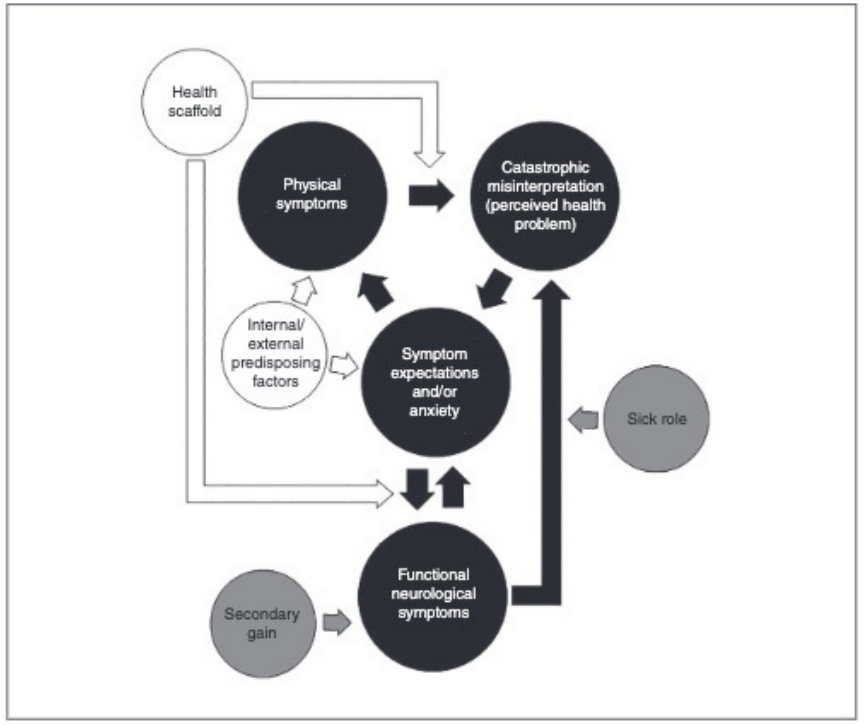


Fig. 1: The integrated biopsychosocial model for functional neurological symptom disorder. White represents predisposing factors, black represents the main model pathway and grey represents reinforcing factors.

PATHOPHYSIOLOGY AND NEUROBIOLOGY[1,4,6]

- Changes in Higher-Order Processing
  - Frontal and subcortical areas activated in response to emotional stress > send input to basal ganglia-thalamocortical circuits > inhibit conscious sensory and motor processing
  - Activation in L dorsolateral prefrontal cortex
  - Increased activation of amygdala, supplementary motor area, and periaqueductal gray matter in response to negative emotions
- Cortical and Sub-Cortical Anatomical Differences
  - Motor FND: decreased volumes of lentiform, thalamic, and caudate nuclei and increased thickness of premotor cortex
  - PNES: cortical atrophy in motor and premotor regions or R hemisphere and B cerebellar atrophy
  - Changes in gray matter volume
- Decreased Interference Pattern - Normal evoked potentials with movement but decreased evoked potentials when imagining movement
- Hypoactivation of Brain Areas Involved with Symptoms

Predisposing Factors[1]

- Trauma
- Psychiatric symptoms
- Somatic symptoms prior to FND without medical explanation
- Illness or Injury Exposure
- Symptom Monitoring
- Neurobiological Factors

Reinforcing Factors[1]

- Sick Role - Acceptance of illness by patient
- Secondary Gain – positive things that happen to patient as a result of being sick/injured

DIAGNOSING FND[2,3,4,6]

History

- Identify all symptoms including those beyond patient's main concern
- Timeline of symptoms
- Ask about potential triggers/precipitating events
- What a typical day looks like for the patient
- Medication review and reasons for medications
- Interactions with other healthcare providers and previous explanations for their condition
- Screening for anxiety and mood disorder

Neuro Exam

Diagnostic Tests- MRI, CT, video EEG, EMG

DSM-5 Criteria:

1. One or more symptoms of altered voluntary motor or sensory function
2. Clinical findings can provide evidence of incompatibility between the symptom and recognized neurological or medical conditions
3. Another medical or mental disorder does not better explain the symptom or deficit.
4. The symptom or deficit results in clinically significant distress or impairment in social, occupational, or other vital areas of functioning or warrants medical evaluation.

DIFFERENTIAL DIAGNOSES[6]

Neurological Disorders

- Multiple Sclerosis
- Epilepsy
- Myasthenia Gravis
- Stroke
- Spinal Disorder

Psychiatric Disorders

- Factitious Disorder
- Somatic Symptom Disorder
- Illness Anxiety Disorder
- Malingering

PROGNOSIS

Positive Factors[5,6]

- Sudden onset
- Early diagnosis
- Short duration of symptoms (<1 year)
- Lack of comorbid psychiatric disorders
- Identifiable stressors and elimination of those stressors
- Positive patient-clinician relationships and satisfaction with care
- Being in good physical health
- Having positive perception of one's life and social life
- <18 years old
- Primary sensory symptoms

Negative Factors[1,5]

- Delayed diagnosis/unknown cause of symptoms
- Unnecessary medications
- Long duration of symptoms
- Primary motor symptoms
- Comorbidities:
  - Personality disorder
  - Substance abuse disorders
  - Other psychiatric disorder
  - Chronic pain
- Smoking
- Dissatisfaction with physician
- Suggestibility

TREATMENT[5]

Multi-Disciplinary Team Member	Role
Neurologist	To help provide confidence in diagnosis through rule out of differential diagnoses
Physical Therapy	Effective in addressing functional impairments
Occupational Therapy	Work to address comorbid functional deficits: ADL promotion Vocational rehabilitation Address comorbid functional vision symptoms if present Promotion of self-management principles Education on use of graded goal setting
SLP	Work to address comorbid functional deficits: Speech symptoms Language impairments (aphasia, dysgraphia, mutism, alexia) Dysphagia Cognitive disorders
Social Worker/Case Manager	Address social comorbidities Assist with health and social care benefits or insurance
Art Therapy	Can be utilized as a form of distraction or emotional release especially during inpatient rehab.
Psychiatrists/Psychologists	Address psychopathology that might be affecting patient Treatment interventions: Medication management or administration specifically antidepressants Psychotherapy: Cognitive behavioral therapy, Prolonged Exposure Therapy, Dialectical Behavior Therapy, Mindfulness-Based Therapy, Acceptance and Commitment Therapy, Psychodynamic Interpersonal Therapy Motivational interviewing
Neuropsychology	Perform neuropsychiatric assessment Assist with reviewing the diagnosis, while providing supporting education and explanation, Work to exploring and address barriers to progress

ROLE OF PHYSICAL THERAPISTS

PT EXAMINATION OF FND[5]

Subjective Findings Suggestive of FND

- Abrupt onset
- Precipitating event
- Relapsing/remitting symptoms – especially with triggering event
- Spontaneous remissions
- Inconsistent phenotype
- Psychiatric comorbidities/abuse or traumatic event
- Remission with psychotherapy
- Previous somatizations
- Employed in health profession
- Pending litigation or compensation or presence of secondary gain
- Young age of onset
- Unresponsive to appropriate medications
- Responsive to placebos

Objective Findings of FND

- Paroxysmal tremor as predominant clinical feature
- High variability/inconsistencies of symptoms throughout exam
- Atypical signs/symptoms
- Precipitation of event or sudden increase in severity of symptoms during exam
- Altered level of responsiveness
- Distractibility
- Entrainment
- Co-Activation
- Suggestibility

PT EXAMINATION OF FND – SPECIAL TESTS[5,6,7,8]

- Hoover's Test
  - Hold pt's heels in your hands and ask them to push down on each leg. Ask pt to lift each leg (hip flexion) against resistance while still holding under pt's contralateral heel.
  - (+) = increased hip extension on weak side with contralateral hip flexion against resistance compared to isolated hip extension on weak side
    (+) = decreased hip extension on strong side with contralateral hip flexion against resistance compared to isolated hip extension on strong side
- Arm Drop Test
  - Hold pt's weak arm out in front of them and drop it
  - (+) = jerky/slow descent of arm into lap and/or not allowing arm to hit them in the face
- Collapsing Weakness
  - Ask pt to hold weak limb in a position and apply very light pressure
  - (+) = limb immediately collapses with light pressure
- SCM Test
  - Have pt rotate head towards both sides
  - (+) = difficulty rotating head towards affected side
- Mirror Test
  - Place mirror in front of patient and tell patient to keep their eyes open while you move the mirror side to side
  - (+) = pt tracks themselves in mirror
- Fingertip Test
  - Ask pt to bring tips of index fingers together
  - (+) = difficulty with this task
- Signature Test
  - Ask pt to write their signature on piece of paper
  - (+) = difficulty
- Tearing Reflex
  - Shine a bright light into pt's eyes
  - (+) = pt begins to tear up

PT TREATMENT OF FND

DISCUSSING THE DIAGNOSIS WITH PATIENTS[2,3,4]

- Explaining that this is not due to an injury in their motor or sensory systems but is instead due to a change in integration of motor and sensory function
- Examples to give patients:
  - "A problem with the software rather than the hardware."
  - "It's like a piano that is out of tune, not broken but just not working properly."
- When patients ask why this happened focus on risk/predisposing factors
- Inform patients that physical therapy can help retrain their nervous system to improve function
- Patients should receive similar education from their neurologist

GENERAL PRINCIPLES[2,5,9,10]

- Create expectation of improvement
- Focus on function and automatic movements instead of impairments and controlled movements that require focus
- Take attention away from deficits
- Develop self-management plan
- Avoiding maladaptive movement patterns and postures and avoiding AD as much as possible
- Recommended Frequency/Duration: 30-60 minute sessions, 1-2x/day, 5 days/week

EDUCATION POINTS[5,9,10]

- This is a genuine problem and it's not made up or in their head
- Their problems have potential for reversibility and can benefit from PT to help with reversing symptoms/retraining nervous system
- Using proper terms such as functional movement disorder instead of psychogenic or conversion
- Discuss risk factors/factors that could trigger symptoms
- Resources to Provide Patients with:
  - https://fndaustralia.com.au/resources/FND-Workbook.PDF
  - www.neurosymptoms.org
  - www.fndhope.org
  - www.fndaction.org.uk
- Family education on avoiding reinforcing "sick role" and abnormal movements

DEMONSTRATING NORMAL MOVEMENT CAN OCCUR[9,10]

- Hoover's Sign
- Hip Abductor Sign
- Distraction or Entrainment of Tremor

RETRAIN MOVEMENT WITH DIVERTED ATTENTION[5,9,10,11]

- Sequential Learning with Task-Based Activities
- Minimize self focused attention by using automatic movements
- Alter focus of motor attention
  - Distracted motor tasks
  - Cognitive Distracting Tasks
- Changing/limiting maladaptive behaviors
- Mirrors can be helpful for visual feedback
- Non-specific graded exercises

SELF-MANAGEMENT PLAN[9]

- Helpful exercises and strategies
- Goals
- Strategies to prevent relapse – pacing, graded activity, exercise plans

*may not be something we are addressing in acute care

DISCHARGE PLANS[5]

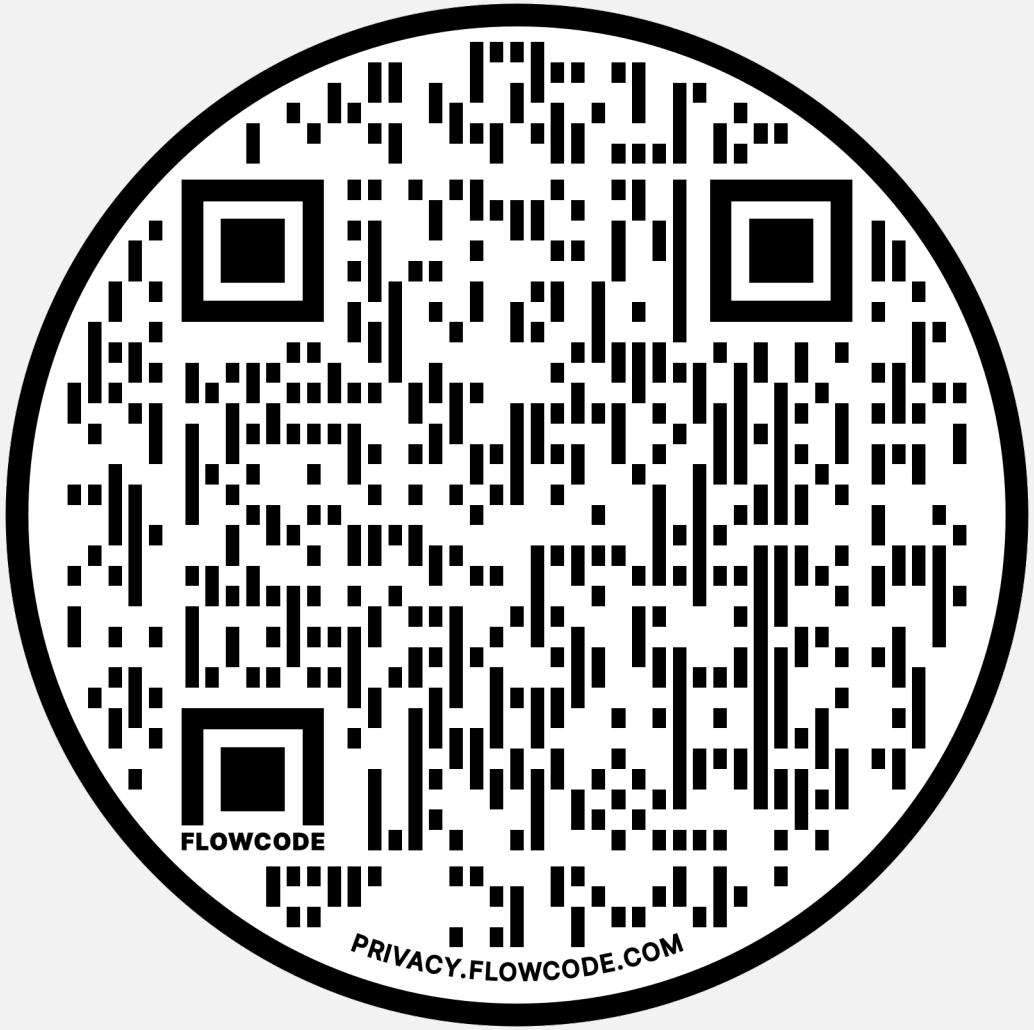
- Inpatient rehab
  - Pros: intense, limits environmental and social factors affecting symptoms
  - Cons: short term, financial coverage
- Outpatient PT
  - Pros: longer term, immersive in typical life of patient helps decrease risk of relapse after discharge
  - Cons: intensity might be too low for some patients

IMPACT OF PT ON PROGNOSIS[4]

Patients receiving immediate PT (in acute/inpatient setting) had significantly better outcomes immediately and one year post onset of symptoms compared to those who waited 4 weeks to receive PT treatment

QUESTIONS

FEEDBACK SURVEY



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