Understanding and Treating Functional Neurological Disorder

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Presentation Outline

- What is FND?
- Etiology of FND
- Treatment of FND

What is FND?

So many names….

Functional neurological disorder, conversion disorder, functional neurological symptom disorder, dissociative neurological symptom disorder….

Confusion is very common among practitioners and providers because of this

FND is more used by researchers and clinicians globally, so we are going to use that

History of FND

Long history of the types of symptoms and causes for what is now often conceptualized as “functional neurological disorder”

Accounts in ancient Mesopotamia, Egypt, and Greece describe loss of speech, blindness, pain

“Witchcraft” and “curses” in Christian Europe during Middle Ages

Salem “witches” during early colonial America

SUPERNATURAL

Punished for your actions by demons or gods

Treated by prayer, temple sleep, punishment, appeasing gods

HYSTERIA

The “wandering uterus” interferes with other organs

Treated by perfumes, suppositories, marriage, or getting pregnant

CONVERSION

Painful emotions and memories are repressed and converted into symptoms

Process memories via psychoanalysis

Early Scientific Work on FND

Physicians in 16th century like Paracelsus denounced supernatural causes, but were largely ignored (or jailed for heresy)

In the 18th century, some physicians began describing it as a dysfunction of the nervous system *and* that it impacted females and (non-uterus having) males

Pierre Briquet, a Parisian neurologist, did observational studies of hundreds of patients with FND symptoms

- Most were female, adolescents or early adults, lower SES, highly suggestible, had family history, and were experiencing situational stressors
- Recommended removing stressors, education, good nutrition…but also opiates and marriage

Early Scientific Work on FND

Jean-Martin Charcot, John Russel Reynolds, and others documented further symptoms and presentations across 1800s and early 1900s

Freud & Breur's *Studies in Hysteria* (1895) elucidated the psychoanalytic idea of the symptoms as a "conversion" of "psychic trauma" in physical manifestations

- *Shell shock* during WWI reinforced these ideas
- Popularity led to suppression of biological or non-psychoanalytic work

FND in the DSM

Conversion reaction in DSM-I

Changed to *conversion disorder* in DSM-III

As of DSM-5 it is called *conversion disorder (functional neurological symptom disorder)*

FND in the ICD

Dissociative Neurological Symptom Disorder is used in the ICD-11

- Removed “conversion” as a descriptor completely

Lists 12 subtypes based on predominant symptom

- visual disturbance
- auditory disturbance
- vertigo or dizziness
- other sensory disturbance
- non-epileptic seizures
- speech disturbance
- paresis or weakness
- with gait disturbance
- with movement disturbance
- with cognitive symptoms

DSM-5 Criteria

A. One or more symptoms of altered voluntary motor or sensory function
B. Clinical findings provide evidence of incompatibility between the symptom and recognized neurological 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

DSM-5 Criteria

Symptom type specifiers:

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

DSM-5 Criteria

Specify if:

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

Specify if:

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

Importance of DSM-5 Changes

Diagnosis can be made in an inclusionary manner by identifying neurological signs that are specific to FNDs *without* reliance on presence or absence of psychological stressors or suggestive historical clues

Highlights a wider range of past sensitizing events (physical trauma, medical illness, or physiological/psychophysiological events)

- Strong ideas and expectations about these events correlate with abnormal predictions of sensory data and body-focused attention

Common Symptoms of FND

Signs and symptoms that affect body movement and function may include:

- Weakness or paralysis
- Abnormal movement, such as tremors or difficulty walking
- Loss of balance
- Difficulty swallowing or feeling "a lump in the throat"
- Seizures or episodes of shaking and apparent loss of consciousness (psychogenic / nonepileptic seizures)
- Episodes of unresponsiveness

Common Symptoms of FND

Signs and symptoms that affect the senses may include:

- Numbness or loss of the touch sensation
- Speech problems, such as the inability to speak or slurred speech
- Vision problems, such as double vision or blindness
- Hearing problems or deafness
- Cognitive difficulties involving memory and concentration

Common Subtypes

Functional movement disorder (FMD)

- Tics, tremors

Psychogenic non-epileptic seizures (PNES)

- Typically resemble *grand mal* seizures
- Loss of consciousness, violent muscle contractions

Epidemiology

Very rare, best estimates are 4-12 per 100,000 people

- 4-5 for motor, 1.5-5 for PNES

More common overall in females (60-75%)

Functional Impact

Similar levels of disability and physical QoL as Parkinson's or essential tremor patients, *worse* mental health QoL

Poor prognosis without treatment

- 40% have similar or worse outcomes 7 years post-onset

Negative predictors include older age and longer duration of symptoms

Neurological Assessment

Given lack of most providers familiarity with neurological disorders, always make a referral to trusted neurologist *first*

Even though FND is rare, research finds neurologists are very accurate at making proper diagnosis

Neurological Assessment

Diagnosis is based on specific elements of the neurological examination demonstrating inconsistency and/or incongruence

- Changing patterns over time with susceptibility to distraction
- Clinical picture incompatible with known organically determined patterns

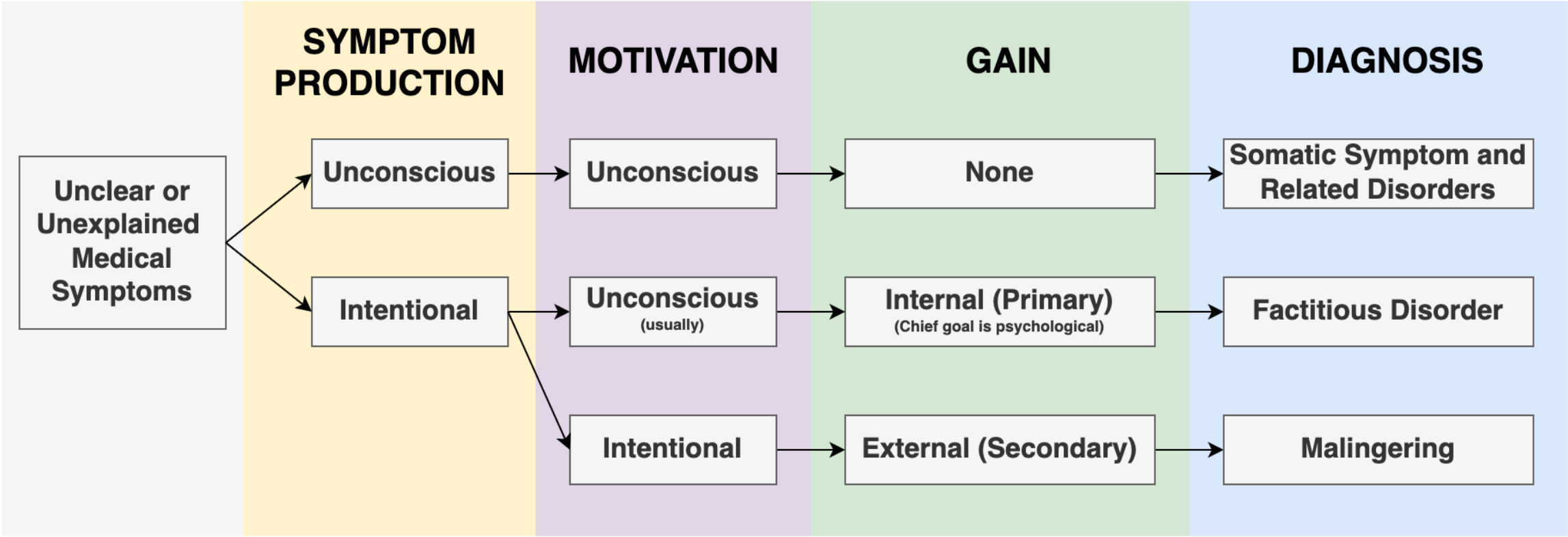
Suggestive clinical features include:

- Sudden onset
- Disappearance with distraction
- Increase with attention
- Excessive fatigue or demonstration of effort

Some Differences in an Epileptic Seizure vs. PNES

Examination Features	Common in PNES, Rare in ES	Common in ES, Rare in PNES	Present in Either
Eyelids and pupils			
Closed	Yes	No	No
Open	No	Yes	No
Fluttering	No	No	Yes
Resistance to eyelid opening	Yes	No	No
Absent light reflex	No	Yes	No
General phenotype			
Duration longer than 2 min	Yes	No	No
Asynchronous limb movements	Yes	No	No
Side-to-side head shaking	Yes	No	No
Prolonged event with falling down and lying still with eyes closed	Yes	No	No

COMPARISON OF SOMATIC DISORDERS, FACTITIOUS DISORDER, AND MALINGERING



Etiology of FND

An Integrated Perspective

As with most mental health problems, it's important to consider psychological, social, and neurobiological contributors

Should include predisposing, precipitating, and perpetuating factors

Likely a mix of higher-order (attention to self, expectation) and bottom-up (trauma, arousal) influence interacting with basic motor functions

Factor	Supporting evidence
Trauma/psychiatric symptoms	History of sexual abuse or trauma Increased stress Increased anxiety and panic symptoms Increased alexithymia Comorbid dissociative disorders
Somatic symptoms	Comorbid fatigue, chronic pain, irritable bowel syndrome Parent reinforcement and concern over physical symptoms, resulting in increased symptoms Impairment in sensory gating, allowing for excessive information loading
Illness exposure	Precipitating physical event or physical trauma Personal or family history of neurological disorder Personal or family history of other health disorder Profession in a medical or paramedical field Media exposure to neurological disorder
Symptom monitoring	Impairment in habituation Increased focus on external body features Increased self-monitoring
Neurobiological evidence	Abnormal attentional focus on affected area Beliefs and expectations about illness Deficits in sense of control over actions Interregional neural network deficits in limbic system, sensorimotor areas and prefrontal cortex Functional and structural brain abnormalities

(Fobian & Elliot, 2019)

Predisposing Factors

Early childhood experiences
- Higher amounts of childhood trauma in PNES compared to epilepsy
- But only a minority (<40%) meet PTSD criteria

Genetics
- Some support for a tryptophan hydroxylase 2 (TPH2) gene polymorphism
- Epigenetic influences as well, as ACEs impact gene expression and DNA methylation

Temperament & personality
- Insecure attachment
- Lower extraversion, conscientious, and openness to experience, higher neuroticism

Precipitating & Perpetuating Factors

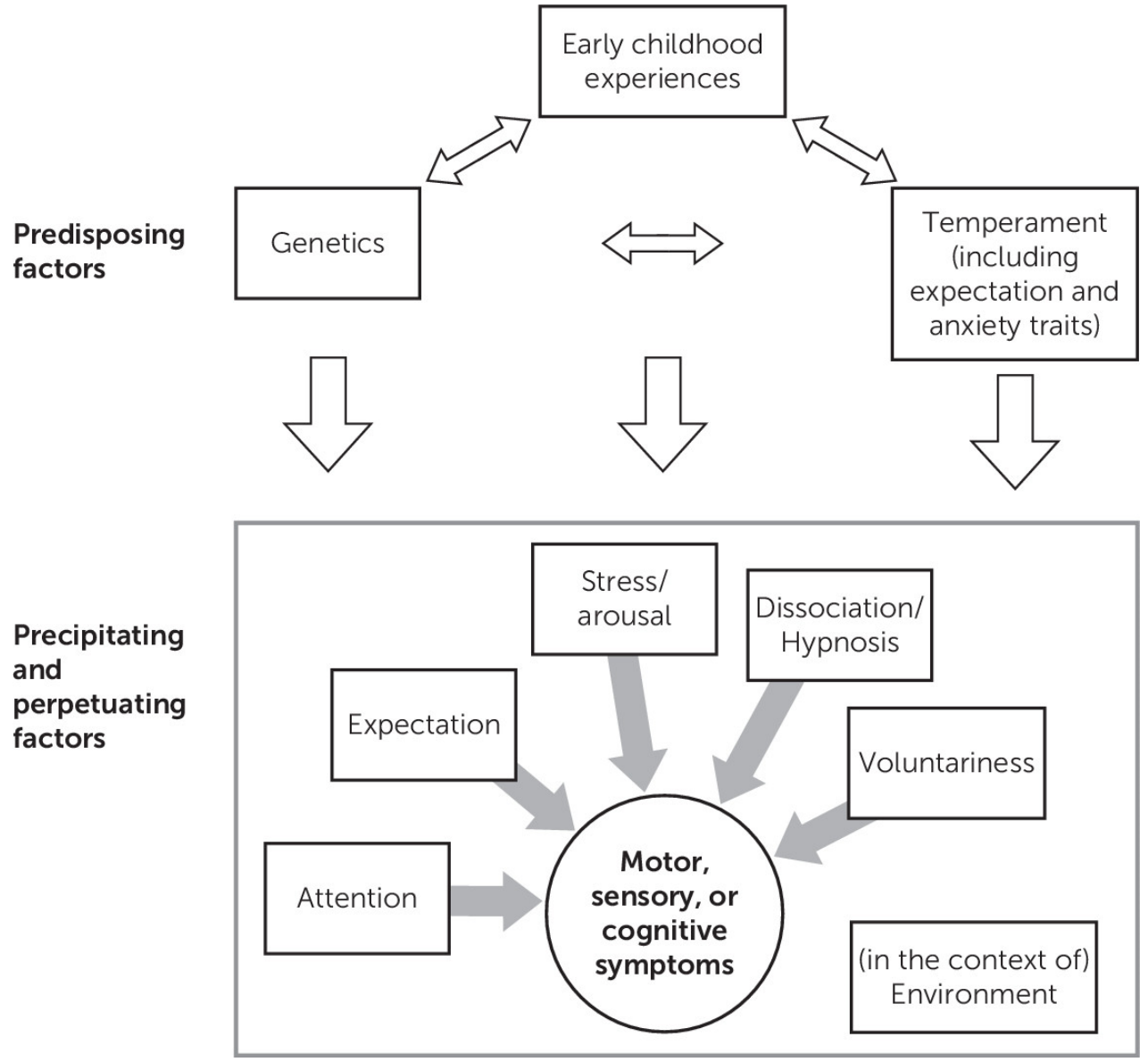
Possible impairments in motor conceptualization or intention (dorsolateral prefrontal cortex-supplementary motor area network)

Enhanced attention to self and self-monitoring of symptoms
- Report more physical symptoms of anxiety/depression, less emotional
- Emotionally avoidant

Expectations and suggestibility

High dissociation (especially during PNES)

Integrated Model for FNDs



(Espay et al., 2018)

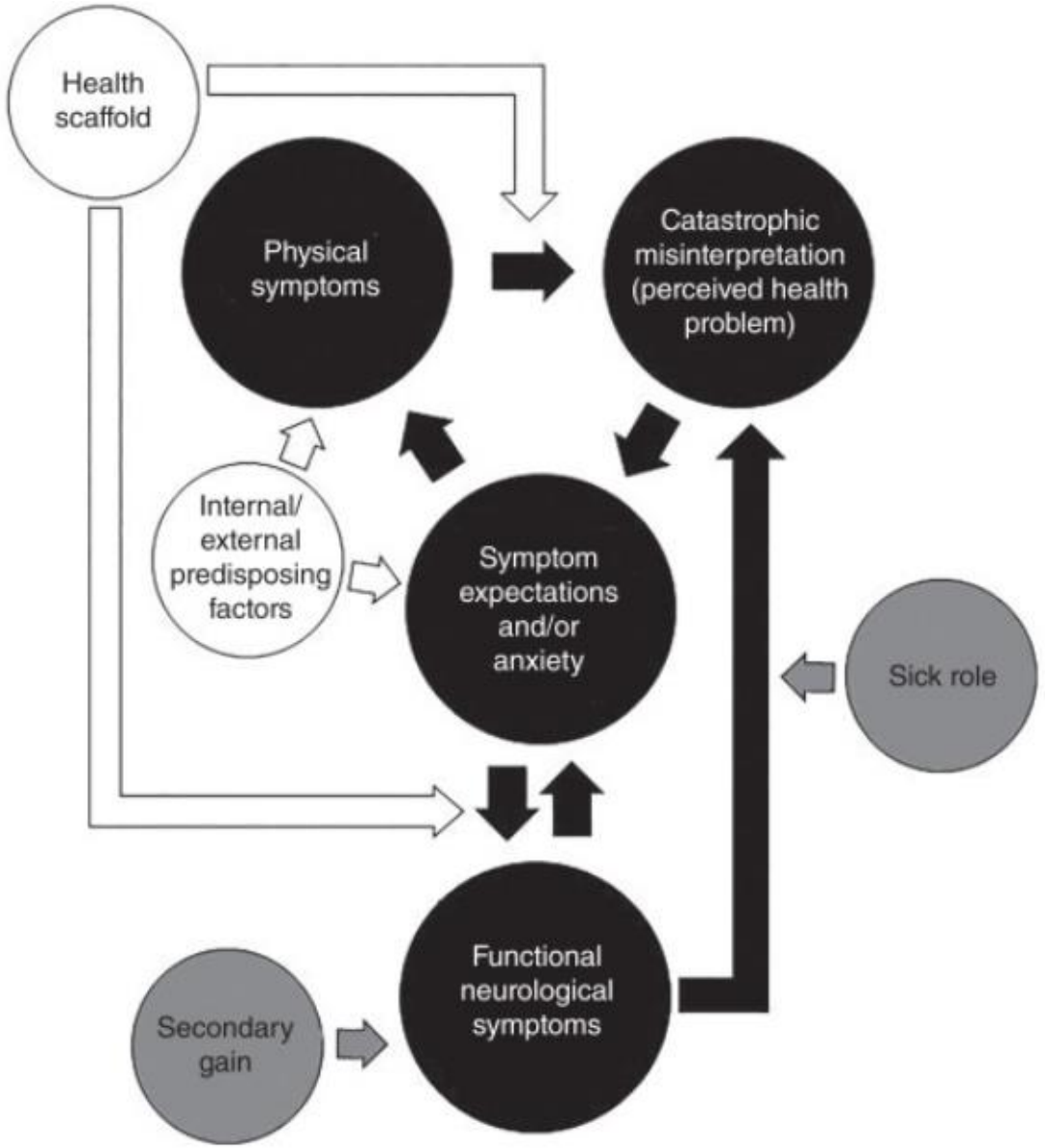
Maintenance of Symptoms

Phobic avoidance of situations and other secondary gains

Reinforcement of “sick role”

Developed affective problems

Eventually, changes in brain plasticity



- White are predisposing factors
- Black are main pathways
- Grey are reinforcing factors

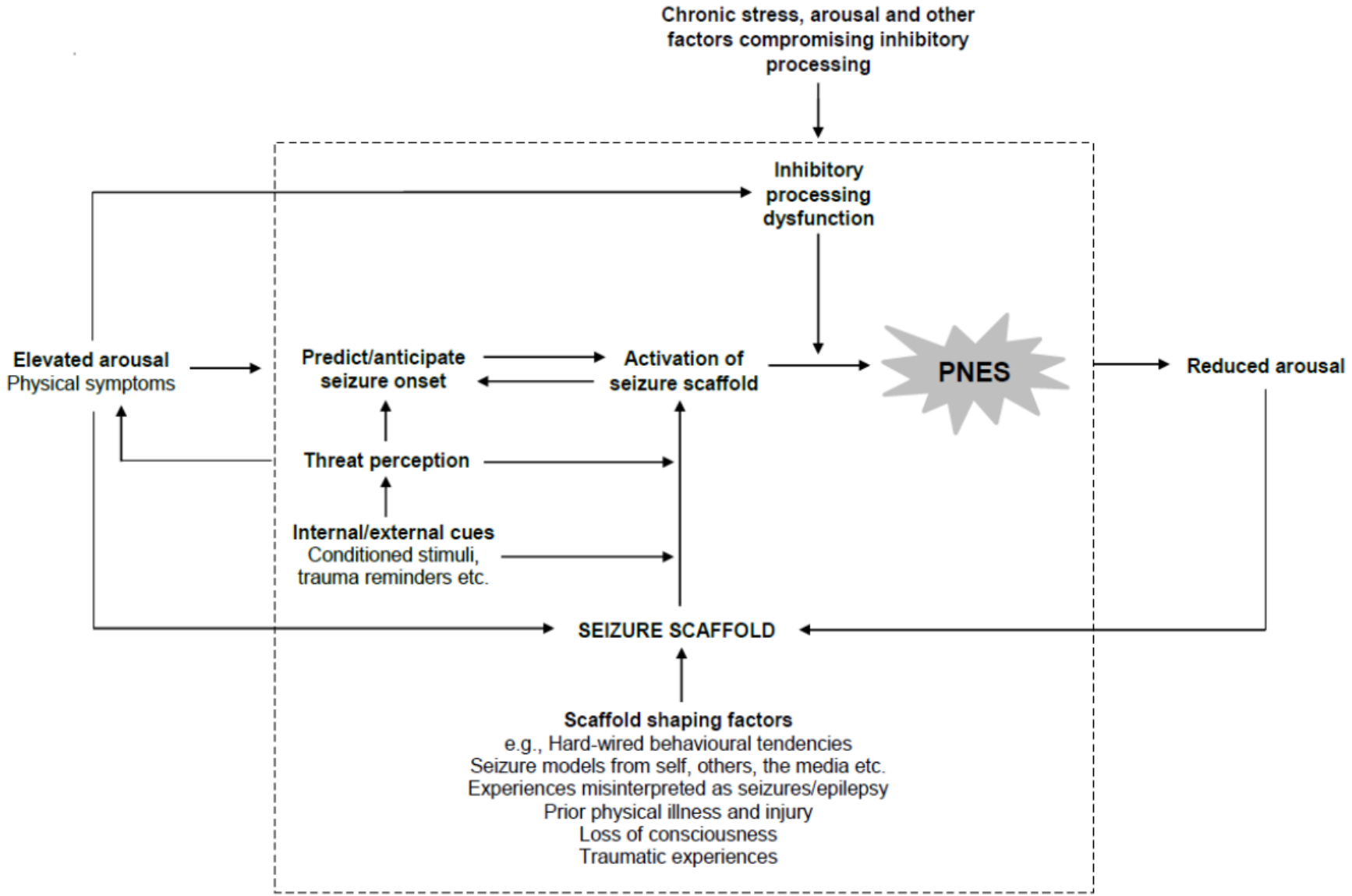
(Fobian & Elliot, 2019)

Psychogenic Non-Epileptic Seizures

In PNES, higher likelihood of

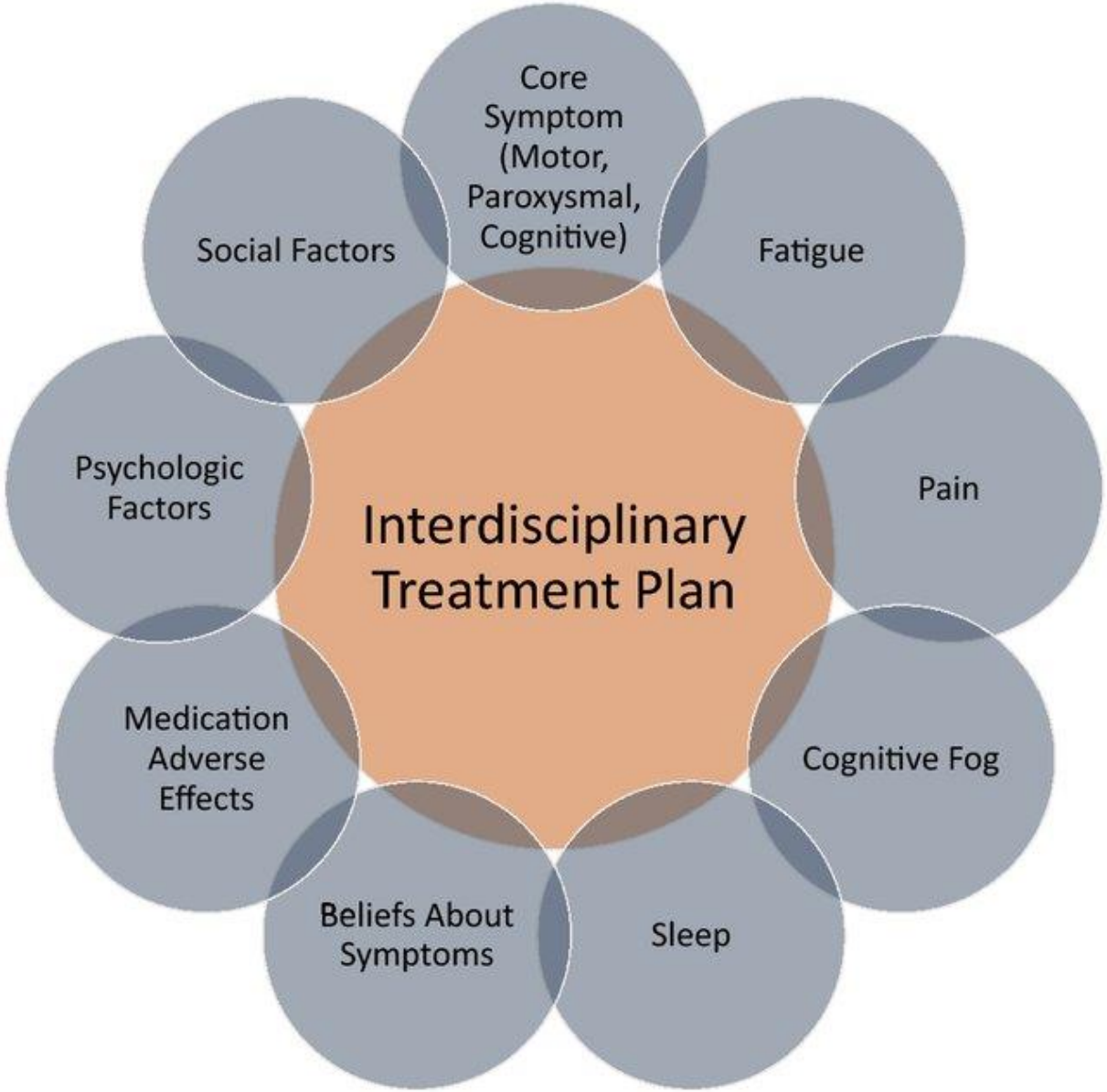
- Being exposed to seizures in other people
- Mild head injury in weeks to months before onset
- Dissociation
- ACEs

Integrated Cognitive Model for PNES



(Brown & Reuber, 2016)

Treatment of FND



(Gilmour et al., 2020)

Software *not* Hardware

Assertive *and* compassionate delivery of the diagnosis and its understanding and acceptance by the patient are the key ingredients for increasing the odds of success

Education and self-help techniques is the most important first-line treatment

- FND is a treatable condition and a disorder of *function* (i.e. - “software”) rather than structure (i.e. - “hardware”)

Adjunctive Treatment

Physical therapy is recommended for motor symptoms of conversion disorder

- A gradual and graded approach is helpful
- Reminders that it takes time, give themselves a chance to recover

Medication to target FND symptoms are NOT an effective treatment based on research

- Could potentially help with comorbid depression & anxiety

General Treatment Principles

Diagnosis should be established prior to starting therapy and clearly communicated to the patient within a biopsychosocial framework

Encourage transparency, especially regarding positive diagnostic features

Explore and address unhelpful illness beliefs and behaviors

Ensure that the patient understands potential for reversibility and is motivated to change

Foster independence and self-management during treatment

Involve the family and caregivers in treatment

(Espay et al., 2018)

FMD Specific Treatment Principles

Establish the treatment goal of relearning normal motor control

Motor retraining begins by establishing elementary movements (eg, weight-shifting) and consecutively adding more complex movements

Visual feedback during motor relearning from mirrors and video can be helpful

Emphasis is placed on the quality of movement instead of the quantity

Avoid excessive attention to abnormal movements

Treatment adjuncts may enhance movement relearning

- Treadmill training, electrical stimulation, electromyography biofeedback, and transcranial magnetic stimulation

(Espay et al., 2018)

PNES Specific Treatment Principles

Learn techniques to avert episodes, if there are warning symptoms

Foster cognitive awareness of triggers when these are present

Develop a self-management and relapse plan

Learn to challenge safety or avoidance behaviors around episodes

(Espay et al., 2018)

CBT for FND

"…a promising intervention for patients with FND."

Focuses on cognitive and behavioral factors that maintain distress and disability *now*

Stresses education, gaining control of symptoms, recognizing triggers, changing C/B, improving interpersonal functioning

(Lin & Espay, 2021)

CBT for FND

Cognitive targets

- ID and challenge unhelpful thinking styles
- Reattribute symptoms to psychosocial issues
- Learn to accept panic without panicking
- Catastrophic symptom expectations
- Low sense of control over symptoms

CBT for FND

Behavioral targets

- Relaxation and breathing techniques
- Developing competing responses to symptoms (habit reversal training)

Outcome Research

Consistent benefits shown on physical symptoms in studies, more variable for other aspects

- Moderate to large effect sizes for physical
- Small to moderate on mental health, functional impairment, QoL

Much higher median effect sizes than psychodynamic therapy

- End of treatment: 0.67 for CBT vs. -0.03 for PDT
- Follow up: 0.32 for CBT vs. 0.11 for PDR

(Gutkin et al., 2021)

Outcome Research

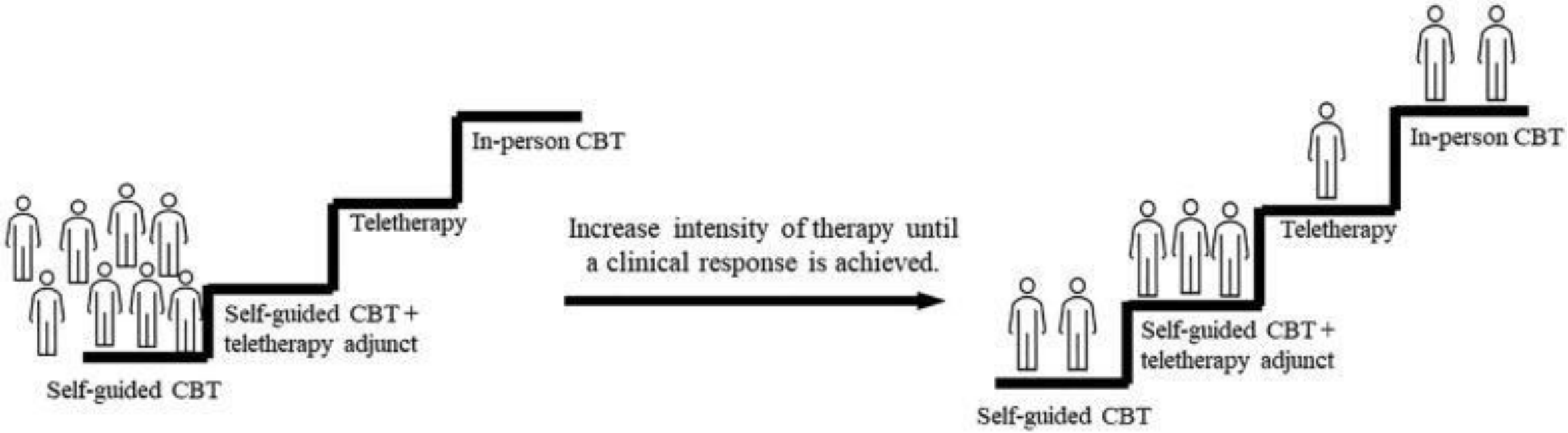
Meta-analysis found 47% of PNES patients were seizure free at completion

- 82% had a decrease of 50% or more in seizure frequency

Acceptance of psychological explanation of symptoms prior to treatment is a key predictor of symptom improvement in FMD

(Carlson et al., 2017)

Stepwise Approach to Treatment



Case Example

Questions?

Useful References

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Resources

Self-guided

- *Overcoming Functional Neurological Symptoms: A Five Areas Approach* by Christopher Williams et al.
- *Taking Control of Your Seizures: Workbook (Treatments That Work)* by Joel M. Reiter et al.
- *Recovery Workbook* at https://www.nestreatmentucd.org/wp-content/uploads/2021/03/FND-Workbook-For-Group.pdf

Therapist resources

- *Treating Nonepileptic Seizures: Therapist Guide (Treatments That Work)* by LaFrance & Wincze
- Fobian, A. D., Long, D. M., & Szaflarski, J. P. (2020). Retraining and control therapy for pediatric psychogenic non-epileptic seizures. *Annals of clinical and translational neurology*, *7*(8), 1410–1419.