

Functional Neurological Disorder: A Rehabilitation Perspective

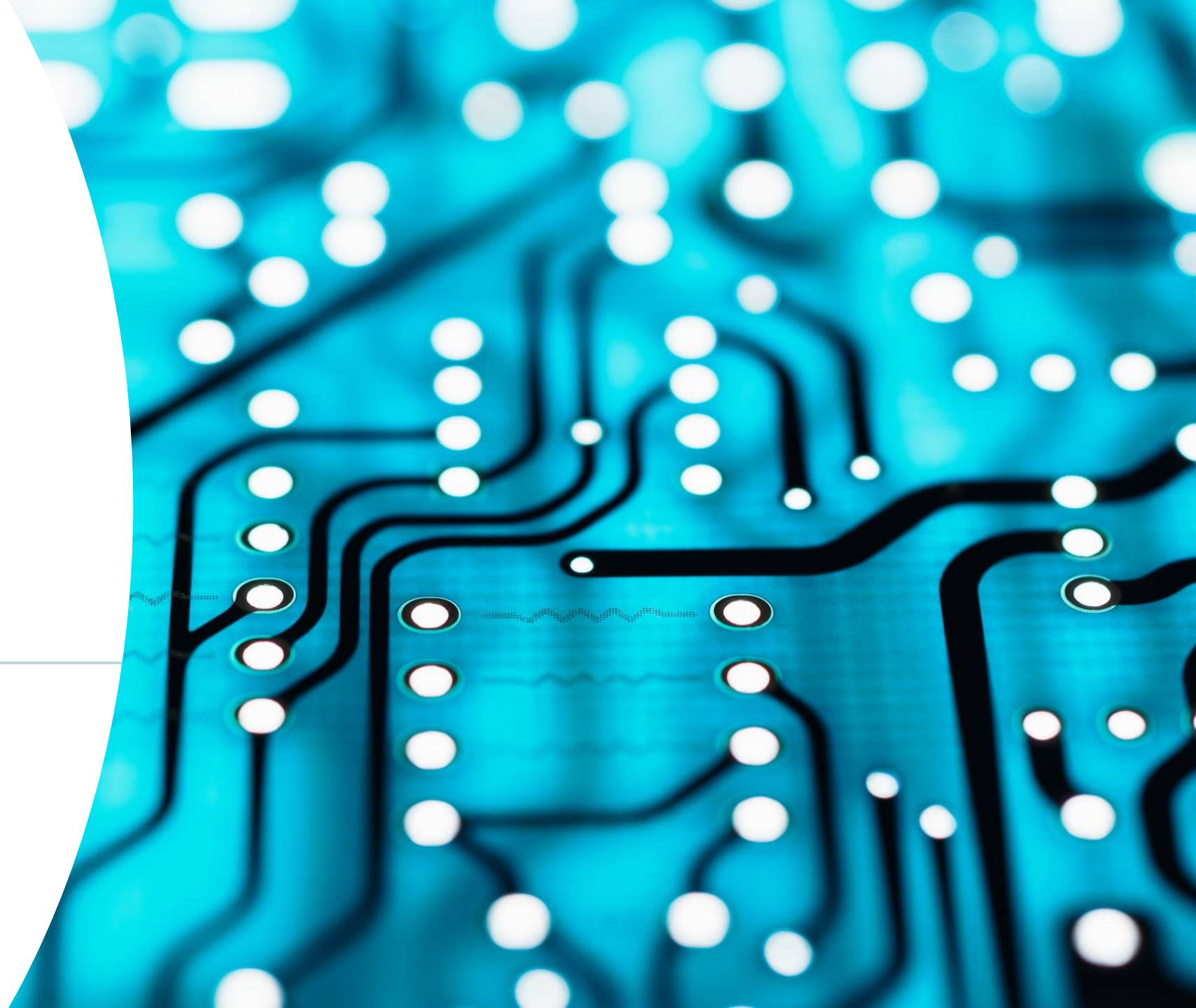
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OhioHealth Neurological Rehabilitation

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Acknowledgements

- This PowerPoint was adapted from the original presentation by Brittany Schroeder, PT, DPT

Learning Objectives



Define Functional Neurological Disorder (FND) and differentiate from other related disorders



Understand the common symptoms and clinical signs of the different subtypes of FND



Review clinical research examples

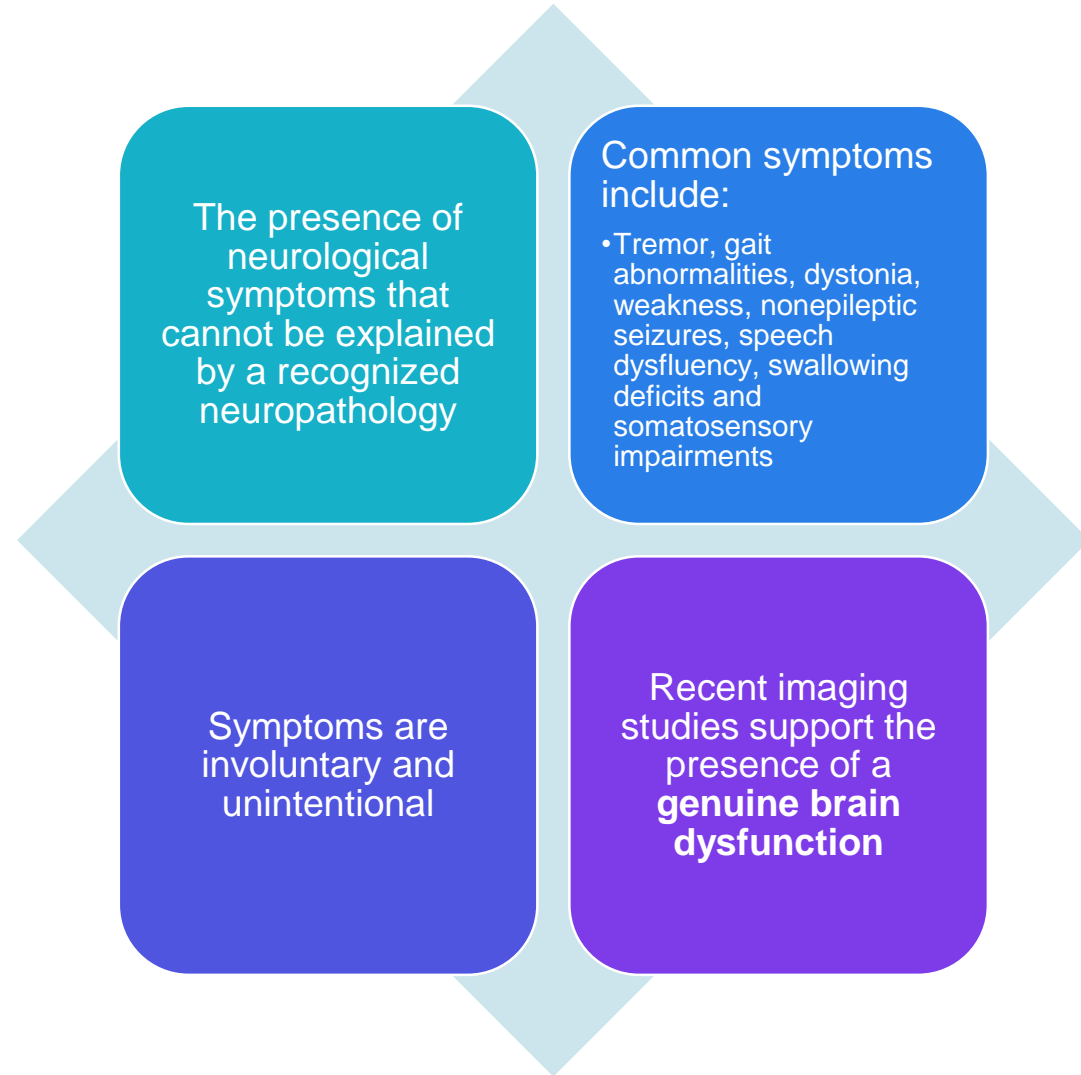


Apply general and discipline-specific treatment principles for FND

What is FND?



What is FND?



What is FND?

- It is now a rule-in diagnosis since the release of the DSM-5 criteria in 2013

- 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.

Specify symptom type:

With weakness or paralysis

With abnormal movement (e.g., tremor, dystonic movement, myoclonus, gait disorder)

With swallowing symptoms

With speech symptom (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 occurring for 6 months or more.

Specify if:

With psychological stressor (*specify stressor*)

Without psychological stressor

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What is FND?

Motor FND

- Sudden onset
- Disappearance with distraction
- Exacerbation with attention
- Excessive fatigue
- Demonstration of effort

FND with Sensory Manifestations

- Tubular vision or missing half defect
- Sensation changes
- Persistent perceptual postural dizziness (PPPD)
- Pain

Axial FND (gait/posture)

- Excessively slowed gait
- Astasia-abasia
- Knee buckling
- Huffing and puffing sign
- Fixed forward flexion of thoracolumbar spine (camptocormia)
- Myoclonal jerks affecting trunk
- Walking-on-ice gait

Speech FND

- Dysfluency
- Stuttering
- Articulation deficits
- Demonstration of effort
- Prosodic abnormalities (adopting a foreign accent)

Paroxysmal FND (seizures/attacks)

- Akinesia: prolonged attacks with closed eyes
- Hyperkinesia: tremor, dystonia, jerks
- No apparent change in awareness
- Variable change in consciousness
- >3 minutes per episode
- Asynchronous limb movement
- Pelvic thrusting
- Side to side head movement
- Ictal crying
- Recall of ictal events

What FND is not...



What FND is not...



Factitious or malingering disorder

Implies intentional or volitional control of symptoms



Somatoform disorder

Psychological disorder where symptoms are inconsistent and cannot be fully explained by any other condition



Psychogenic or conversion disorder

Based in Freudian theory that implies a psychological component driving physical presentation

What FND is not...

Psychological explanation is insufficient because:

Causal relationship between psychological factors and symptoms has not been supported in literature

Lack of neurophysiological mechanism for conversion

Similar experiences of trauma result in different symptom presentations

Long latency between trauma and onset

Absence of trauma in many patients with FND



The term “functional” is preferred for its “...causative neutrality”

Patient Perspectives

High burden of living with FND

Sense of being an enigma

Dissatisfaction with psychological explanations

Sense of being abandoned by medical community and social network

Experience of iatrogenic harm

Sense of powerlessness

Why is this important?



FND represents up to 16% of new patients in neurology clinics and up to 20% of patients in movement disorder clinics



Left untreated, FND is often chronic and disabling, therefore resulting in high levels of health care utilization



UK study estimated annual cost at 10% of public health expenses



Quality of life for patients with FND can be as impacted as in patients with organic disorders like MS or Parkinson's

Epidemiology and Etiology



Epidemiology and Etiology

Incidence: 4-12 per 100,000

Prevalence: 50 per 100,000

Tremor and dystonia are most common overall (70-90%)

Women comprise 60-75% of the patient population

Functional myoclonus and Parkinsonism are higher in males

Typical age of onset is between 39-50 years

Tend to have higher rates of childhood trauma

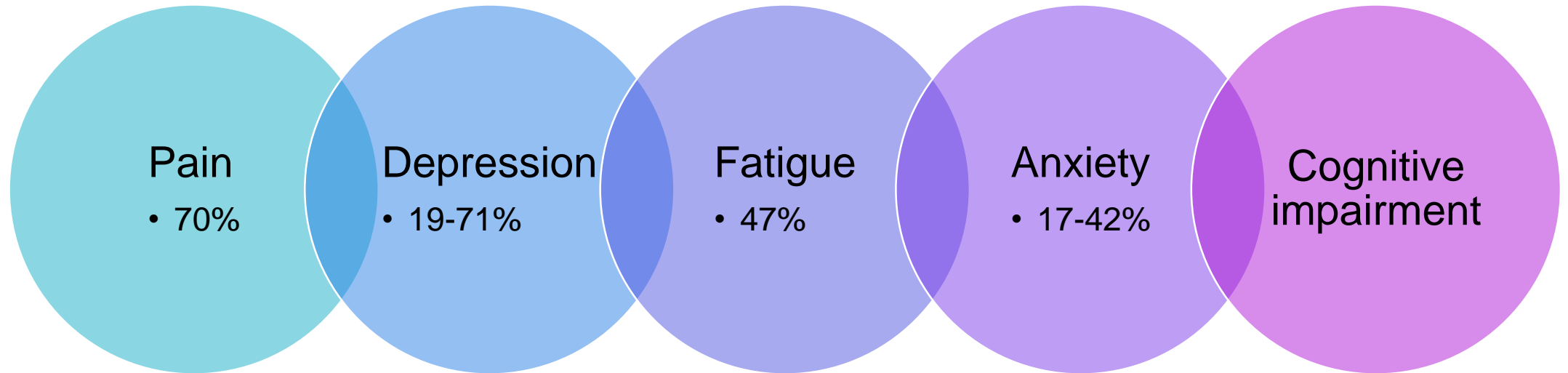
Commonly report challenges with emotional functioning (i.e. anxiety, depression, alexithymia)

39% have no psychological comorbidities at all

Epidemiology and Etiology

	Biological	Psychological	Social
Common to all levels	<ul style="list-style-type: none"> ▶ 'Organic' disease ▶ History of previous functional symptoms 	<ul style="list-style-type: none"> ▶ Emotional disorder ▶ Personality disorder 	<ul style="list-style-type: none"> ▶ Socio-economic/deprivation ▶ Life events and difficulties
Predisposing vulnerabilities	<ul style="list-style-type: none"> ▶ Genetic factors affecting personality ▶ Biological vulnerabilities in the nervous system 	<ul style="list-style-type: none"> ▶ Perception of childhood experience as adverse ▶ Personality traits ▶ Poor attachment/coping style 	<ul style="list-style-type: none"> ▶ Childhood neglect/abuse ▶ Poor family functioning ▶ Symptom modelling of others
Precipitating mechanisms	<ul style="list-style-type: none"> ▶ Abnormal physiological event or state (eg, drug side effect hyperventilation, sleep deprivation, sleep paralysis) ▶ Physical injury/pain 	<ul style="list-style-type: none"> ▶ Perception of life event as negative, unexpected ▶ Acute dissociative episode/panic attack. 	
Perpetuating factors	<ul style="list-style-type: none"> ▶ Plasticity in CNS motor and sensory (including pain) pathways leading to habitual abnormal movement ▶ Deconditioning ▶ Neuroendocrine and immunological abnormalities similar to those seen in depression and anxiety 	<ul style="list-style-type: none"> ▶ Illness beliefs (patient and family) ▶ Perception of symptoms as being irreversible ▶ Not feeling believed ▶ Perception that movement causes damage ▶ Avoidance of symptom provocation ▶ Fear of falling 	<ul style="list-style-type: none"> ▶ Social benefits of being ill ▶ Availability of legal compensation ▶ Ongoing medical investigations and uncertainty ▶ Excessive reliance on sources of information or group affiliations which reinforce beliefs that symptoms are irreversible and purely physical in nature

Comorbidities



Prognosis



Limited evidence regarding outcomes in patients with FND due to variability in treatment and follow-up



Well supported negative prognostic factors identified: longer duration of symptoms, older age, pending litigation, multiple hospitalizations, use of government benefits, higher anxiety and depression symptoms, psychiatric involvement and clear precipitating event



Well supported positive prognostic factors identified: short duration of symptoms, early diagnosis, good explanation for diagnosis and patient's confidence in physician

Pathophysiology



Pathophysiology

Growing body of evidence through imaging and EMG studies to suggest a **true dysfunction in the brain**

Overactivity of amygdala suggesting an **emotional dysregulation**

Suppression of symptoms through distraction supports **attentional dysregulation** whereby abnormal predictions about sensory information drive abnormal movements or perceptions

Pathophysiology

Preliminary evidence demonstrates that tasks involving emotional processing elicit abnormal sensorimotor responses in patients with FND



INCREASED
PRECONSCIOUS
PROCESSING OF
AFFECTIVE STIMULI



INCREASED AFFECTIVE
AROUSAL

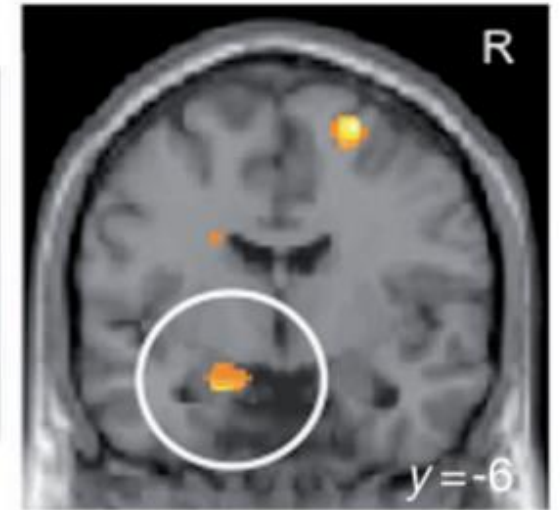
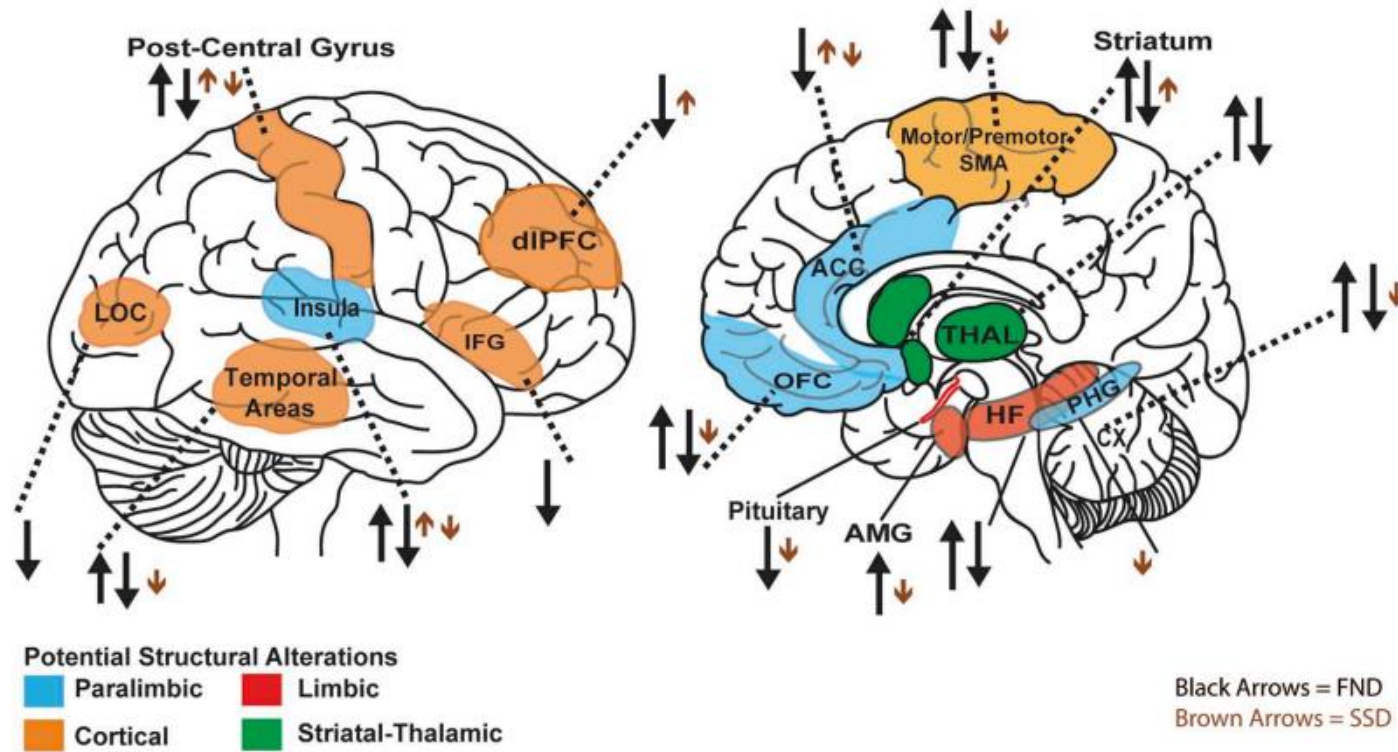


ALTERED TOP-DOWN
REGULATION



ALTERED INTEROCEPTION
OF BODILY EMOTIONAL
RESPONSES

Pathophysiology



Clinical Research Studies



Clinical Research Studies



- Vestfold Hospital Trust, PM&R Clinic in Norway
- Randomized control trial, cross-over study
- 60 patients with functional gait disorder
- 3 week inpatient rehab program
 - Adapted physical activity with educational and cognitive behavioral frame of reference
 - Intervention included symptom explanation, positively reinforcing normal function and not on dysfunction
- Results
 - Clinically significant 1 month post treatment effects with long-lasting 1-year follow-up
 - Majority returned to independent living and many returned to work
 - No wheelchair or crutches needed at discharge

Clinical Research Studies



- Mayo Clinic Functional Movement Disorder Motor Reprogramming Protocol
- Historical cohort study
- 60 FMD patients with age/sex-matched controls
- Completed individual PMR program
- Initial counseling session
- 2x per day PT/OT/ST (prn) for 5 consecutive days
- Short-term results: 73.3% had “good outcome” as rated by physician, 68.8% as rated by patient
- Long-term results: 60.4% had “good outcome” as opposed to 21.9% of controls; 25% of treatment group were considered treatment failures

Clinical Research Studies



- The National Hospital for Neurology and Neurosurgery in London
- Prospective case series
- 47 patients with FMD for average >5 years
 - 55% receiving disability-related benefits and only 38% employed
- 5 day admittance to daycare unit
- Initial consultation with neurologist and PT
- Individualized PT treatment up to 8 sessions over 5 days
- 63.9% with good outcome at discharge, 55.3% at follow-up according to CGI
- Improvement in objective assessments of motor function and QOL measures are possible even in patients with poor prognosis

Clinical Research Studies



KentuckyOne Health™
Frazier Rehab Institute

- Frazier Rehab Institute implemented Motor Reprogramming (MoRe) Program for FMD
- Retrospective chart review of 32 patients
- 1-week multidisciplinary IPR program
 - Included 3 hours total PT/OT/ST and 1 hour psychology daily
- 86.7% reported symptom improvement at discharge and 69.2% maintained at 6-month follow-up
- 59.1% improvement in abnormal movements and speech patterns as rated by movement specialist
- Independent ambulatory status increased to 87.5% and wheelchair use decreased to 3.1%

Clinical Research Studies



- Retrospective naturalistic cohort study of 50 patients with FND
- 1-hour initial assessment
- Weekly 1-hour outpatient PT session for 6-12 weeks
- Results:
 - 17/42 had clinical improvement
 - Improved group had average attendance of 8.0 sessions as opposed to unimproved group attendance of 5.7 sessions
 - 11 patients in unimproved group discontinued PT prior to discharge
 - In those improved patients where it was appropriate to use 10MWT, scores increased from 0.83 m/s to 1.2 m/s
 - Attendance positively correlated with clinical improvement



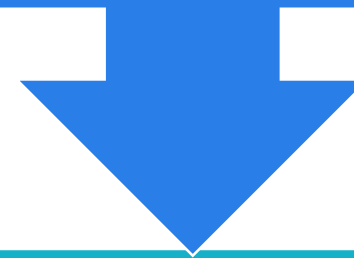
Research Summary

- Evidence is limited with small sample sizes
- General consensus supports the use of multidisciplinary teams for rehabilitation
- Improvement was noted with rehabilitation in most studies even with varied dosages, more so in higher frequencies

Current Recommendations

Current Recommendations

Goal for treatment is “retraining in a positive and nonjudgmental context”



4 core principles of treatment derived from systematic review

Education

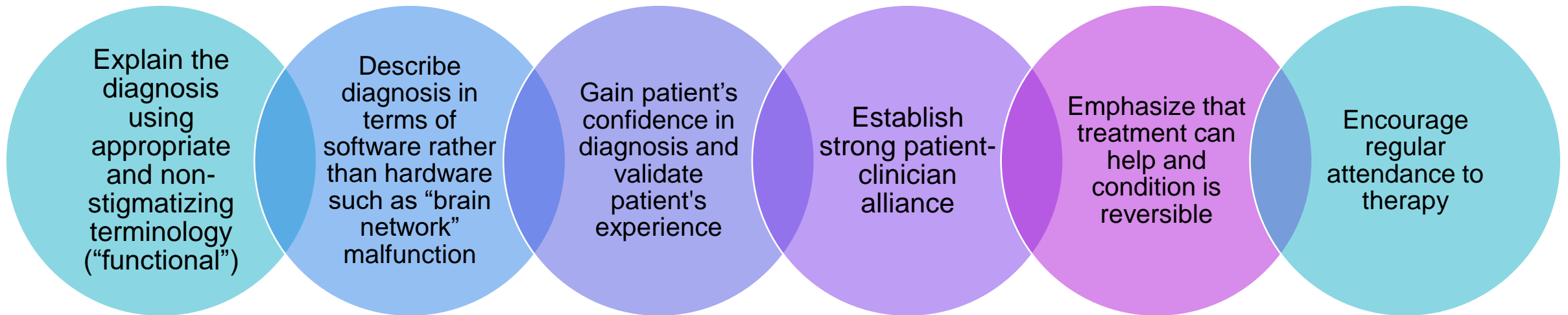
Demonstration that normal movement/speech can occur

Retraining of normal movement/speech with diverted attention

Addressing maladaptive behaviors and cognitions

Current Recommendations: 4 Core Principles

1. EDUCATION



Current Recommendations: 4 Core Principles

2. DEMONSTRATE THAT NORMAL MOVEMENT/SPEECH CAN OCCUR

- Positive clinical signs can be used both to explain the diagnosis and emphasize the potential for normalized motor patterns

Current Recommendations: 4 Core Principles

3. RETRAIN MOVEMENT/SPEECH WITH DIVERTED ATTENTION

Mental imagery of normalized movement can be used to prime patients

Begin with simple movement and progress to more complex movements

Use task-oriented distraction versus cognitive

Verbally reinforce positive gains

Emphasize quality of movement over quantity

Focus on functional and automatic tasks rather than impairment level tasks

Ignore and extinguish abnormal patterns

Mental Practice

Mental practice

- Guide the patient to imagine performing goal activity without abnormal movements or with speaking fluently
- Provide specific details on how the normal movements are performed and include emotional cues

Refocusing in the room

- Close eyes and focus on breath
- Take a deep breath, pause, and let it out
- Feel the calm and relaxation
- Open eyes
- Start activity when ready

Muscle Relaxation

- Close your eyes
- Imagine a warm, safe place
- Focus on breath
- Take a deep breath in (pause) and let it all out x2
- Make a fist with 1 hand (pause) and let it relax x2
- Circle 1 ankle (pause) and let it relax x2
- Feel all remaining tension in your body (pause) and let it go



Mindfulness Apps

- Calm
- Headspace
- Ten Percent
- Mindfulness Coach
- Mindfulness

*In-app purchases but have features available for free

Current Recommendations: 4 Core Principles

4. ADDRESS MALADAPTIVE BEHAVIORS AND COGNITIONS



Examples:

“My nerves are damaged” or
“I can’t move because I
could cause more harm”



CBT/psychodynamic
therapy as appropriate



Pain neuroscience
education as needed

Cognitive-Behavioral Therapy

Activity Pacing

Attention Diversion

Cognitive Restructuring

Goal Setting

Graded Exposure

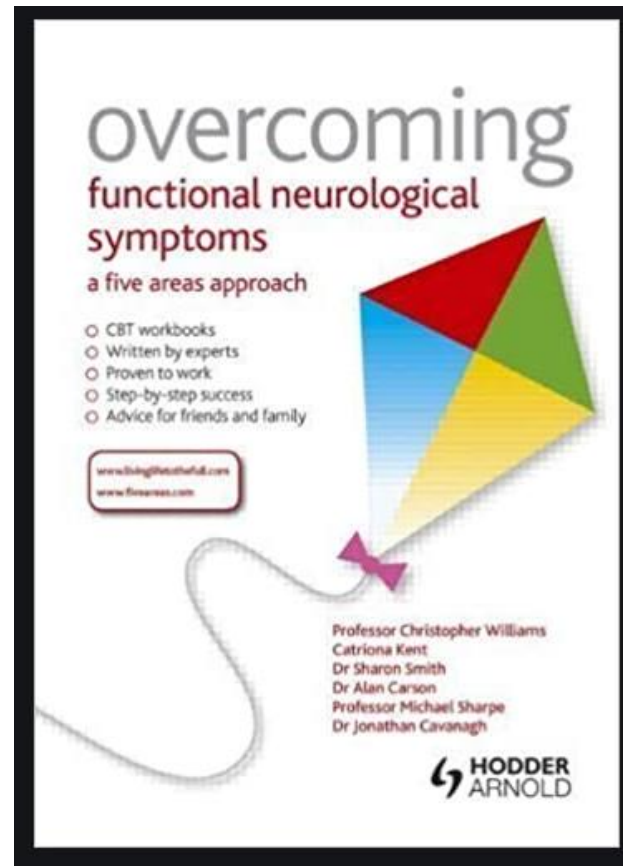
Maintenance Strategies

Problem solving strategies



Goal is to change the thoughts and behaviors that contribute to distressing emotions by building a skillset and increasing awareness

CBT Workbook



Current Recommendations

Open and consistent communication between multidisciplinary team and patient

Involve family and caregivers in treatment

Foster independence and self-management

Develop a self-management and relapse prevention plan

Recognize and challenge unhelpful thoughts and behaviors



Current Recommendations

WHAT TO AVOID

Failing to acknowledge the diagnosis

Use of deception in any form

Use of inappropriate terminology

Attributing condition to stress

Making assumptions about patient's mental health

Encouraging use of compensatory strategies, surgery or symptom management treatments

Focusing interventions on impairment level deficits

Stone 2019, Nielsen 2015, Hallett 2019, Espay 2018, Maggio 2020

Current Recommendations

SUBJECTIVE QUESTIONS IN EVALUATION

Detailed understanding of range of symptoms experienced

Effect on day to day function

Setting goals for therapy

Gain rapport

Patient's understanding of and level of confidence in diagnosis already given

Current Recommendations

SUBJECTIVE QUESTIONS IN EVALUATION

Understanding

- Full understanding
- No understanding

Acceptance

- Agree that diagnosis of FND is correct
- Willing to consider FND as diagnosis, but unsure
- Do not think FND is correct diagnosis, it's something else

Expectation of Recovery

- Full recovery
- No recovery



Goal Setting

- Define specific length of time patient is able to demonstrate normal movement/speech pattern without symptoms
- Assess progress based on improvement on subjective and/or objective outcome measures
- Include goal to establish self-management strategies and ability to identify triggers

Outcome Measures

Challenging to find meaningful outcome measures given variability in presentation between and within patients

International FND Core Outcome Measure Group has been formed to produce a “core outcome set”

Subjective outcome measures to assess disability and QOL

- Short Form Health Survey (SF-36 or SF-12)
- Work and Social Adjustment Scale (WSAS)
- Sheehan Disability Scale (SDS)

Current Recommendations

IDEAL REHAB CANDIDATE



RECEIVED A CONCRETE
DIAGNOSIS FROM
NEUROLOGIST



CONFIDENCE IN DIAGNOSIS



DESIRE TO IMPROVE AND HAS
GOALS FOR THERAPY

Physical Therapy





FND and Physical Therapy

- Types of FND: Axial and Motor
- Clinical signs
- Treatment
- Outcome Measures

Axial FND

Gait	Balance	Posture
Knee buckling Dragging foot Excessive slowness or similar to walking on ice Huffing and puffing sign	Astasia-abasia Controlled falls or none despite excessive swaying Swaying and imbalance lessened with dual task	Variability of positions over time Inconsistent, uneconomic postures May manifest as myoclonic jerks affecting the trunk Fixed forward flexion of thoracolumbar spine (camptocormia)

Axial FND: Functional Gait



Functional Gait Treatment Strategies

- Speed up or slow down
- Slide feet forward and progress toward normal graded steps
- Lateral weight shift progress to allowing feet to automatically advance forward in gradually increased size of steps
- Side steps or backward gait
- Ambulate with physical dual task
- Ambulate to metronome or beat of music
- Exaggerate movement
- Up/down stairs

What is motor FND?

Functional Weakness

- Variable presentation over time, especially within same session
- Global or one sided
- Giveaway weakness or other clinical signs for functional leg weakness
- Inability to rotate head toward paralyzed side

Functional Parkinsonism

- Excessive slowness
- Variable resistance during passive movement
- Normal speed spontaneous movement

Functional Dystonia

- Fixed dystonia at onset
- Variable resistance to passive manipulation
- Typically posturing at ankle or hand
- Tonic contraction in face

Functional Myoclonus

- Predominance of axial or facial jerks
- Jerking movements that are too slow or too complex to be organic myoclonus
- Entrainment or full suppressibility
- Variability in duration, latency, and/or distribution
- Presence of Bereitschaftspotential (premotor potential)

Functional Tremor

- Variable frequency
- Positive entrainment test

Clinical Signs

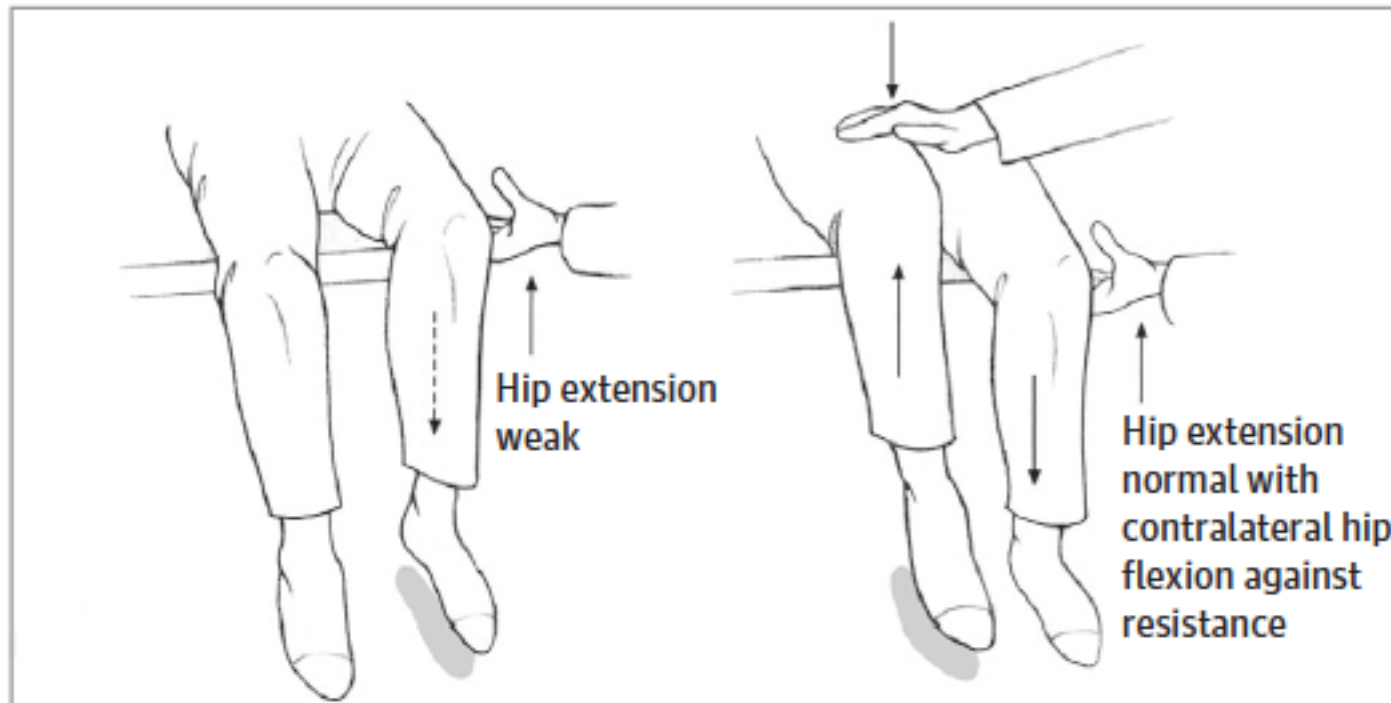
Table 1 – Description of the 7 validated positive clinical signs in functional motor deficit.

Clinical sign	Reference	Sensitivity (%)	Specificity (%)	Description
★ Hoover's sign	[41]	63	99	Hip extension weakness that returns to normal with contralateral hip flexion against resistance
★ Abductor sign	[42]	100	100	Hip abduction weakness that returns to normal with contralateral hip abduction against resistance
Abductor finger sign	[43]	100	100	Synkinetic abduction finger movements of paretic hand during abduction finger movement against resistance with healthy hand
★ Spinal injury test	[44]	100	98	Patient in supine position is asked to lift his knees. If not possible, examiner lifts them up. The sign is positive if the patient keeps them up, negative if legs drop in abduction
★ Collapsing/give-way weakness	[45]	63	97	A position is maintained, and limb collapses with a light touch. During muscle strength testing: a normal strength is developed and then collapses suddenly
★ Co-contraction of antagonist muscles	[46]	17	100	During muscle strength testing: simultaneous contraction of agonist and antagonist muscles, resulting in no or very little movement
★ Motor inconsistency	[47]	13	98	Impossibility to do a movement while another movement using the same muscle is possible

Reference is the first article for validation. Sensitivity and specificity have been estimated in a recent meta-analysis with the help of different existing validation studies [40].

Clinical Signs

A Hoover sign in the weak leg



Current Recommendations

Table 2 Clinical signs which can be shown to a patient with functional motor disorder to demonstrate the diagnosis and potential for reversibility and examples of how to discuss it with patients

Hoover's sign

Weakness of hip extension which returns to normal with contralateral hip flexion against resistance

"I can see that when you try to push that leg down on the floor its weak, in fact the harder you try the weaker it becomes. But when you are lifting up your other leg, can you feel that the movement in your bad leg comes back to normal? Your affected leg is working much better when you move your good leg. What this tells me is that your brain is having difficulty sending messages to the leg but that problem improves when you are distracted and trying to move your other leg. This also shows us that the weakness must be reversible/cannot be due to damage"

Similar to Hoover's sign

Hip abductor sign

Weakness of hip abduction which returns to normal with contralateral hip abduction against resistance

"When you are trying to copy the movement in your good hand can you see that the tremor in your affected hand improves? That is typical of functional tremor"

Distraction or entrainment of a tremor

Abolishing tremor by asking the patient to copy rhythmical movements or generate ballistic movements with the contralateral limb (ie, index to thumb tapping at different speeds)

Functional Weakness Treatment Strategies

Leg weakness

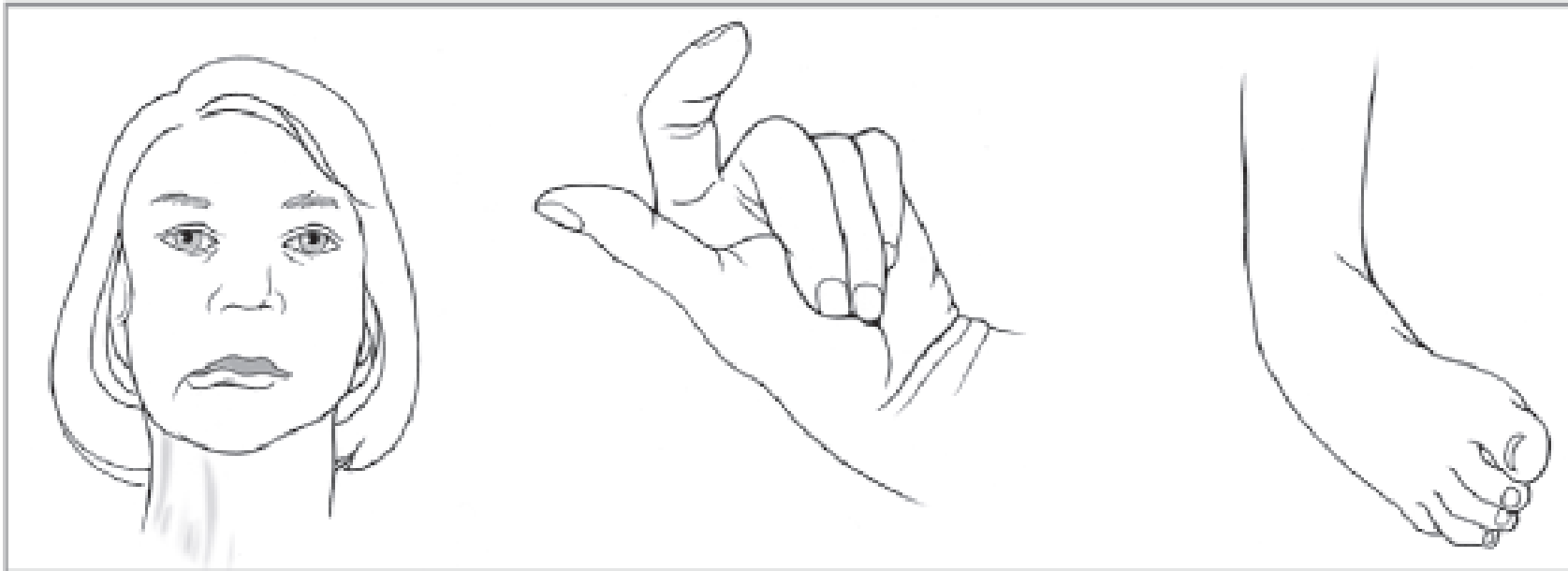
- Early WB with progressively less upper limb support
- Lateral weight shifting
- Crawling on all fours progressed to tall kneeling position
- Increase walking speed
- Treadmill walking with or without body weight support harness and feedback from mirror

Ankle weakness

- Elicit ankle dorsiflexion with retro gait, A/P weight shifting, ambulate by sliding feet on floor
- Use of FES in function, not in isolation

Clinical Signs

- C** Tonic contraction of the mouth with jaw and tongue deviation, fixed posturing of hand, and fixed posturing of foot



Functional Dystonia Treatment Strategies

- Change habitual postures to prevent prolonged time in end range joint positions >> Promote neutral alignment
- Normalize movement patterns with altered focus of attention
- Discourage unhelpful protective avoidance behaviors and encourage normal sensory experiences
- Teach strategies to turn off overactive muscles in sitting and lying
- Consider use of FES to normalize limb position and movement
- Prevent or address hypersensitivity or hypervigilance

Functional LE Tremor and Myoclonus Treatment Strategies

LE Tremor

- Lateral or A/P weight shifting
- Completing movements such as toe tapping
- Ensure even WB in standing
 - Can use mirror, Wii board or Biodex for feedback
- Change habitual postures associated with symptoms

Myoclonus

- Movement retraining may be less helpful for intermittent or sudden jerky movements
- Look for self-focused attention or specific symptoms prior to a jerk that can be addressed with distraction or redirected attention
- •Address pain, overactive muscles, or altered movement patterns that may precede a jerk if present

PT Treatment Principles

Evidence is limited

Movement retraining with redirection of patient's focus

- Dual tasking, physical > cognitive distraction

Establish simple movements and progress to complex movements, symptom-free

Focus on function and automatic movement

- Not specific impairments and controlled movement

Emphasize quality of movement rather than quantity

PT Treatment Techniques

Limit
"hands-on"
treatment

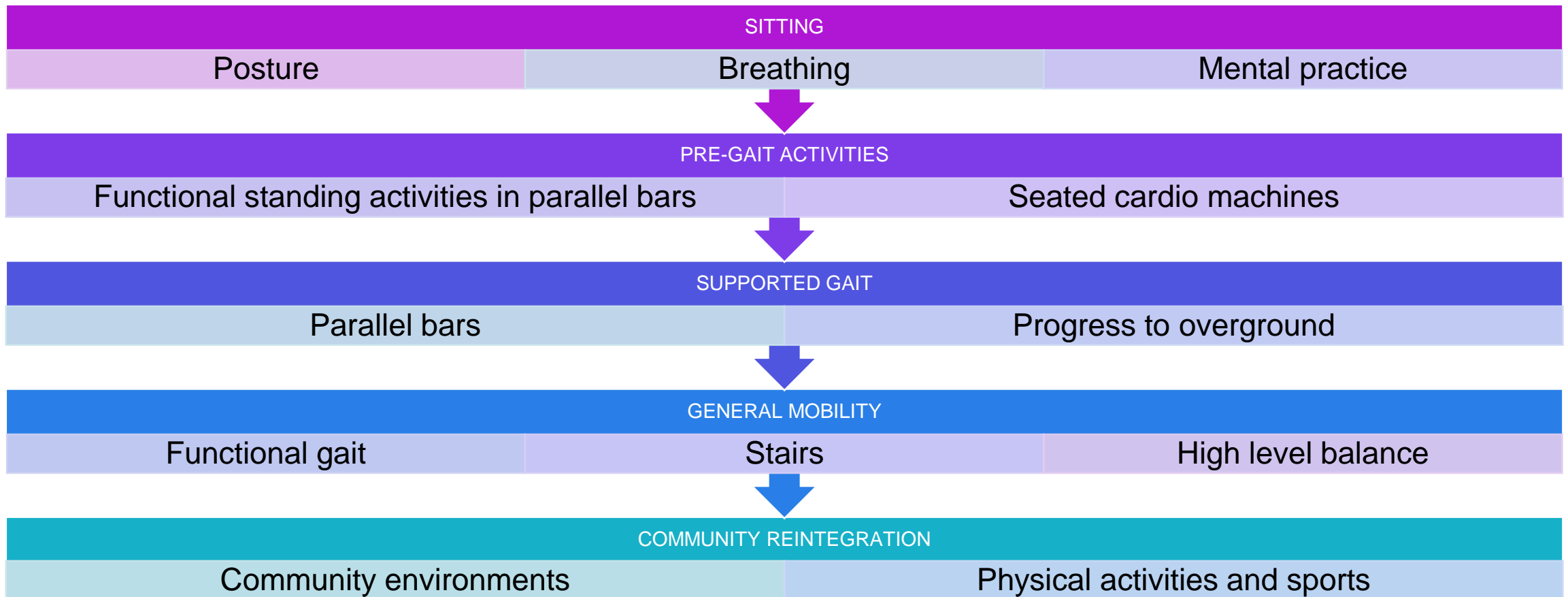
Encourage
early
weight-
bearing

Visual
feedback
may be
helpful

Limited use
of adaptive
equipment
+ assistive
devices

FES in gait
may be
beneficial

PT Treatment Progression



Objective PT Outcome Measures

- 10 meter walk test
- Berg

Occupational Therapy





FND and Occupational Therapy

- Types of FND: Motor and Somatosensory
- Clinical Signs
- Treatment
- Outcome Measures

Occupational Therapy FND Categories

Functional weakness

- Variable presentation over time, especially within same session
- Positive FND clinical signs (drift w/o pronation)

Functional tremor

- Variable frequency
- Positive entrainment test

Functional Parkinsonism

- Excessive slowness
- Variable rigidity
- Normal speed spontaneous movement

Functional myoclonus

- Predominance of axial or facial jerks
- Jerking movements that are too slow or too complex to be organic myoclonus
- Entrainment or full suppressibility
- Variability in duration, latency, and/or distribution

Functional dystonia

- Tonic contraction of mouth pulled to one side
- Unilateral or bilateral platysma contraction
- Jaw or tongue deviation
- Elevation of contralateral rather than ipsilateral eyebrow
- Posturing at ankle/hand

Functional somatosensory impairments

- Precise midline splitting of vibration across a single bone (i.e. sternum or forehead)
- Sharp sensory loss at groin/shoulder
- Tubular vision field
- Missing-half defect
- Persistent perceptual postural dizziness (PPPD)

Upper Extremity Tremor

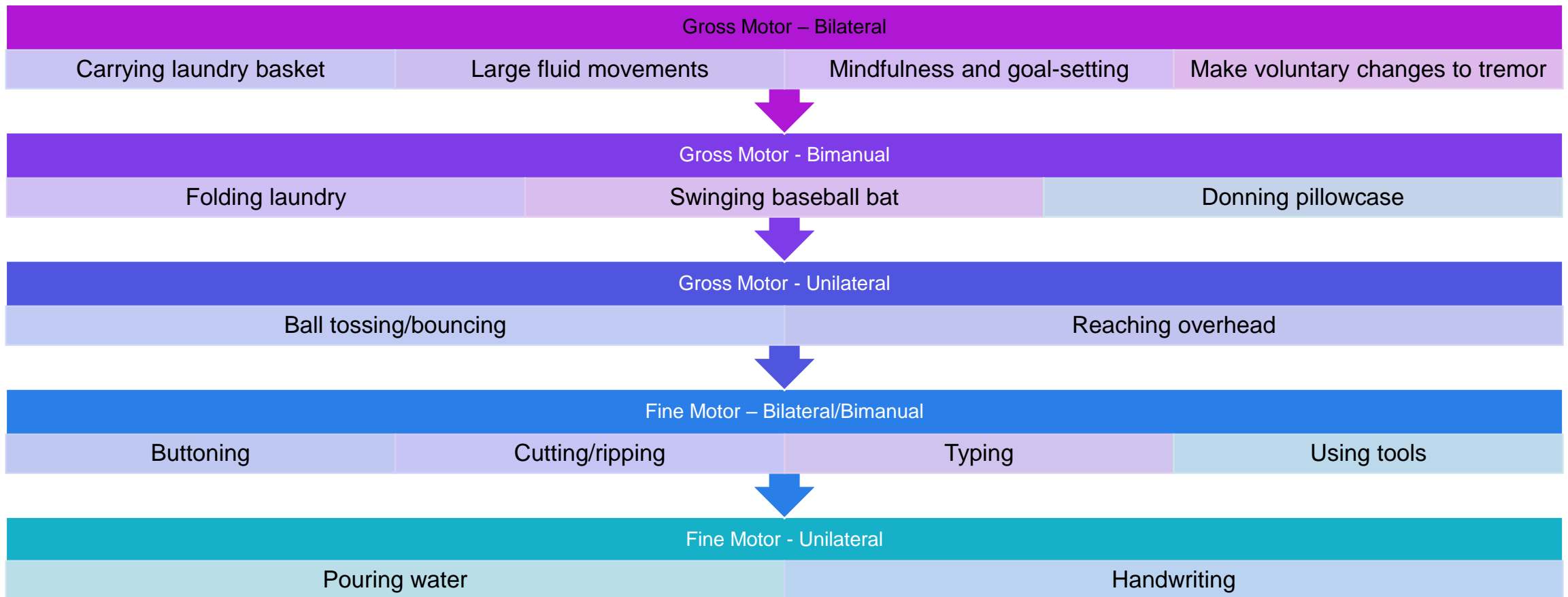
- How to distinguish from an essential or other organic tremor
 - Clinical signs
 - Tapping test
 - If unaffected hand begins to tap, the affected will adopt the frequency at which it is tapping
 - Entrainment
 - Can slow or suppress tremor voluntarily
 - Ballistic movement test
 - If affected arm does an explosive movement, tremor will pause or dampen for a few seconds
 - Disappears/pauses with distraction
 - Inconsistent frequency



Youtube: "2.13. Psychogenic Tremor - Tremors [Spring Video Atlas]"

Espay 2018, Hallett 2019, Garcin 2018

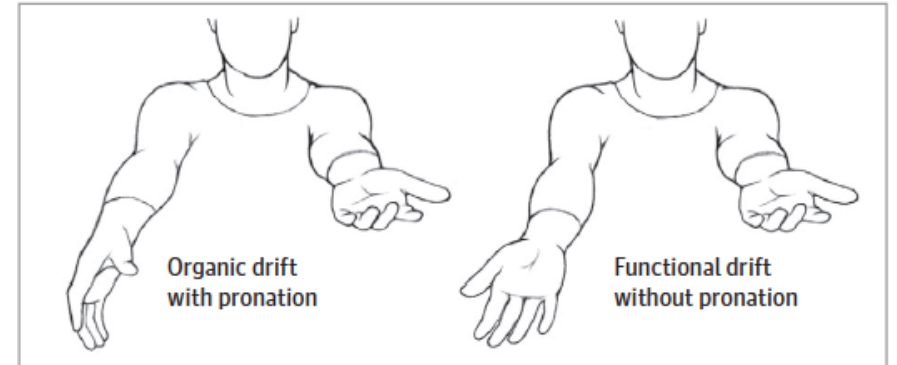
OT Treatment Progression – UE Tremor



Upper Extremity Weakness

- How to distinguish from other types of weakness
 - Clinical signs
 - Pronator drift
 - If patient closes eyes while shoulders are flexed and forearms in supination, drift downward without pronation would be a positive sign for FND
 - Giveway weakness
 - Patient can initially provide resistance against clinician but then will collapse, providing no resistance
 - Finger Abduction Sign
 - Provide resistance against finger abduction on unaffected side for 2 minutes; patient will demonstrate finger abduction on affected side
 - Co-contraction of agonist and antagonist muscles

B Drift without pronation of the weak arm



Upper Extremity Weakness

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Motor inconsistency	[47]	13	98	Impossibility to do a movement while another movement using the same muscle is possible

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OT Treatment Progression – UE Weakness

Support

- Utilize upper extremity while doing complex tasks with stepping/gait, support response
- Carrying objects, supporting on a table
- Bring attention to use of the arm

Pre-functional

- Supported reach with grasp and release
- Automatic responses of ball catching; cognitive distractions
- Minimalize non-use of arm

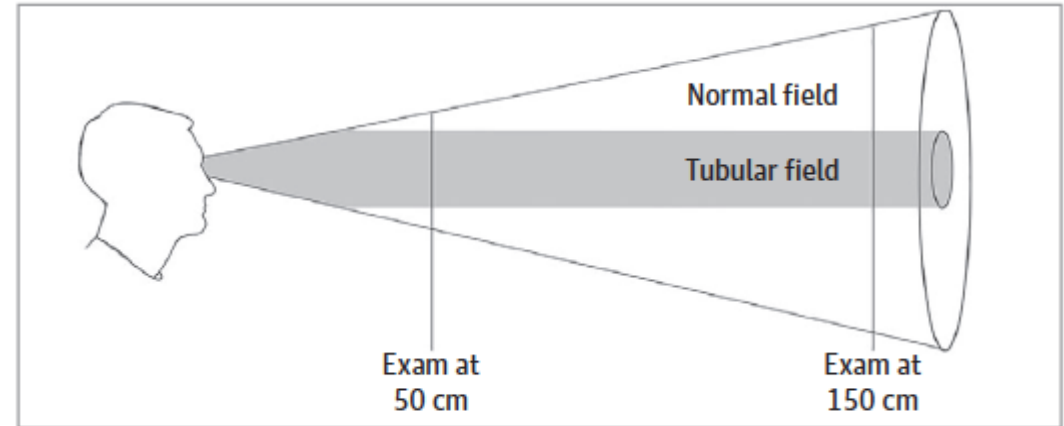
Functional

- Use in any functional tasks as appropriate
- Can progress similarly to the tremor progression
- Focus on familiar tasks first

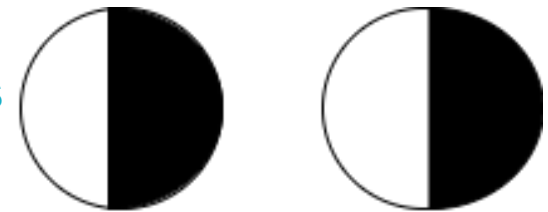
Vision Deficits

- Visual Deficits
 - Tubular visual deficit
- Missing half defect
 - "Hysterical hemianopia"
 - Ipsilateral monocular visual loss

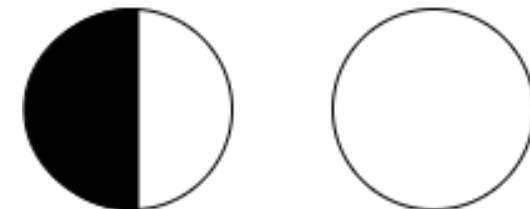
D Tubular vision defect



**Homonymous
Hemiaopia**



**Missing Half
Defect**



OT Treatment Progression - Vision

- Focus on strictly functional tasks – not exercises
 - Computer use, XBOX kinect, ball tossing, cooking, laundry, discussion about surrounding objects, outdoor tasks
- Intentionally bring information into impaired visual field
 - Therapist, stimuli, lights, movement
- Bring attention to improvements in visual field attention

Treatment Verbiage

"When you were distracted by this balance task, your tremor temporarily stopped. This is very typical of functional neurological disorders."

"I have noticed your weakness isn't always present. Have you noticed that at home? This shows that you still have that strength present and your weakness can be reversible and improved."

"A piece of adaptive equipment may help temporarily, but we've seen that your tremor can be improved through our strategies we have discussed. You don't need to rely on equipment."



Outcome Measures

- Canadian Occupational Performance Measure (COPM)
- Patient Specific Functional Scale (PSFS)
- Time without a certain deficit present
- Performance of ADL/IADL tasks with increased independence

Speech Therapy





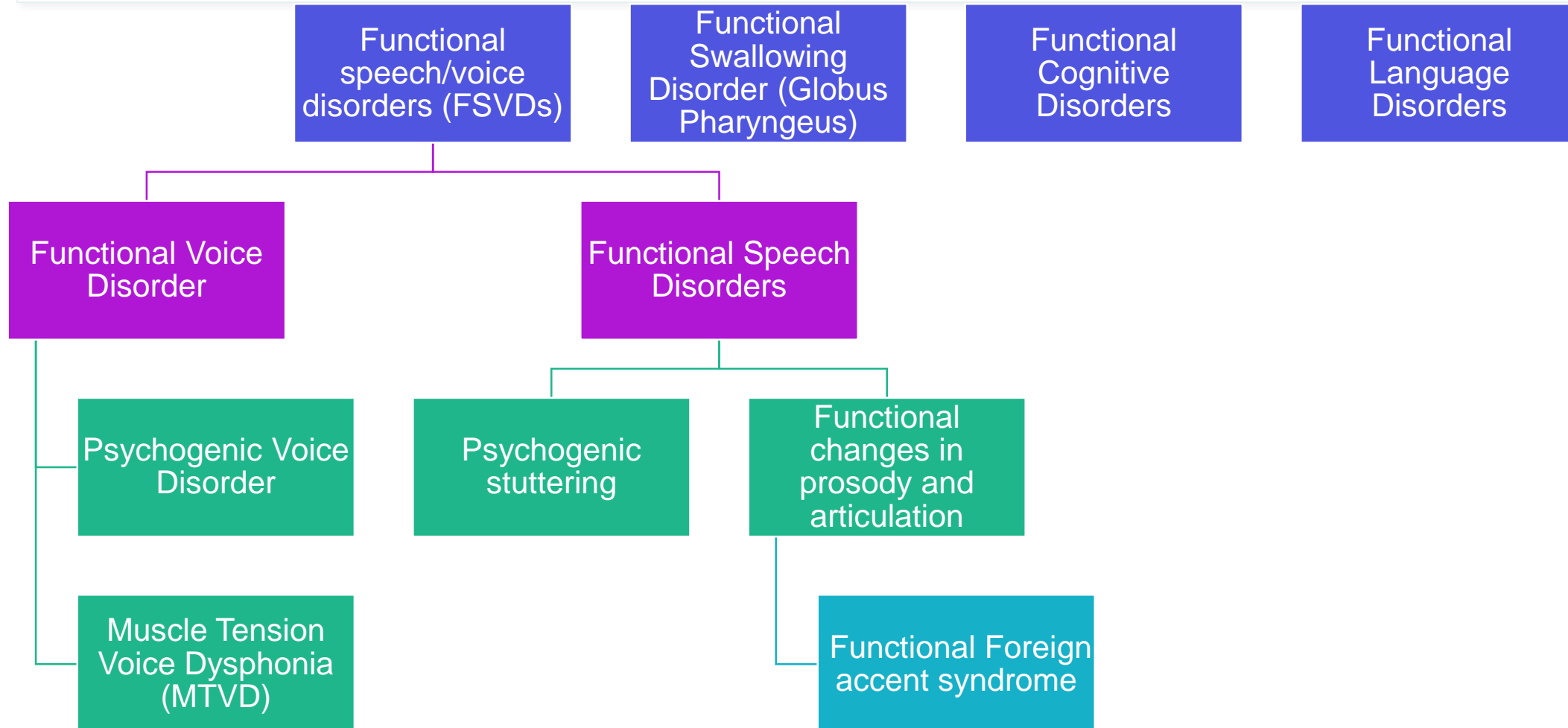
FND and Speech Therapy

- Type of FND: Speech
- Clinical Signs
- Treatment
- Outcome Measures

The Speech Therapist's Role in FND-Overview

- Only 13% of patients with functional speech/swallowing disorders received input from an SLP
- SLPs most often involved in the treatment of:
 - Globus pharyngeus
 - Functional dysphonia
- Increasing awareness of psychogenic stuttering and functional foreign accent syndrome.
- Limited research available regarding number of patients with FND with speech impairments or effects of SLP input
- Currently functional swallowing/speech disorders are a diagnosis of **exclusion**-unlike FND which has positive diagnostic criteria.

FND symptoms/disorders relevant to SLPs



Diagnosis of Functional Speech/Voice Disorders (FSVDs)

When FSVD is suspected, answer the following questions:

Can the abnormal speech pattern be classified neurologically?

Are observations of the oral mechanism consistent with what is typically seen with the neurologic disease?

Is the speech deficit consistent?

Is the speech deficit suggestible or subject to distractibility?

Does speech fatigue in a lawful manner?

Is the speech deficit acute in onset and reversible?

Treatment of Functional Voice Disorder

Combination of direct and indirect therapy techniques is the best available option:

Direct Therapy

- Breath support
- Laryngeal re-posturing
- Vocal fold medial compression (e.g. yawn-sigh)
- Establish optimal pitch
- Laryngeal manipulation

Indirect Therapy

- Eliminate factors that contribute to voice problem
- Patient education
- Auditory training
- Vocal hygiene

Diagnosis of Psychogenic Stuttering

Differentiated from organic stuttering by:

Indifference toward
abnormal speech

Accent on wrong
syllable

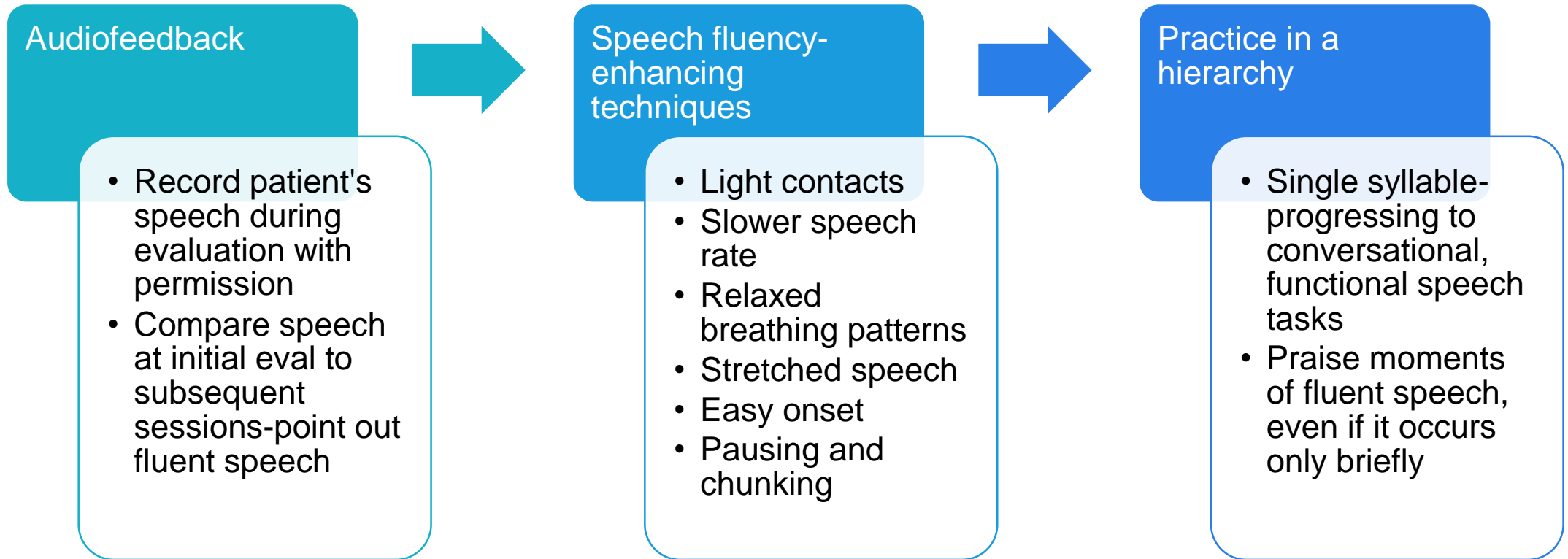
Absence of
dysarthria, aphasia
or apraxia of speech

Variable moments of
fluent speech
interspersed with
significant stuttering

Stuttering on every
sound, syllable or
word

Equal presentation
in males and
females

Psychogenic Stuttering Treatment Progression



Diagnosis of Functional Disorder of Prosody

Variability of prosody in absence of dysarthria, aphasia or speech apraxia

Foreign accent syndrome (FAS):

- Can be organic-often due to CVA or TBI
 - Organic FAS is a fixed accent, cannot produce a different accent without considerable effort
- Functional FAS-can exhibit variability of accent and able to imitate other accents with relative ease
 - May also exhibit stereotyped behavioral mannerisms associated with that accent

Infantile or child-like prosody-"baby-talk"

- Usually accompanied by child-like behaviors
- Display common developmental errors (r, l, and lisp)

Diagnosis of Functional Articulation Disorders

Organic articulation disorders range in severity, whereas functional articulation disorders are usually not subtle

Often associated with inconsistent lingual/jaw/facial weakness on non-speech tasks

When hemiparesis is present-often see wrong-way tongue deviation away from hemiparetic side

Treatment of Functional Articulation/Prosody Disorder

Minimal pair work-for sounds in isolation and word level



Use of mirror for guiding correct placement



Focus on stress and timing



Use of pacing board for sentence/conversation level tasks

Diagnosis of Globus Pharyngeus

- Globus Pharyngeus-persistent or intermittent non-painful sensation of lump/foreign body in the throat.
 - Not always functional in nature-also occurs due to organic reasons (e.g. GERD)
 - Referral to ST should occur ONLY after testing (endoscopy, barium swallow, etc) and intervention with medication if appropriate

Diagnosis of Globus Pharyngeus

Lee BE *et al.* Globus pharyngeus: An updated review

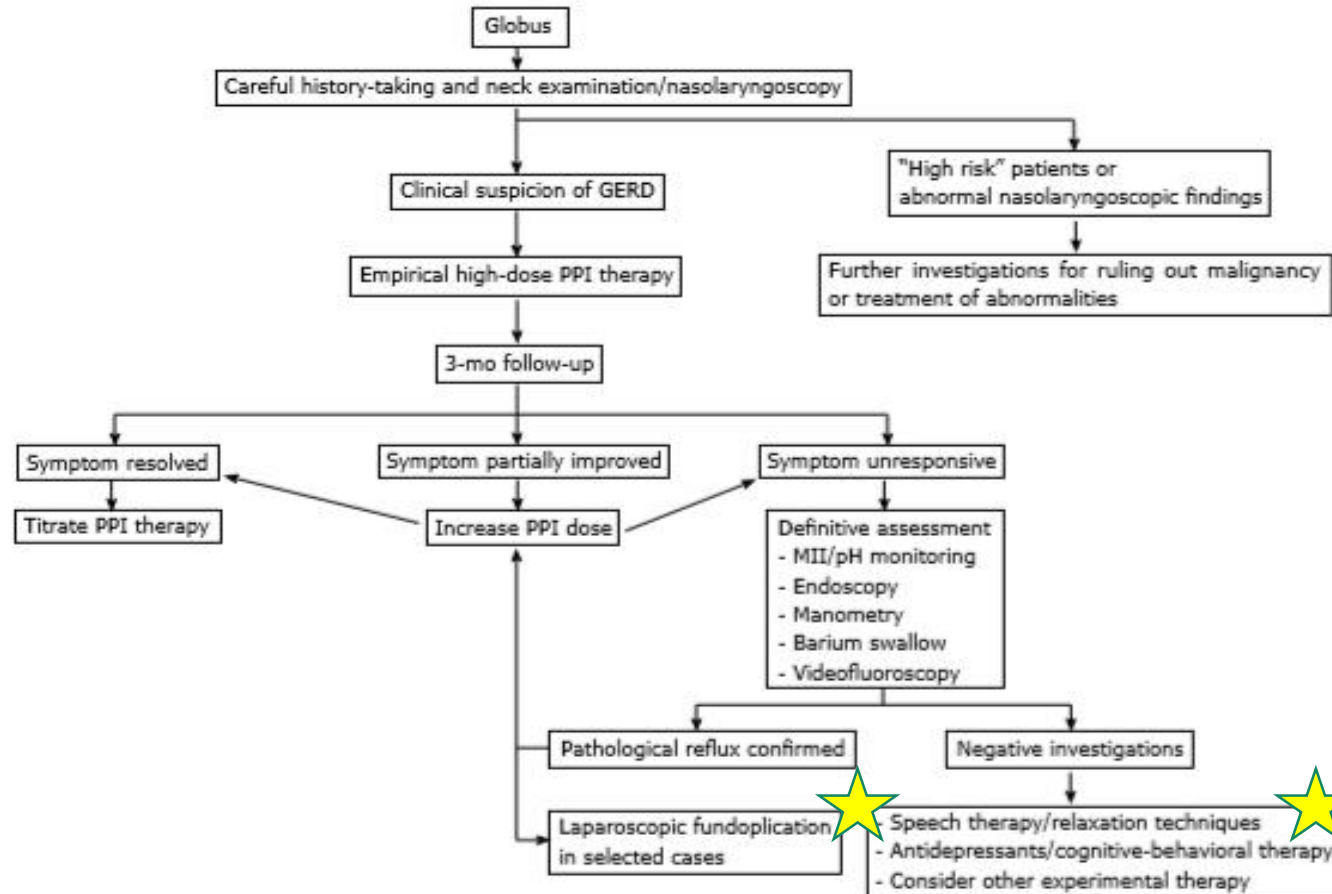


Figure 1 Algorithm for management of globus. GERD: Gastroesophageal reflux disease; PPI: Proton pump inhibitor; MII: Multichannel intraluminal impedance.

Treatment of Globus Pharyngeus

- Relaxation techniques, including:
 - Neck and shoulder exercises
 - General relaxation techniques
- Voice hygiene to relieve vocal tract discomfort and tension
 - Adopt “giggle-posture”-helps to retract false vocal folds.
 - Adopt “wet swallow” as opposed to “dry” or “check” swallow which aggravates symptoms.
- Voice exercises
 - Yawn-sigh technique
- Study by Lee (2012) indicated that in 25 globus patients, 92% experienced improvement following treatment

Diagnosis of Functional Cognitive Disorder

Group of memory related symptoms-with inconsistencies present between self-reported symptoms and neuropsychological testing



If suspected by SLP, a referral should be placed to neuropsychologist for further assessment

Treatment of Functional Cognitive Disorders

- Currently, there is little evidence to guide treatment strategies
- Recommendations include:
 - Avoid/reduce medications that may worsen memory symptoms
 - Focus on functional memory tasks
 - Apply memory strategies to real-life scenarios
 - Normalize the experience of forgetting
 - Group therapy involving education and stress management was effective in improving self-rated memory at 6 month follow-up

Diagnosis of Functional Language Disorders

Clinical Signs:

Unusual word substitutions not easily explained by normal language patterns

Inconsistencies when reading/naming/spelling

- Able to read, name or spell low frequency words better than everyday words
- Unable to read during eval despite reading street signs/store names, etc at home
- Reading in unorthodox ways
- Able to spell irregular words (e.g. castle) but not regular words (e.g. tiger)
- Attempting to write "illegal" letter combinations (e.g. "ckul")

Difficulty with comprehension of basic directions/tasks, despite independence at home.

ST Outcome Measures

- Relevant Standardized Assessments based on area of deficit
- Voice Handicap Index
- Time/duration without presence of deficit
- Performance during functional communication tasks
- Conversational speech samples

Additional Considerations



Home Exercise Programs

Traditional HEP is not usually part of patient plan of care

Encourage patient to incorporate movement strategies and plans into their normal daily routine



Rehabilitation Journal

- Helps the patient reflect, remember, and reinforce the information provided in therapy sessions
- Keep track of goals, achievements, strategies
- May help with compliance with treatment and encourage self-management
- Including a written explanation of the patient's problems and triggers has been shown to be helpful for patients to reference after discharge



Patient Resources

- Informational websites

- www.neurosymptoms.org
- www.fndhope.org
- www.fndsociety.org
- www.fndaction.org.uk

- Blogs

- www.fndrecovery.com
- www.managingchronic.com
- www.fndportal.org
- www.thrivingwhiledisabled.com

Conclusion



FND is a common, real, and disabling condition that involves a varied clinical presentation



Up to 16% of new patients in neurology clinics have FND, yet there are minimal FND programs in the country to address their needs



Evidence supports a multidisciplinary approach to rehabilitation focusing on building patient rapport and establishing expectations and goals for improvement

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