

# MDS African Parkinson's Disease and Movement Disorders Conference (APMC) Nairobi, Kenya | March 10-11, 2026



International Parkinson and  
Movement Disorder Society  
African Section

**gp<sup>2</sup>** Global Parkinson's  
Genetics Program

Supported in part by the Global Parkinson's Genetics Program, a program of the Aligning Science Across Parkinson's initiative and implemented by the Michael J. Fox Foundation.

# Functional Movement Disorders

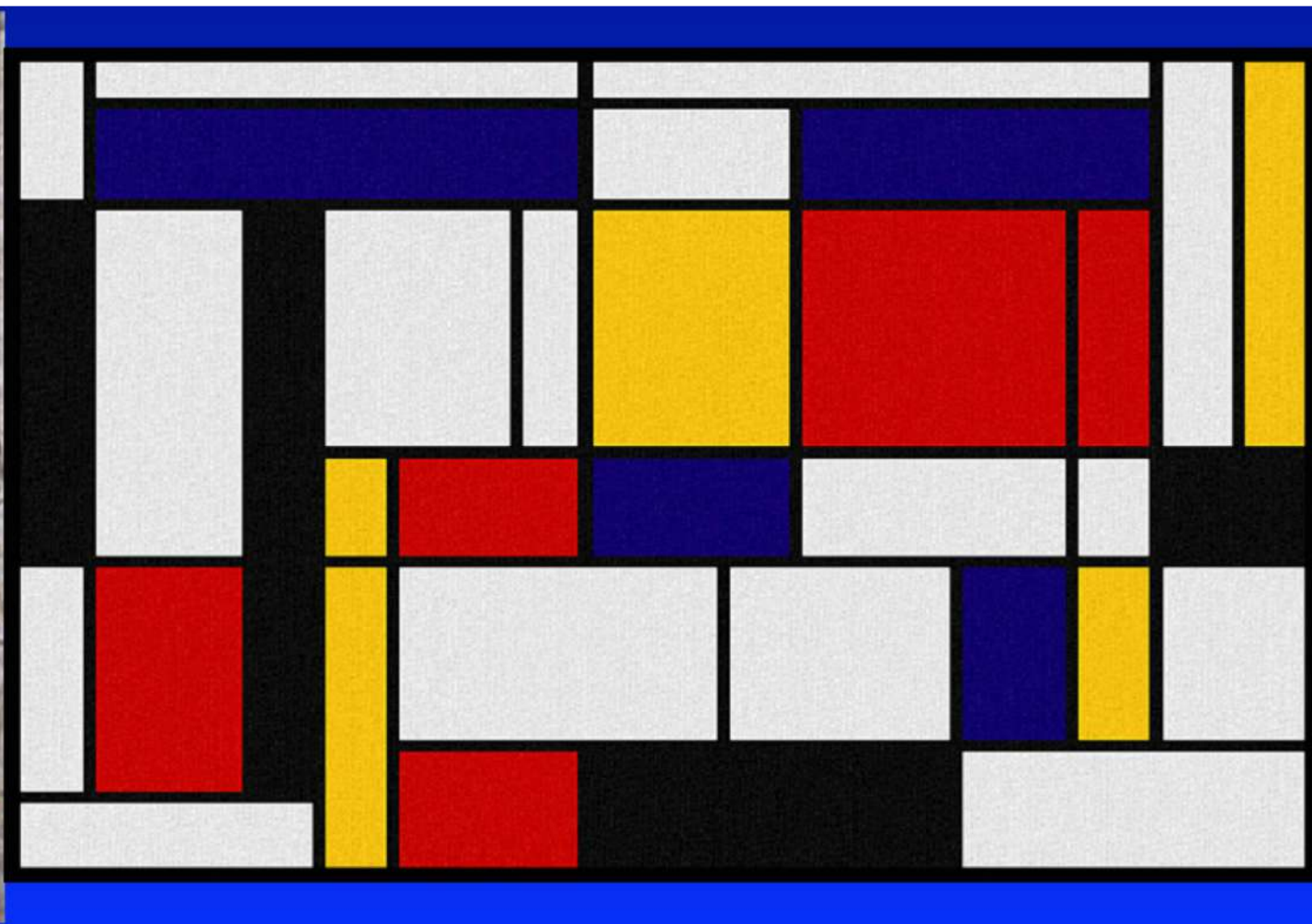


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**Université Cheikh Anta DIOP-FMPOS**

















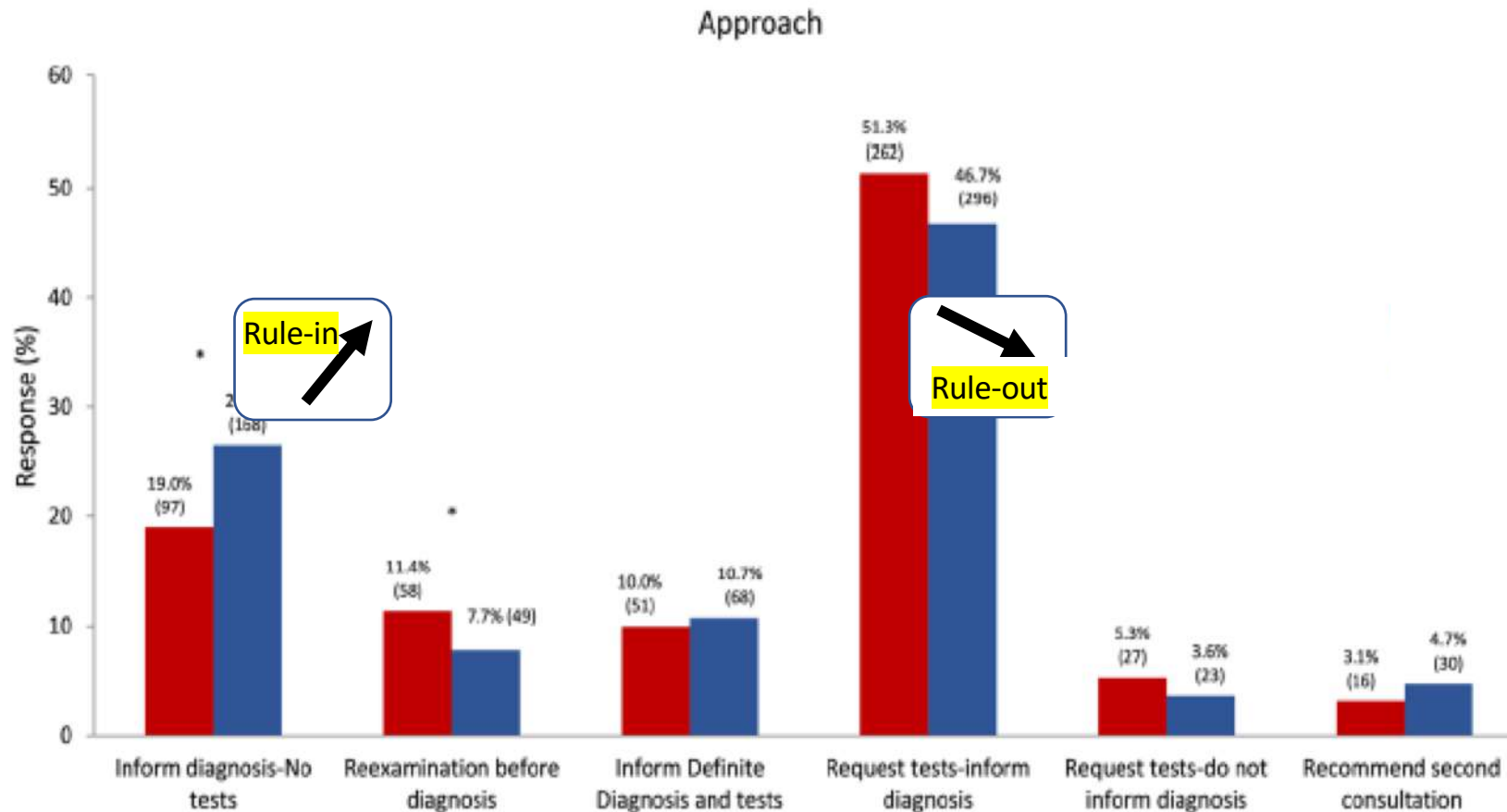


# Definitions of concepts

- ❖ Neuropsychiatric condition characterized by involuntary motor symptoms that are inconsistent with known neurological diseases and linked to dysfunction in brain networks involved in motor control, emotion regulation, attention, and agency
- ❖ Common and often disabling condition seen across neurological practice
- ❖ Now understood as a neuropsychiatric condition arising from the complex interaction of neurobiological, psychological, and social factors.

## Opinions and clinical practices related to diagnosing and managing functional (psychogenic) movement disorders: changes in the last decade

K. LaFaver<sup>a</sup>  A. E. Lang<sup>b</sup>  J. Stone<sup>c</sup>  F. Morgante<sup>d e</sup>  M. Edwards<sup>d</sup>  S. Lidstone<sup>b</sup>   
C. W. Maurer<sup>f</sup>  M. Hallett<sup>g</sup>  A. K. Dwivedi<sup>h</sup>  and A. J. Espay<sup>i</sup>  on behalf of the MDS FMD Study Group



2008

2018

Late 19th century - Sigmund Freud and Jean-Martin Charcot



### Conversion Disorder (Functional Neurological Symptom Disorder)

#### Diagnostic Criteria

- A. One or more symptoms of impairment of voluntary motor or sensory functions.
- B. Clinical data demonstrate incompatibility between the symptoms and a recognized neurological or medical condition.**
- C. The symptoms or impairments are not better accounted for by another medical or mental disorder.
- D. The symptom or impairment causes clinically significant distress or impairment in social, occupational, or other important areas of functioning, or requires medical evaluation.

Coding Note: The ICD-9-CM code for Conversion Disorder is 300.11 and is assigned regardless of (see below).

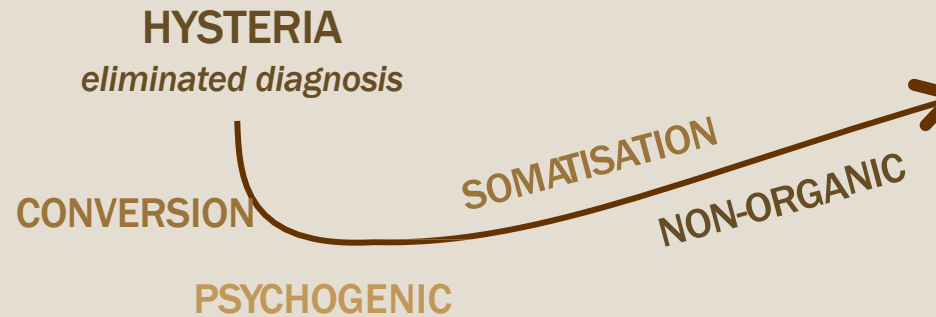
- Specify the symptom type:
  - (F44.4) With weakness
  - (F44.4) With abnormal movements, myoclonus, gait disturbance)
  - (F44.4) With swallowing disorder)
  - (F44.4) With speech disorder)
  - (F44.5) With epileptiform seizures)
  - (F44.6) With anesthesia)
  - (F44.6) With specific sensory disturbances)
  - (F44.7) With associated symptoms)



Rule-in

Positive

- 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



# DSM-5 diagnostic criteria

No specific biomarker available in the context of FMD

- 1 Presence of one or more symptoms of impaired voluntary motor skills or sensory functions
- 2 Presence of clinical signs providing evidence of incompatibility between the motor symptom and an established neurological or medical condition
- 3 Symptoms or deficits that cannot be better explained by another medical or mental condition
- 4 Symptoms or deficits that cause significant clinical distress or disabling social, occupational, or other functional impairment

The concept of « **recent psychological stress** »  
is no longer included in these criteria



## Current Concepts in Diagnosis and Treatment of Functional Neurological Disorders

JAMA Neurol. 2018;75(9):1132-1141. doi:10.1001/jamaneurol.2018.1264  
Published online June 4, 2018.

Alberto J. Espay, MD, MSc; Selma Aybek, MD; Alan Carson, MD, FRCPsych, FRCP; Mark J. Edwards, FRCP, PhD; Laura H. Goldstein, PhD; Mark Hallett, MD; Kathrin LaFaver, MD; W. Curt LaFrance Jr, MD, MPH; Anthony E. Lang, MD, FRCPC; Tim Nicholson, MD, PhD; Glenn Nielsen, PhD; Markus Reuber, MD; Valerie Voon, MD; Jon Stone, MB ChB, FRCP, PhD; Francesca Morgante, MD, PhD

### Frequent presentations of functional neurological disorders

Grandes classes de troubles fonctionnels	Exemples de sous-types fréquemment observés
Non-epileptic seizures (or dissociative seizures)	
Functional weakness of a limb	Monoparesis, paraparesis, alien limb
Sensory disorders	Whether or not associated with chronic pain, diffuse dysesthesia
<b>Movement disorders</b>	<b>Functional tremor</b> <b>Pseudodystonia and postural disorders</b> <b>Pseudomyoclonic jerks</b>
Walking difficulties	Dragging gait with internal or external rotation of the hip Repetitive pulling back of a limb Waddling
Sleep disorders, fatigue, dizziness, discomfort Memory and concentration disorders	Functional memory disorders (working memory) Nominal aphasia

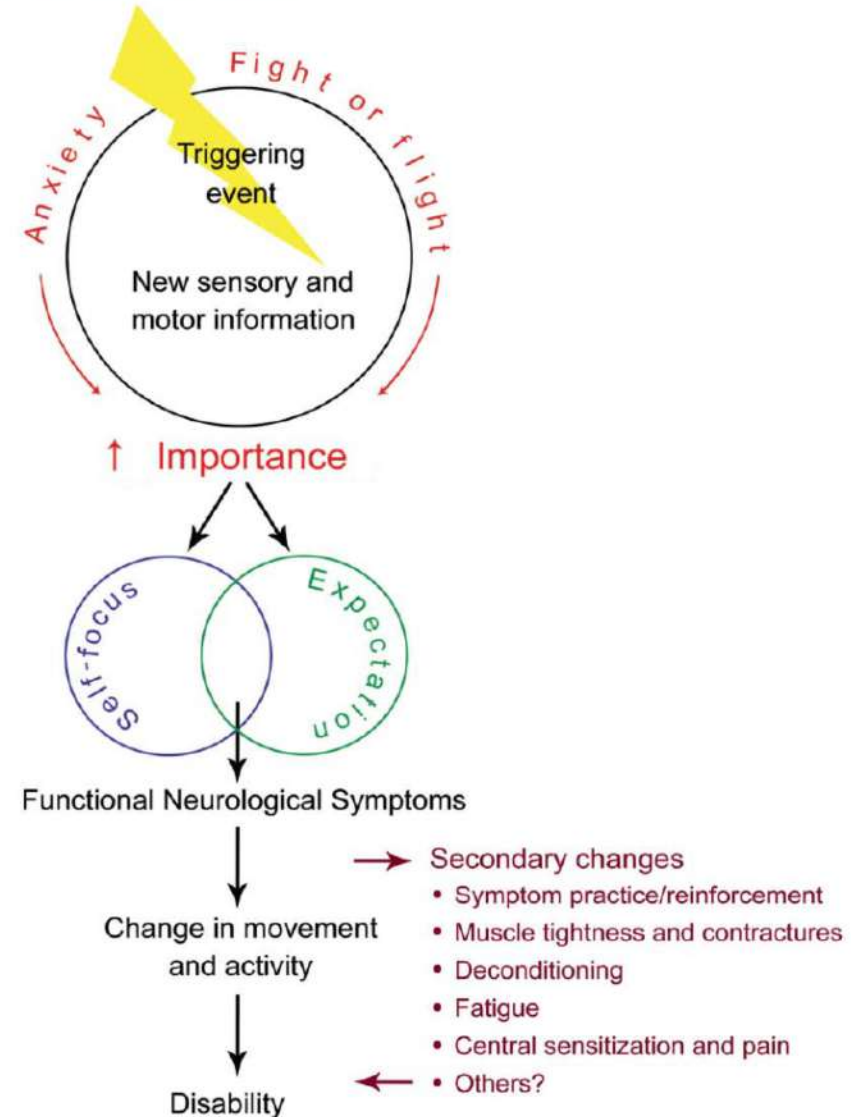
# Functional movement disorders

## Five new things 2017

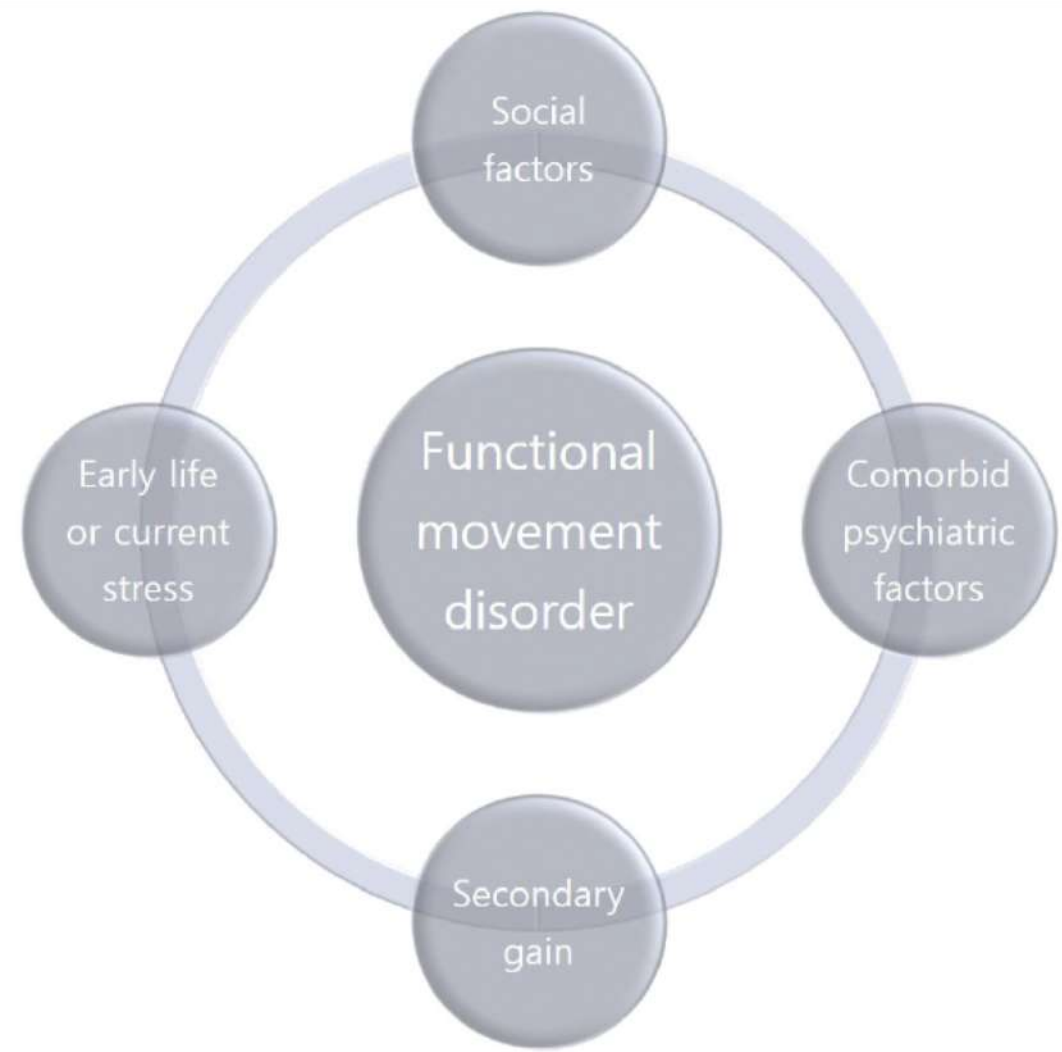
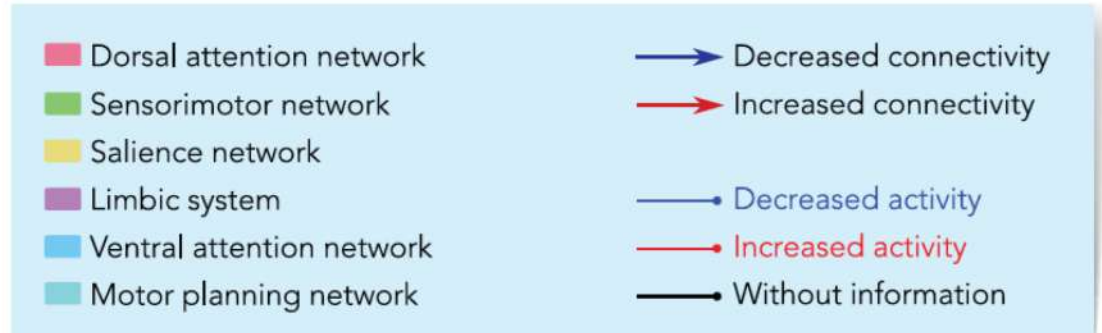
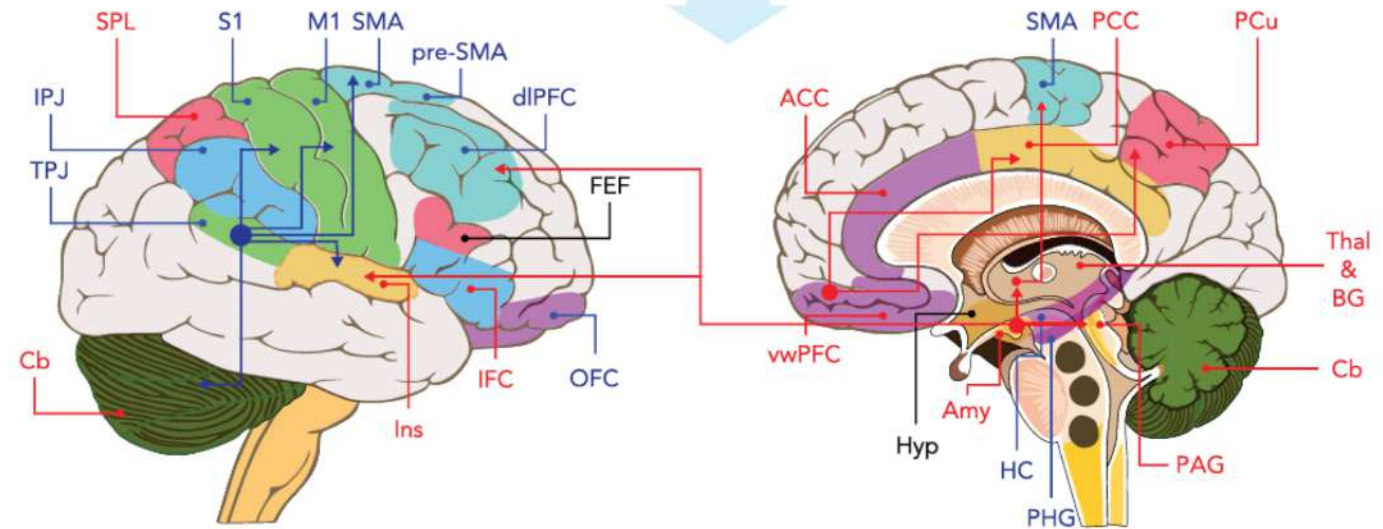
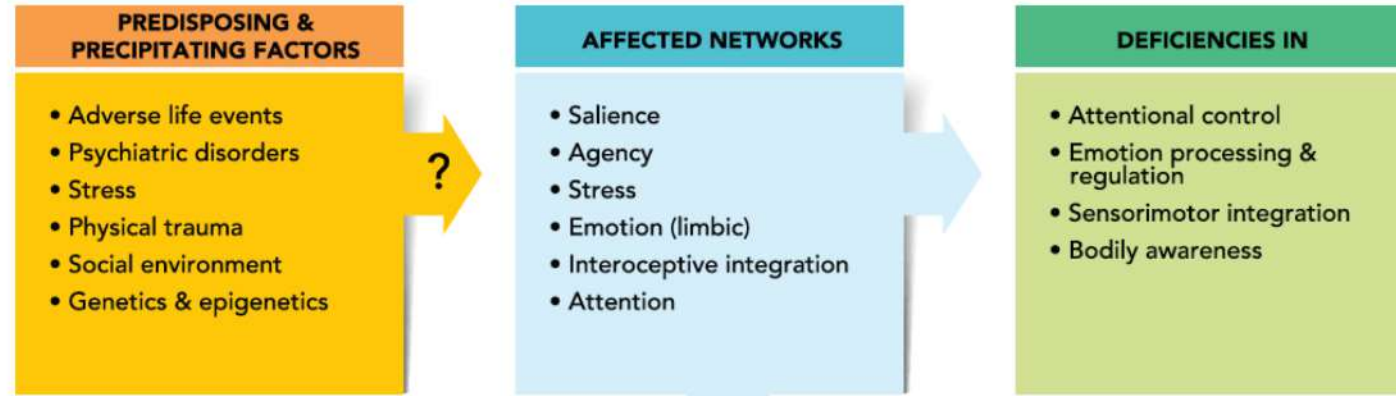
Tamara Pringsheim, MD; Mark Edwards, MD

### Functional movement disorders: Five new things

- Preferential use of the term functional movement disorders is proposed as being freer from etiologic assumptions and recognizes that the cause of symptoms may not be evident.
- Patients with functional movement disorders have heterogeneous psychological backgrounds.
- Specific physical rehabilitation techniques can be helpful in improving physical and social function in individuals with functional movement disorders.
- Experimental evidence suggests that individuals with functional movement disorders do not attenuate the sensory consequences of their actions, and that this may reflect their lack of sense of agency for their actions.
- Functional MRI during recall of life events judged to be of causal significance in individuals with conversion disorder reveals increased activity in the left dorsolateral prefrontal cortex, with decreased hippocampal and parahippocampal activity, a pattern compatible with memory suppression.



# Neurobiological model of FMD



Biopsychosocial model of FMD

# Functional Movement Disorders: Updates and Clinical Overview

Jung E Park <sup>✉</sup>

Department of Neurology, Dongguk University Ilsan Hospital, Goyang, Korea



- **Intuition is not enough !**
- **Common characteristics :**
  - ***Sudden onset***
  - ***Distractibility vs. increase when attention is focused on symptoms***
  - ***Fluctuation in symptoms***
  - ***Fatigue during exertion***
  - ***Incongruity (e.g., resolutive paraplegia during automatic movement)***

***Remember to observe movements and gait outside of the consultation and clinical examination ++***

- ***History of functional disorder***
- ***Frequency of diagnostic error among neurologists : 4%***

## Clinical Diagnosis

Core feature	Examples	How to perform the diagnostic maneuver
Inconsistency	Variability	Observing the movement of interest (e.g., tremor) in different situations and at different timepoints
	Distractibility	Observing the patient by having them perform various mental tasks (e.g., how does the tremor change when the patient performs serial subtractions?)
	Suggestibility	Engaging in conversation with the patient about the symptom, and watching how the movement changes (e.g., does the tremor worsen?)
	Selectivity	Watching to see if the movement occurs in certain situations, but disappears in others
Incongruity	Hoover's sign	Weakness of hip extension returns to normal with contralateral hip flexion against resistance
	Psychogenic toe sign	Fixed posturing and resistance to manipulation are noted
	Whack-a-mole sign	When the examiner suppresses a moving body part, movement in another body part occurs
	Swivel chair sign	Patient with functional gait difficulty is able to propel a chair while seated normally

# Functional Movement Disorder: Evolving Mechanisms, Diagnostic Precision, and Personalized Multidisciplinary Care

Emmanuel Ortega-Robles, PhD,<sup>1</sup> Ali Shalash, MD, PhD,<sup>2</sup> Jesús Ramírez-Bermúdez, MD, PhD,<sup>3</sup> and Oscar Arias-Carrión, MD, PhD<sup>1,4,\*</sup>

## Clinical Diagnosis

### Patient history

- Sudden or abrupt symptom onset
- Clear triggers such as physical injury, illness, or psychological stressors
- Spontaneous remissions or marked symptom fluctuations
- History of childhood trauma or adverse life events
- Psychiatric comorbidities (eg, anxiety, depression, PTSD)
- Family history of functional neurological or psychiatric disorders
- Detailed, emotionally charged descriptions of symptom onset

### Physical examination

#### Inconsistency

- *Variability*: Movement characteristics (eg, tremor amplitude or frequency) change across time or context
- *Distractibility*: Symptoms diminish or resolve when attention is diverted (eg, mental arithmetic)
- *Suggestibility*: Symptom intensity alters in response to verbal suggestion or clinician focus
- *Selectivity*: Symptoms manifest only in specific contexts (eg, clinical exam) but not in everyday function


#### Incongruence (Positive Signs)

- *Entrainment*: Tremor aligns with the rhythm of voluntary movement in another limb
- *Hoover's sign*: Apparent weakness in hip extension improves during contralateral resisted hip flexion
- *Fixed postures with resistance*: Involuntary toe posturing resistant to passive manipulation (eg, “functional toe sign”)
- *Whack-a-mole sign*: Inhibiting one movement leads to the emergence of a different body part
- *Swivel chair sign*: Patient unable to walk can propel a chair using legs while seated

# Clinical Diagnosis

## FUNCTIONAL MOVEMENT DISORDERS !!!

### ❖ Clinical examination, an essential step

- ✓ Characterize movement
- ✓ Identify associated signs  diagnosis

### ❖ Investigations ???

- ✓ Brain MRI (lesional causes)
- ✓ Electrophysiology (help characterize MD)

Systematic search for causes before considering others, especially in cases of **acute MD**

Genetic causes, even though molecular genetics techniques remain underdeveloped

# Clinical Diagnosis

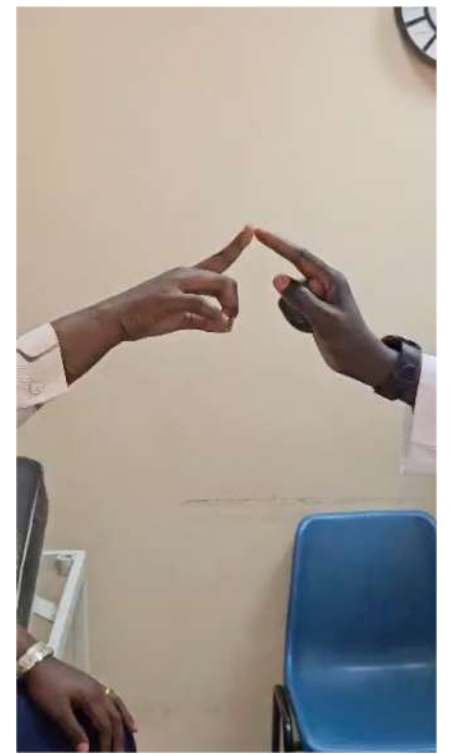
Some progressive and phenomenological elements:

❖ Acute or subacute onset with rapidly reaching maximum severity and sometimes unexplained

phases of remission or worsening

❖ Random topographical spread of motor symptoms

❖ Significant variations in phenomenology and severity over time (particularly alternating spontaneous remission and relapse/suggestion or placebo effect)



# Bunch of positive signs



Main positive signs/basis for clinical maneuvers :

- ❖ Distractibility
- ❖ Entrainment
- ❖ Variability
- ❖ « **Huffing and Puffing sign** » : high positive predictive value
- ❖ Whack-a-Mole and Swivel Chair Signs





# A Critical Appraisal of the Whack-a-Mole and Swivel Chair Signs in the Diagnosis of Functional Movement Disorders

Tjerk J. Lagrand, MD,<sup>1,\*</sup>  Marjolein Brusse-Keizer, PhD,<sup>2,3</sup> Andrew Charmley, MD,<sup>4</sup> Mark J. Edwards, PhD,<sup>5</sup> Marina A.J. Tijssen, MD, PhD,<sup>6,7</sup>  and Alexander C. Lehn, MD<sup>8,9</sup>



Diagnostic measure	Whack-a-mole test (n = 59)
Overall frequency of the sign	49%
Positivity of the sign	
FMD patients (n/total)	11/16
Organic patients (n/total)	19/43
Sens (CI)	52% (46–58)
Spec (CI)	78% (66–89)
PPV (CI)	44% (33–55)
NPV (CI)	85% (84–85)

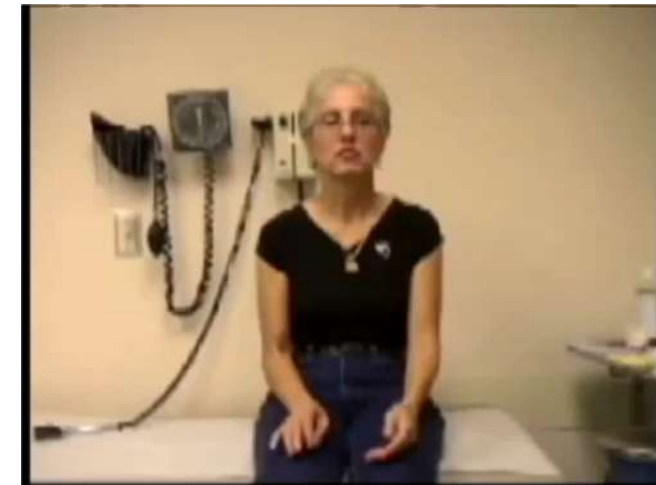
Abbreviations: CI, confidence interval; FMD, functional movement disorder; NPV, negative predictive value; PPV, positive predictive value; Spec, specificity.

# Functional tremor

- ❖ Variable frequency and a characteristic response to externally induced rhythmic movements (drive test)



- « finger tapping »
- « ballistic movements » by the unaffected member
- « carrying a load » : paradoxical aggravation



# Functional Parkinson's syndrome

## Tremor

Same characteristics as functional tremor

Most commonly observed symptom

As well as postural, than intentional, than at rest

No tremors re-emerge\*

No crumbling

## Rigidity

Voluntary resistance, opposition

Froment's counter sign:  
Decreased rigidity during the Froment maneuver  
(distractible & variable)

## Akinesia

Difficulty performing the movement without significant bradykinesia

Difficulty initiating movement but speed of execution preserved

No bradykinesia or progressive hypokinesia as usually found in PK

Distractibility, variability, Huff & Puff

## Gait

Slow, stiff, sometimes painful walking

Analysis of postural reflexes can be very relevant:

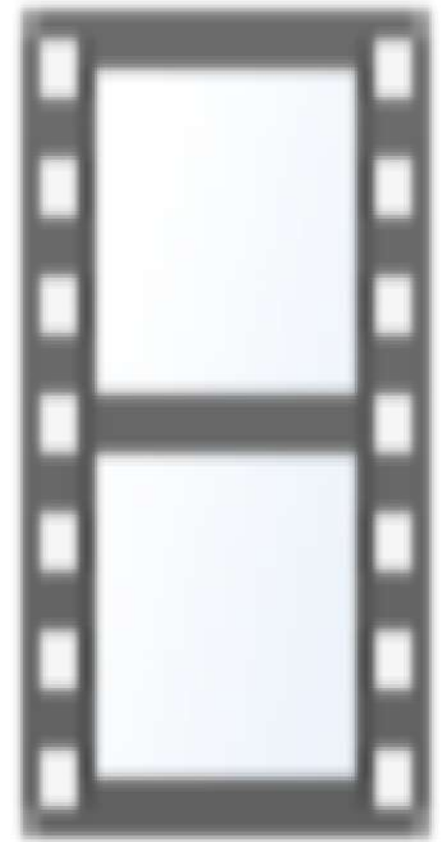
No fall, but a disproportionate or even dramatic response.

Discrepancy between complaint and objective analysis of gait and balance

0.64/100,000 inhabitants; 0.24% Parkinson's syndrome; 67% women; onset at 45-50 years of age.

# Pseudomyoclonic jerks

- ❖ Frequent mode of expression of FMD
- ❖ Rich and polymorphic clinical presentation
- ❖ Focal, multifocal, axial, or generalized
- ❖ Sporadic or repetitive onset, rhythmic or non-rhythmic
- ❖ Spontaneous or induced by stimulation
- ❖ Neurophysiological examination identical to functional T
- ❖ « [whack-a-mole sign](#) » : rare sign with high predictive value ++





# Dystonia and postural disorders

Functional dystonia: a special case that is more difficult to diagnose

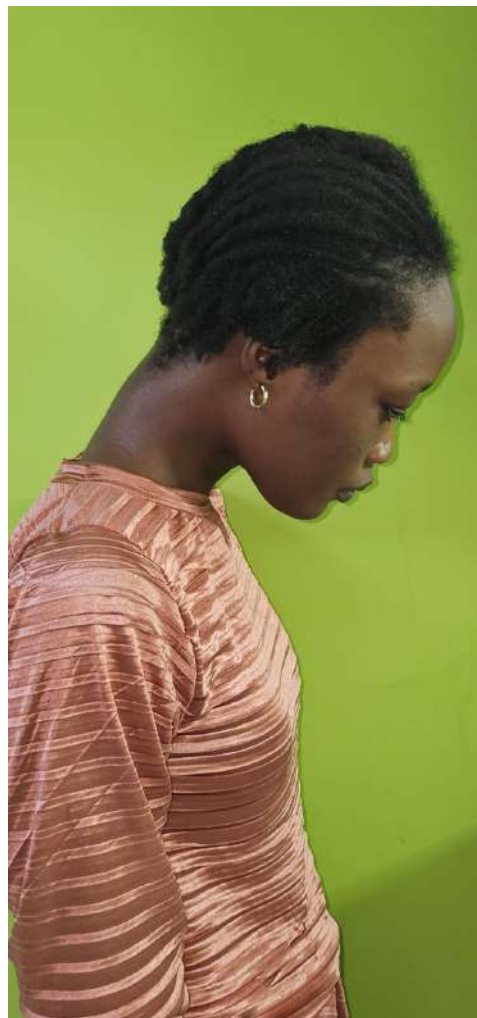
Fewer positive signs with lower predictive value

- ❖ Typically, pain is the primary symptom
- ❖ Fixed, tonic character from the outset, also highly suggestive
- ❖ Absence of antagonistic movements or atypical movements
- ❖ Absence of “task specificity”
- ❖ No “overflow”

19-year-old girl, motherless, raised by her aunt

Suddenly presents with a fixed, irreducible, painful antecolis with dysphagia

MRI and CT scan of the brain and cervical spine normal



# Dystonia and postural disorders

❖ Certain dystonic postures are particularly suggestive :

- plantar flexion with inversion of the foot
- extension of the big toe with flexion of the other toes
- closed fist with the thumb extended
- lateral neck tilt with elevation of the ipsilateral shoulder and lowering of the contralateral shoulder



❖ Topographical distribution in relation to age:



- focal dystonias in adults often begin between the 4th and 5th decades of life
- generalized dystonias typically appear during childhood or adolescence

# Other movements

## ❖ Paroxysmal functional movement disorders :

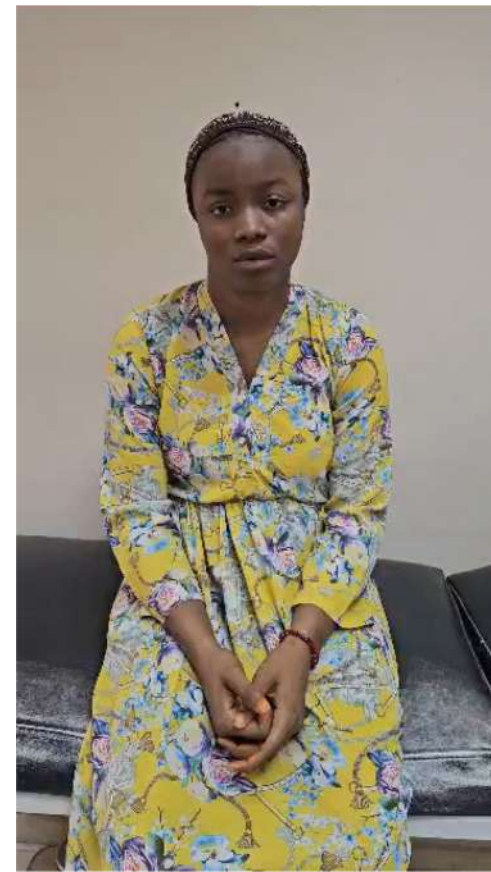
- Later age of onset, no family history of PMD
- Unusual triggers (clinical examination or noise)
- Other positive predictive signs: fluctuations in intensity, vocalizations or sighs/gasps, lack of response to questions during episodes
- Association with tremor, opisthotonic posture, undulating movements, rhythmic pelvic movement, lateral jerks from side to side, facial movements limited to the lower part of the face



# Other movements

## ❖ Functional tics :



- later age (adolescence or young adulthood),  
sudden onset
- no complex rostrocaudal distribution and progression
- from the outset, with large movements of the upper limbs
- more control over tics and less specific premonitory sensations



# Clinical diagnosis - Tics

Characteristics	Tourette's Syndrome	Functional Tic Disorders
Sex Ratio	Male Predominance	Large Female Predominance
Comorbidities	ADHD, OCD, Autism Spectrum Disorder. Typical Premonitory Sensation	Comorbidities: Anxiety Disorders, Depression
Age of Onset	In Childhood (before 10 years)	In Adolescence
Course	Onset with simple tics, evolution of "coming and going", slow modification of tics over time	Abrupt onset (in a few hours or days) with the immediate presence of multiple and complex phenomena
Copro-phenomena	Rare copro-phenomena: simple words	Frequent copro-phenomena: long sentences
Involvement	Rostro-caudal Distribution	Predominantly Trunk and Limbs
Associated Signs	Simple tics predominant, limited number of tics	Complex auto- and hetero-aggressive behaviors, e.g., putting objects in the mouth, throwing objects
Premonitory sensation	Typical	Less specific
Tic control	Possible transiently	Most often impossible

# Tics and TikTok: Functional Tics Spread Through Social Media

Mariam Hull, MD\*  and Mered Parnes, MD 

MOVEMENT DISORDERS CLINICAL PRACTICE 2021. doi: [10.1002/mdc3.13267](https://doi.org/10.1002/mdc3.13267)

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# ATTENTION



- ❖ The presence of certain inconsistencies cannot be considered pathognomonic of a functional disorder
- ❖ Variability in the expression of dystonic gait or ataxic “organic” (almost miraculous improvement when walking backwards or on stairs, for example)

# MANAGEMENT

Initial Consultation

Main complaint, positive signs, comorbidities, functional impact

Diagnostic announcement

Frequent disorder, automatic-voluntary dysregulation, multifactorial, use of metaphors, no structural lesion, potentially reversible

Personalized multidisciplinary care program

Research  
-  
management of factors (3P)

Predisposing  
Precipitating  
Perpetuating

Functional dissociative crises

Physical treatments:

- Physiotherapy / Occupational therapy
- Rehabilitation center

Additional treatments

- Speech therapy
- Botulinum toxin, psychedelic?
- *TMS, tDCS*

Psychotherapy

CBT  
Psychodynamic therapy,  
EMDR, Hypnotherapy

Motor disorders

Functional impact (+/- impact of those around them):

Mild to moderate

Outpatient

Moderate to severe

Day hospital

Severe

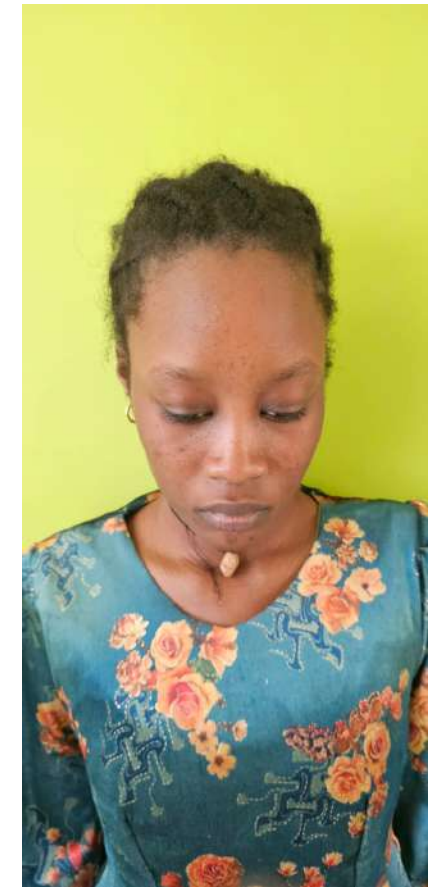
Full hospitalization



19-year-old girl, motherless, raised by her aunt

Suddenly presents with a fixed, irreducible, painful antécolis with dysphagia

MRI and CT scan of the brain and cervical spine normal

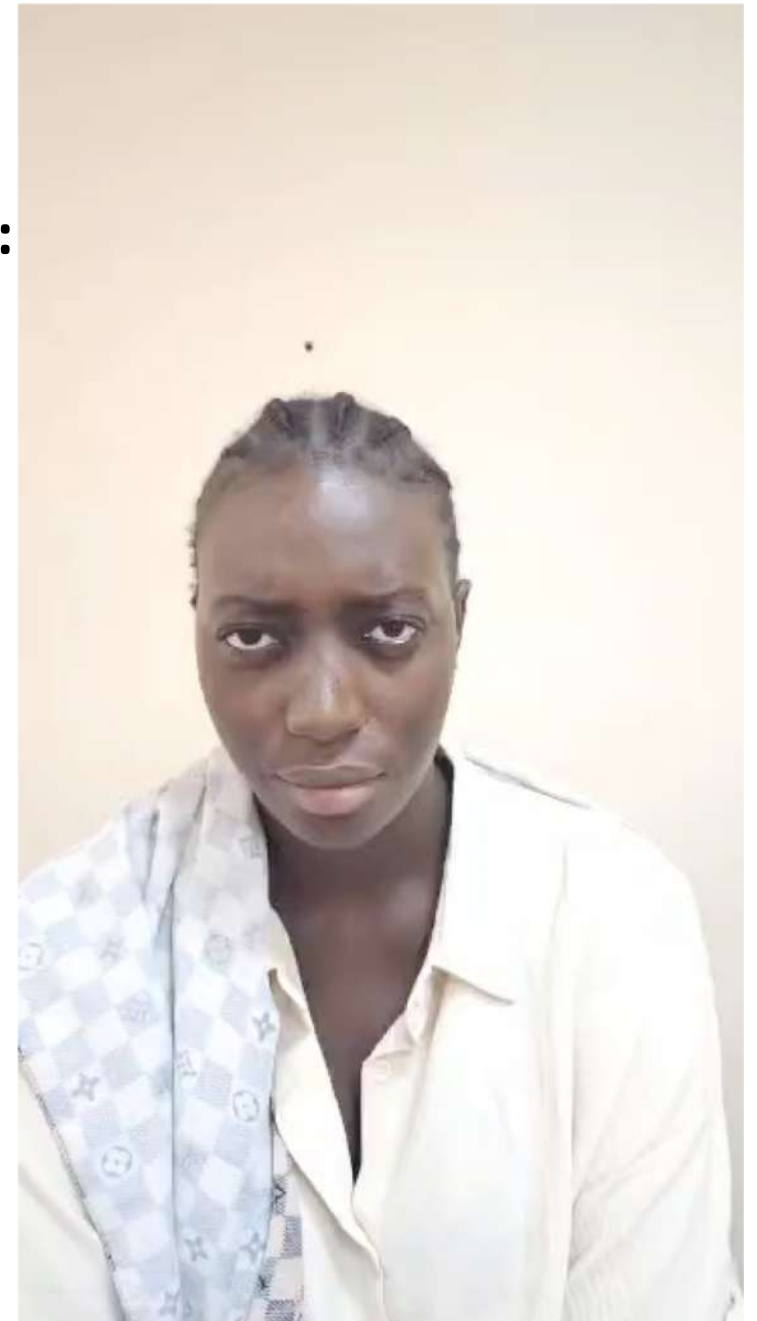


**After 4 weeks with management : physiotherapy, Psychotherapy, painkiller**



**After 2 months of management :**

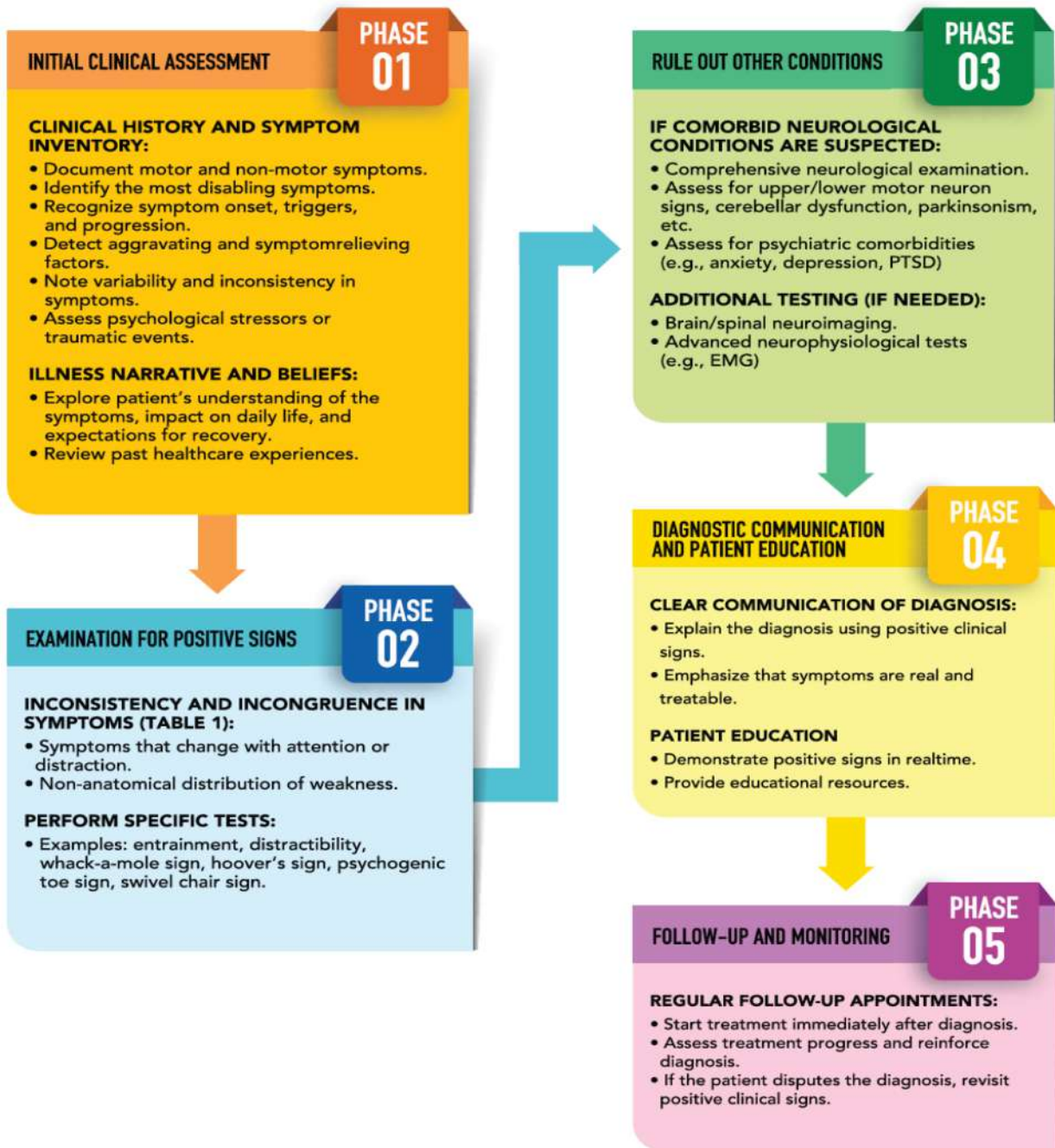
- **Psychotherapy**
- **Antidepressant (serotonin reuptake inhibitor)**
- **Physiotherapy**



# Take home message

- ❖ TNFs, of which MAFs are a subtype, are common and debilitating but potentially reversible
- ❖ A positive or inclusive diagnosis can be established with a high degree of certainty
- ❖ Clinical examination and identification of positive signs play a key role in diagnosis
- ❖ Knowledge of these specific signs associated with each TNF phenotype enables early diagnosis

# To summarise



Keep calm, analyse the movement carefully,  
do not rush into a diagnosis or treatment

