Psychogenic movement disorders

Raja Mehanna MD
### Functional or psychogenic: what's the better name?

<table>
<thead>
<tr>
<th></th>
<th>Psychogenic</th>
<th>Functional</th>
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<tbody>
<tr>
<td>Fahn and Olanow</td>
<td>+</td>
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<tr>
<td>Jankovic</td>
<td>+</td>
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<td>Edwards et al</td>
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<td>LaFaver and Hallet</td>
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<td>Ganos et al</td>
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## Terminology

**Box 1**

**Psychogenic movement disorders terminology**

**Psychogenic**

Although it suggests a purely psychological etiology, it is widely used among neurologists, implying biopsychosocial pathogenesis.

**Functional**

It does not address disability because patients perceive themselves unable to function (dysfunctional rather than functional).

**Nonorganic**

“Organic” is not well defined. It implies a nondiagnosis.

**Conversion disorder**

According to the *Diagnostic and Statistical Manual of Mental Disorders*, it requires an identifiable trigger.

**Psychosomatic**

In its true intended sense, it implies an interaction between mind and body manifested by multiple physical symptoms.

**Medically unexplained**

It may become obsolete as better understanding is gained of the underlying pathogenesis. Also it is impractical when conveying the diagnosis to patients.

**Dissociative motor disorder**

There is a lack of evidence that dissociation is the underlying mechanism.

**Hysterical**

It suggests a link between symptoms and uterus and carries substantial stigma.

Thengannat and Jankovic, 2015
“You are NOT faking it”

- PMDs ≠ factitious disorder and malingering
- PMD ≠ intentional deception.
- Factitious disorder: fabrication of physical or psychological symptoms without an obvious external reward.
- Malingering: falsification of symptoms for secondary gain (avoiding employment or obtaining financial compensation).

Bass and Halligan, 2014
Diagnosis

• No evidence-based guidelines or gold standard.
• Diagnostic criteria published, but never validated.
<table>
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<tr>
<th>Incongruence</th>
<th>Inconsistency</th>
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<tbody>
<tr>
<td><strong>What does it mean?</strong></td>
<td>1. Movements vary over time</td>
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<tr>
<td>Movements do not present or progress according to the wide phenotypic range of known organic movement disorders</td>
<td>2. Movements change or are suppressed with complex tasks&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
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<td></td>
<td>3. Disability is disproportionate to objective findings</td>
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<tr>
<td><strong>What does it require?</strong></td>
<td>Careful examination of changes in movement to distracting tasks or non-physiologic interventions</td>
</tr>
<tr>
<td>Extensive experience on organic disorders</td>
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<tr>
<td><strong>What does it imply?</strong></td>
<td>Diagnosis may require a longer period of examination and observation than for most movement disorders</td>
</tr>
<tr>
<td>Diagnosis can only be made by a neurologist with expertise in movement disorders</td>
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<sup>a</sup>Caveats: (1) Changes over time and suppressibility with complex tasks are also a domain of organic tics but not of most other movement disorders. (2) This item is also part of *Incongruence*
### Fahn and Williams 1988

<table>
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<tr>
<th>Clinically definite</th>
<th>Clinically probable</th>
<th>Clinically possible</th>
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<tbody>
<tr>
<td><em>Documented</em> or <em>Clinically established:</em> Incongruent or inconsistent <em>plus</em> ≥1 of: 1. Other false signs 2. Multiple somatizations 3. Obvious psychiatric disturbance 4. Distractibility 5. Deliberate slowness</td>
<td>Inconsistent or incongruent movements or either one of: 1 Distractibility 2. Other false signs 3. Multiple somatizations</td>
<td>Obvious emotional disturbance. (No requirement for movements to be inconsistent or incongruent)</td>
</tr>
<tr>
<td>Clinically definite</td>
<td>Clinically probable</td>
<td>Clinically possible</td>
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<tr>
<td><strong>Movements that are inconsistent or three other primary criteria, plus one secondary</strong>&lt;br&gt;1. Excessive pain or fatigue&lt;br&gt;2. Previous exposure to a disease model&lt;br&gt;3. Potential for secondary gain&lt;br&gt;<strong>Secondary criteria</strong>&lt;br&gt;1. Multiple somatizations (other than pain and fatigue)&lt;br&gt;2. Obvious psychiatric disturbance</td>
<td><strong>Inconsistent movements or two other primary criteria plus two secondary.</strong>&lt;br&gt;Example of probable <em>(all 4)</em>&lt;br&gt;1. Excessive pain or fatigue&lt;br&gt;2. Previous exposure to a disease model&lt;br&gt;3. Multiple somatizations&lt;br&gt;4. Obvious psychiatric disturbance</td>
<td><strong>Only one primary criterion and two secondary or two primary and one secondary</strong>&lt;br&gt;(inconsistent/incongruent movement is not mandatory)&lt;br&gt;Example of possible <em>(all 3)</em>&lt;br&gt;1. Excessive pain or fatigue&lt;br&gt;2. Multiple somatizations&lt;br&gt;3. Obvious psychiatric disturbance</td>
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• The inter-rater reliability of diagnosis using the Fahn-Williams and Shill-Gerber criteria was evaluated among movement disorder neurologists and general neurologists.

• Based on video evaluation of phenomenology alone, there was a low level of diagnostic agreement among raters, and diagnosis relied heavily on clinical history and diagnostic work-up.

Morgante et al., 2012
<table>
<thead>
<tr>
<th>Clinically definite</th>
<th>Clinically probable</th>
<th>Clinically possible</th>
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<tbody>
<tr>
<td><em>Documented</em> (as per F&amp;W) or <em>Clinically established plus other features</em> (as per F&amp;W) or <em>Clinically established minus other features</em> (unequivocal clinical features of FMD, incompatible with organic disease, without the other features required by the F&amp;W criteria)</td>
<td>Not endorsed</td>
<td>Not endorsed</td>
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<tr>
<td>Functional phenotype</td>
<td>Clinically definite if all are present</td>
<td>Supportive but neither necessary nor sufficient</td>
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<td>Tremor</td>
<td>1. Entrainment or full suppressibility 2. Distractibility 3. Tonic coactivation at tremor onset 4. Pause of tremor during contralateral ballistic movements 5. Variability in frequency, axis, and/or distribution</td>
<td>1. Dual task interference [17] 2. Increase in tremor amplitude with weight loading [18]</td>
</tr>
<tr>
<td>Dystonia</td>
<td>1. Rapid onset (^b) 2. Fixed dystonia at rest 3. Variable resistance to manipulation and/or distractibility or absence when unobserved</td>
<td>1. Associated pain (except neck) 2. Complex regional pain syndrome [20]</td>
</tr>
<tr>
<td>Myoclonus</td>
<td>1. Variability in duration and/or distribution of jerks or of their latency (if stimulus sensitive) 2. Entrainment or full suppressibility 3. Distractibility</td>
<td>Variability in amplitude</td>
</tr>
<tr>
<td>Tics</td>
<td>1. Not fully stereotypical 2. Interference with speech or voluntary actions</td>
<td>1. Lack of premonitory urge 2. Lack of voluntary control (^e)</td>
</tr>
<tr>
<td>Parkinsonism</td>
<td>1. Marked slowness on examined manual tasks discordant with casual manual tasks (e.g., buttoning, tying shoe laces) 2. Variable resistance against passive movements without cogwheel rigidity</td>
<td>1. “Huffing and puffing” sign [22] 2. Pincer function preserved 3. Absence of decrement during finger tapping 4. Arm held tightly to the side or cradled in front [23]</td>
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\(^a\)\(^b\)\(^c\)\(^d\)\(^e\) Refer to Espay and Lang, 2015
Fig. 1.
Tremor recording in a patient with left upper limb tremors of ~2 Hz frequency. Trace (a) shows distractibility. When the patient is asked to perform a mental task (arrow), the tremors stop momentarily and then reappear but irregular. Trace (b) shows entrainability. When the patient is asked to perform voluntary movements with right upper limb (flexion and extension of wrist slowly), the left upper limb tremor is entrained with a frequency similar to that of right upper limb (~1.5 Hz).
How comfortable are we?

- Survey of 509 MDS member-neurologists found that even when patients showed definite signs of a PMD:
  - only 20% of neurologists informed patients of the diagnosis without additional diagnostic testing
  - 50% reported conducting additional diagnostic testing to rule out organic causes. This practice often reflects limited experience of the neurologists because it was associated with fewer years of fellowship training and a smaller PMD population in their practice.

Espay et al., 2009
PMD Prevalence

• Reported prevalence at movement disorders clinic: 2-20%
• Women: 70% to 80% of all cases.
• Most common in young adults, before age 50
• Also reported in children and the elderly.

Edwards and Bhatia, 2012; Edwards and Schrag, 2011; Ferrara and Jankovic, 2008; Schwingenschuh et al. 2008; Canavese et al. 2012; Batla et al. 2013
• In children,
  – Female predominance with onset after age 13
  – Two-thirds of children demonstrated multiple phenotypes with the most common being tremor, dystonia, and myclonus.

• In elderly (>60 years):
  – Tremor most common PMD
  – Gait abnormalities.

Ferrara and Jankovic, 2008; Batla et al. 2013
PMD risk factors

- Psychological stressor.
  - Not always reported.
  - Can be physical event (including physical injury, infection, neurologic illness, drug reaction, surgery, and vasovagal syncope)

- Family history of MD:
  - may suggest organic disease,
  - But F Hy of PMD maybe a risk factor for PMD as well.

Parees et al., 2014; Stamelou et al., 2013
History

• Abrupt onset with a rapid progression to maximum severity.
• Paroxysmal or episodic movement with spontaneous remissions and recurrences.
• Change in phenomenology over time.

Ganos et al., 2014.
Other negative signs

- Marked somatization and a long list of other unexplained medical symptoms
- Using a variety of devices (canes, crutches, sunglasses...)
- Regressive behavior (forming attachments with stuffed animals)
- Seen multiple medical professionals - numerous investigations and surgical procedures.
- Impending litigation, (more severe and persistent disability)

Hoerth et al., 2008; Scarano and Jankovic 1998.
Exam

- Variability of direction, frequency, and amplitude
- Distractibility when focusing on other motor or mental tasks
- Entrainment
- Non-patterned abnormal postures and spasms
- Suggestibility to sensory stimuli, such as a vibrating tuning fork or pressure applied to “trigger points”
- Give-away weakness
- Non-anatomic sensory findings

Thenganatt and Jankovic, 2015
• Excessive startle to sensory stimuli
• Exaggerated response to minimal pull backwards
• Astasia-abasia, knee buckling, bouncing gait, monoplegic dragging gait
• Convergence spasm
• Deliberate slowness demonstrating excessive effort when performing rapid successive movements

Thenganatt and Jankovic, 2015
• Abnormal speech pattern (hesitant and slow, bursts of verbal gibberish, changing dialects and accents)
• Facial grimacing, alternating facial contractions
• La belle indifference
• Demonstration of exhaustion and extreme effort to perform tasks

Thenganatt and Jankovic, 2015
## Phenomenology of PMD

<table>
<thead>
<tr>
<th>Predominant movement feature</th>
<th>No.</th>
<th>Percent</th>
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<tbody>
<tr>
<td>Tremor</td>
<td>467</td>
<td>37.5</td>
</tr>
<tr>
<td>Dystonia</td>
<td>365</td>
<td>29.3</td>
</tr>
<tr>
<td>Myoclonus</td>
<td>146</td>
<td>11.7</td>
</tr>
<tr>
<td>Gait disorder</td>
<td>114</td>
<td>9.2</td>
</tr>
<tr>
<td>Parkinsonism</td>
<td>60</td>
<td>4.8</td>
</tr>
<tr>
<td>Tics</td>
<td>29</td>
<td>2.3</td>
</tr>
<tr>
<td>Other</td>
<td>64</td>
<td>5.1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1245</td>
<td><strong>100</strong></td>
</tr>
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Treatment of PMD

- No standard protocol.
- Open and candid communication with patients
  - Patients who are accepting of their diagnosis at the onset are more likely to have long-term successful outcomes
  - Sharing the supporting physical signs of PMDs with patients may have therapeutic benefit and help them understand their diagnosis

Jankovic et al., 2006; Ricciardi et al., 2014; Jankovic et al., 2006; Stone et al., 2010
Psychotherapy

• Hinson et al., 2006:
  – Single-blind study, n=10, 12 weeks of psychotherapy (1 hr/wk). PMDRS: 71.2 -> 29.0 (P = .0195).
  – Improvements in Hamilton Depression Rating Scale score (P = .009), Beck anxiety inventory score (P = .002), and the Global Assessment of Functioning (P = .0083)

• Sharpe et al., 2011:
  – CBT helps as well
Psychotherapy versus neurologic observation and support

• Kompoliti et al., 2014:
  – Randomized crossover study, n=15, weekly psychotherapy versus neurologic observation and support, 3 months of each
  – At 6 months: improvement in Clinical Global Impression severity ($P = .04$), the Hamilton Depression Rating Scale ($P = .001$) and Beck Anxiety Inventory ($P < .0005$).
  – No difference between the 2 groups at 3 or 6 months.

>>> Continued neurologic support can be just as effective for treatment of PMDs as psychiatric care.
Physical therapy

• Czarnecki et al., 2012
  – Historical-cohort-study
  – 60 patients with 1 week intensive outpatient physical therapy program vs historical matched controls
  – At 1 week: 68.8% markedly improved or almost completely normal/in remission was seen in as reported by patients (73.3% based on physician assessment).
  – At 33 months, 60.4% marked improvement or almost completely normal/in remission as reported by patients (21.9% in controls) (P<0.001)
Physical therapy

• Dallocchio et al., 2010
  – Blinded rater, n=16, low-intensity (walking x 3 /week) exercise program for 12 weeks.
  – At 12 weeks: 70% improvement from baseline on the PMDRS.

• Jordbru et al., 2014
  – Cross over, randomized, n=60 (psychogenic gait), 3 weeks intensive inpatient therapy.
  – Gait improvement at 1 month and 1 year.
TENS

• Ferrara et al., 2011
  – Blinded rater, n=19, 6.9 months median follow up
  – 5 patients (26%) had greater than 50% improvement on the PMDRS score.
  – Two patients (10.5%) had 20% to 30% improvement,
  – 2 (10.5%) had transient worsening and
  – 10 (53%) had less than 5% improvement from baseline.
  – No side effects except a transient worsening of the PMD in 2 patients.
• Garcin et al., 2013:
  • n=24, blinded evaluation before and immediately after low-frequency TMS
  • 75% of patients: >50% improvement in the clinical rating scale (one-third of whom -> complete resolution).
  • At 19.8 months: some degree of persistent improvement in 71%.
  • No side effects.
Prognosis of PMD

• Early diagnosis and treatment = improved outcome.

• Long-term outcome often poor.

• McKeon et al., 2009
  – Psychogenic tremor, median follow-up of 5.1 years, 64% of patients reported moderate to severe tremor.
  – Those with mild or no tremor at follow-up had a shorter duration of symptoms prior to diagnosis.
Prognosis of PMD

• Gelauff et al., 2014
  – Systematic review of the literature
  – Highly variable reported outcomes.
  – 4 studies, 66% to 100% of patients had similar or worse symptoms at follow-up
  – 14 studies, 33% to 66% had similar or worse symptoms
  – 5 studies, 33% or less of patients had similar or worse symptoms at follow-up.
Prognosis of PMD

• Poor outcome
  – Delayed diagnosis
  – Personality disorder

• Good outcome
  Short duration of symptoms (< 1 year)
  Early diagnosis
  High satisfaction with patient care
References

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