



Function of Gait in Movement Disorders

Seoul, Korea | October 3, 2026



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Movement Disorder Society
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Functional gait disorder

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- I have no potential conflicts of interest to report.



Functional gait disorder

- A gait manifestation of functional neurological disorder (FND)
- Symptoms are experienced as involuntary and can cause substantial disability
- Psychological stressors or psychiatric illness are not required for diagnosis
- Functional symptoms can coexist with another neurological disorder

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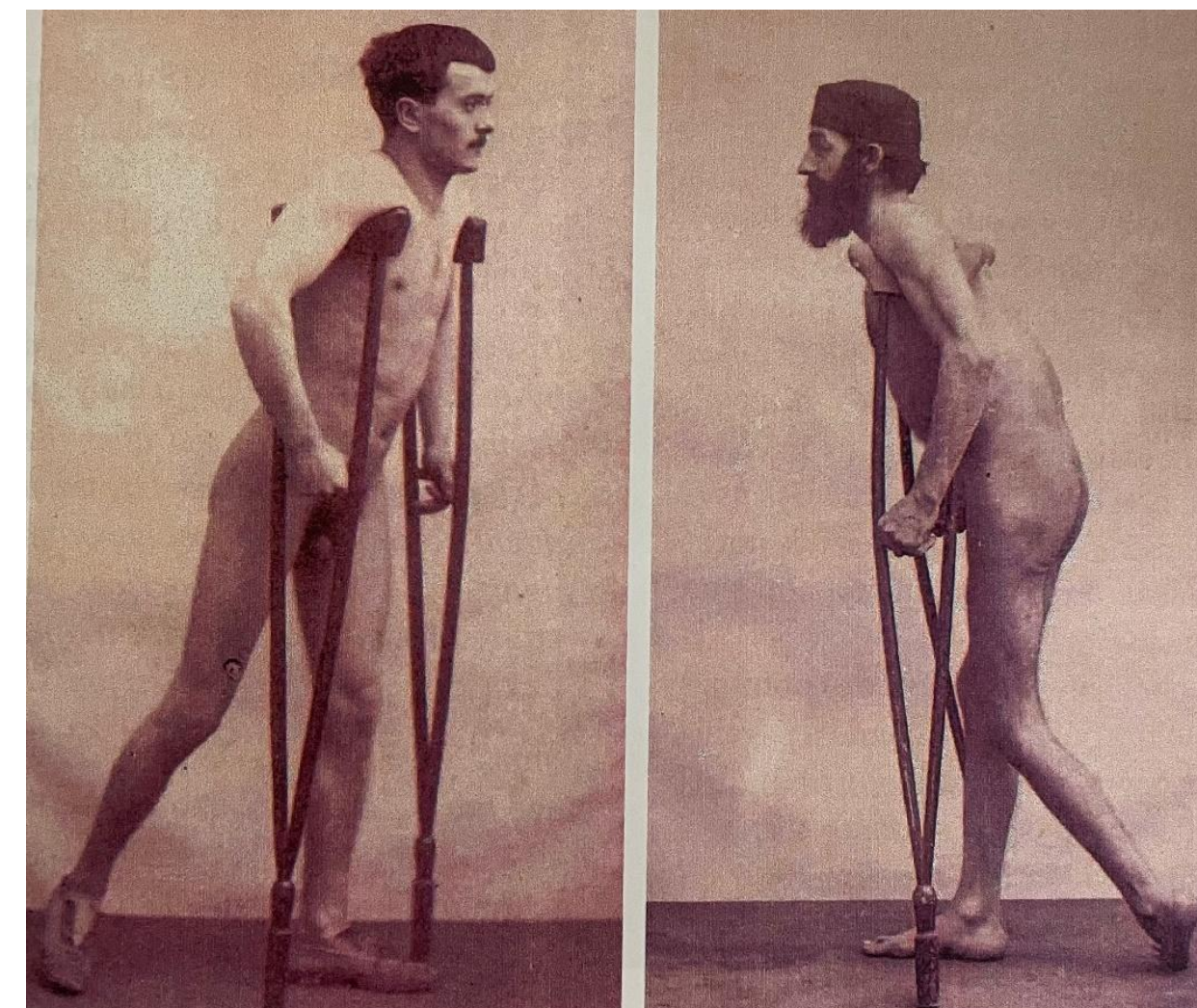
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FGD within the functional motor spectrum

- Gait disturbance often accompanies other functional motor symptoms (approximately 40%)
- Isolated FGD represented approximately 6-8.5% of FND in older cohorts
- Frequency estimates depend on the clinical setting and the denominator





Positive clinical diagnosis

- Inconsistency: demonstrable changes across tasks that reveal preserved capacity
- Incongruity: findings that do not fit the expected neurological pattern
- Interpret both in the context of a comprehensive neurological examination
- A striking or unfamiliar gait pattern alone is insufficient



A structured gait examination

- Observe standing, initiation, walking and turning in a corridor
- Describe the predominant pattern and examine strength, tone, reflexes and sensation
- Compare usual walking with tandem, backward walking or a dual task when safe
- Relate task-dependent changes to the rest of the examination

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Examples of functional gait patterns

- Excessive slowness or hesitation
- Knee buckling
- Astasia–abasia
- Tightrope walking
- Trembling or truncal jerking

[Video: knee buckling](#)

[Video: astasia–abasia](#)

[Video: tightrope walking](#)





Incongruity and task-dependent change

- Knee buckling despite normal quadriceps strength
- Scissoring without the expected corticospinal findings
- An antalgic-appearing gait without reported pain
- Marked improvement during a different motor or cognitive task



Diagnostic pitfalls: evidence from 2026

- Review of 42 publications describing 150 patients later assigned another diagnosis
 - Gait disorders and dystonia were prominent among the reported misdiagnoses
 - Reliance on incongruence alone was a recurring diagnostic problem
- The practical lesson is to seek converging, demonstrable positive signs



History as supporting evidence: TASMAN

DOI: 10.1111/ene.16525

ORIGINAL ARTICLE

Positive signs from the history as an aid for early diagnosis in functional movement disorders: The prospective TASMAN study

Tjerk J. Lagrand^{1,2,3} | Jeannette M. Gelauff⁴ | Marjolein Brusse-Keizer^{5,6} |
Alexander C. Lehn^{7,8} | Marina A. J. Tijssen^{1,2} |
other individuals of the TASMAN Study Group

European Journal
of Neurology

- Prospective cohort: 465 new referrals, including 171 with FMD
 - Onset, triggers and fluctuation patterns contributed diagnostic information
 - Associated pain, fatigue and other symptoms also helped discriminate groups
- History can support the examination, but does not replace positive motor signs

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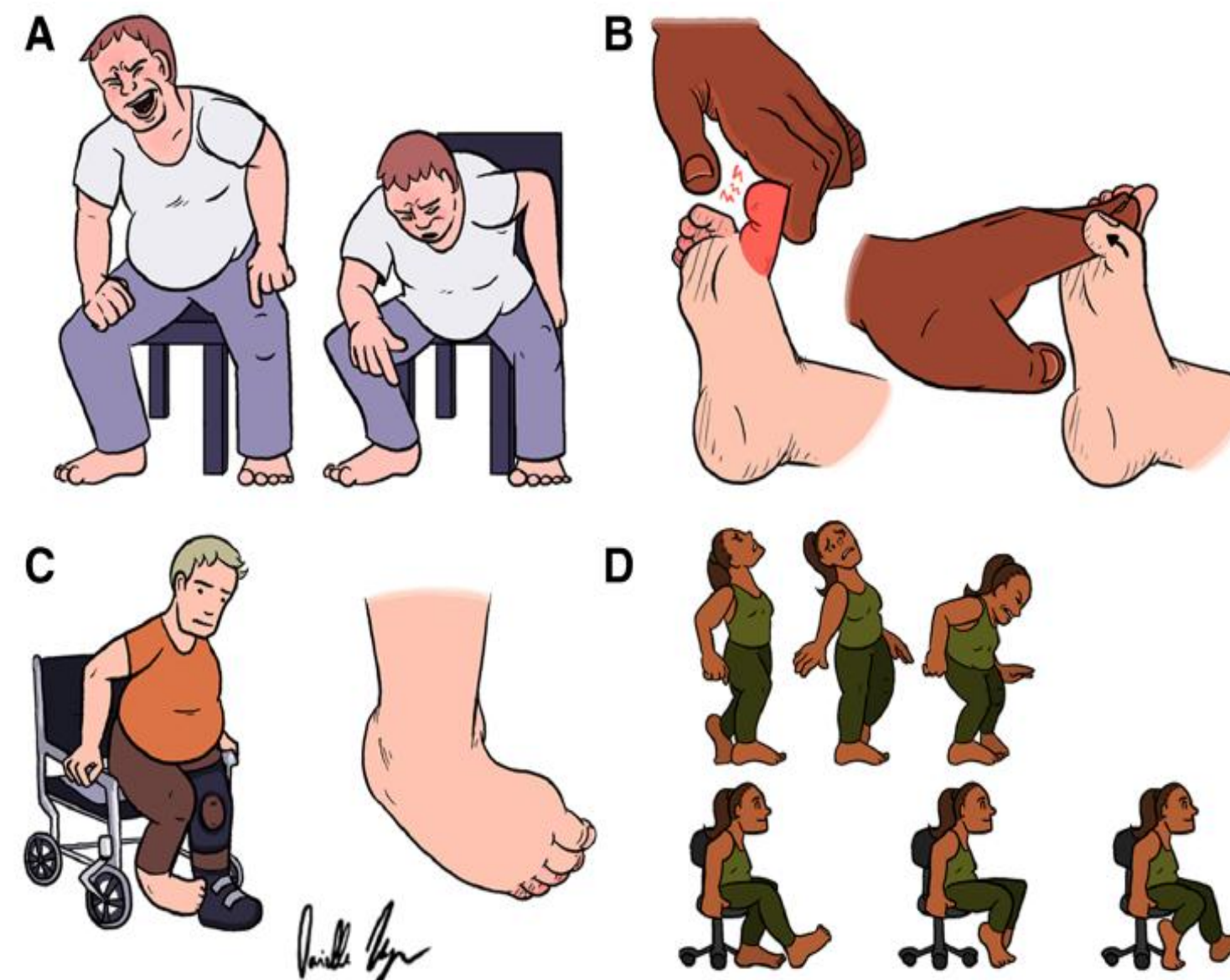
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Supportive bedside signs

- Excessive effort during gait
- Extended great-toe posture
- Fixed plantar flexion and inversion
- Swivel-chair discrepancy





Excessive effort during gait

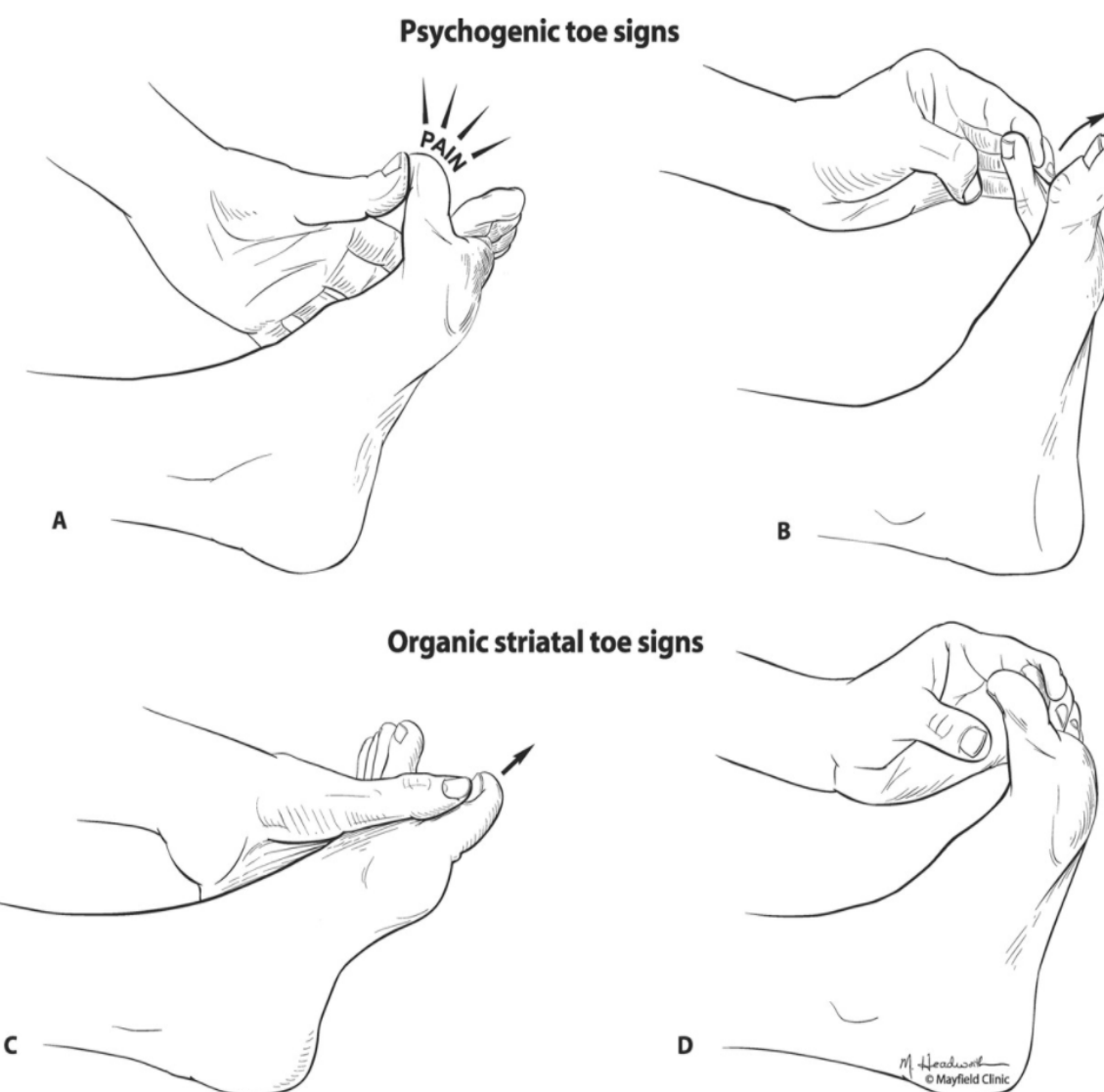
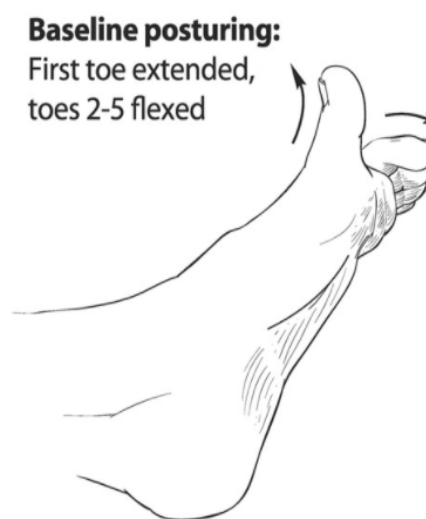
- The historical “huffing and puffing” sign includes grimacing, grunting and breath-holding
: Reported sensitivity 17–57% and specificity 89–100% in selected studies
- Interpret effort alongside pain, breathlessness and the neurological findings

[Video](#)



Extended great-toe posture

- Historically described as the “psychogenic toe” sign
- Painful resistance to passive flexion may change with manipulation of the other toes
- A rare supportive finding with limited validation



[Video](#)



Fixed plantar flexion and inversion

- May appear suddenly and remain difficult to correct passively
- Pain, fixed dystonia and complex regional pain syndrome may overlap
- The posture alone cannot establish a functional diagnosis
- Assessment should include the wider examination and functional capacity

[Video](#)



The swivel-chair sign

- Compare walking with propulsion while seated on a wheeled chair
- Original small study: 8 of 9 FGD patients could propel the chair
- A useful discrepancy to explore, with limited diagnostic validation

[Video](#)

Okun et al. Neurologist 2007;13:87–91; Sokol & Espay 2016

ORIGINAL ARTICLE

The “Chair Test” to Aid in the Diagnosis of Psychogenic Gait Disorders

Michael S. Okun, MD,†‡ Ramon L. Rodriguez, MD,* Kelly D. Foote, MD,†
and Hubert H. Fernandez, MD**





Scissoring and associated functional signs

- Scissoring without the expected tone or reflex changes prompts closer examination
- Look for other positive functional signs in the same patient
- A functional component and another gait disorder can coexist

[Video](#)

Nonnekes et al. Neurology 2020.

Video from the Department of Neurology, Dongguk University Ilsan Hospital



Attention and preserved motor capacity

- Two reported patients had acute difficulty standing still
- Balance improved during another task, such as using a phone
- The observation can help explain preserved capacity and guide retraining

NEUROLOGICAL RARITIES

iPhone-responsive functional gait disorder

Shona Scott, Jon Stone

Task-dependent improvement is clinically useful when it fits the overall exam

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Historical descriptions and current practice

- Descriptions of functional stance and gait long predate modern terminology
- Historical photographs show recognizable patterns
- Current diagnosis relies on positive examination findings and clinical context

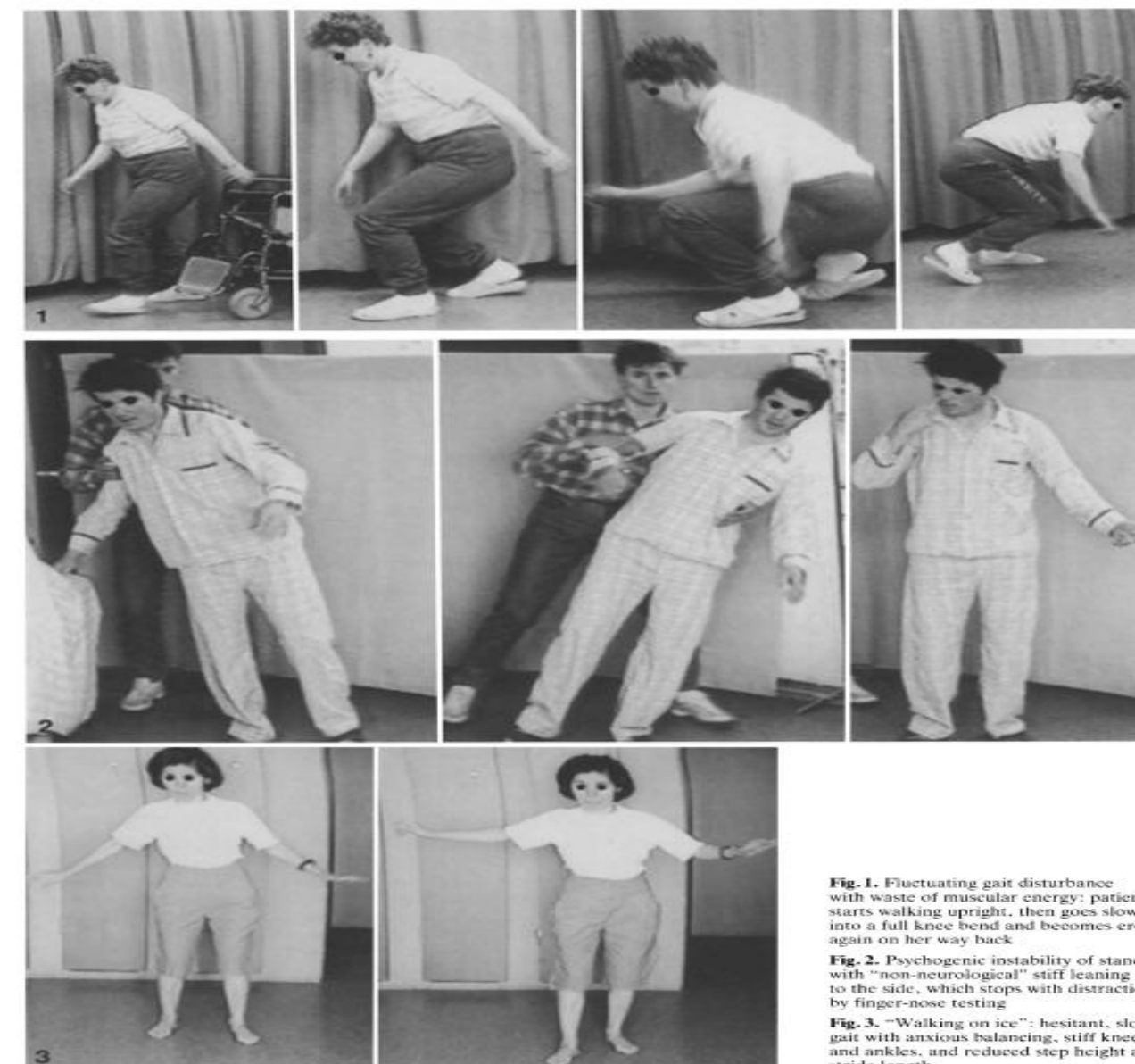


Fig. 1. Fluctuating gait disturbance with waste of muscular energy: patient starts walking upright, then goes slowly into a full knee bend and becomes erect again on her way back

Fig. 2. Psychogenic instability of stance with "non-neurological" stiff leaning to the side, which stops with distraction by finger-nose testing

Fig. 3. "Walking on ice": hesitant, slow gait with anxious balancing, stiff knees and ankles, and reduced step height and stride length

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Brain and Behavior

WILEY

Brain and Behavior

Open Access

Symptoms beyond gait: FGD-specific data

ORIGINAL ARTICLE OPEN ACCESS

Self-Reported Motor and Non-Motor Symptoms in People With Functional Gait Disorder: A Cross-Sectional Study

Sara Issak^{1,2} | Gavin Williams^{1,2} | Richard A. Kanaan³ | Natalie A. Fini² | Glenn Nielsen⁴

¹Department of Physiotherapy, Epworth Healthcare, Melbourne, Australia | ²Department of Physiotherapy, Melbourne School of Health Sciences, The University of Melbourne, Victoria, Australia | ³Department of Psychiatry, University of Melbourne, Austin Health, Victoria, Australia | ⁴Neurosciences Research Centre, Molecular & Clinical Sciences Research Institute, St George's, University of London, London, UK

- 2025 online survey of 156 people with functional gait disorder
 - Pain and fatigue were among the symptoms associated with poorer physical quality of life
 - Fear of falling and depression contributed to associations with work and social impairment
- Clinical assessment should include nonmotor symptoms and participation



Management of functional gait disorder

- A clear explanation grounded in the examination
- Rehabilitation focused on meaningful movement and activity
- Individual treatment for associated symptoms and comorbidities
- Follow-up with agreed goals and a plan for setbacks



Explaining the diagnosis

- Name the diagnosis and acknowledge the symptoms and disability
- Show the positive finding that supports the diagnosis
- Explain how preserved movement offers a starting point for rehabilitation
- Agree on the next step and check the patient's understanding



Motor retraining in practice

- Identify a task or context in which movement becomes easier
- Use external focus, rhythm or task variation to encourage more automatic movement
- Progress toward meaningful walking tasks and everyday participation
- Adapt the pace to pain, fatigue, confidence and safety



Individualized multidisciplinary care

- Physiotherapy addresses gait, movement strategies and functional goals
- Psychological treatment can address relevant beliefs, fear, distress or comorbidity
- Occupational therapy supports daily activity and return to valued roles
- Persistent pain, fatigue and other neurological symptoms need their own assessment



Physio4FMD: the major rehabilitation trial

- 355 adults with functional motor disorder at 11 hospitals
- Specialist physiotherapy: nine sessions plus follow-up
- Comparator: community neurological physiotherapy
- Primary outcome: SF-36 physical functioning at 12 months



Physio4FMD: primary outcome

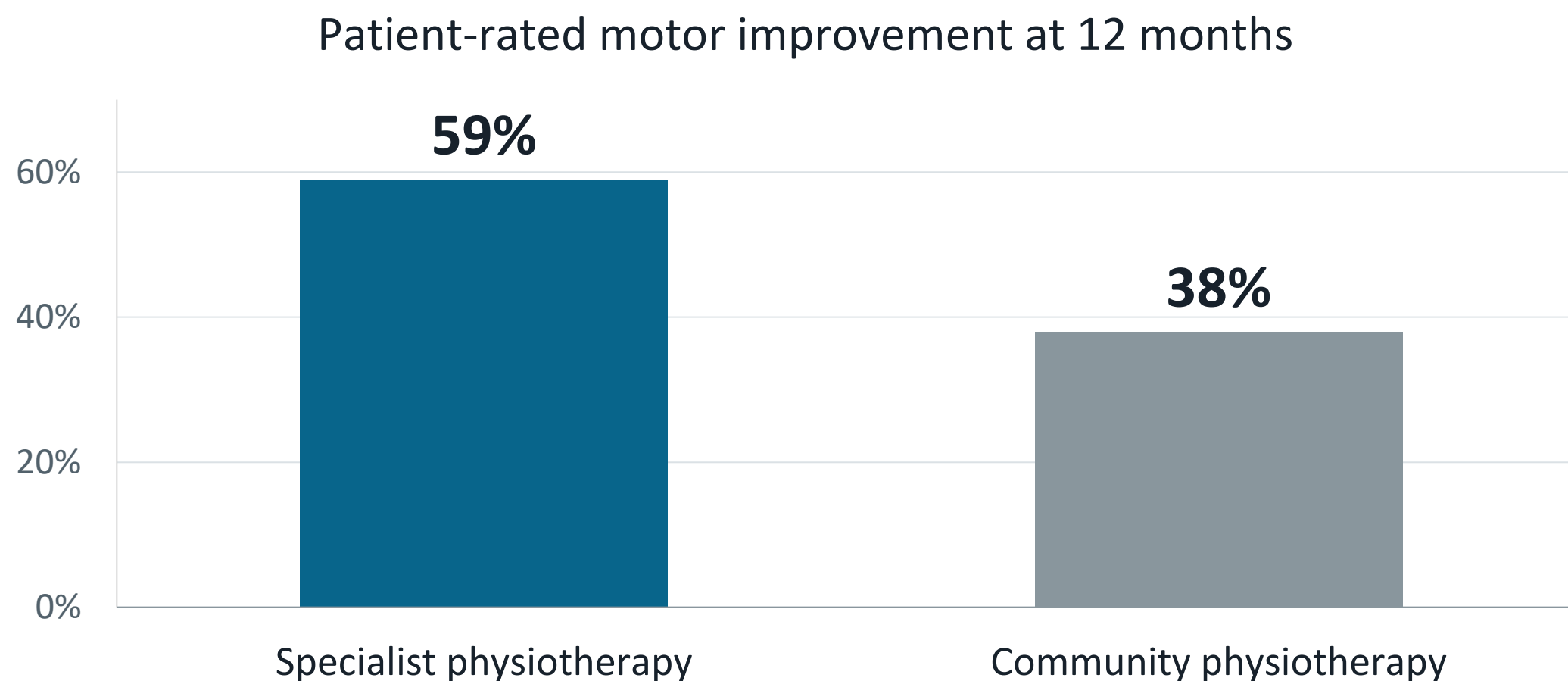
Specialist physiotherapy did not demonstrate superiority on the primary outcome

Adjusted difference: specialist minus community physiotherapy
95% CI -2.3 to 9.3 $p = 0.23$

No significant difference in SF-36 physical functioning at 12 months



Physio4FMD: secondary outcomes



- Selected secondary outcomes favored specialist treatment
- Benefits included perceived motor improvement and mental health
- These findings accompany a negative primary endpoint

Evidence from broader functional motor disorder, with an active physiotherapy comparator



Physiotherapy and cognitive behavioral therapy

- Randomized trial of 40 patients with functional movement disorders
- Specialist physiotherapy plus CBT versus supportive psychological treatment

+5.62 points

SF-36 physical component score at 5 months
95% CI 2.3–8.9

- Small, single-center trial
- Short follow-up
- No physiotherapy-only arm

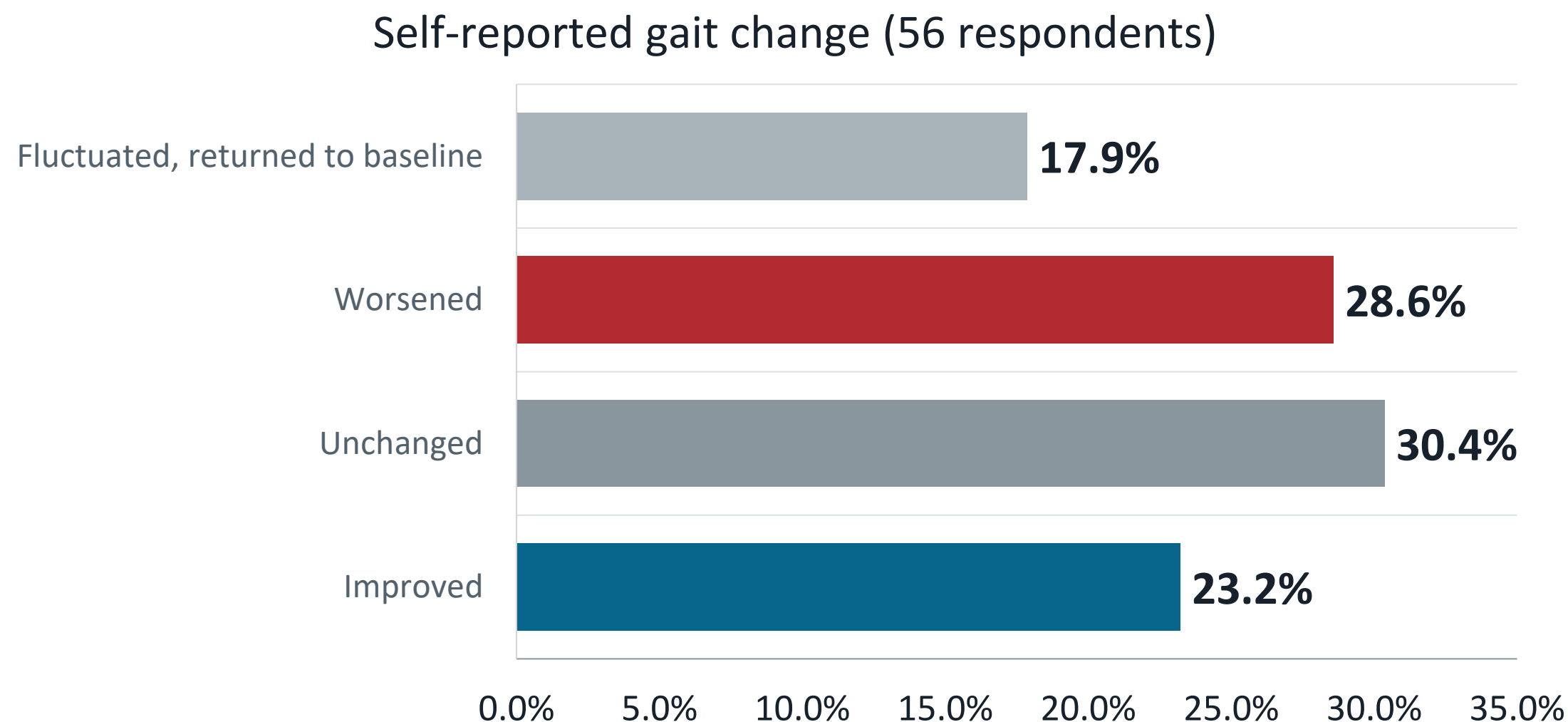
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FGD trajectories over 12 months



- 65 of 149 consenting participants responded at 12 months
- 56 answered the gait-change question
- Attrition and self-report limit generalization



Follow-up and meaningful outcomes

- Agree on a concrete activity goal (e.g., walking to a local shop)
- Track participation, walking confidence and symptom burden as well as gait appearance
- Review progress, setbacks and barriers with the rehabilitation team
- Reassess the diagnosis when new findings or an unexpected course emerge

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Take-home points

- FGD requires a positive, contextual neurological diagnosis
- Demonstrable task-dependent changes can support explanation and retraining
- Rehabilitation evidence has grown, with mixed primary and secondary trial results
- Outcome varies, and improvement remains possible in longstanding illness

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Selected references

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[Marín-Medina et al. J Neurol 2026](#)

Positive clinical diagnosis

Physio4FMD randomized trial

Full Physio4FMD report

Combined physiotherapy and CBT

TASMAN prospective study

FGD symptom burden

Longitudinal FGD outcomes

Diagnostic pitfalls