

The full HOUSE: the top five clinical tests for Functional Neurological Disorders to teach non-specialists.

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Introduction

Functional Neurological Disorders (FND) are commonly seen across medicine and surgery and most cases are seen by non-specialists.

-Both ICD 11 and DSM-5-TR have moved towards a more 'positive' diagnosis of FND rather than being a diagnosis of exclusion. A key component is the correct use of clinical tests for FND.

-However, existing teaching of FND and clinical tests to healthcare professionals is insufficient.

-Hoover's test is the best-known clinical test for FND but may not be relevant for patients with functional: arm weakness/sensory loss/ movement disorders/seizure disorders.

-Over 50 different clinical tests have been described for FND. Clarifying which tests to use may help teaching of FND to non-specialists

Aims

Our research group examined sought to establish from existing literature:

-What are the commonest presentations of FND?

-What is the range of clinical tests for FND?

-What FND tests have 90-100% specificity, in keeping with the approach to FND of 'ruling it in'?

-The main aim was to identify the most relevant presentations, then the most appropriate clinical tests for these presentations to promote a clear and refined number of tests that non-specialists could learn about in a single teaching session (which might be the only teaching they ever receive about FNDs)

Methods

A) Our research team performed literature searches using PubMed to cover the following topics:

- 1) The relative frequency with which patients with FND present with symptoms attributable to FND.
- 2) The range of different clinical tests in the literature for use in FNDs, in particular specific tests for functional weakness, functional seizure disorders, functional sensory disturbance and functional movement disorders.
- 3) Evidence for validity of existing FND clinical testing, focussing on evidence for specificity of these tests.

B) Within each topic area, project members would then compile 2-page summary documents including citations and references from their literature search.

C) These summary documents were then reviewed, relevant references cross-checked and where needed references from the articles identified by the literature searches would be assessed for possible inclusion in the project.

D) Finally, all the above work was synthesised all the above into the present poster.

Figure 1: The Queen Square Institute of Neurology where this project was carried out



Results

1) Clinical testing of functional weakness:

A total of 28 different tests were found in the literature

2) Clinical testing of functional sensory disturbance:

A total of 8 different tests were found in the literature

3) Clinical testing of functional movement disorders:

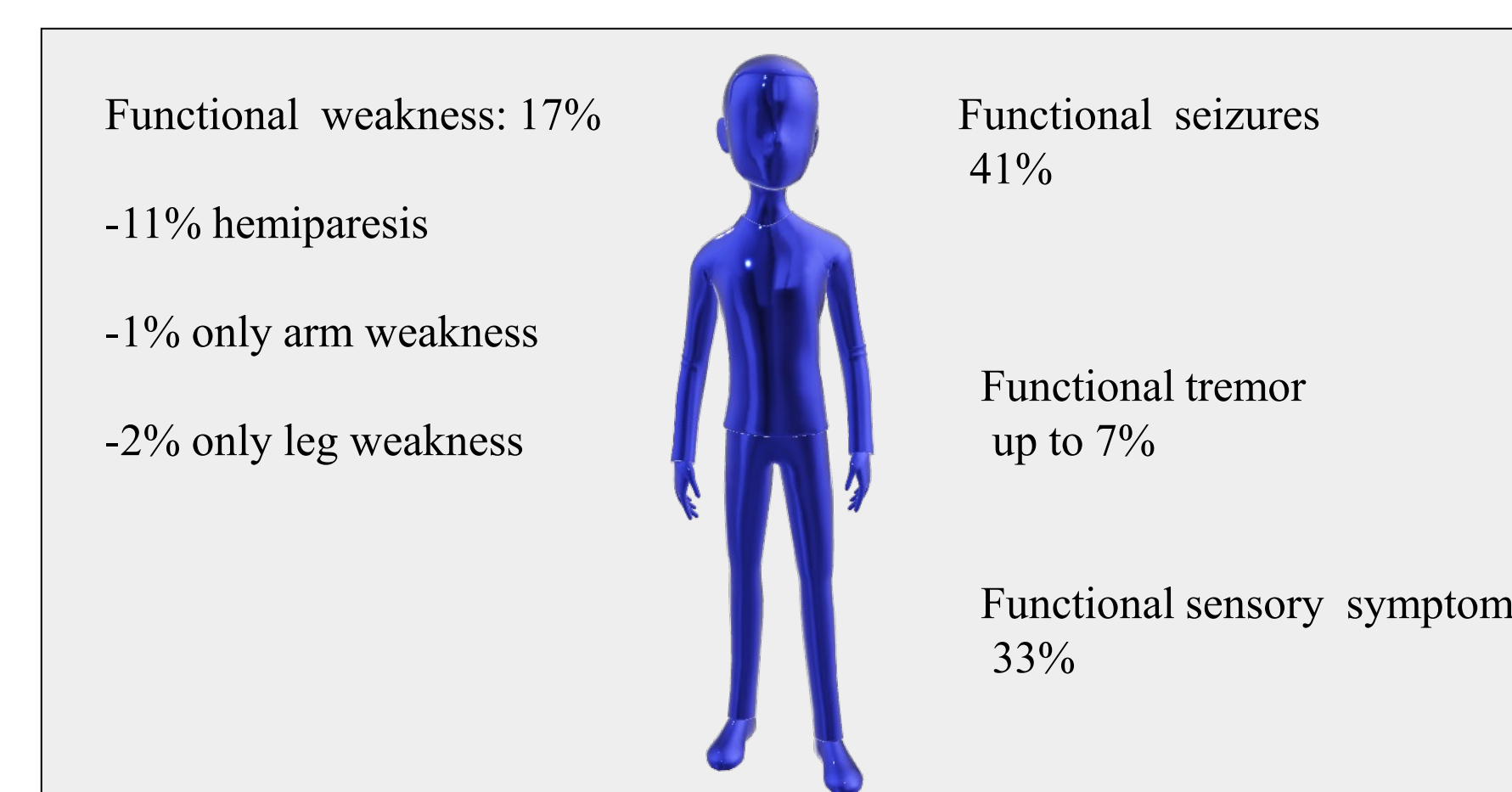
A total of 16 different tests were found in the literature

4) Clinical testing of functional seizure disorders:

A total of 9 different tests were found in the literature

Frequency of symptoms in FND ('Conversion') patients

Calculated from Stone et al 2009 with additional estimates for hemiparesis, arm weakness, leg weakness and tremor from Stone et al 2010



Functional sign	Corresponding clinical test with specificity >90%	Specificity (Patwal et al 2023) and Muthusamy et al 2022
Functional weakness of the leg	Hoover's test	97.8-100%
Functional weakness of the arm	Overhead arm drop test.	100%
Functional seizure disorder	Unopened eyes during apparent generalised seizure.	98%
Functional sensory loss	Splitting of reported sensation sharply at the midline	92.5-100%
Functional tremor disorder	Entrainment of tremor	100%

Table showing selected clinical test for each of the 5 main identified FND presentations. Each test had a specificity above 90%-in most cases much higher. Taken together these tests form the acronym 'HOUSE'.

Discussion

Whilst patients with FND can present with multiple symptoms (a mean of 9 symptoms in the study by Stone et al 2010), some presentations are particularly common.

We found that in particular, functional symptoms of altered sensation, weakness (of leg, arm or both), non-epileptic seizure disorder and tremor were among the commonest.

We found a large number of recorded clinical tests for FND, but only a small number met the required high specificity to confidently use in helping to rule in FND.

For weakness testing: collapsing weakness, leg dragging and the abductor test also had high specificities, but we selected Hoover's test as the best known FND test with the Overhead arm drop test as this specifically tested the upper limb. For functional seizures, ictal weeping had similar specificity but lower sensitivity than eye closure.

Conclusion

Our study has identified 5 of the commonest presentations of FND. For each of these presentations we identified a high specificity clinical test-consistent with the modern use of such tests to help 'rule in' FND.

We suggest providing consistent teaching to non-specialists on these 5 tests to give clarity from the 61 different clinical tests for FND identified in this study.

The acronym 'HOUSE' could be a helpful mnemonic for learners to remember these 5 tests-all of which could be taught in a single teaching session.

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References:

- Muthusamy S, Seneviratne U, Ding C, Phan TG. Using Semiology to Classify Epileptic Seizures vs Psychogenic Nonepileptic Seizures: A Meta-analysis. *Neurol Clin Pract.* 2022 Jun;12(3):234-247.
- Patwal et al Diagnostic accuracy of clinical signs and investigations for functional weakness, sensory and movement disorders: A systematic review. *J Psychosom Res.* 2023 May;168:1-10
- Stone J et al Symptoms 'unexplained by organic disease' in 1144 new neurology out-patients: how often does the diagnosis change at follow-up?. *Brain*, 2009 Volume 132, Vol 10, 2878-2888
- Stone J, Warlow C, Sharpe M. The symptom of functional weakness: a controlled study of 107 patients. *Brain.* 2010 May;133(Pt 5):1537-51