

Distinguishing neurological from non-organic conditions

Vague symptom complexes can be difficult to manage in a neurological context.

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Although neurological conditions may present with specific clinical patterns, practitioners often encounter patients with vague symptom complexes. In this context, a common trap is to assume that the condition is non-organic in origin, thereby possibly missing an important diagnosis. It is easy to be frustrated with such a patient – should they simply be reassured, or should one investigate further?

One way to deal with this is to direct history taking and examination towards the features that are likely to indicate something serious. If no sinister features are revealed, it may be best to delay further investigation in favour of repeat examination should symptoms remain or progress. Various authors have suggested strategies to differentiate between organic and non-organic causes of neurological symptoms and signs. Fahn and Williams proposed a set of diagnostic criteria for psychogenic movement disorders in 1988, which may be applied to a wide spectrum of diseases, including key features such as an abrupt onset, inconsistent features, with false weakness and sensory abnormalities, as well as distractibility.^[1]

Psychogenic neurological signs or conversion disorder generally result from a disturbance in higher cortical structures that interpret or produce neurological messages. Patients with these conditions therefore experience, but do not have control over, their signs and symptoms. The term malingering refers to the deliberate feigning of signs or symptoms, usually for secondary gain.^[2] For the purposes of this article, non-organic refers to both malingering and conversion disorder, and distinguishes them from organic pathology. Remember that paraneoplastic syndromes typically present with bizarre symptoms and signs.

Special investigations and radiological imaging are costly and time consuming. It is not just about time and money though. Sometimes well-intentioned investigations reveal incidental lesions that have nothing to do with the patient's symptoms but now become a new focus for concern. In this article the authors highlight features that will aid the clinician in decisions on referral as well as further investigations, focusing on symptom complexes that occur commonly in general practice.

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Headache

According to the WHO fact sheet on Headache Disorders (2011),^[3] an estimated 47% of adults worldwide will have headaches at least once a year. This makes headache one of the most common conditions that a family practitioner encounters in daily practice. 'Do I have a brain tumour doctor?', is a question that the headache patient often asks. Fortunately, the correct answer is almost always 'No, you don't', but the pitfall is that the patient with an intracranial tumour may have nonspecific headache as a presenting feature, as may many other organic diseases. Features suggestive of a serious underlying cause include:

- any decrease in level of consciousness
- sudden onset of severe headaches associated with neck stiffness
- headache associated with any new neurological deficit or papilloedema
- early morning headache that improves during the day

- headache associated with nausea and vomiting – in the absence of previous diagnosis of migraine
- headache that is position dependent (worse on bending forward and lying down)
- headache that is worse on straining (Valsalva and coughing)
- chronic headaches in children younger than 10 years.

In the presence of any of the abovementioned signs radiological investigation is required to rule out brain tumours, hydrocephalus and cerebral haemorrhage or subarachnoid haemorrhage. Although normal fundoscopy is often reassuring, it does not exclude an acute cause for headache.

It is extremely difficult to rule out psychiatric or non-organic causes of headaches. Therefore, the role of a careful history and insight into the patient's family, job and personal satisfaction cannot be over-emphasised.

Dizziness

Dizziness is a term used by patients to describe a whole range of symptoms – anything from feeling faint, fainting spells or light headedness to losing balance and vertigo. A detailed history is important. Dizziness is rarely caused by a life-threatening neurological condition, but it may be a sign of neurological disease.

Loss of balance (disequilibrium) may be a symptom of cerebellar ataxia or inner ear diseases such as Meniere's disease, otitis media or vestibulitis. Vertigo (the sense of motion or spinning) may be associated with cerebello-pontine lesions as well as cerebellar lesions. If any of these symptoms are associated with cerebellar signs or weakness, further investigation is warranted.

Medication and cardiac as well as anxiety disorders are more common causes of dizziness and fainting. Therefore, one should always start by ruling these out. Check patient medication history, blood pressure, ECG, and psychological history thoroughly.

The presence of the following in the history should alert to the potential for neurological causes of the dizziness:

- recent trauma or head injury
- leakage of fluid (CSF) from the ear or nose
- poor co-ordination of gait or fine motor activity (such as buttoning a shirt)
- associated headaches or vomiting
- transient blindness or blind spots in visual field
- problems with swallowing or speech
- association with seizures or absences.

A thorough neurological examination should always be part of the workup of any patient complaining of dizziness. Also check eye-sight in the elderly, the neck for presence of bruits and the external ear canal for the presence of wax build-up.

Weakness/lameness

Weakness of a limb or of all the limbs is a frequent claim in insurance and workman's compensation claims. This is probably one of the most readily manipulated features of malingering behaviour. There are, however, some tricks that the astute physician can use to counter these 'acts'. With few exceptions, motor weakness fits into either an upper motor neuron or lower motor neuron pattern (Table 1).^[4] There are, however, some exceptions such as motor neuron disease, which may have both upper and lower motor neuron signs.

Weakness that does not fit into any of these categories is unlikely to be organic in origin. Remember to check deep tendon reflexes in different positions, as they tend to be constant if disease is present. Another useful test to differentiate organic from non-organic weakness is the sternocleidomastoid muscle group test. Anatomically, the muscle on the right of the neck causes rotation to the contralateral side and flexion, therefore turning the head to the left tests the muscle on the right side. Weakness of all muscles

Table 1. Upper versus lower motor neuron weakness

Upper motor neuron weakness	Lower motor neuron weakness
Muscle weakness	Muscle weakness
Less atrophy of muscles (may be disuse)	Atrophy of muscles
Increased tone, spasticity	Low muscle tone
Increased deep tendon reflexes	Diminished or absent deep tendon reflexes
No fasciculation	Fasciculation
Hemiplegic, quadriplegic or paraplegic distribution of weakness; upper limb extensors and lower limb flexors predominantly affected	Specific distribution of weakness, i.e. proximal weakness in muscle dystrophy v. distal weakness in peripheral neuropathies
Decreased or absent abdominal reflexes	Abdominal reflexes present
Extensor plantar reflex (Babinski sign)	Flexing plantar reflexes
Clonus at ankle and patella	Raised creatine kinase level in muscular diseases
Flexor withdrawal reflex	Abnormal electromyograph

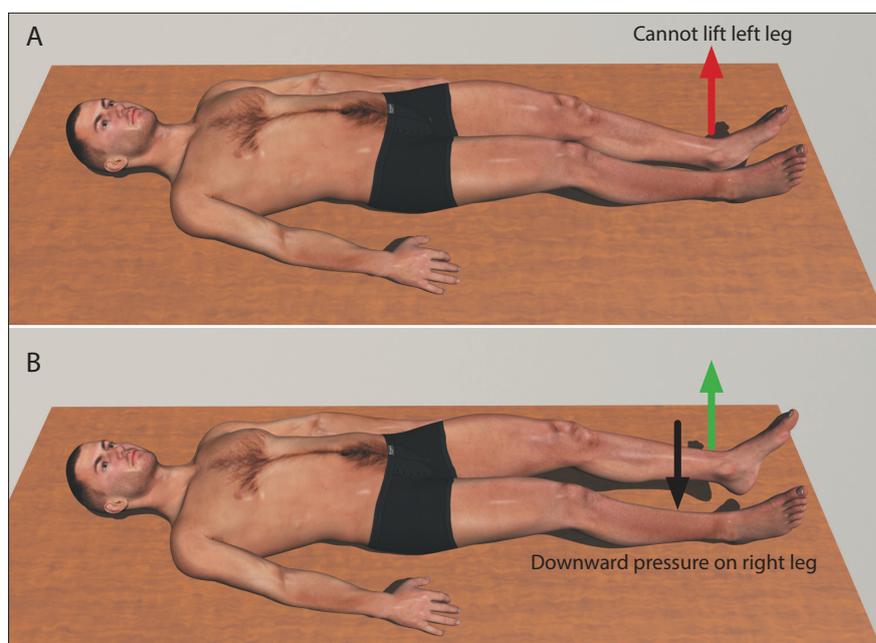


Fig. 1. Hoover's sign.

on the right, but intact head turning and flexion to the left, should cause suspicion. Testing limb muscles on the left in standing or sitting on unsteady surfaces also shows intact postural reflexes that utilises muscles of the trunk and contralateral limbs to stabilise, hereby allowing the examiner to observe discrepancies in the formal testing and these 'catch out' tests. The Hoover sign^[5] is designed to elicit this phenomenon (Fig. 1).

Sensory changes

When doing a sensory examination it is very important to have a sound understanding of the anatomy of the sensory system.^[6] Organic

sensory abnormalities tend to follow certain rules:

- dermatomal pattern in radicular syndromes
- glove and stocking distal sensory loss in peripheral neuropathies, such as diabetes mellitus and alcohol neuropathy
- spinal injury or compression causes a definite sensory level
- central cord syndrome leads to a suspended sensory level ('cape distribution')
- herpes zoster has typical vesicular skin changes and follows a clear dermatomal pattern that does not cross the midline
- myofascial pain syndromes may have patchy areas of sensory changes; however,

these are associated with well-defined trigger points in associated muscles

- peripheral nerve injuries have specific patterns with autonomic changes, such as anhydrosis of the same area and weakness of denervated muscles
- neurological sensory loss remains consistent – the sensory system does not ‘forget’ which area it innervates, but patients forget.

Keep the motor examination findings in mind when deciding on organic versus non-organic features.

The technique used to test sensation may also elucidate inconsistencies in the patient’s fall-out. It is good practice to test sensation in such a way that the patient cannot watch what you are doing (instruct the patient to keep their eyes closed and ask for a response when they feel anything, instead of asking ‘do you feel this?’ every time). Malingering patients are easily confused by position change, so it is a good idea to examine sensation with the patient on their back and repeat testing after asking them to turn over. If the side of sensory loss changes from one side to the other this is clearly not organic. Some of the most convincing patients are those who say they can’t feel pain when in fact they can and the tell-

Table 2. Red flags in back pain

History	Physical examination
History of cancer	Saddle anaesthesia
Unexplained weight loss	Loss of anal sphincter tone
Steroid use over long periods	Motor fall-out in lower limbs
Recurrent UTIs	Fever
Fever	Tenderness over spinous processes
Pain – not relieved by rest	Increased reflexes
Bladder and bowel incontinence	Limited spinal range of motion
Child less <10 years; adults >50 years	
Urinary retention	

tale feature is that they want to show you how much stimulation they can take. Beware of the person who asks you to push the pin in. Testing of pinprick (pain – lateral spinothalamic tract), light touch (antero-lateral spinothalamic tract) as well as proprioception (dorsal columns) is usually deemed sufficient for the general sensory examination.

Seizures

Epilepsy is one of the neurological emergencies. It is important to differentiate the ‘mimics’ of epilepsy and treat other causes of seizures accurately from the beginning.^[7] These can include migraine, parasomnia, delirium tremens and psychosis. Apparent seizures are also one of the more common non-organic hysterical attacks. The typical features of an epileptic attack are therefore noteworthy:

- epilepsy can occur in any position or posture – rule out postural causes such as syncope
- personal injury such as tongue biting or bruising
- unawareness of surroundings or events during a generalised seizure
- loss of autonomic control such as bladder incontinence
- no clear trigger identifiable, such as stressful home events
- temporal lobe epilepsy (complex partial seizures) may present with features of psychotic episodes or abnormal behaviour
- unprovoked and surprising nature.

Epilepsy is, however, a broad topic and for the purpose of this article it is important to convey the following message – adult-onset seizures must be investigated to rule out organic pathological conditions such as brain tumours.

Back pain

Back and neck pain are among the most common problems that confront the family physician. About 1 in every 4 patients in a developed country reports low back pain. Neck pain gets reported in 13% of people.^[8] Costs associated with management and investigation adds up to \$50 billion every year in the USA.^[9] It is therefore important that every medical practitioner knows when to investigate further these common complaints. ‘Red flags’ in back pain are listed in Table 2.^[10]

Waddell’s signs^[10] are useful in deciding who needs further investigation (Table 3). The heel tap test^[11] is a rapid alternative to Waddell’s test. The patient sits on a bench with hips and knees flexed at 90 degrees. The examiner then suggests to the patient that the test may cause lower back pain and then lightly taps the patient’s heel (Fig. 2). A complaint of sudden-

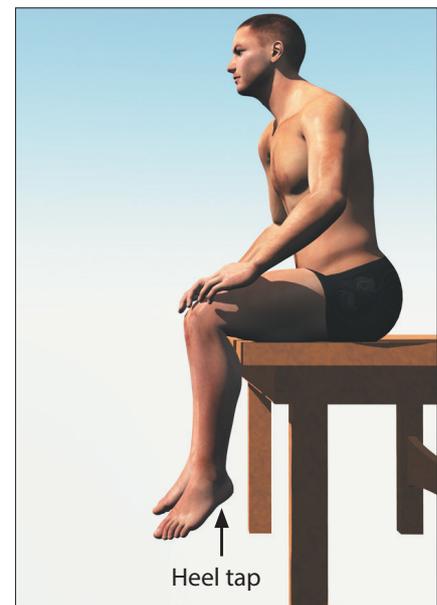


Fig. 2. Heel tap test.

Table 3. Waddell's signs

Tenderness	
Superficial	Skin tender over large area of lumbar skin
Non-anatomical	Not in a dermatome or myotome
Stimulation tests	
Axial loading	Pain on vertical pressure on patient's skull – discount neck pain
Rotation	Back pain on passive rotation of shoulders and pelvis in same plane
Regional signs	
Weakness	'Giving away' of many muscle groups – not explained anatomically
Sensory changes	Non-dermatomal pattern
Distraction: straight leg raising	'Distract' patient by comparing straight leg raise and sitting on couch and extending the knee and ankle
Overreaction	Out of what might be expected – 'over- dramatised'

onset back pain is considered a positive heel tap test. This test correlates well with Waddell's test and can easily be incorporated into any bench-side examination to identify potential non-organic back pain.

Nausea and vomiting

Nausea and vomiting are common. There are, however, associated features that may indicate a neurological cause. Cerebellar lesions are probably the most commonly missed neurological cause of persistent nausea and vomiting, especially in children. The following are red flags:

- early-morning daily vomiting (in the absence of pregnancy) – may indicate raised intracranial pressure
- associated severe headaches
- visual changes
- torticollis or opisthotonus in children
- any neurological signs such as motor deficit, anisocoria, meningism and respiratory pattern changes
- recent head trauma
- previous neurosurgery, including endoscopic third ventriculostomy or ventriculo-peritoneal shunt for hydrocephalus.

In the presence of any of the abovementioned features a detailed neurological examination is required and a CT scan of the brain is indicated.

Vision problems

It is estimated that about 1% of visual problems seen by an ophthalmologist are non-organic in nature.^[12] This is even more

common in general practice. Establishing that the objective visual acuity is better than the subjective visual loss is the mainstay of evaluation.

Several tests are available to determine true visual acuity as well as visual field deficits and the reader is encouraged to read the article on non-organic visual loss for detailed description on these tests. In general there are four crude tests which can be done to evaluate non-organic visual loss:^[12]

- an intact 'menacing' reflex (rapid movement towards the eye – leading to reflex blinking or turning of the face) shows at least some crude vision present
- moving a mirror in front of the blind eye and observing for pursuit movements
- checking for optokinetic nystagmus – one needs at least 6/60 visual acuity if this is present
- testing of proprioception is independent of vision – a person feigning blindness might not know this and will therefore not be 'able' to tell position of joints in space.

Binocular visual acuity and visual field defects are present in up to 80% of non-organic causes. This is rare in organic pathology. The visual field abnormalities tend to be 'too clear cut' in non-organic defects. Signs that are too perfect are suspicious. The pupillary light reflex and accommodation reflex are non-voluntary and therefore important identifiers of non-organic pathology. Associated cranial nerve

abnormalities and other neurological signs indicate the need for further investigation such as CT scanning of the brain and even visual evoked potentials.

In young patients and those without associated psychiatric diagnosis, complete recovery of vision can be expected in up to 78% of cases. This good prognosis and reassurance should form the basis of management in patients with non-organic visual problems.^[13]

About 1 in every 4 patients in a developed country reports low back pain.

Conclusion

Non-organic pathology is commonly encountered in general practice. Neurological symptoms and signs are some of the most common areas of concern. An important start is a detailed history and a thorough examination. The abovementioned lists are not exhaustive. An opinion from another doctor is always just a phone call away and is a valuable way of ensuring that something is not missed. Most important in managing patients with non-organic disorders is

reassurance that there is no life-threatening illness, and to give support. Always emphasise the good prognosis, as their presentation is not always about personal gain. Sometimes patients are just worried about their health.

References

1. Voon V, Lang AE, Hallett M. Diagnosing psychogenic movement disorders - which criteria should be used in clinical practice? *Nat Clin Pract Neuro* 2007;3(3):134-135. [<http://dx.doi.org/10.1038/ncpneuro0408>]
2. Mace CJ. 'Hysteria', 'functional' or 'psychogenic'? A survey of British neurologists' preferences. *J R Soc Med* 1991;84:471-475.
3. World Health Organization. Headache disorders - fact sheet. Geneva: World Health Organization, 2011. <http://www.who.int/mediacentre/factsheets/fs277/en/> (accessed 16 January 2013).
4. Van Der Meyden C. *Neurology Handbook*. 1st ed. Pretoria: University of Pretoria, 1999.
5. Stone J. Functional neurological symptoms. *J R Coll Physicians Edinb* 2011;41(1):38-41. [<http://dx.doi.org/10.4997/JRCPE.2011.110>]
6. Voiss DV. Occupational injury. Fact, fantasy, or fraud? *Neurol Clin* 1995;13(2):431-446.
7. Smith PEM. Epilepsy: Mimics, borderland and chameleons. *Practical Neurology* 2012;12(5):299-307.
8. Deyo RA, Mirza SK, Martin BI. Back pain prevalence and visit rates: Estimates from US national surveys, 2002. *Spine* 2006;31(23):2724-2727.
9. Frymoyer JW, Cats-Baril WL. An overview of the incidences and costs of low back pain. *Orthop Clin North Am* 1991;22(2):263-271.
10. Bratton RL. Assessment and management of acute low back pain. *Am Fam Physician* 1999;60(8):2299-2308.
11. Waddell G, McCulloch JA, Kummel E, Venner RM. Nonorganic physical signs in low-back pain. *Spine* 1980;5(2):117-125. [<http://dx.doi.org/10.1097/00007632-198003000-00005>]
12. Blom AT, Whitehouse S, Orr B, Smith E. A new sign of inappropriate lower back pain. *Ann R Coll Surg Engl* 2002;84:342-343. [<http://dx.doi.org/10.1308/003588402760452682>]
13. Beatty S. Non-organic visual loss. *Postgrad Med J* 1999;75(882):201-207.

IN A NUTSHELL

- Hard neurological signs should always warrant further investigation.
- Make use of 'trick' tests, such as the heel-tap test, to catch out malingering patients.
- Children under 10 years should not have chronic headaches – always investigate further.
- Persistent nausea and vomiting needs neurological workup, especially in children.
- Acknowledgement and reassurance forms the mainstay of treatment in non-organic pathology.