

**PERIPHERAL
NEUROPATHY
CHEAT SHEET**
Peripheral Neuropathy & Sensory Ataxia — Cheat Sheet for Vestibular Physicians

Anchor on the Romberg-positive, eyes-closed decompensation and the dorsal-column pathway. Separate sensory from cerebellar and vestibular ataxia at the bedside.

► Why sensory ataxia matters

Large-fibre sensory neuropathy is a primary or major cause of imbalance in 15–25% of balance-clinic patients, and combined somatosensory and vestibular loss triples the fall rate. There are no validated criteria — diagnosis is clinical, and a structured work-up identifies a treatable cause in 75–80%.

Indications — when this work-up fits

- **When to apply this work-up**
- **Progressive gait unsteadiness, worse in the dark and on uneven ground, with a positive Romberg sign.**
- **Impaired vibration (128 Hz) and joint-position sense at the toes and ankles with absent ankle reflexes.**
- **Distinguish from cerebellar ataxia, bilateral vestibular hypofunction, dorsal-column/cord disease and functional gait disorder.**

Mechanism — why sensory ataxia happens

Site	Lesion	Clinical relevance
Peripheral nerve axon	Axonal loss (DPN, toxic) or demyelination (CIDP)	Length-dependent, distal SNAP loss; the commonest pattern.
Dorsal root ganglion	Neuronopathy (anti-Hu, Sjögren)	Non-length-dependent, asymmetric; profound proprioceptive loss with pseudoathetosis.
Dorsal columns	B12 SCD, cervical myelopathy, MS	Romberg-positive with normal NCS; inverted-V T2 signal on cord MRI.

Pearl — Time the bedside, not the scan — tandem gait fails before the Romberg turns positive, and pseudoathetosis signals severe loss; screen for neuronopathy, B12 deficiency and paraneoplastic disease.

Diagnostic approach — clinical, then localise

Stage	What to establish
Confirm proprioceptive	Romberg-positive, eyes-closed decompensation; not cerebellar (little change on eye closure) or vestibular (oscillopsia, positive head-impulse).
Localise the lesion	NCS pattern — axonal vs demyelinating vs ganglionopathy; reflexes, sensory level and MRI for dorsal-column or cord disease.

Pearl — There are no validated criteria for 'sensory ataxia' — confirm the ataxia is proprioceptive first, then localise to peripheral nerve, dorsal root ganglion or dorsal column.

Investigations — anchored on nerve conduction studies

Test	Purpose	When to order
Nerve conduction studies / EMG	Axonal vs demyelinating vs ganglionopathy; absent sural SNAP earliest	First-line in every case.
Bloods: B12 + MMA, folate, HbA1c, FBC, U&E, LFT, TFT, SPEP/UPEP, ESR/CRP, ANA, anti-SSA/SSB	Identify common and reversible causes	First-line; MMA catches functional B12 deficiency.
Onconeural Abs (anti-Hu, CV2, CASPR2, MAG) + CT / FDG-PET	Paraneoplastic neuronopathy / occult malignancy	Subacute, asymmetric or non-length-dependent.
Skin punch biopsy (IENFD)	Confirm small-fibre neuropathy	NCS normal but neuropathic picture.
MRI cord (± brain)	Dorsal-column disease (inverted-V T2), myelopathy	Romberg-positive with normal NCS.

Pearl — Pair B12 with MMA — functional deficiency hides behind a low-normal B12, especially in the elderly and patients on a proton-pump inhibitor or metformin.

Differential diagnosis — high-yield mimics

Mimic	Key distinguishing features
Cerebellar ataxia	Broad-based; little change on eye closure (Romberg weak/negative); dysmetria, gaze-evoked nystagmus, dysarthria.
Bilateral vestibular hypofunction	Oscillopsia, reduced dynamic visual acuity, bilaterally positive head-impulse, absent calorics; also worse in the dark.
Dorsal-column / cord disease	Brisk or pathological reflexes, a sensory level, Lhermitte's, bladder involvement; relatively preserved NCS.
Functional gait disorder	Internal inconsistency, improvement with distraction, Hoover's sign; requires positive signs, not just normal tests.
CANVAS	Cerebellar, neuropathic and bilateral vestibular failure together; consider RFC1 repeat-expansion testing.

► **Red flags — image or refer before reassuring** — Subacute, asymmetric, non-length-dependent ataxia with pseudoathetosis → paraneoplastic; urgent CT/FDG-PET. Brisk reflexes, a sensory level or Lhermitte's → cord disease; image the spine. Rapidly progressive ataxia with raised CSF protein → CIDP (treatable).

Management — aetiology first, then rehabilitation

Target	Intervention	Practice principles
Reversible cause	B12 IM; glycaemic control; IVIG/SCIG or steroids for CIDP	B12 recovers 70–80% if early; DPN slowed not reversed; CIDP ~70% respond.
Neuropathic pain	Pregabalin / duloxetine / amitriptyline	Choose by comorbidity; treat sleep and mood.
Balance rehabilitation (12 wk)	Gaze stabilisation, floor→foam, dynamic and dual-task gait, proprioceptive surfaces	Works by sensory substitution; the most evidence-supported functional gain.
Falls prevention	Home/lighting, cane, thin firm-soled shoes	Cane restores hand feedback; thick cushioned soles reduce plantar input.

Pearl — You cannot regrow the lost fibres — rehabilitation retrains the brain to balance without them. Treat the reversible cause early, before axonal loss becomes fixed.

Counselling and follow-up

- Review 3–6-monthly while active and annually when stable; repeat NCS at 12 months; DGI/FGA/Berg at each rehab review.
- Monitor HbA1c and B12/MMA annually; watch immunotherapy side-effects (IVIG thrombosis, steroid effects).
- Address falls risk actively and screen for low mood and anxiety — both are common and treatable.
- Driving: counsel on night-time and uneven-ground risk; review per jurisdiction where falls or visual reliance are significant.

Prognosis — tracks the underlying cause

B12 deficiency recovers well if treated before axonal loss; diabetic neuropathy is slowed but rarely reversed; CIDP remits in roughly 70% but relapses off treatment; paraneoplastic and hereditary disease usually plateau or progress. Functional adaptation and rehabilitation improve quality of life even when the neurological deficit is fixed.

Key references — England 2009 (AAN/AANEM DSP) · Van den Bergh 2021 (EFNS/PNS CIDP) · Dyck & Thomas, *Peripheral Neuropathy* · Allet 2010 (Cochrane, exercise in diabetic neuropathy) · Cortese 2020 (RFC1 CANVAS).