MdDS CHEAT SHEET

Mal de Débarquement Syndrome — Cheat Sheet for Vestibular Physicians

Anchor on the paradoxical motion-relief: internal rocking that eases with passive motion and returns at rest, after prolonged travel.

► Why MdDS matters

A central disorder of velocity-storage maladaptation — not a labyrinthine lesion. Persistent rocking, swaying or bobbing that continues after prolonged passive motion, classically a cruise. About 1–3% of specialist dizziness-clinic diagnoses; ~75–80% female; peak onset in the fourth to fifth decade. Frequently missed for years; the diagnosis is clinical and the vestibular battery is normal.

► When to apply this work-up

- Persistent non-spinning rocking, swaying or bobbing ≥48 h, continuous or near-continuous.
- Onset within ~48 h of ending prolonged passive motion (sea > air > land) — or spontaneous-onset with no trigger.
- Temporary relief with passive-motion re-exposure (being driven, flying) — the diagnostic hallmark; active self-motion does not relieve.
- Distinguish from PPPD, vestibular migraine, bilateral vestibulopathy, Ménière's and posterior-fossa disease.

► Mechanism — why MdDS happens

Layer	Mechanism	Clinical relevance
Velocity storage	Nodulus/uvula + medial vestibular nuclei extend the VOR time constant	Substrate that adapts to sustained motion
Entrainment	VOR adapts to the oscillatory frequency of travel (~0.16–0.2 Hz ocean swell)	Normal 'sea-legs' adaptation
Failed extinction	Adapted state persists after motion ceases; brain stays 'locked' to the frequency	Generates the internal rocking signal
Modulators	Oestrogen–GABA influence; shared migraine vulnerability	Female predominance; screen and treat migraine

Pearl — *Optokinetic attenuation of velocity storage (Yakushin 2024) reduces symptoms — the mechanistic basis of readaptation therapy.*

► Diagnostic criteria — Bárány Society 2020

Criterion	Requirement
A — Core symptom	Non-spinning rocking/swaying/bobbing, continuous or near-continuous ≥48 h
B — Motion trigger	Onset ≤48 h after ending prolonged passive motion lasting hours to days
C — Motion relief	Temporary reduction/abolition on passive-motion re-exposure (paradoxical)
D — Duration	Transient: resolves <1 month · Persistent: >1 month
E — Exclusion	No better neuro-otological explanation (normal battery, audiogram, MRI)

Pearl — *A, C, D and E met but no motion trigger (B absent) → probable spontaneous-onset MdDS; exclude PPPD, vestibular migraine and FND first.*

► Investigations — exclude mimics, document a normal baseline

Test	Purpose	When to order
VNG + vHIT + calorics	Expected normal; exclude a peripheral lesion	Tier 1 — all patients
Pure-tone audiometry, tympanometry	Normal; hearing loss points away from MdDS	Tier 1 — all patients
MRI brain + gadolinium (IAM / posterior	Exclude tumour, demyelination,	Tier 2 — at presentation

fossa)	degeneration, stroke	
Posturography; cVEMP/oVEMP; bloods; orthostatic BP	Adjuncts to clarify atypical presentations	Tier 3 — atypical only

Pearl — *Normal results are confirmatory, not frustrating — the lesion is central adaptation, not the ear.*

► Differential diagnosis

Mimic	Key distinguishing features
PPPD	Worsens (not relieved) with motion; provoked by upright posture and complex visual scenes
Vestibular migraine	Episodic migrainous attacks; headache, photophobia/phonophobia; may coexist
Bilateral vestibulopathy	Oscillopsia; imbalance worse in the dark / on uneven ground; abnormal vHIT and calorics
Ménière's disease	Episodic spinning vertigo with low-frequency SNHL, tinnitus and aural fullness
Posterior-fossa pathology	Direction-changing nystagmus, focal signs, gait ataxia → urgent MRI
Functional (FND) / anxiety	Variable, distractible; no consistent motion trigger or paradoxical relief

► ***Red flags —*** *Hearing loss or tinnitus · spontaneous direction-changing nystagmus · focal neurological signs · gait ataxia out of proportion to symptoms → urgent neuroimaging to exclude a central structural lesion.*

► Management — stepwise

Tier	Intervention	Practice principles
Foundation	Diagnosis, education, reassurance	Frame as a relearnable central adaptation; set realistic expectations
Disease-modifying	VOR readaptation — the Dai protocol	Optokinetic + head movement at ~0.16–0.2 Hz; ~64% response (Schoenmaekers 2024). NOT standard VRT
Symptomatic	Low-dose clonazepam 0.25–0.5 mg BD	Best anecdotal evidence; balance benefit against dependence/sedation
Adjuncts	SSRI/SNRI; migraine prophylaxis	For anxiety or SO-MdDS overlap; optimise comorbid migraine
Refractory	rTMS; specialist vestibular referral	Emerging; small sham-controlled evidence

Pearl — *Standard habituation / gaze-stabilisation VRT is designed for peripheral hypofunction and may worsen MdDS — refer for the Dai readaptation protocol instead.*

► Counselling and follow-up

► Transient cases may remit; persistence beyond 6–12 months is less likely to self-resolve — treat early.
► Readaptation achieves meaningful, sustained improvement in 60–70%; complete resolution in a minority.
► Recurrence risk is elevated with future prolonged passive motion (especially cruises); repeat episodes are often longer.
► Screen and treat anxiety/depression; integrate CBT where avoidance is prominent.

► Subtypes & prognostic factors

Motion-triggered (MT-MdDS): within ~48 h of travel, sea most common. Spontaneous-onset (SO-MdDS): no identifiable trigger, longer duration, more anxiety, overlaps PPPD. Worse prognosis with longer duration at presentation, migraine comorbidity, significant anxiety, spontaneous onset, and no access to readaptation therapy.

Key references — Cha YH et al. Bárány Society MdDS criteria. J Vestib Res 2020;30:285–293 · Schoenmaekers C et al. Front Neurol 2024;14:1359116 · Dai M et al. Front Neurol 2014;5:124 · Yakushin SB et al. Front Neurol 2024;15:1186902 · Kinkhabwala CM et al. Otol Neurotol 2023;44:e197–e203.