VP 07 CHEAT SHEET

Concussion Vestibular Rehab — Cheat Sheet for Physiotherapists

VOMS, Buffalo Treadmill, sub-symptom threshold exercise, return-to-play.

► Why concussion vestibular rehab matters

Active rehab beats prolonged rest. 50–80 percent of concussion patients have dizziness acutely; 15–30 percent persist beyond a month. Leddy 2019 RCT (n=103 adolescents): sub-symptom aerobic recovered in 13 vs 17 days versus stretching control; persistent symptoms beyond 28 days fell from 13 to 4 percent. Early VOMS + Buffalo treadmill + sub-symptom threshold dosing is the evidence-based pathway.

Indications — when this approach fits

► When to use this pathway

- ► Acute or sub-acute concussion with vestibular, ocular or cervical trajectory features.
- ► Post-concussion dizziness or motion sensitivity persisting beyond 7–10 days.
- ► Athletes progressing through return-to-play protocols, after BPPV has been ruled out.

Five concussion trajectories

Trajectory	Lead features	Lead therapy
Vestibular	Dizziness, gaze instability, motion sensitivity	VRT, VOMS-targeted exercises
Ocular	Convergence insufficiency (Master 2016: 47%), accommodative dysfunction (51%)	Convergence drills, accommodation work
Cervical	Neck pain, JPE deficit, headache	Cervical manual therapy + sensorimotor retraining (Schneider 2014: 8x clearance)
Cognitive	Memory, processing speed, attention	Graded cognitive load + neuropsych
Mood / anxiety	Anxiety, depression, irritability	Psychology referral, CBT

► Pearl: screen Dix-Hallpike on every concussion

Up to 30 percent of post-concussion vertigo cases have BPPV. It will not respond to vestibular rehab alone. Screen with Dix-Hallpike and supine roll at the first visit, treat first, then re-screen for trajectory at one to two weeks.

Assessment battery

Domain	Test	Notes
VOMS	7-domain screen vs baseline	+2-pt rise on any 0–10 scale = positive (Mucha 2014: sens 89%, spec 86%)
Convergence	Near point of convergence	NPC over 10 cm + symptoms = insufficiency
Buffalo treadmill	5.4 km/h, +1°/min; ends at +3 sx, 90% HR-max, or RPE 17	Threshold HR sets home dose @ 80–85% of value
Cervical	JPE, ROM, palpation	Screen all post-trauma cases
BPPV screen	Dix-Hallpike + supine roll	Always rule out before VRT
Self-report	PCSS or SCAT5/6 symptom checklist	Baseline + weekly re-test

Prescription / treatment cheat list

Category	Frequency	Duration	Progress when…
VOMS-targeted	2–3x daily	5–10 min	Provoked symptom less than 2/10 across domain
Convergence	Daily	3 sets x 10–15	NPC less than 10 cm sustained
Aerobic (Buffalo)	5–6x/wk	20–30 min	Target = 80–85% BCTT threshold; flare ≤ 3/10
Cervical / vestibular combo	2–3x/wk	15–20 min	Add when cervical or vestibular trajectory

Return-to-activity ladder	Per stage	24 h symptom-free / step	Berlin/Amsterdam 6-stage; SCAT6 at gates

► Pearl: sub-symptom threshold beats hard pushing

Exercise above the symptom threshold reinforces symptoms and prolongs recovery. Cap intensity at 80–85 percent of Buffalo threshold for at least one week, then progress only when fully symptom-stable across two consecutive sessions. Buckley 2016 — strict rest does NOT shorten recovery; Leddy 2019 RCT confirms sub-symptom dosing accelerates recovery and slashes persistent symptoms.

► Red flags — escalate

Worsening headache, repeated vomiting, focal neurology, seizure, fluctuating consciousness, second impact within 24 hours → urgent imaging and emergency review; do not progress sport.

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Outcome measures — re-test every 4–6 weeks

Domain	Tool	MCID / threshold
Symptoms	PCSS	Drop greater than 13 points clinically meaningful
VOMS	Provoked symptom rise vs baseline	Less than 2-pt rise on every domain
Convergence	NPC (cm)	Less than 10 cm sustained
Aerobic capacity	Buffalo threshold HR	Threshold rises week-on-week; target ≥ stage 4
Functional balance	BESS / FGA	Within normal range

► Compliance — what helps adherence

Open with the active-rehab rationale — "rest is no longer the answer". Symptom diary plus weekly VOMS gives the patient and the clinician objective progress markers. Telehealth check-ins between in-person sessions reduce drop-out in younger athletes.

► When to refer onward

- ► No improvement by 4–6 weeks → multidisciplinary review (neurology, vestibular physician, neuropsych).
- ► Persistent symptoms greater than 3 months → multidisciplinary persistent post-concussion clinic.
- ► Mood or anxiety dominant trajectory → clinical psychology for CBT.
- ► Repeat concussions (greater than 3) → return-to-play decision with sports medicine team.

► Twelve-second tips

Active rehab beats rest (Leddy 2019). VOMS sens 89% / spec 86%. Sub-symptom threshold = 3/10 or less during exercise. Six-step ladder, 24 h symptom-free per step. Paediatric patients need slower progression.

► Common pitfalls — and how to avoid them

- ► Prescribing prolonged rest beyond 48–72 hours — slows recovery in published cohorts.
- ► Pushing intensity above symptom threshold — reinforces symptoms and stalls progress.
- ► Skipping BPPV screen — up to 30 percent miss rate without Dix-Hallpike.
- ► Returning to play after one symptom-free session — needs 24 h per stage of the ladder.
- ► Treating only the dominant trajectory and ignoring secondary cervical or ocular components.

► Special populations

- ► Paediatric / adolescent — slower progression, longer baseline rest (3–7 days), school accommodations.
- ► Athletes — full 6-step ladder; do not skip steps; medical clearance before contact.
- ► Repeat concussion — multidisciplinary review and longer time at each stage.
- ► Persistent (greater than 3 months) — combined VRT plus sub-symptom aerobic plus CBT outperforms single modality.