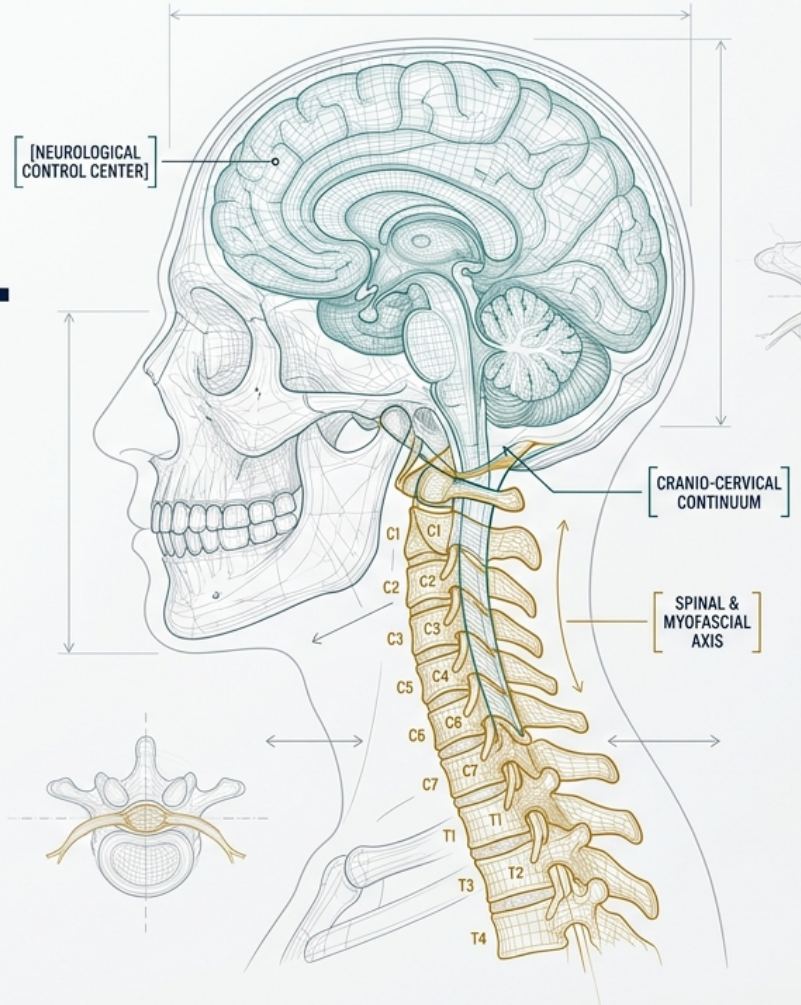
BEYOND THE BRAIN: THE NEUROMYOFASCIAL SCIENCE PERSPECTIVE

Post-Concussion Syndrome (PCS), Spinal Concussion Syndrome (SCS), and the Cranio-Cervical Continuum. A Clinical Framework for Persistent Concussion-Like Symptoms.

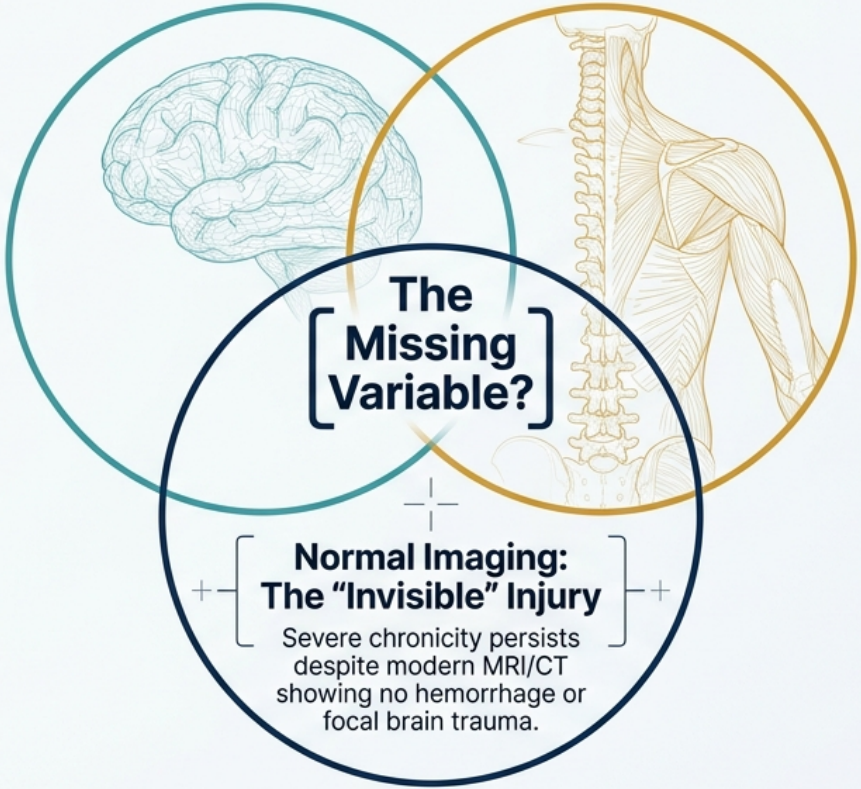


The Clinical Paradox of Post-Concussion Syndrome

Are Persistent Concussion Symptoms Always Brain-Based?

Variability: Highly Individualized Symptoms

No two patients present identically (e.g., isolated tinnitus vs. severe photophobia).



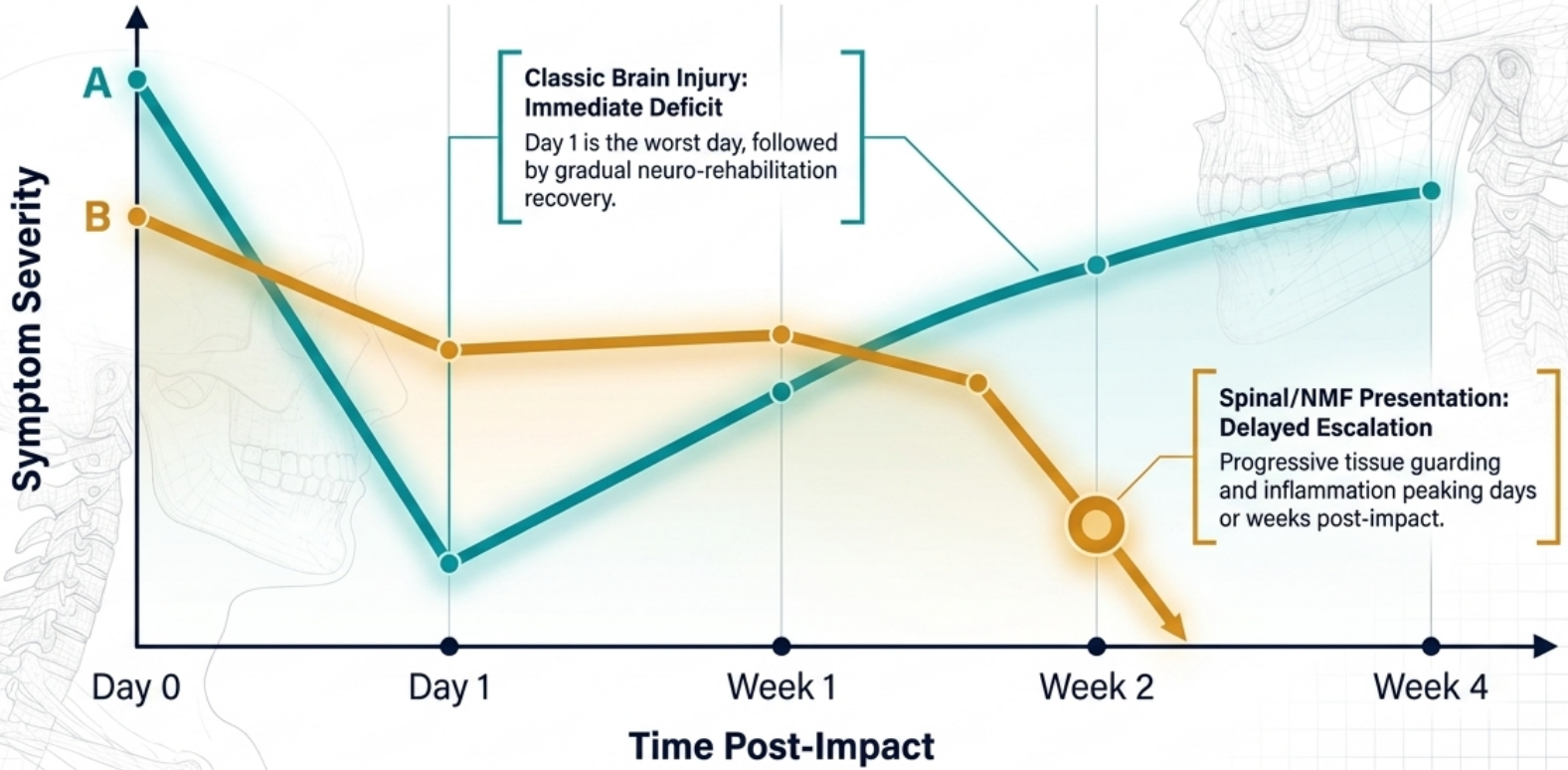
Severity Mismatch: Impact vs. Burden

Minor impacts frequently cause debilitating chronicity; major impacts can result in minimal ongoing symptoms.

1980s CT Scans (“Brain Bruise” Model)

Modern Clinical Reality

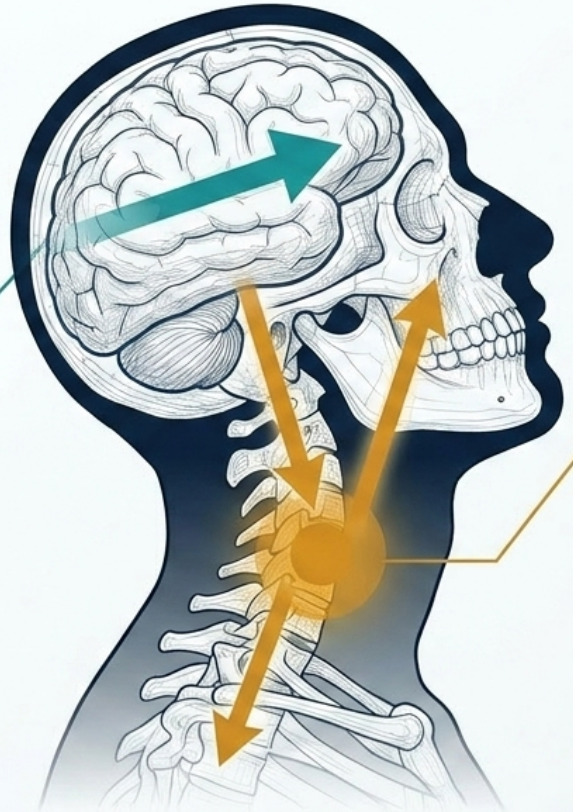
The Timing Discrepancy: Immediate vs. Delayed Onset



The Kinetic Reality: A Dual-Impact Event

The Cranial Load

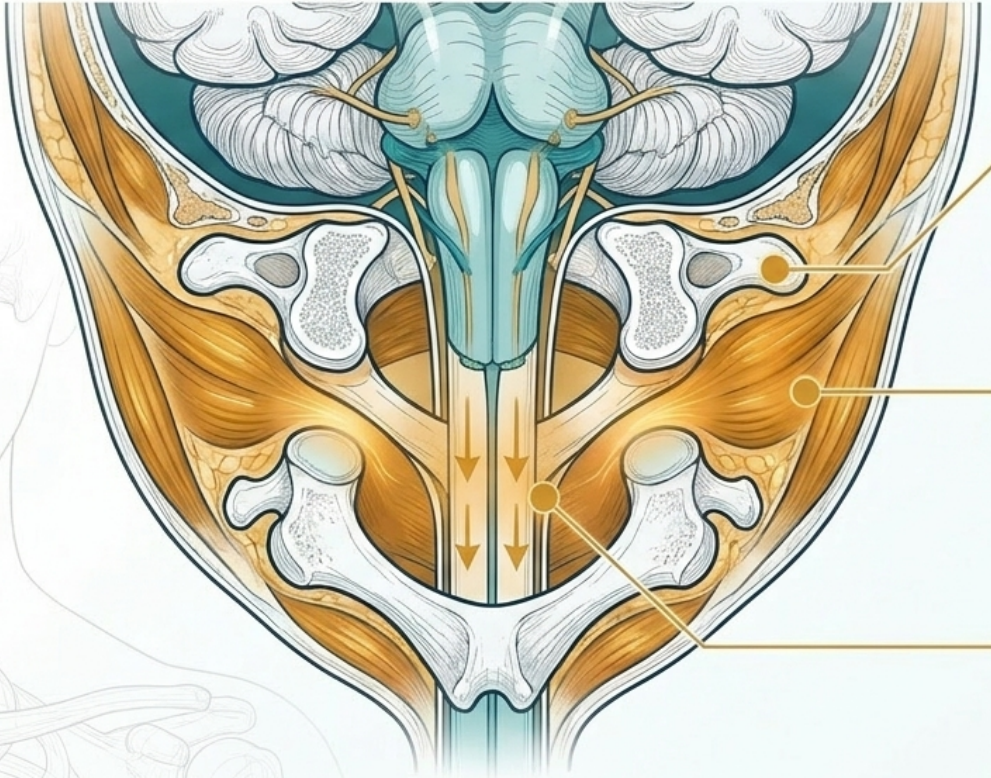
Shear forces act upon the cortex. Diagnosed as Acquired Brain Injury (ABI).



The Cervicothoracic Load

Massive tensile and compressive forces absorbed by the neck. The structural fulcrum of the injury.

Spinal Concussion & The Cranio-Cervical Junction

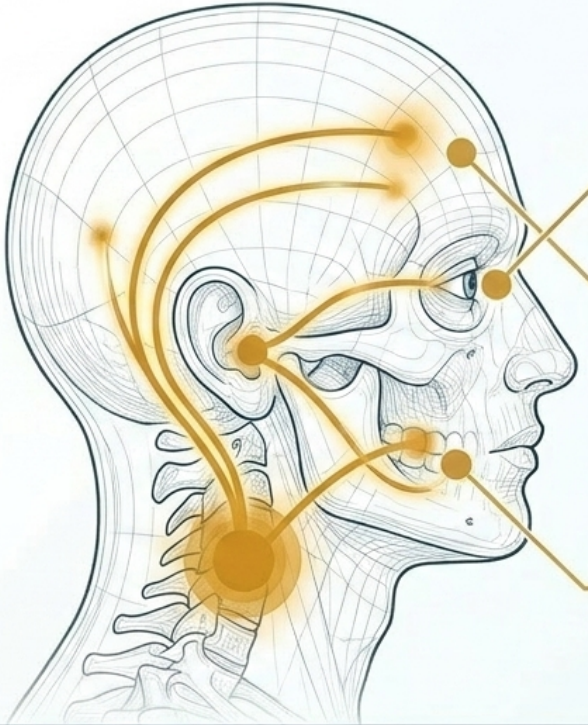


Atlas-Axis (C1-C2):
High-density proprioceptive region; vulnerable to shear forces due to lack of intervertebral discs.

The Evolutionary Response:
Trauma initiates protective tissue guarding, leading to chronic myofascial restriction.

Spinal Cord Tethering Hypothesis:
Subtle dynamic restriction and dural tension altering local neurophysiology.

Reclassifying ‘Brain’ Symptoms as Cranio-Cervical Referrals



Vestibulo-Ocular Mismatch:
Dizziness, light sensitivity, tracking deficits driven by cervical proprioceptive errors.

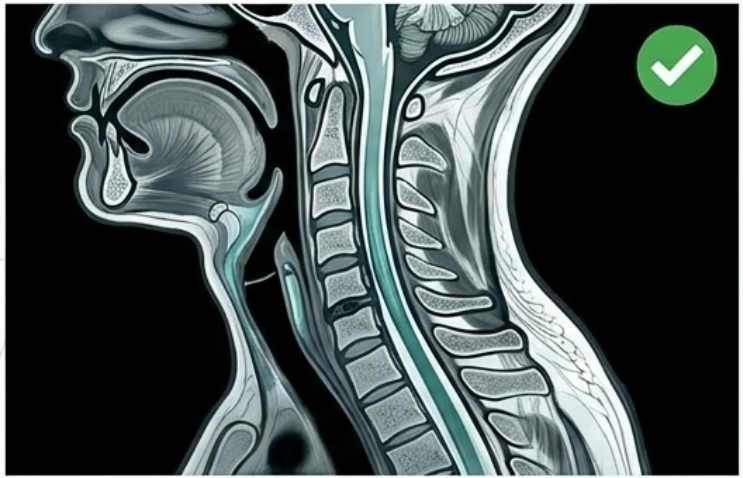
Craniofacial Pain:
Migraines and occipital neuralgia stemming from upper-cervical nerve root irritation.

Auditory/TMJ:
Tinnitus secondary to cervical and jaw mechanical dysfunction.

Complicating Factor: Underlying hypermobility (e.g., hEDS) exacerbates tissue vulnerability and delays mechanical stabilization.

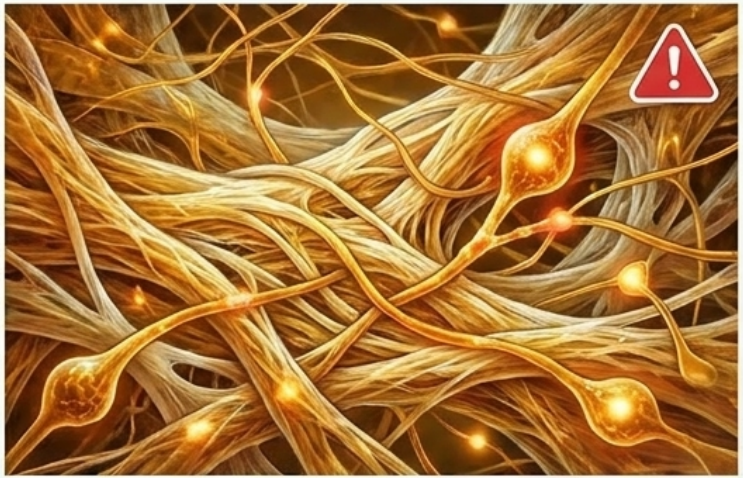
The Imaging Gap: Macro-Pathology vs. Micro-Restriction

Standard MRI



Macro-Pathology: Detects bleeds, fractures, and gross instability. Calibrated for structural emergencies.

Tissue Level



Micro-Restriction: Misses micro-fibrosis, dynamic fascial guarding, and aberrant proprioceptive signaling.

Clinical Maxim: A normal scan confirms the absence of a structural emergency. It does not equate to healthy, functional tissue.

The Diagnostic Matrix: PCS vs. SCS

Feature	Post-Concussion / Brain	Spinal Concussion / NMF
Primary Driver	Cortical/Subcortical Trauma	Cervicothoracic Kinetic Overload
Onset Timing	Immediate (Day 1 worst)	Often Delayed (Progressive worsening)
Pain Profile	Diffuse, generalized headache	Base-of-skull, TMJ, unilateral referral
Vestibular	Central processing deficits	Cervicogenic proprioceptive mismatch
Key Aggravators	Cognitive load, screen time	Physical posture, sustained neck positions

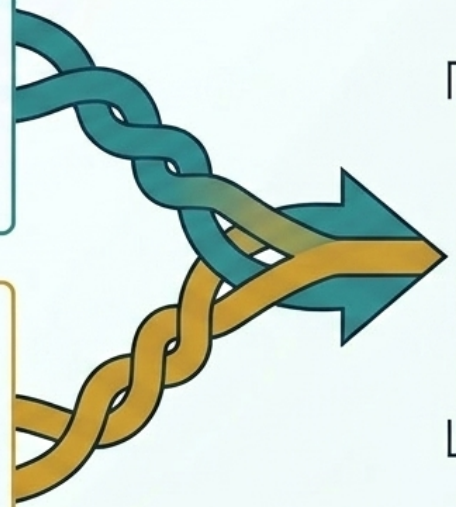
Evidence Base: Functional Cervical & Vestibular Impairment

Focus 1: Cervicovestibular Rehabilitation

Published evidence strongly supports that targeted cervical physical therapy significantly accelerates recovery in delayed-recovery concussion cohorts.

Focus 2: Cervical Dysfunction Prevalence

High rates of objective, measurable cervical spine dysfunction exist in patients strictly diagnosed with persistent PCS.



Symptom Chronicity

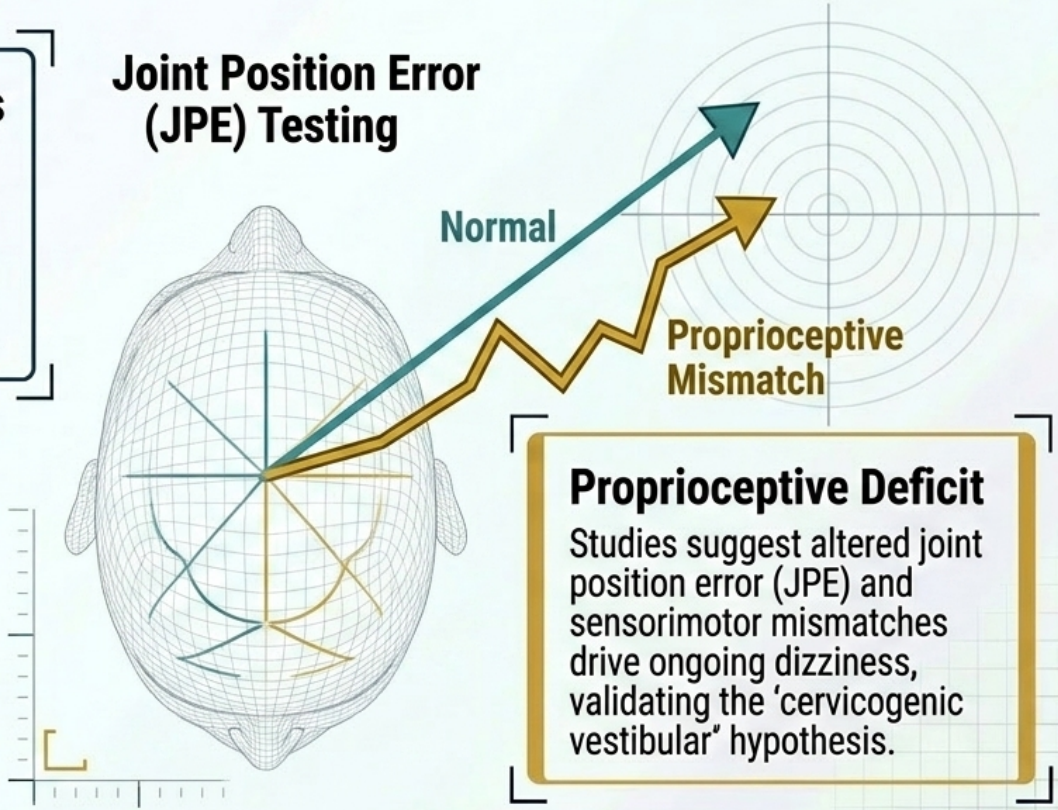
The convergence of unaddressed cervical and vestibular impairments drives prolonged symptom persistence and functional limitation.

Evidence Base: Myofascial & Proprioceptive Deficits

Myofascial Impairments

Published research confirms persistent hypertonicity and restricted mobility in the upper cervical/suboccipital tissues of post-concussive patients.

Joint Position Error (JPE) Testing



Proprioceptive Deficit

Studies suggest altered joint position error (JPE) and sensorimotor mismatches drive ongoing dizziness, validating the 'cervicogenic vestibular" hypothesis.

Intellectual Rigor: Distinguishing Evidence from Framework

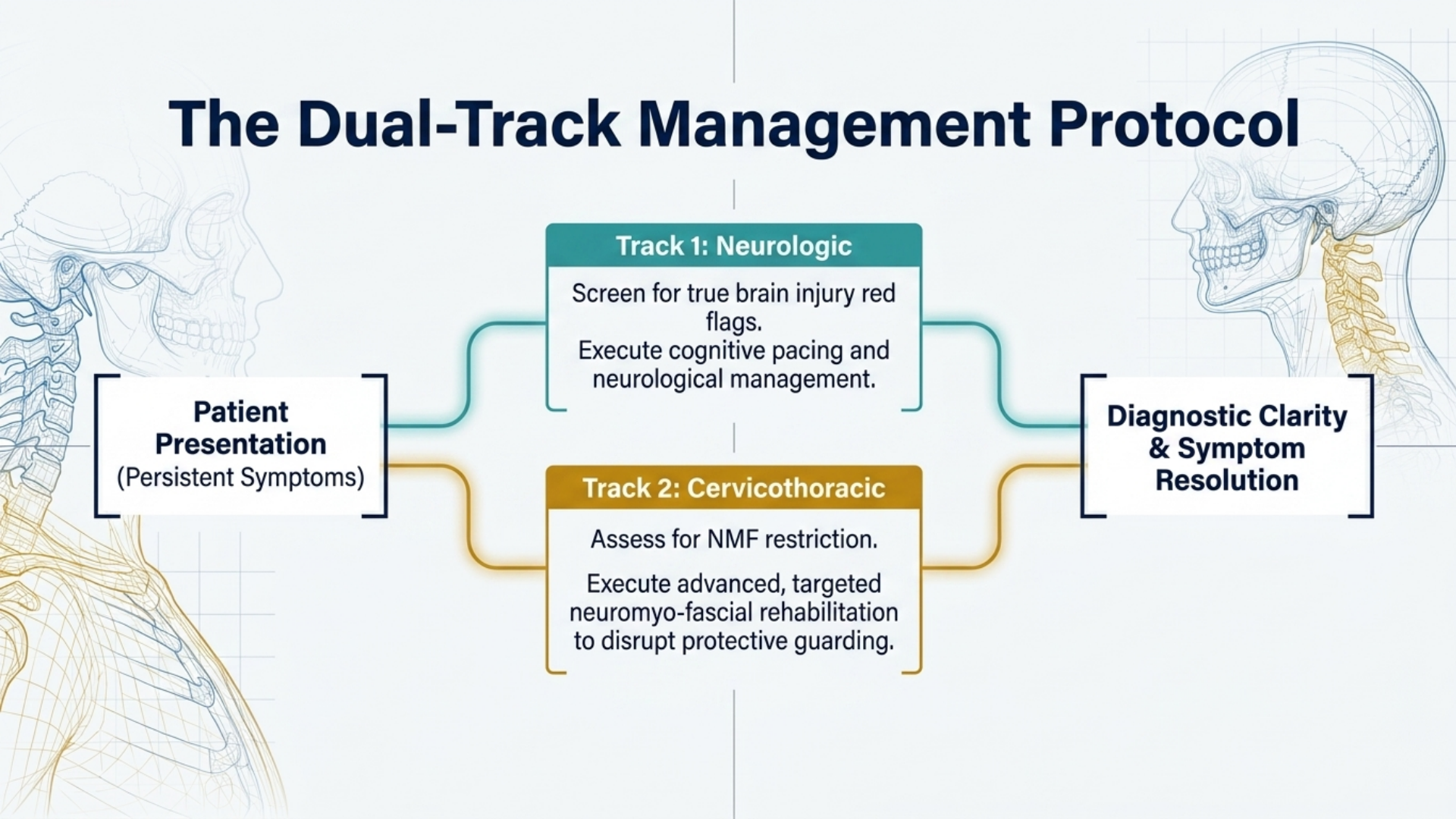
Established Component Mechanisms

- The cervical spine is heavily loaded during concussive events.
- Cervical/vestibular dysfunction mimics and prolongs PCS symptoms.
- Treating the cervical spine improves clinical outcomes.

Theoretical SCS Synthesis

- The ‘Spinal Cord Tethering’ hypothesis as a primary, universal mechanism.
- The exact biochemical threshold where progressive fibrosis transitions to irreversible central sensitization.

The Dual-Track Management Protocol



Changing the Trajectory of Chronic Care

The Cost of Misdiagnosis

Prolonged suffering, ineffective “dark room rest,” and massive healthcare resource strain.

The Global Shift

Leading sports medicine and vestibular clinics are already intuitively shifting toward early neck assessment.

The Call to Action

Integrate thorough cervicothoracic and myofascial screening into all standard post-concussion baseline protocols.

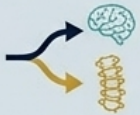
Key Takeaways for the Clinical Synthesis

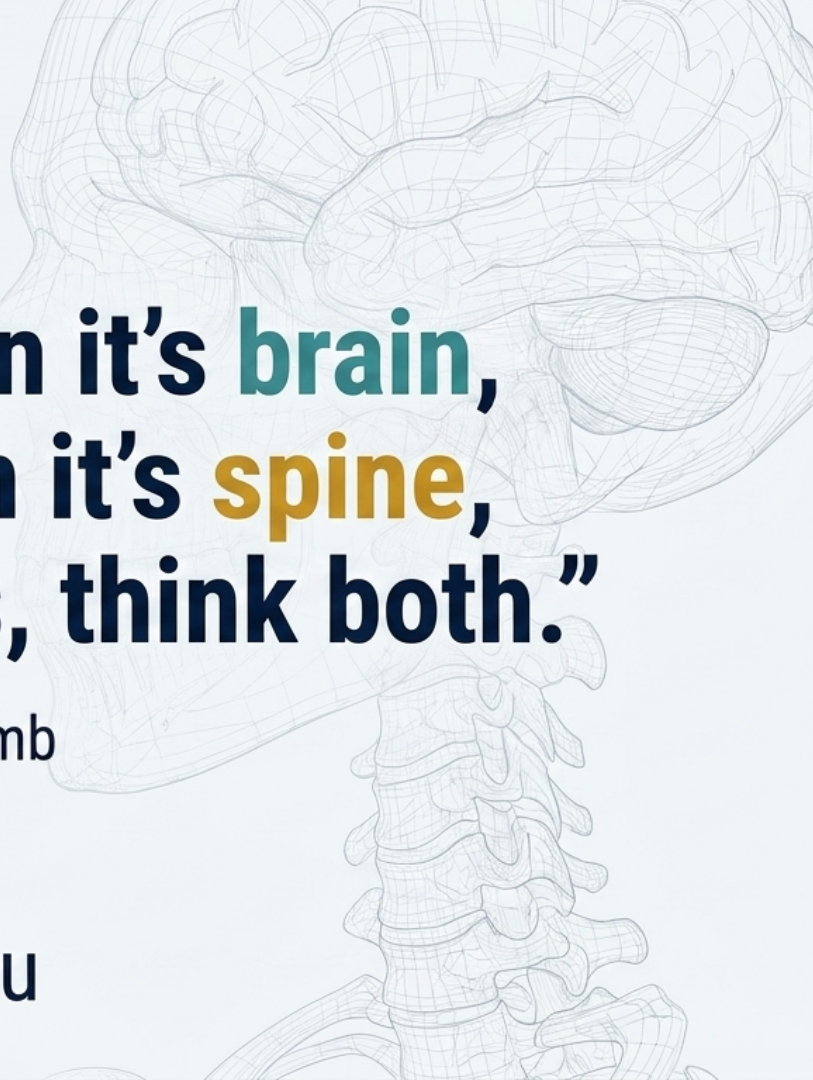
1.  Concussive impacts are **dual-events** (Cranium + Cervicothoracic).

2.  **Delayed onset** and **symptom severity mismatch** strongly suggest Spinal Concussion (**SCS**).

3.  **Normal MRI/CT** rules out structural emergencies, not functional tissue restrictions or fibrosis.

4.  Published evidence supports cervical drivers for dizziness, facial pain, and sensory mismatch.

5.  **Apply dual-track evaluation**: Assess both the neurological and the neuromyo-fascial systems simultaneously.



**“Think brain when it’s brain,
think spine when it’s spine,
and in many cases, think both.”**

— Dr. Blair Lamb

Thank You