ION

PERFORMANCE AND WELLNESS

Concussion Awareness and Management

South Burnaby Metro Soccer — A Guide for Coaches & Parents

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CHAPTER 1

The Invisible Injury

Understanding concussions — what they are, why they matter, and why every coach and parent needs to be prepared before the season begins.

About Me: Physiotherapist & Strength Specialist

PHYSIOTHERAPIST

CLINIC DIRECTOR AT ION PERFORMANCE AND WELLNESS

STRENGTH AND CONDITIONING COACH

Complete Concussion Management Certified Clinician

Evidence-based concussion course that focuses on improving patient outcomes

Constant research updates that are at the forefront of concussion management, treatment, and rehabilitation

Previous experience supporting soccer athletes through evidence-based, sport-specific training and treatment.

English Premier League Soccer Academy (EPL)

UBC Soccer Team

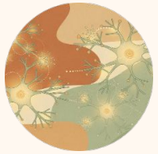
Metroford Soccer

What is a Concussion?

A concussion is a **traumatic brain injury** caused by a direct blow or indirect force to the head or body. Unlike structural injuries, it is a **functional disturbance** — meaning it rarely shows up on X-rays or CT scans.
It can affect memory, balance, coordination, and reaction time — often with no visible signs at all.

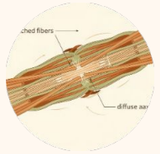
> Per the **Berlin Consensus Statement (2016/2023)**: Concussion is a subset of mild TBI, typically presenting with short-lived neurological impairment that resolves spontaneously.

What's Happening in the Brain



Neurometabolic cascade

After impact, neurons experience ionic flux — potassium efflux, calcium influx, and glutamate release — which triggers an energy crisis as the brain works harder to restore balance.



Axonal stretching

Rapid acceleration and deceleration can stretch axons, causing diffuse axonal injury (DAI). This is usually a functional disruption of axonal transport rather than a visible structural tear.

Reduced blood flow

Cerebral blood flow may drop and become uncoupled from metabolic demand, creating a supply-demand mismatch that can worsen symptoms and slow recovery.

Neuroinflammation

Microglia become activated and release cytokines, contributing to inflammation that can prolong neurological dysfunction after the initial injury.

Vulnerability window

In the period after injury, the brain is especially susceptible to a second impact before it has fully recovered, which is why return-to-play decisions matter.

BASELINE TESTING | PRE-SEASON

Why Pre-Season Baseline Testing Matters

Before the season starts, every athlete should establish their personal "normal" — so we have a reliable comparison point if an injury occurs.

What It Is

A battery of cognitive and physical tests performed **before** the season, capturing each athlete's individual baseline performance.

Why It's Critical

Post-injury scores compared against **that athlete's own baseline** — not population norms — dramatically improve accuracy of concussion detection.

Gold Standard Tool

The **SCAT6** (Sport Concussion Assessment Tool 6) is the internationally recognized tool for baseline and post-injury testing.

Evidence: McCrory et al., BJSM 2017; Echemendia et al., BJSM 2023 — SCAT6 normative data and clinical utility studies.

CCMI's Multimodal Baseline Protocol

A five-part assessment designed to capture each athlete's true baseline

Registration & Consent

Medical history, previous concussion history, and informed consent are collected before testing begins.

Neurocognitive Testing

Sensitive tests for executive function, memory, impulse control, and attention target frontal and temporal lobe function and can pick up subtle deficits invisible to standard assessments.

Balance & Postural Sway

Force plate testing in two-foot, one-foot, and tandem gait positions assesses cerebellum and parietal lobe function. Everyone's "normal" sway is different — that's why individual baselines matter.

Visual & Reaction Time Testing

Evaluates visual processing, tracking, and response time linked to brainstem and occipital lobe function.

Post-Test Review

The clinician reviews results, flags areas of concern, and recommends follow-up if needed. Results are stored for post-injury comparison.

CCMI's battery tests 10+ areas of brain function — far beyond standard single-test approaches. Endorsed by the NCAA, CDC, and Canadian Academy of Sport and Exercise Medicine.

Source: completeconcussions.com/baseline-testing/

CHAPTER 2

Recognizing the Signs

On-field screening — knowing what to look for in the moment when it counts most.

The SCAT6: Your On-Field Toolkit

The **Sport Concussion Assessment Tool 6 (SCAT6)** is the global standard for evaluating suspected concussions. Administered by a **healthcare professional**, it takes 10–15 minutes and combines multiple domains into one validated assessment.

SCAT 6 for individuals aged 13+
https://bjsm.bmj.com/content/bjsports/57/11/6

Click here

Use Child SCAT 6 for individuals 12 and under
https://bjsm.bmj.com/content/bjsports/57/11/6

Click here

CRT (concussion recognition tool for non- health care practitioners)
https://bjsm.bmj.com/content/bjsports/57/11/692.

Click here

Symptom Evaluation
22-item self-reported symptom checklist with severity ratings

Cognitive Screen
Orientation, immediate memory, and concentration tasks

Neurological Screen
Balance testing (modified BESS) and coordination

Key Rule: If a concussion is suspected — **remove the athlete from play immediately.** No athlete returns to sport on the day of injury, regardless of symptom resolution.

CRT6: What Coaches & Parents Watch For

The **Concussion Recognition Tool 6 (CRT6)** is the sideline version for non-medical personnel. No training required — trust what you observe.

🔍 Observable Signs

- Dazed, blank, or stunned appearance
- Confused about game, score, or opponent
- Moves clumsily or unsteadily
- Answers questions slowly
- Loss of consciousness (even briefly)
- Mood, behavior, or personality changes
- Cannot recall events before or after the hit

🗣️ Ask the Athlete

- Headache or "pressure" in the head
- Nausea or vomiting
- Balance problems or dizziness
- Double or blurry vision
- Sensitivity to light or noise
- Feeling foggy, sluggish, or groggy
- "Just not feeling right"

🚨 Red Flags: Call 911 Immediately

Loss of Consciousness

Any prolonged or repeated LOC

Seizures or Convulsions

Any seizure activity post-impact

Worsening Headache

Headache rapidly escalating in intensity

Neck Pain

Suspect cervical spine injury — immobilize

Repeated Vomiting

More than one episode post-impact

Cannot Be Woken

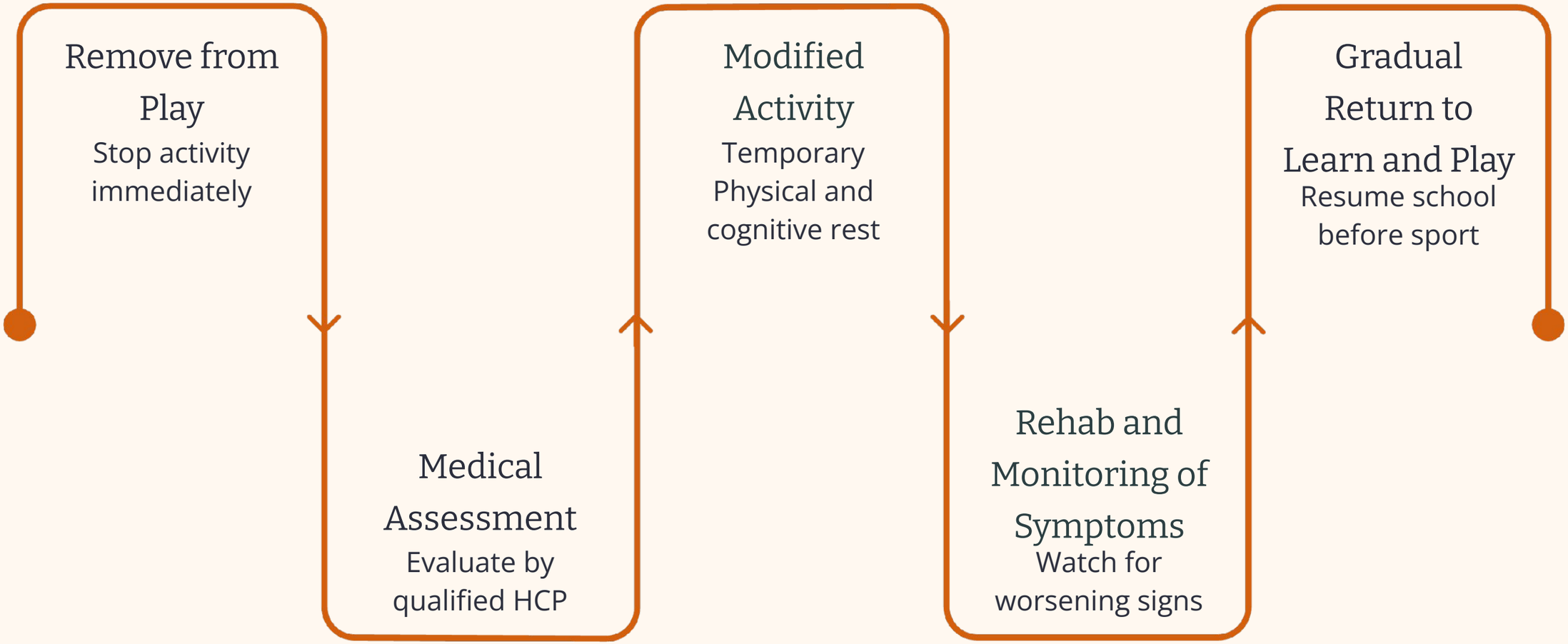
Significant drowsiness or unresponsiveness

CHAPTER 3

Managing a Concussion

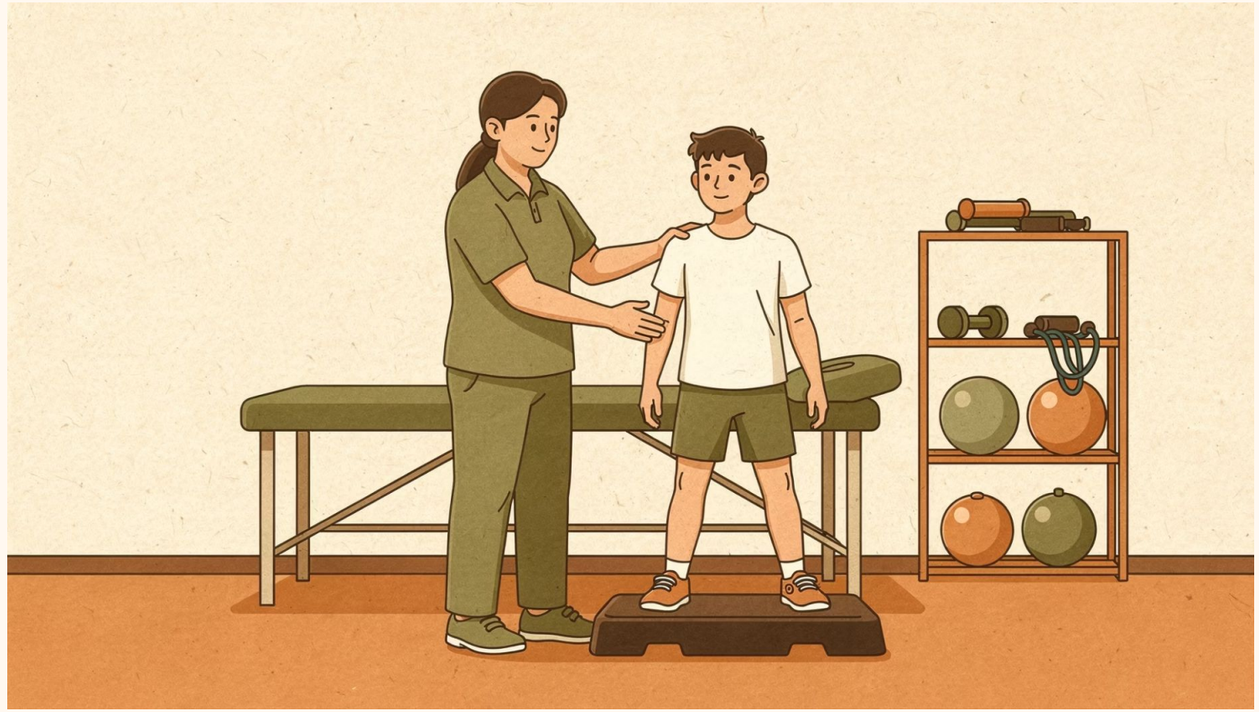
The road to recovery — structured, evidence-based steps that protect the athlete and guide them safely back to health.

Concussion Management: Step-by-Step



Recovery is **not linear** — symptoms can fluctuate. A qualified healthcare professional must guide each phase. The SCAT6 is a *screening tool*, not a diagnosis. Medical evaluation is always required.

The Role of Physiotherapy in Recovery (Post-Injury Assessment)



Physiotherapists with concussion specialization provide **targeted, evidence-based interventions** that address the root causes of prolonged symptoms — not just rest.

Vestibular Rehabilitation

Reduces dizziness and restores balance (Schneider et al., BJSM 2014)

Vision Therapy

Treats oculomotor deficits and visual disturbances

Cervicogenic Treatment

Addresses neck dysfunction — a major driver of headache and concussion symptoms (JOSPT, 2021)

Graduated Exertion

Supervised return to activity using the Buffalo Concussion Treadmill Test protocol

Post-Injury Assessment Summary

Red Flag Clearance

No Loss of Consciousness
No LOC reported at time of injury or assessment.

No Seizure Activity
No seizures observed or reported.

No Repeated Vomiting
Nausea/vomiting score: 0/6.

No Focal Neurological Deficit
Balance (BESS 30/30), orientation (5/5), and reaction time all within normal limits.

No Worsening Symptoms
Symptom severity low (11/132); no escalating pattern identified.

No Vision or Pupil Abnormality
Blurred vision score: 0/6; King-Devick completed without neurological concern.

✅ No red flags identified at time of assessment. Athlete does not require emergency referral. Continue with standard concussion management protocol.

37/132
Total Symptom Severity

7/22
Total Symptoms Reported

Symptoms Reported

- Headache
- Pressure in Head
- Neck Pain
- Sensitivity to Noise
- Don't Feel Right
- Fatigue or Low Energy
- Drowsiness
- All other symptoms

Cognitive & Orientation Tests

Orientation
5/5 ✓

Immediate Memory
3 trials: 5, 8, 10
Total: 23/30

Concentration
4/5
Numbers Reverse: 4/4
Months Reverse: 0/1

Delayed Memory
10/10 ✓

Test your memory

CHAPTER 4

Returning to Sport

Safely and responsibly — guided by the Berlin Consensus Statement and international best practice.

Berlin Consensus: Return-to-Play Protocol

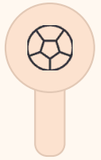
No athlete returns to play on the **day of injury** — period. The stepwise RTP protocol requires **24–48 hours symptom-free at each stage** before progression.

Stage 1: Symptom-Limited Activity

Daily activities that do not provoke symptoms

Stage 2: Light Aerobic Exercise

Walking, swimming — no resistance training



Stage 3: Sport-Specific Exercise

Running drills, skating — no contact

Stage 4: Non-Contact Training

Full practice without contact; medical clearance required

Stage 5: Full Return to Sport

Medical clearance from qualified HCP mandatory before competition

Reducing Injuries & Promoting Safe Play

Proper Technique

Emphasize safe heading mechanics and body-contact technique. Evidence supports **limiting heading** in youth athletes (BJSM, 2020).

Ongoing Education

Annual concussion education for athletes, coaches, and parents is evidence-supported and increasingly required by sport governing bodies.

Culture of Fair Play

Foster respect and sportsmanship. Reducing unnecessary collisions starts with a team culture that values safety over aggression.

Strength & Conditioning

Consistent strength training and physiotherapy build resilience in the muscles and structures that support the head and neck — reducing injury risk and improving recovery outcomes when concussions do occur.

Our Commitment to Athlete Safety

🧠 Recognize

Pre-season baselines + CRT6 sideline screening give every athlete the best chance of early detection.

❤️ Recover

Evidence-based management and physiotherapy guided by the Berlin Consensus Statement protect long-term brain health.

⚽ Return

Stepwise, medically cleared return-to-play ensures athletes come back stronger — and safely.

Questions? Contact your club's designated concussion liaison or speak with a registered physiotherapist specializing in sport concussion. Resources: **Berlin Consensus Statement · SCAT6 · CRT6 · JOSPT · BJSM**

Thank You!

I hope this presentation has increased your awareness of concussions in sport and better management of injuries/recovery

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