Concussion Update: 2024

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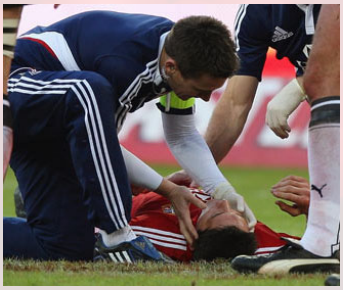

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OBJECTIVE

- Be aware of the process leading to the latest concussion guidelines
- Be familiar with the latest concussion assessment tools
- Be able to employ the latest recommendations on subthreshold exercise
- Be able to make early referrals for vestibular therapy

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Consensus statement on concussion in sport: the 6th International Conference on Concussion in Sport–Amsterdam, October 2022

Jon S Patricios [1], Kathryn J Schneider [2], Jiri Dvorak [3], Osman Hassan Ahmed [4,5], Cheri Blauwet [6,7], Robert C Cantu, [8,9] Gavin A Davis [10,11], Ruben J Echemendia [12,13], Michael Makdissi, [14,15] Michael McNamee, [16,17] Steven Broglio [18], Carolyn A Emery [2], Nina Feddermann-Demont, [19,20] Gordon Ward Fuller [21], Christopher C Giza, [22,23] Kevin M Guskiewicz, [24] Brian Hainline [25], Grant L Iverson [26,27], Jeffrey S Kutcher, [28] John J Leddy [29], David Maddocks, [30] Geoff Manley [31], Michael McCrea [32], Laura K Purcell, [33] Margot Putukian [34], Haruhiko Sato [35], Markku P Tuominen, [36] Michael Turner [37,38], Keith Owen Yeates [39], Stanley A Herring, [40,41] Willem Meeuwisse [42]

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THE 11 "RS" OF CONCUSSION MANAGEMENT

- Recognize*
- Reduce*
- Remove
- Re-Evaluate*
- Rest & Exercise*
- Refer*
- Rehabilitation*
- Recovery
- Return to Learn* & Return to Sport
- Reconsider
- Refine

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RECOGNIZE

- Evaluation of symptoms
- Assessment of cognitive function
- Neurological examination
- Assessment of balance, coordination, vestibular/ocular responses

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SCAT6™

Sport Concussion Assessment Tool

For Adolescents (13 years +) & Adults

What is the SCAT6?

The SCAT6 is a standardised tool for evaluating concussions designed for use by Health Care Professionals (HCPs). The SCAT6 cannot be performed correctly in less than 10-15 minutes. Except for the symptoms scale, the SCAT6 is intended to be used in the acute phase, ideally within 72 hours (3 days), and up to 7 days, following injury. If greater than 7 days post-injury, consider using the SCOAT6/Child SCOAT6.

The SCAT6 is used for evaluating athletes aged 13 years and older. For children aged 12 years or younger, please use the Child SCAT6.

If you are not an HCP, please use the Concussion Recognition Tool 6 (CRT6).

Preseason baseline testing with the SCAT6 can be helpful for interpreting post-injury test scores but is not required for that

Key Points

- Any athlete with suspected concussion should be REMOVED FROM PLAY, medically assessed, and monitored for injury-related signs and symptoms, including deterioration of their clinical condition.
- No athlete diagnosed with concussion should return to play on the day of injury.
- If an athlete is suspected of having a concussion and medical personnel are not immediately available, the athlete should be referred (or transported if needed) to a medical facility for assessment.
- Athletes with suspected or diagnosed concussion should not take medications such as aspirin or other anti-inflammatories, sedatives or opiates, drink alcohol or use recreational drugs and should not drive a motor vehicle until cleared to do so by a medical professional.
- Concussion signs and symptoms may evolve over time; it is

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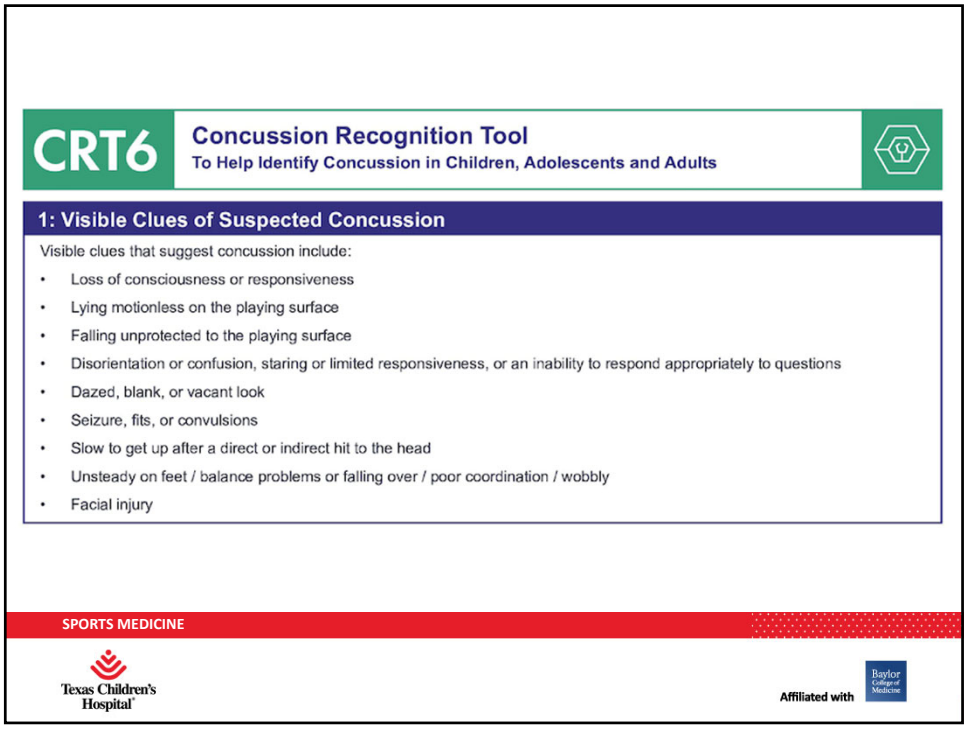

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2: Symptoms of Suspected Concussion

Physical Symptoms
Headache
"Pressure in head"
Balance problems
Nausea or vomiting
Drowsiness
Dizziness
Blurred vision
More sensitive to light
More sensitive to noise
Fatigue or low energy
"Don't feel right"
Neck Pain

Changes in Emotions
More emotional
More Irritable
Sadness
Nervous or anxious

Changes in Thinking
Difficulty concentrating
Difficulty remembering
Feeling slowed down
Feeling like "in a fog"

Remember, symptoms may develop over minutes or hours following a head injury.

3: Awareness

(Modify each question appropriately for each sport and age of athlete)

Failure to answer any of these questions correctly may suggest a concussion:

"Where are we today?"

"What event were you doing?"

"Who scored last in this game?"

"What team did you play last week/game?"

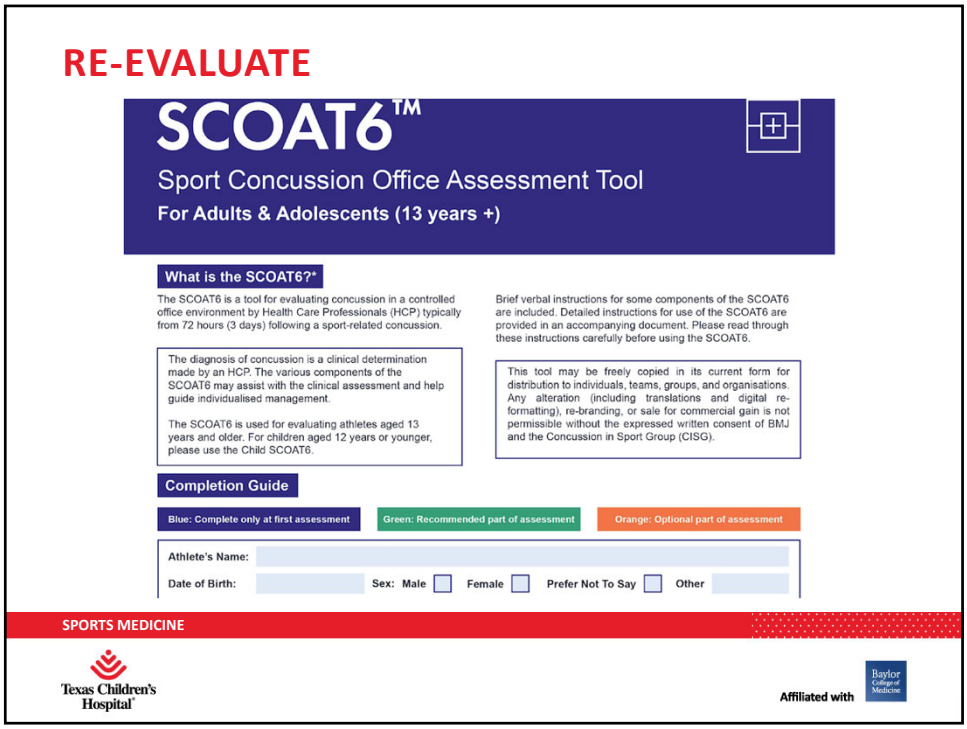
"Did your team win the last game?"

Any athlete with a suspected concussion should be - IMMEDIATELY REMOVED FROM PRACTICE OR PLAY and should NOT RETURN TO ANY ACTIVITY WITH RISK OF HEAD CONTACT, FALL OR COLLISION, including SPORT ACTIVITY until ASSESSED MEDICALLY, even if the symptoms resolve.

Athletes with suspected concussion should **NOT**:

- Be left alone initially (at least for the first 3 hours). Worsening of symptoms should lead to immediate medical attention.
- Be sent home by themselves. They need to be with a responsible adult.
- Drink alcohol, use recreational drugs or drugs not prescribed by their HCP
- Drive a motor vehicle until cleared to do so by a healthcare professional

RE-EVALUATE



SCOAT6™

Sport Concussion Office Assessment Tool

For Adults & Adolescents (13 years +)

What is the SCOAT6?*

The SCOAT6 is a tool for evaluating concussion in a controlled office environment by Health Care Professionals (HCP) typically from 72 hours (3 days) following a sport-related concussion.

The diagnosis of concussion is a clinical determination made by an HCP. The various components of the SCOAT6 may assist with the clinical assessment and help guide individualised management.

The SCOAT6 is used for evaluating athletes aged 13 years and older. For children aged 12 years or younger, please use the Child SCOAT6.

Brief verbal instructions for some components of the SCOAT6 are included. Detailed instructions for use of the SCOAT6 are provided in an accompanying document. Please read through these instructions carefully before using the SCOAT6.

Completion Guide

Blue: Complete only at first assessment | Green: Recommended part of assessment | Orange: Optional part of assessment

Athlete's Name:

Date of Birth: Sex: Male ☐ Female ☐ Prefer Not To Say ☐ Other

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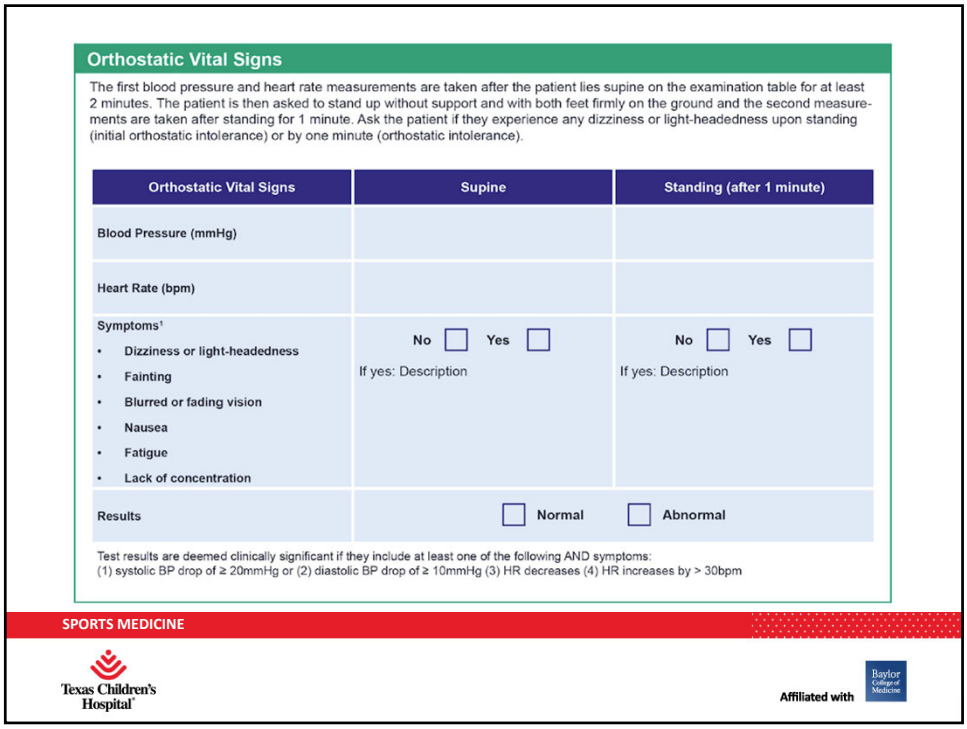

Orthostatic Vital Signs

The first blood pressure and heart rate measurements are taken after the patient lies supine on the examination table for at least 2 minutes. The patient is then asked to stand up without support and with both feet firmly on the ground and the second measurements are taken after standing for 1 minute. Ask the patient if they experience any dizziness or light-headedness upon standing (initial orthostatic intolerance) or by one minute (orthostatic intolerance).

Orthostatic Vital Signs	Supine	Standing (after 1 minute)
Blood Pressure (mmHg)		
Heart Rate (bpm)		
Symptoms[1] • Dizziness or light-headedness • Fainting • Blurred or fading vision • Nausea • Fatigue • Lack of concentration	No ☐ Yes ☐ If yes: Description	No ☐ Yes ☐ If yes: Description
Results	☐ Normal ☐ Abnormal	

Test results are deemed clinically significant if they include at least one of the following AND symptoms:
(1) systolic BP drop of ≥ 20mmHg or (2) diastolic BP drop of ≥ 10mmHg (3) HR decreases (4) HR increases by > 30bpm

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COGNITIVE ASSESSMENT

- Sx checklist (22 items, score 0-6)
- Orientation (mo, date, day, yr, time)
- Immediate memory - recall 10 words x3
- Concentration – months backwards, timed
- Delayed recall – recall 10 words

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BALANCE ERROR SCORING SYSTEM (BESS)



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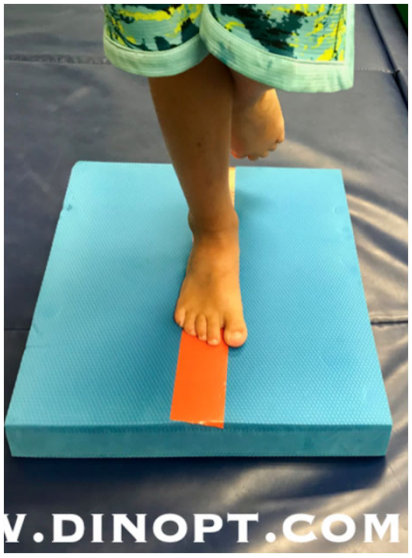

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TIMED TANDEM GAIT

- Heel-toe walk 3m line
- Turn-around, come back
- 3 trials
- Dual task tandem gait

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REST & EXERCISE

- Stronger recommendations for active recovery
- Begin 2 days after injury
- Allow gradual increase in intensity/duration as sx improve

https://www.dickssportinggoods.com/protips/sports-and-activities/soccer/five-soccer-workouts-for-your-offseason

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SUBTHRESHOLD EXERCISE

- Daily low intensity exercise associated with quicker recovery
- Target HR ideally determined by formal exercise testing
- HR that produces <2/10 increase in symptoms
- Exercise testing not practical in most settings

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SUBTHRESHOLD EXERCISE

- *Prescribed sub-symptom threshold aerobic exercise within 2–10 days of SRC is effective for reducing the incidence of persisting symptoms after concussion (symptoms >1 month) and is also effective for facilitating recovery in athletes suffering from symptoms lasting longer than 1 month*

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SUB-SYMPTOM THRESHOLD EXERCISE

- Walking – start with 10-20 min depending on severity of sx
- As symptoms improve – increase walking, introduce low intensity, sport-specific activities

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SCREEN TIME

- *The best data on cognitive exertion show that reduced screen use in the first 48 hours after injury is warranted but may not be effective beyond that*
- Keep in mind that ALL electronic media is designed to stimulate the brain

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Concussion Symptom Clusters

Cognitive/Fatigue
- Sleep management
- RTL mods

Anxiety/Mood
- Counseling
- CBT
- relaxation techniques

Vestibular
- Home vestibular prog
- Vestibular PT

Headache
- Analgesics
- Food/fluids
- Migraine Rx

Oculomotor
- Home ocular prog
- Vestibular PT

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REFER

- *Individuals with persisting symptoms (ie, symptom duration >4 weeks) should be evaluated with a multimodal clinical assessment including the use of standardised and validated symptom rating scales*
- *A multimodal clinical assessment, ideally by a multidisciplinary team, is indicated to characterize individuals with persisting symptoms, including the types, pattern and severity of symptoms, and any associated conditions or other factors that may be causing or contributing to the symptoms*

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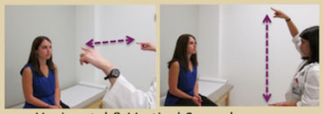
VESTIBULAR/OCULOMOTOR SCREENING (VOMS)

Identifying Vestibular and Ocular Problems after Concussion: UPMC VOMS

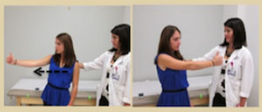
Horizontal & Vertical Pursuits



Horizontal & Vertical Saccades

Near Point Convergence

Horizontal & Vertical VOR



Visual Motion Sensitivity

- A brief 5 minute ***clinical screening*** tool to identify additional vestibular and ocular motor impairment and symptoms following concussion
- Used in conjunction with symptom reporting, neurocognitive assessment, balance testing, cervical and exertion screening in order to provide more complete clinical picture

Mucha et al, 2014

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REHABILITATION

https://www.risingtidephysicaltherapy.com/treatments/manual-traction/

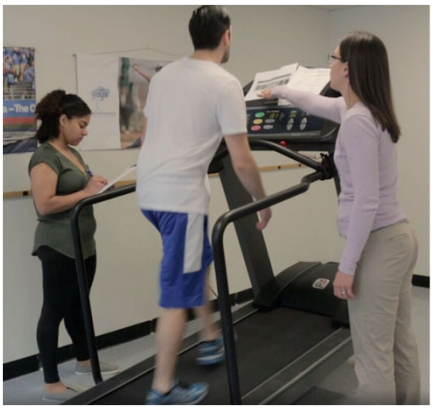
- If dizziness, neck pain and/or headaches persist for more than 10 days, cervicovestibular rehabilitation is recommended

VESTIBULAR PT

- Focuses on desensitizing movements
- Restoring neck motion
- Improving balance
- Dual task training
- Buffalo Treadmill Test

BUFFALO TREADMILL TEST

- Standardized treadmill test
- HR, RPE, symptoms monitored as both incline & speed are increased
- Test terminated if symptoms increase or exertion jumps before the end of the test



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COGNITIVE REST - "BRAIN REST"

- Reduce TV, gaming, web-surfing, social media
- Reduce phone & texting to essential
  - "Mom, come pick me up at school"
- Modify reduce school/home work
  - "Return to Learn"

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"RETURN TO LEARN (RTL)"

- The concussed brain requires physical and mental rest to recover
- School is the setting where the student uses his brain the most
- Guidelines for reducing mental work & managing sxs at school

An Educator's Guide to Concussions in the Classroom

2nd Edition

NATIONWIDE CHILDREN'S
When your child needs a hospital, everything matters.™

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RTL MODIFICATIONS

- Environmental adjustments
- Physical adjustments
- Curriculum adjustments
- Testing adjustments

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RETURN TO LEARN CLASSROOM MODS

+ Extra time with tests/assignments
+ Postpone tests if necessary
+ Provide written notes, if able. Minimize computer use.
+ Decrease homework load by 50%
+ Allow student to take breaks during class assignments
+ Allow student to sit in a quiet place during lunch, PE/athletics or band/orchestra
+ Please allow the student to visit the school nurse as needed for headache medication, and to rest for up to 30 minutes as needed
+ Allow to wear sunglasses or use earplugs as needed
+ Athlete should NOT be required to attend team functions (practice, meetings should be optional)
+ It can be extremely difficult for a student with a prolonged concussion to make up every piece of missed work. Decide what is necessary for key learning and then waive unessential work to help lighten the load of make-up work. The stress of having to make up a huge amount of work can also be detrimental to healing.

THESE MODIFICATIONS SHOULD REMAIN IN PLACE UNTIL INSTRUCTED OTHERWISE

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GRADUATED RTL PROTOCOL

Stage	Activities
1. No school	Individual having severe symptoms No activities that worsen sx Sub-symptom-threshold exercise
2. Half-day attendance w/acommodations	Some sx improvement Focus on core classes, cut non-essential work Sub-symptom-threshold exercise
3. Full-day with mods	Minimal sx Prioritize increasing workload, reducing mods, 1 test/day
4. Full-day w/o mods	Minimal or no sx Prioritize completing missed work, limiting stress
5. Full-school & extra-curricular activites	Return to Play

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RTL GUIDELINES 2022

- Highly individualized approach to school mods
- Gradually eliminate mods as symptoms improve
- *The systematic review revealed that the vast majority of athletes (93%) of all ages have a full RTL with no additional academic support by 10 days*

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RETURN TO PLAY

- *Following an initial period of relative rest (Step 1: approximately 24–48 hours following injury), clinicians can implement Step 2 (ie, light (Step 2A) and then moderate (Step 2B) aerobic activity) of the RTS strategy as a treatment of acute concussion*

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GRADUATED RTP PROTOCOL

Stage	Functional Exercise
1. Sx-limited activity	ADLs, walking
2. Aerobic exercise 2A – light, 2B - moderate	Walking, cycling, light resistance training
3. Individual, sport-specific exercise	Sport-related drills (e.g. agility for soccer, fb; skating), no contact
4. Non-contact drills	Up to normal intensity, complex drills (multi-player drills), light resistance trng
5. Full-contact practice	Participate in normal training
6. Return to play	Normal game play

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KEY POINTS

- SCAT6 may not be valid beyond 72hrs
- Subthreshold exercise may include up to Level 2 of RTP
- Individualize RTL modifications
- Refer for vestibular therapy for headache, neck pain, balance, vestibular problems > 10 days

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