
# 46TH ANNUAL EDUCATIONAL CONFERENCE

CANP

COLLABORATE. EDUCATE. ADVOCATE.

# The Concussed Student Athlete: Prevention, Assessment, and Treatment

Presenters:
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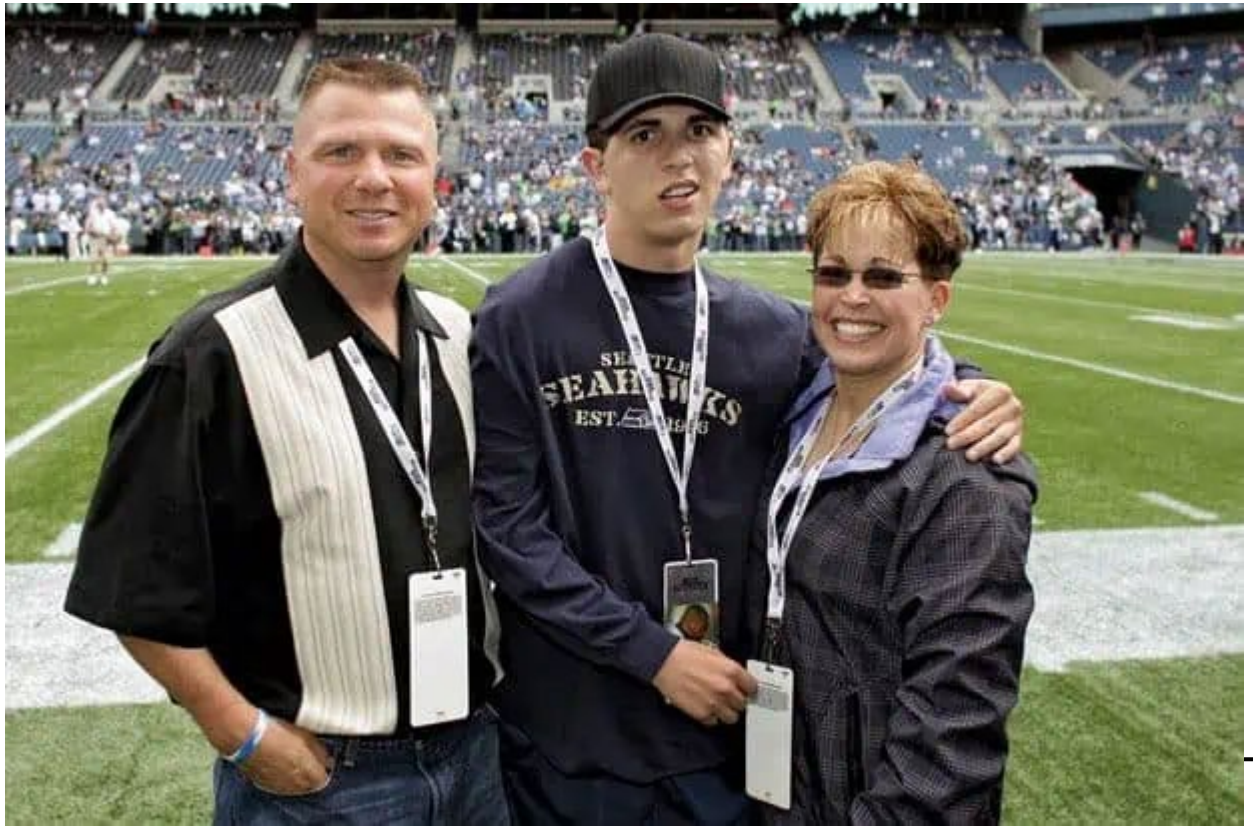
# Disclaimers

We have nothing to disclose.

# The Zackery Lystedt Law



# Learning Outcomes

Prevent concussions.

Diagnose a concussion (updated 2023 criteria).

Manage a concussion using a stepwise approach.

Returning athlete to play AND learn.

Breaking News! Scoat 6!

# Case 1: Football Orientation

OK, coach. I got fitted for my helmet and did my computer testing. What now?

# Case 2: Clinic

Student incidentally reports feeling dissociated since car accident last week.

# Case 3: Minute Clinic

Teenager brought in by his mom after having his “Bell Rung” in an American Football game.

# Who needs to know!

Family Nurse Practitioner

Urgent Care Nurse Practitioner.

College Health Nurse Practitioner.

# Concussion Statistics

7 per minute in the United States (2017)

9% of all sports related injuries (2019)

Consequences:

- Academic, athletic, and psychosocial functioning.
- For weeks, months, and sometimes beyond.

# Who does it affect?

General risk factors:

Previous concussion

Age: prepubescent

Sport: combat, collision

Sex: female possibly at more risk

Impact density

Highest concussion rates:
boxing
mixed martial arts
rugby
American football
ice hockey
boys' and men's lacrosse

Highest total number:
girls' and women's soccer

(in part due to the large number of participants).

# Risks for severe concussions

| Intrinsic Risk Factors | Injury-specific risk factors |
| --- | --- |
| Prior concussion w/ slow recovery | Double or rotational hit. |
| Migraines (personal or fam hx) | Continuing after hit. |
| Psychiatric comorbidities | Delayed or no evaluation. |
| Seizure disorders. | High early symptom Burden. |
| Motion sickness. | Vestibular Dysfunction (new) |

# Gary

15 years old

Sustained a concussion playing football

Still recovering after 6 months

# Traumatic Brain Injury: biomechanical forces

Early reporting is INTEGRAL to recovery!!!

Athlete MUST be remove from play and returned to play stepwise.

Avoid a SECOND, debilitating concussion.

**Continued play immediately after concussion can DOUBLE the time required to be cleared to return to play!**

# Concussion: A functional Neurological Disturbance.

2010 National College Athletic Association implemented

Concussion Policy and Legislation

1. Concussion education
2. Remove from play if there are symptoms
3. Mandatory rest period
4. Clearance required by physician or appointee.

# Legislature

California Assembly bill 25 This bill would require a school district that elects to offer athletic programs to immediately remove from a school-sponsored athletic activity for the remainder of the day an athlete who is suspected of sustaining a concussion or head injury during that activity.

California Assembly bill 2127 The bill would prohibit high school and middle school football teams of school districts, charter schools, or private schools that elect to offer an athletic program from conducting more than 2 full-contact practices, as defined, per week during the preseason and regular season, as defined. The bill would also prohibit the full-contact portion of a practice from exceeding 90 minutes in any single day, and completely prohibit full-contact practice during the off-season, as defined. ” This bill would provide that an athlete suspected of sustaining a concussion or head injury is prohibited from returning to the athletic activity until the athlete is evaluated by a licensed health care provider, as defined to mean a licensed health care provider trained in the management of concussions and acting within the scope of his or her practice, and the athlete receives written clearance from a licensed health care provider. The bill would further provide that, if a licensed health care provider determines that the athlete sustained a concussion or a head injury, the athlete is required to complete a graduated return-to-play protocol of no less than 7 days in duration under the supervision of a licensed health care provider.

California Assembly bill 2007 The bill would require youth sports organizations to notify the parents or guardians of athletes 17 years of age or younger who have been removed from athletic activities due to suspected concussions, as specified. The bill would require youth sports organizations to offer concussion and head injury education, or related educational materials, or both, to each of their coaches and administrators on a yearly basis, as prescribed. The bill would require each of these coaches and administrators to successfully complete each concussion and head injury education offered under the bill at least once either online or in person.

# Prevention

Education, awareness, and recognition.

Well fitting helmet and mouthguard.

Training and conditioning.

Contextual Procedural Learning

## Change the Culture!!!!

# Contextual Procedural Learning

Concussion reporting drills embedded in practice:

Huddle after warm-up.

Sports Medicine Staff explaining steps of drill.

Student Athletes repeated reporting phrase aloud twice.

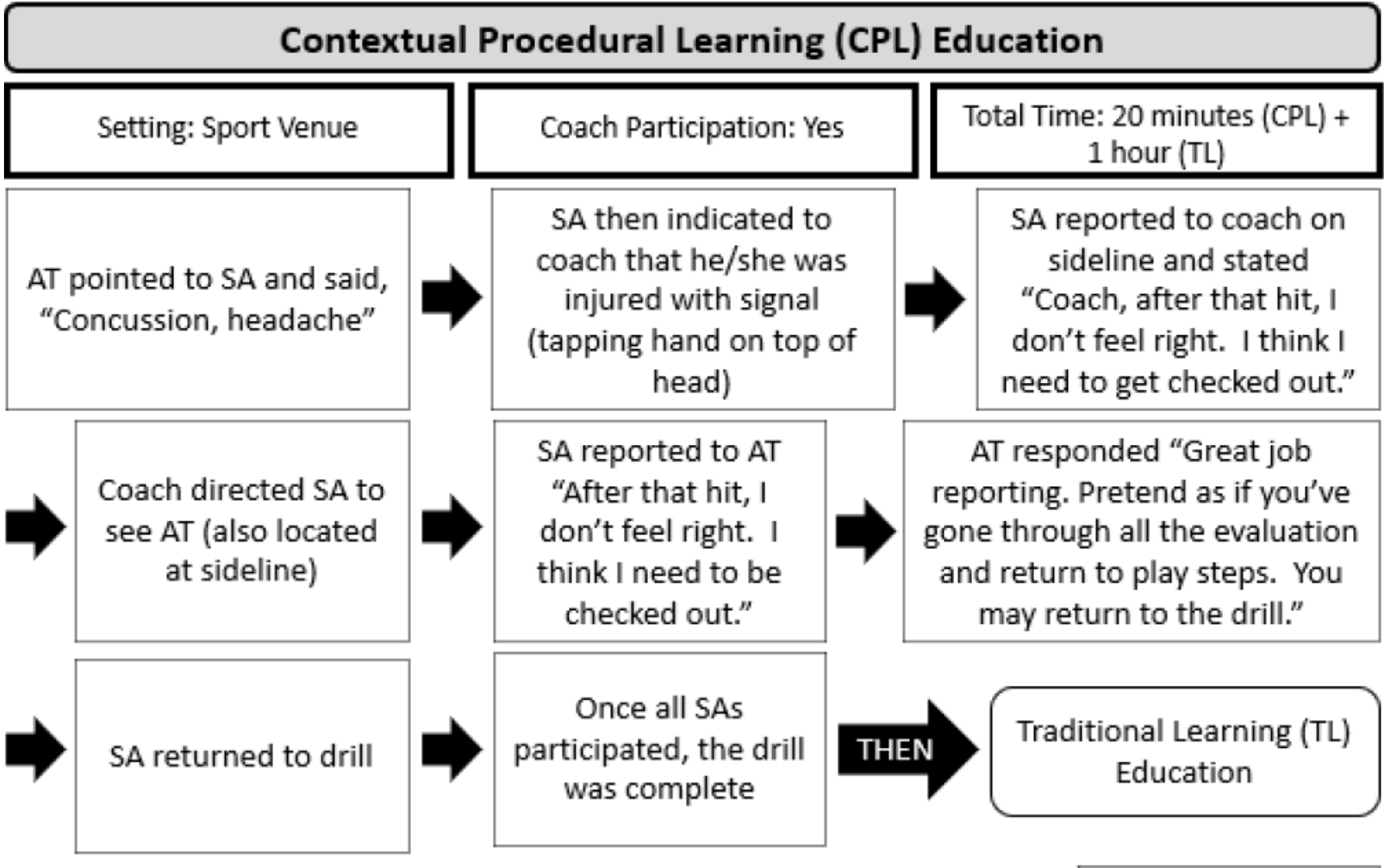
## Traditional Learning (TL) Education

| Setting: Classroom | Coach Participation: None | Total Time: 1 hour |
| --- | --- | --- |

**Lecture (40 minutes)** PowerPoint

**Video (15 minutes)** National Collegiate Athletic Association (NCAA)

**Handout (5 minutes)** Centers for Disease Control and Prevention & NCAA


Contextual Procedural Learning (CPL) Education
Setting: Sport Venue
Coach Participation: Yes
Total Time: 20 minutes (CPL) + 1 hour (TL)
AT pointed to SA and said, "Concussion, headache"
SA then indicated to coach that he/she was injured with signal (tapping hand on top of head)
SA reported to coach on sideline and stated "Coach, after that hit, I don't feel right. I think I need to get checked out."
Coach directed SA to see AT (also located at sideline)
SA reported to AT "After that hit, I don't feel right. I think I need to be checked out."
AT responded "Great job reporting. Pretend as if you've gone through all the evaluation and return to play steps. You may return to the drill."
SA returned to drill
Once all SAs participated, the drill was complete
THEN
Traditional Learning (TL) Education

# Outcomes

traditional : 6.3% reported concussions (n=176)

CPL: 12.5% reported concussions (n=152)

Small but statistically significant increase in reporting.

CPL 2.14 times more likely to report a concussion as TL

# Brief Neurocognitive Assessments

Sport Concussion Assessment Tool (SCOAT6)

Immediate Post-Concussion Assessment Cognitive Testing

# Planning: ImPACT Testing

Immediate Post-Concussion Assessment and Cognitive Testing

Nationwide norms- inaccurate for athletes from diverse cultural and linguistic backgrounds.

Sex differences also make normative marks less accurate.

# Planning: ImPACT

ImPACT testing = computerized test at baseline

1. before the season starts and annually
2. After the concussion and before full contact practice.

Is the athlete/student close to or back at baseline?

Are they ready to play?

Allows for personalization of an academic or medical plan when deficits are seen.

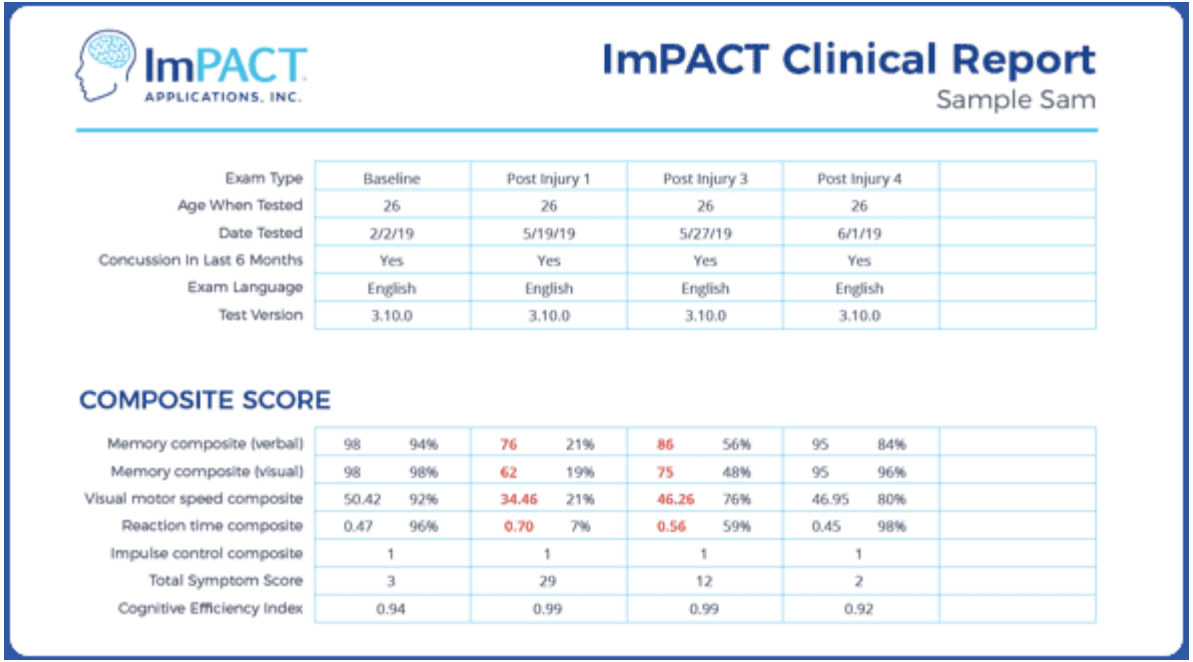
# Baseline and Post -Injury Testing

FDA approved computerized neurocognitive test.

A medical device to assess and manage concussions.

- visual and verbal memory
- reaction time
- processing speed

# Example of Impact Testing



ImPACT APPLICATIONS, INC.

## ImPACT Clinical Report

Sample Sam

| | Baseline | Post Injury 1 | Post Injury 3 | Post Injury 4 |
|---|---|---|---|---|
| Exam Type | | | | |
| Age When Tested | 26 | 26 | 26 | 26 |
| Date Tested | 2/2/19 | 5/19/19 | 5/27/19 | 6/1/19 |
| Concussion In Last 6 Months | Yes | Yes | Yes | Yes |
| Exam Language | English | English | English | English |
| Test Version | 3.10.0 | 3.10.0 | 3.10.0 | 3.10.0 |

### COMPOSITE SCORE

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Memory composite (verbal) | 98 | 94% | 76 | 21% | 86 | 56% | 95 | 84% |
| Memory composite (visual) | 98 | 98% | 62 | 19% | 75 | 48% | 95 | 96% |
| Visual motor speed composite | 50.42 | 92% | 34.46 | 21% | 46.26 | 76% | 46.95 | 80% |
| Reaction time composite | 0.47 | 96% | 0.70 | 7% | 0.56 | 59% | 0.45 | 98% |
| Impulse control composite | 1 | | 1 | | 1 | | 1 | |
| Total Symptom Score | 3 | | 29 | | 12 | | 2 | |
| Cognitive Efficiency Index | 0.94 | | 0.99 | | 0.99 | | 0.92 | |

# Concussion aka Mild TBI

Traumatic brain injury (TBI) occurs when direct or indirect force is applied to the brain, for example, through direct contact to the head, whiplash, or via explosion pressure wave.

Mild TBI (mTBI) involves loss of consciousness for less than 30 minutes, other symptoms for up to one day, and no abnormalities on brain imaging like CT Scan (aapmr.org).

# Concussion signs and symptoms

## Concussion Signs Observed

- Can't recall events *prior to* or *after* a hit or fall.
- Appears dazed or stunned.
- Forgets an instruction, is confused about an assignment or position, or is unsure of the game, score, or opponent.
- Moves clumsily.
- Answers questions slowly.
- Loses consciousness *(even briefly)*.
- Shows mood, behavior, or personality changes.

## Concussion Symptoms Reported

- Headache or "pressure" in head.
- Nausea or vomiting.
- Balance problems or dizziness, or double or blurry vision.
- Bothered by light or noise.
- Feeling sluggish, hazy, foggy, or groggy.
- Confusion, or concentration or memory problems.
- Just not "feeling right," or "feeling down".

CDC.gov, 2024

# Office Visit:

Allow for 60-90 mins

HPI including social hx, learning disabilities, MH hx, current workload on classes, employment, medications

HEENT

Neuro Exam

Recommendation on follow up care, clear expectations, S/S's to watch out for and when to seek care

Providing letter of support for school or work

Connecting with those who can provide academic support to student

# What is the SCOAT6

- The SCOAT6 stands for Sport Concussion Office Assessment Tool for Adults and Adolescents 13 years and older
- A standardized tool for evaluating concussions
- Designed for use by physicians and licensed healthcare professionals
- Composed  of first assessment, recommended part of the assessment and optional part of the assessment.

# RTP protocol

- Composed of 6 steps for returning to sport and 4 for returning to school
- A repeat ImPACT should be done before resuming contact practice
- Important for athlete to have “physical rest and relative cognitive rest for a few days” and gradually begin graded return to play
- See SCOAT5

# Step-wise approach

Once the athlete is able to complete their usual daily activities without concussion-related symptoms, the second step of the return to play/sport progression can be started. The athlete should not return to play/sport until their concussion-related symptoms have resolved and the athlete has successfully returned to full school/learning activities.

(Davis GA, et al. Br J Sports Med 2017)

# Graduated Return to Sport Strategy

| Step | Exercise Strategy | Activity at Each Step | Goal |
|---|---|---|---|
| 1 | Symptom-limited activity. | Daily activities that do not exacerbate symptoms (e.g., walking). | Gradual reintroduction of work/school. |
| 2 | Aerobic exercise<br>**2A – Light** (up to approx. 55% max HR)<br>**then**<br>**2B – Moderate** (up to approximately 70% max HR) | Stationary cycling or walking at slow to medium pace. May start light resistance training that does not result in more than mild and brief exacerbation* of concussion symptoms. | Increase heart rate. |
| 3 | Individual sport-specific exercise<br>**NOTE:** If sport-specific exercise involves any risk of head impact, medical determination of readiness should occur prior to step 3. | Sport-specific training away from the team environment (e.g., running, change of direction and/or individual training drills away from the team environment). No activities at risk of head impact. | Add movement, change of direction. |
| Steps 4-6 should begin after resolution of any symptoms, abnormalities in cognitive function, and any other clinical findings related to the current concussion, including with and after physical exertion. | | | |
| 4 | Non-contact training drills. | Exercise to high intensity including more challenging training drills (e.g., passing drills, multiplayer training). Can integrate into team environment. | Resume usual intensity of exercise, coordination, and increased thinking. |
| 5 | Full contact practice. | Participate in normal training activities. | Restore confidence and assess functional skills by coaching staff. |
| 6 | Return to sport. | Normal game play. | |

maxHR = predicted maximal Heart Rate according to age (i.e., 220-age)

| Age Predicted Maximal HR= 220-age | Mild Aerobic Exercise | Moderate Aerobic Exercise |
|---|---|---|
| 55% | 220-age x 0.55 = training target HR | |
| 70% | | 220-age x 0.70 = training target HR |

# Rest and Exercise

## REST and exercise

*The best available evidence shows that recommending strict rest until the complete resolution of concussion-related symptoms is not beneficial following SRC. Relative (not strict) rest, which includes activities of daily living and reduced screen time, is indicated immediately and for up to the first 2 days after injury*.30 Individuals can return to light-intensity physical activity (PA), such as walking that does not more than mildly exacerbate symptoms, during the initial 24–48 hours following a concussion.30

- *Clinicians are encouraged to recommend early (after 24–48 hours) return to PA as tolerated (eg, walking or stationary cycling while avoiding the risk of contact, collision or fall*).30
- *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*.31 32
- *Individuals can systematically advance their exercise intensity based on the degree of symptom exacerbation experienced during the prior bout of aerobic exercise*.
- *HCPs with access to exercise testing can safely prescribe subsymptom threshold aerobic exercise treatment within 2–10 days after SRC, based on the individual's heart rate threshold (HRt) that does not elicit more than mild symptom exacerbation during the exercise test (eg, 'mild'=testing stops with an increase of more than two points on a 0–10 point scale when compared with the pre-exercise resting value). Subsymptom threshold aerobic exercise treatment can be progressed systematically based on the determination of the new HRt on repeat exercise testing (every few days to every week*).33 34

# Return to Learn

**RETURN-to-learn (RTL)**

The transition back to learning and to school following SRC is an important consideration for children, adolescents and young adults. 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.41 While many students can quickly return to learning with no or minimal difficulty, the RTL process can be more challenging for those who have specific considerations (eg, high acute symptom severity, a prior learning disability) that may affect recovery. To minimise academic and social disruptions during the RTL strategy, HCPs should avoid recommending complete rest and isolation, even for the initial 24–48 hours, and instead recommend a period of relative rest. Early return to activities of daily living should be encouraged provided that symptoms are no more than mildly and briefly increased (ie, an increase of no more than 2 points on a 0–10 point scale for less than an hour). In consultation with educators, and accounting for social determinants of health, some students may be offered academic supports to promote RTL including:

- **Environmental adjustments**, such as modified school attendance, frequent rest breaks from cognitive/thinking/deskwork tasks throughout the day and/or limited screen time on electronic devices.
- **Physical adjustments** to avoid any activities at risk of contact, collision or falls, such as contact sports or game play during physical education classes or after-school activities, while allowing for safe non-contact PA (eg, walking).
- **Curriculum adjustments**, such as extra time to complete assignments/homework and/or preprinted class notes.
- **Testing adjustments**, such as delaying tests/quizzes and/or permitting additional time to complete them.41

# Updates:

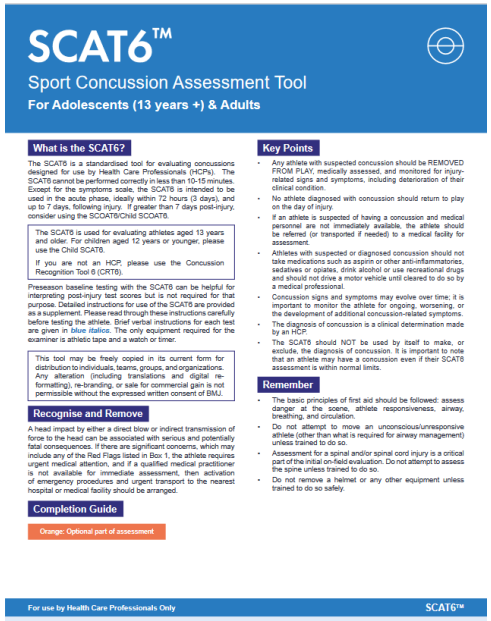
As of June 2023 SCAT5 has been updated and now validated. We should now be using SCAT6 or SCOAT6 depending on when concussion occurred.

Modifications and Recommendations:

The following recommendations were made based on the systematic review and subsequent expert panel discussions:

- *Create both paper and electronic formats of SCAT6/Child SCAT6/CRT6*.
- *Explore the development of alternate tools for serial evaluation in the office setting*.
- *Improve psychometric properties: longer word list (eg, 12- or 15-word list) and remove the 5-word list*.
- *Further examine form differences on existing 10-word lists and consider the use of regression-based norms*.
- *Create a cognitive composite score to improve test–retest reliability and reduce false positives*.
- *Add digits (ie, increase the longest string by two digits) to the digit span backward subtest to reduce ceiling effects*.
- *Revise months backward to include a component of timed information processing*.
- *Add timed dual gait tasks*.
- *Implement tests and/or procedures to assess the performance validity of baseline testing*.
- *Add a more robust set of visible signs to the SCAT6/Child SCAT6/CRT6, including: Falling with no protective action, tonic posturing, impact seizure, ataxia/motor incoordination, altered mental status and blank/vacant/dazed look*.
- Support serial SCAT6/Child SCAT6 assessments after an athlete is removed from play, for example, half-time after the game and 24–48 hours after injury.

# What is the SCAT6



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 purpose. Detailed instructions for use of the SCAT6 are provided as a supplement. Please read through these instructions carefully before testing the athlete. Brief verbal instructions for each test are given in *blue italics*. The only equipment required for the examiner is athletic tape and a watch or timer.

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**Recognise and Remove**

A head impact by either a direct blow or indirect transmission of force to the head can be associated with serious and potentially fatal consequences. If there are significant concerns, which may include any of the Red Flags listed in Box 1, the athlete requires urgent medical attention, and if a qualified medical practitioner is not available for immediate assessment, then activation of emergency procedures and urgent transport to the nearest hospital or medical facility should be arranged.

**Completion Guide**

Orange: Optional part of assessment

**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 important to monitor the athlete for ongoing, worsening, or the development of additional concussion-related symptoms.
- The diagnosis of concussion is a clinical determination made by an HCP.
- The SCAT6 should NOT be used by itself to make, or exclude, the diagnosis of concussion. It is important to note that an athlete may have a concussion even if their SCAT6 assessment is within normal limits.

**Remember**

- The basic principles of first aid should be followed: assess danger at the scene, athlete responsiveness, airway, breathing, and circulation.
- Do not attempt to move an unconscious/unresponsive athlete (other than what is required for airway management) unless trained to do so.
- Assessment for a spinal and/or spinal cord injury is a critical part of the initial on-field evaluation. Do not attempt to assess the spine unless trained to do so.
- Do not remove a helmet or any other equipment unless trained to do so safely.

For use by Health Care Professionals Only SCAT6™

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- 9 pages long

# Immediate Assessment/Neuro Screen part of SCAT6

Demographics

Algorhythm for Immediate Assessment/Neuro Screen

Step 1: observable signs

Step 2: Glasgow Coma Scale

Ste3: Cervical Spine Assessment

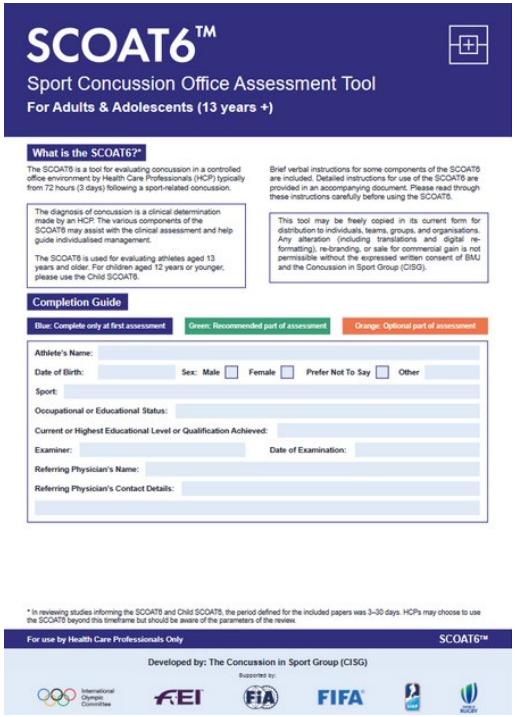
Step 4: Coordination & Ocular/Motor Screen

Step 5: Memory Assessment

**Box 1: Red Flags**

- Neck pain or tenderness
- Seizure or convulsion
- Double vision
- Loss of consciousness
- Weakness or tingling/burning in more than 1 arm or in the legs
- Deteriorating conscious state
- Vomiting
- Severe or increasing headache
- Increasingly restless, agitated or combative
- GCS <15
- Visible deformity of the skull

# SCOAT6



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

Sport:

Occupational or Educational Status:

Current or Highest Educational Level or Qualification Achieved:

Examiner: Date of Examination:

Referring Physician's Name:

Referring Physician's Contact Details:

* In reviewing studies informing the SCOAT6 and Child SCOAT6, the period defined for the included papers was 3-30 days. HCPs may choose to use the SCOAT6 beyond this timeframe but should be aware of the parameters of the reviews.

For use by Health Care Professionals Only SCOAT6™

Developed by: The Concussion in Sport Group (CISG)

Supported by:

- The Sport Concussion Office Assessment Tool 6 (SCOAT6) is to be used in the sub-acute setting, typically from 72 hours (3 days) after injury; where an athlete presents to a healthcare provider before this time, use of the SCOAT6 may still be appropriate.
- 15 pages long

# SCOAT6 Assessment Tool

Note: Banner colors on sections:

**Completion Guide**

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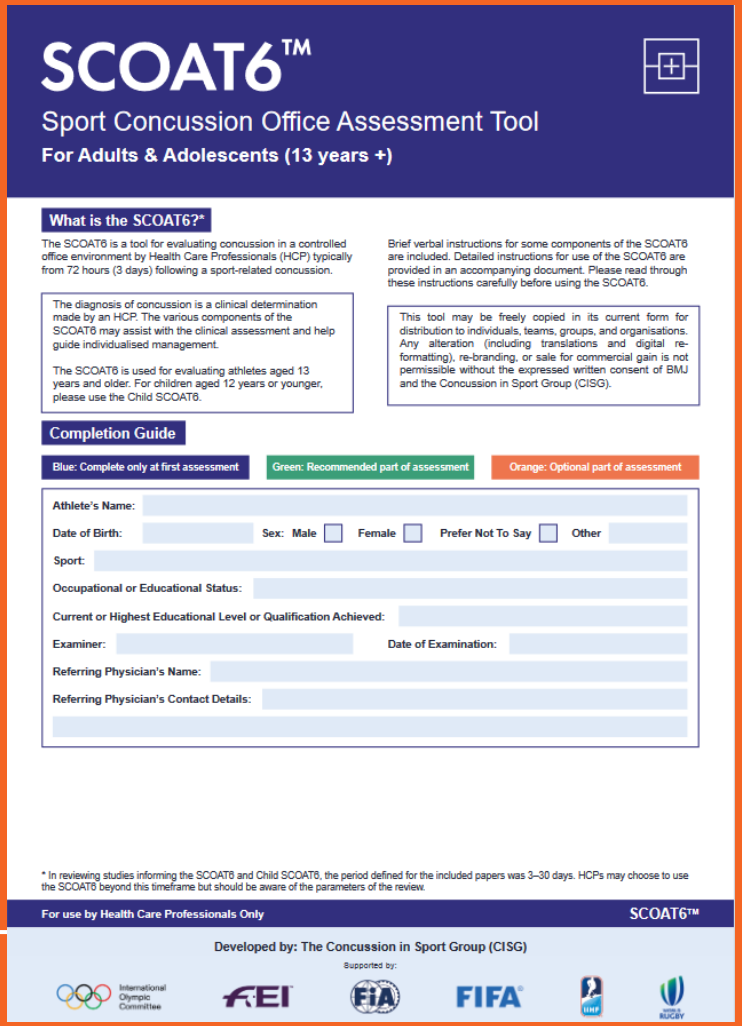

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**Completion Guide**

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

Sport:

Occupational or Educational Status:

Current or Highest Educational Level or Qualification Achieved:

Examiner: Date of Examination:

Referring Physician's Name:

Referring Physician's Contact Details:

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For use by Health Care Professionals Only SCOAT6™

Developed by: The Concussion in Sport Group (CISG)

Supported by:

# SCOAT6 Packet includes:

- Second pg: Current Injury, Hx of head injuries, hx of any neuro, psych, or learning d/o's
- Third pg: Medication, Fam Hx (optional)
- Fourth & Fifth pg: Symptom Evaluation, Verbal Cognitive tests,
- Sixth pg: Verbal Cognitive Tests: 15 word (optional), Digit Backwards, Months in Reverse Order
- Seventh pg: Exam portion which includes Ortho V/S and Cervical Spine assessment
- Eighth pg: Neuro and Balance, Tandem Gait

# SCOAT6 Packet includes:

- Ninth pg: Complex Tandem Gait, Dual Task Gait (optional)
- Tenth pg: mVOMS, Optional: Anxiety , depression, sleep screen
- Eleventh pg: Delayed word recall, computerized cognitive test results (optional), graded aerobic exercise test (optional), Overall assessment
- Twelve pg: management and follow up plan, Referral
- Thirteenth pg: Additional Clinical Notes, advice on return to learn
- Fourteenth pg: Advice on return to sport

# mBESS stances

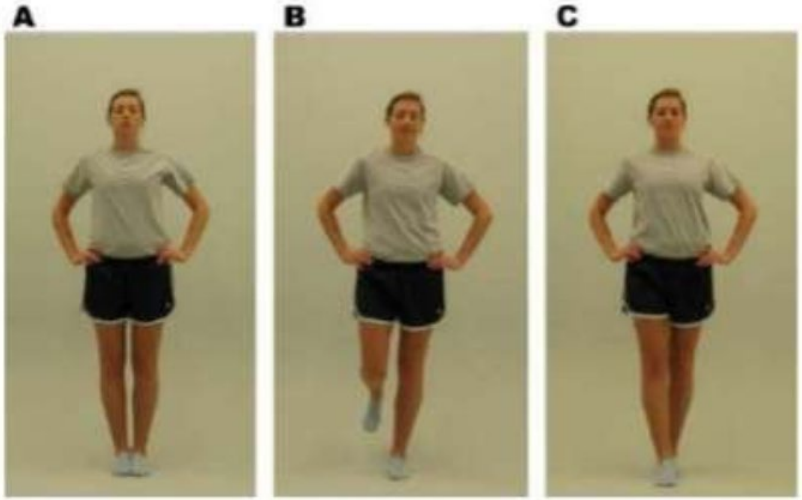


Illustration of mBESS stances taken for SCAT5. A) Double leg stance; B) single leg stance on non-dominant foot; C) tandem heel-to-toe stance with non-dominant foot at the back (Sulapas, 2018).

## Neurological Examination

### Abridged Cranial Nerve Exam

**Cranial Nerve 1: Olfactory Nerve**

- Subjective- Do you have any issues with smell?
- Objective- have a smell that players can identify (coffee, mint, or vanilla) test sense of smell each nostril with eyes closed.

**Cranial Nerve 2: Optic Nerve**

Briefly shine a pen/torch light into each pupil.

Pupils Equal And Reactive (PEARL)- pupil equal and reactive to light. Examine – pupillary constriction.

Consensual reflex – look for constriction of a pupil when light is shone into the other eye.

Visual fields – Using red hat pin or finger, assess each visual field quadrant of each eye separately.

**Cranial Nerve 3, 4 & 6: Eye Movement**

Examine position of the eye lid, and eye tracking with athlete's head still and examiner's finger drawing an "H" and an "X"

**Cranial Nerve 5: Sensory**

Examine sense of touch in 3 anatomical regions

- Forehead, above both eyes
- On both check bones
- On both sides of the jaw line

Motor - examine opening the mouth and side-to-side movements of the mandible.

Jaw jerk

**Cranial Nerve 7: Facial Nerve**

Look for symmetry in the following movements:

- Raise eyebrows
- Close eyes tight
- Puff cheeks
- Big smile
- Purse lips
- Tight closed lips

Instructional Video

**Cranial Nerve 8: Gross hearing test**

Whisper a number in each ear while clicking fingers in opposite ear.

**Cranial Nerves 9 & 10:**

Inspect uvula's symmetrical movement when saying "Ahhhhh".

**Cranial Nerve 11: Trapezius and SCM Control**

Athlete performs a shoulder shrug against resistance followed by neck rotation against resistance (if no neck pain or tenderness detected).

**Cranial Nerve 12: Tongue**

Stick tongue out – make sure it protrudes

### Cerebellar Function

**Rapid repetitive movement**

Place the right hand on top of the dorsum of the left hand, and repeatedly and rapidly supinate and pronate the right forearm so that the right hand repeatedly is palm up followed by palm down, atop the left hand. Repeat using the left hand.

**Finger to nose test**

Instruct the athlete to place right index finger on his/her nose and then (with your index finger 50-60cm in front of their face) instruct them to touch your finger and then their nose and repeat 5 times. Then repeat with left index finger.

Then repeat the test with the athlete's eyes closed.

Looking for the movement to be performed smoothly.

**Heel to shin test**

With athlete supine, slide heel up and down shin – test both left and right legs.

### Limb Bulk and Tone

Look at muscle tone at rest and look for definition, ensure muscles of upper and lower limb are not flaccid or in spasm.

## Limb Strength

**Test upper and lower limb strength against resistance in seated position**

- Shoulder
- Elbow flexion and extension
- Wrist extension and flexion
- Hands/fingers
- Hip flexion and extension
- Knee extension and flexion
- Foot dorsi and plantar flexion




# mVOMS:

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Game
HEADS UP
CONCUSSION

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Join us in protecting the brains and future success of our young athletes!

# References


The American Congress of Rehabilitation Medicine Diagnostic Criteria for Mild Traumatic Brain Injury, Noah D. Silverberg, PhD , Grant L. Iverson, PhD, et al; Published:May 19, 2023DOI:https://doi.org/10.1016/j.apmr.2023.03.036

Consensus statement on concussion in sport: the 6th International Conference on Concussion in Sport, Amsterdam, October 2022 Patricios JS, Schneider KJ, Dvorak J, et al. Br J Sports Med 2023;57:695–711.

The Zack Lystadt Law: A Concussion Survivor's Return to Play

Resendes Chinn, Nancy, Monica Ohkubo, and Brianna Thomsen. 2021. "Advances in Concussion Education: Contextual Procedure-based Learning Enhances Concussion Reporting." *The International Journal of Sport and Society* 12 (1): 165-173. doi:10.18848/2152-7857/CGP/v12i01/165-173.

Archives of Clinical Neuropsychology 38 (2023) 1635–1645 Does Frequency of Baseline Testing Influence Concussion Diagnostic Decision Making Among College Athletes Andrew Crane, Concussion Management Program, Florida Institute of Technology, 150 W University Blvd, Melbourne, FL 32901


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