

# Concussion & EMS



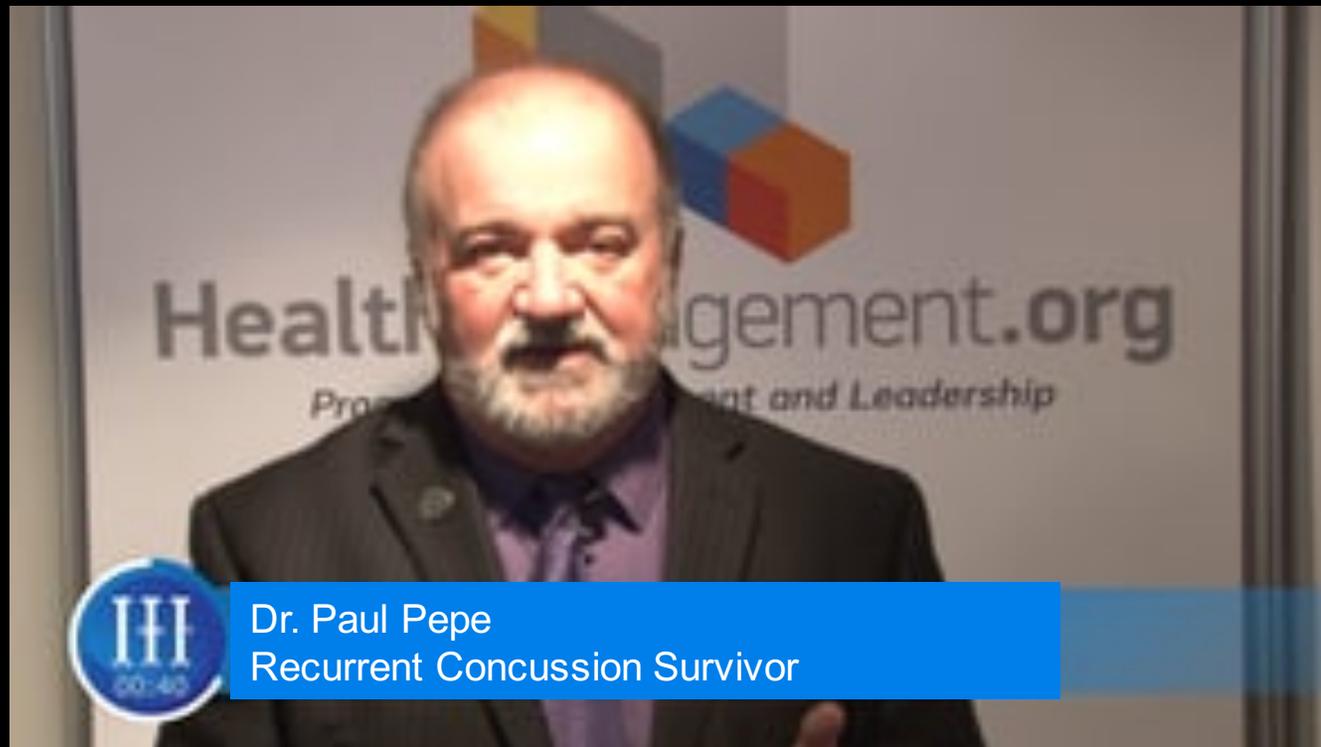


# RINGING OF THE BELL.

THE JOURNEY OF UNDERSTANDING,  
RECOGNIZING AND MANAGING  
CONCUSSION

NOT JUST A “STAND BY”

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Chief Medical Officer  
American Medical Response – AMR Medicine



Concussion strikes those we love  
The silent personality thief

W I L L S M I T H



BASED ON A TRUE STORY

# CONCUSSION

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CONCUSSION  
CHRISTMAS

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CHRISTMAS

# TBI.

- Worldwide, TBI is the leading injury cause of death and permanent disability
- 1.4 million cases of TBI present to emergency services every year in the US
- 235,000 hospitalizations
- 50,000 deaths
- Blunt trauma alone kills 1% of those affected, but when a TBI is also involved, the mortality rate increases to 30%
- *50% of those who die from TBI do so within the first two hours of injury*

# Concussion...

- Derived from the Latin word *Concutere* – To shake violently
- A specific type of mild Traumatic Brain Injury (mTBI) that results in alteration of brain function even in the absence of LOC

# Incidence

- According to the CDC, the annual estimate of concussion in the US is 1.6M-3.8M
- Top reported concussion sports (NCAA)
  - Football
  - **Women's Soccer**
  - Women's Basketball
  - Men's Basketball
  - **Men's Soccer**
  - Wrestling

# Autopsy data

- Pro football players
  - Mike Webster
  - Frank Gifford
  - Fred McNeill
- Chronic Traumatic Encephalopathy (CTE)
  - A degenerative brain disease caused by repetitive trauma to the head
    - Memory loss
    - Depression
    - Dementia

**Early in-theater management of combat-related traumatic brain injury:  
A prospective, observational study to identify opportunities for performance improvement  
(32,996 cases)**

“Avoidance of secondary brain injury by optimizing oxygenation, ventilation, and cerebral perfusion is the primary goal in the contemporary care of moderate-to-severe CRTBI.

Ideally, this crucial care must begin as early as possible after injury”



Cliff Avril (56) of the Seattle Seahawks is down with a concussion during Super Bowl XLIX in 2015. (AP Photo/Kevin Terrell)

CONCUSSION WATCH | LEAGUE OF DENIAL: THE NFL'S CONCUSSION CRISIS

# NFL Acknowledges a Link Between Football, CTE



MARCH 15, 2016 / by JASON M. BRESLOW

Updated on 03/15/16 by JASON M. BRESLOW



## FOOTBALL, CTE

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# Second Impact Syndrome (SIS)

Second-impact syndrome (SIS) occurs when the brain swells rapidly, and catastrophically, after a person suffers a second concussion before symptoms from an earlier one have subsided.

This second blow may occur minutes, days or weeks after an initial concussion, and even the mildest grade of concussion can lead to SIS.



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## NASCAR expands concussion protocol in latest push for driver safety

NASCAR



NASCAR's protocol, which applies to all three national touring series, includes the following guidelines:

Any driver whose car sustains damage from an accident or contact of any kind and goes behind the pit wall or to the garage is required to visit the Infield Care Center for evaluation.

The medical portion of NASCAR's Event Standards now require that Infield Care Center physicians incorporate the SCAT-3 diagnostic tool in screening for head injuries.

American Medical Response will provide on-site neurological consultative support at select NASCAR events during the 2017 season and will work directly with the sanctioning body in the continued development of concussion protocol.

Concussion procedures have come under increased scrutiny in the NFL and other professional sports in recent years. Drivers are certainly subject to head injuries; the sport's biggest star, Dale Earnhardt Jr., missed half of last season with concussion-like symptoms.

"NASCAR has worked very closely with the industry to ensure our concussion protocol reflects emerging best practices in this rapidly developing area of sports medicine," NASCAR senior vice president of racing operations Jim Cassidy said in a **statement**. "We will continue to utilize relationships we've had for years with leaders in the neurological research field who helped to shape these updates."

Earlier this month, NASCAR announced a partnership with American Medical Response that adds a doctor and paramedic to the existing on-site medical staff for each Monster Energy NASCAR Cup race weekend. The AMR doctor and paramedic, who would travel to every race, would help provide familiarity with competitors and their medical history.



# Signs & Symptoms

(As reported by the patient or noticed by others)

| Reported by Patient/Athlete  | Observed by Others  |
|--|---|
| <ul style="list-style-type: none"><li>• Headache or pressure in head</li><li>• Double or blurry vision; seeing stars in peripheral vision</li><li>• Ringing in ears</li><li>• Nausea or vomiting</li><li>• Sensitivity to light or noise</li><li>• Dizziness or balance problems</li><li>• Fatigue, drowsiness</li><li>• Numbness or tingling in face or extremities</li><li>• Slowed reaction time</li><li>• Sleeping less or more than usual or difficulty falling or staying asleep</li></ul> | <ul style="list-style-type: none"><li>• Loss of consciousness (any)</li><li>• Moves clumsily (altered coordination)</li><li>• Exhibits balance problems</li><li>• Less energetic</li><li>• Pupil dilation</li><li>• Seizure activity</li><li>• Slurred speech</li></ul> |

# Signs & Symptoms

(As reported by the patient or noticed by others)



## Reported by Patient/Athlete

- Concentration problems
- Memory deficits
- Confusion, mental foginess
- Difficulty focusing

## Observed by Others

- Appears dazed or stunned
- Is confused about assignment or position
- Responds slowly to or cannot answer questions
- Forgets instructions/play strategies, events prior to or after the concussion
- Is unsure of game, score, or opponent

# Signs & Symptoms

(As reported by the patient or noticed by others)



## Reported by Patient/Athlete

- Depression
- Unusually irritable
- Nervousness
- More emotional than usual

## Observed by Others

- Changes in behavior, mood, or personality
- Emotional outbursts
- Sadness
- Nervousness

# SCAT 3

## SCAT3™



### Sport Concussion Assessment Tool – 3rd Edition

For use by medical professionals only

Name: \_\_\_\_\_ Date/Time of Injury: \_\_\_\_\_ Examiner: \_\_\_\_\_  
Date of Assessment: \_\_\_\_\_

#### What is the SCAT3?

The SCAT3 is a standardized tool for evaluating injured athletes for concussion and can be used in athletes aged from 13 years and older. It supersedes the original SCAT and the SCAT2 published in 2005 and 2009, respectively. For younger persons, ages 12 and under, please use the Child SCAT3. The SCAT3 is designed for use by medical professionals. If you are not qualified, please use the Sport Concussion Recognition Tool. Pre-season baseline testing with the SCAT3 can be helpful for interpreting post-injury test scores.

Specific instructions for use of the SCAT3 are provided on page 3. If you are not familiar with the SCAT3, please read through these instructions carefully. This tool may be freely copied in its current form for distribution to individuals, teams, groups and organizations. Any revision or any reproduction in a digital form requires approval by the Concussion in Sport Group.

**NOTE:** The diagnosis of a concussion is a clinical judgment, ideally made by a medical professional. The SCAT3 should not be used solely to make, or exclude, the diagnosis of concussion in the absence of clinical judgment. An athlete may have a concussion even if their SCAT3 is "normal".

#### What is a concussion?

A concussion is a disturbance in brain function caused by a direct or indirect force to the head. It results in a variety of non-specific signs and/or symptoms (some examples listed below) and most often does not involve loss of consciousness. Concussion should be suspected in the presence of **any one or more** of the following:

- Symptoms (e.g., headache), or
- Physical signs (e.g., unsteadiness), or
- Impaired brain function (e.g., confusion) or
- Abnormal behaviour (e.g., change in personality).

#### SIDELINE ASSESSMENT

##### Indications for Emergency Management

**NOTE:** A hit to the head can sometimes be associated with a more serious brain injury. Any of the following warrants consideration of activating emergency procedures and urgent transportation to the nearest hospital:

- Glasgow Coma score less than 15
- Deteriorating mental status
- Potential spinal injury
- Progressive, worsening symptoms or new neurologic signs

##### Potential signs of concussion?

If any of the following signs are observed after a direct or indirect blow to the head, the athlete should stop participation, be evaluated by a medical professional and **should not be permitted to return to sport the same day** if a concussion is suspected.

- Any loss of consciousness?  Y  N  
"If so, how long?" \_\_\_\_\_
- Balance or motor incoordination (stumbles, slow/laboured movements, etc.?)  Y  N
- Disorientation or confusion (inability to respond appropriately to questions?)  Y  N
- Loss of memory: "If so, how long?" \_\_\_\_\_
- "Before or after the injury?" \_\_\_\_\_
- Blank or vacant look.  Y  N
- Visible facial injury in combination with any of the above:  Y  N

#### 1 Glasgow coma scale (GCS)

| Best eye response (E)                 |              |
|---------------------------------------|--------------|
| No eye opening                        | 1            |
| Eye opening in response to pain       | 2            |
| Eye opening to speech                 | 3            |
| Eyes opening spontaneously            | 4            |
| Best verbal response (V)              |              |
| No verbal response                    | 1            |
| Incomprehensible sounds               | 2            |
| Inappropriate words                   | 3            |
| Confused                              | 4            |
| Oriented                              | 5            |
| Best motor response (M)               |              |
| No motor response                     | 1            |
| Extension to pain                     | 2            |
| Abnormal flexion to pain              | 3            |
| Flexion/Withdrawal to pain            | 4            |
| Localizes to pain                     | 5            |
| Obeys commands                        | 6            |
| <b>Glasgow Coma score (E + V + M)</b> | <b>of 15</b> |

GCS should be recorded for all athletes in case of subsequent deterioration.

#### 2 Maddocks Score<sup>1</sup>

"I am going to ask you a few questions, please listen carefully and give your best effort"  
Modified Maddocks questions (1 point for each correct answer)

|  |             |   |
|--|-------------|---|
| What venue are we at today?            | 0           | 1 |
| Which half is it now?                  | 0           | 1 |
| Who scored last in this match?         | 0           | 1 |
| What team did you play last week/game? | 0           | 1 |
| Did your team win the last game?       | 0           | 1 |
| <b>Maddocks score</b>                  | <b>of 5</b> |   |

Maddocks score is validated for sideline diagnosis of concussion only and is not used for serial testing.

**Notes:** Mechanism of Injury ("tell me what happened"):

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Any athlete with a suspected concussion should be REMOVED FROM PLAY, medically assessed, monitored for deterioration (i.e., should not be left alone) and should not drive a motor vehicle until cleared to do so by a medical professional. No athlete diagnosed with concussion should be returned to sports participation on the day of injury.**

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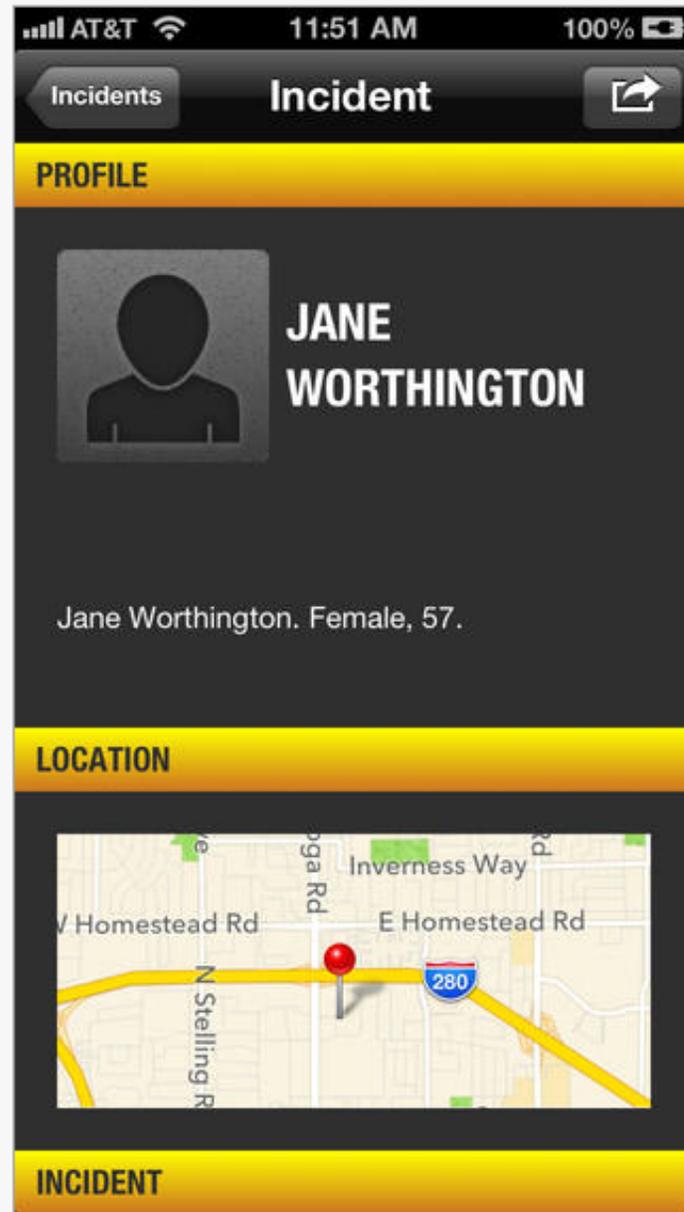
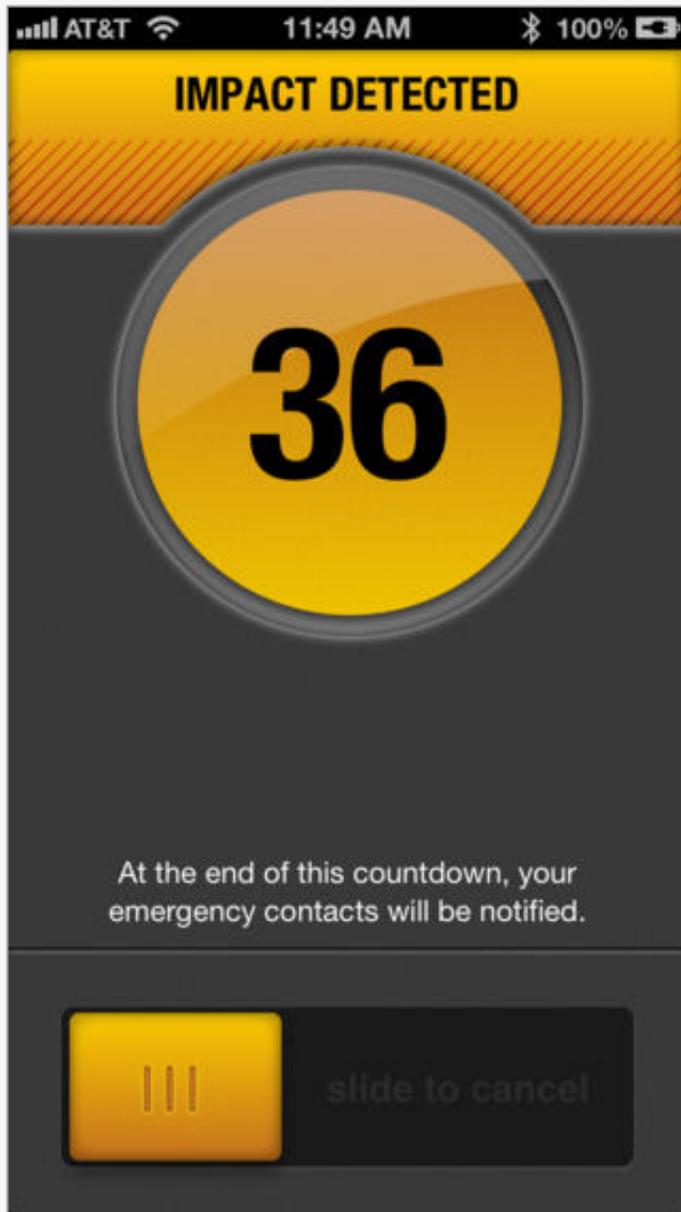


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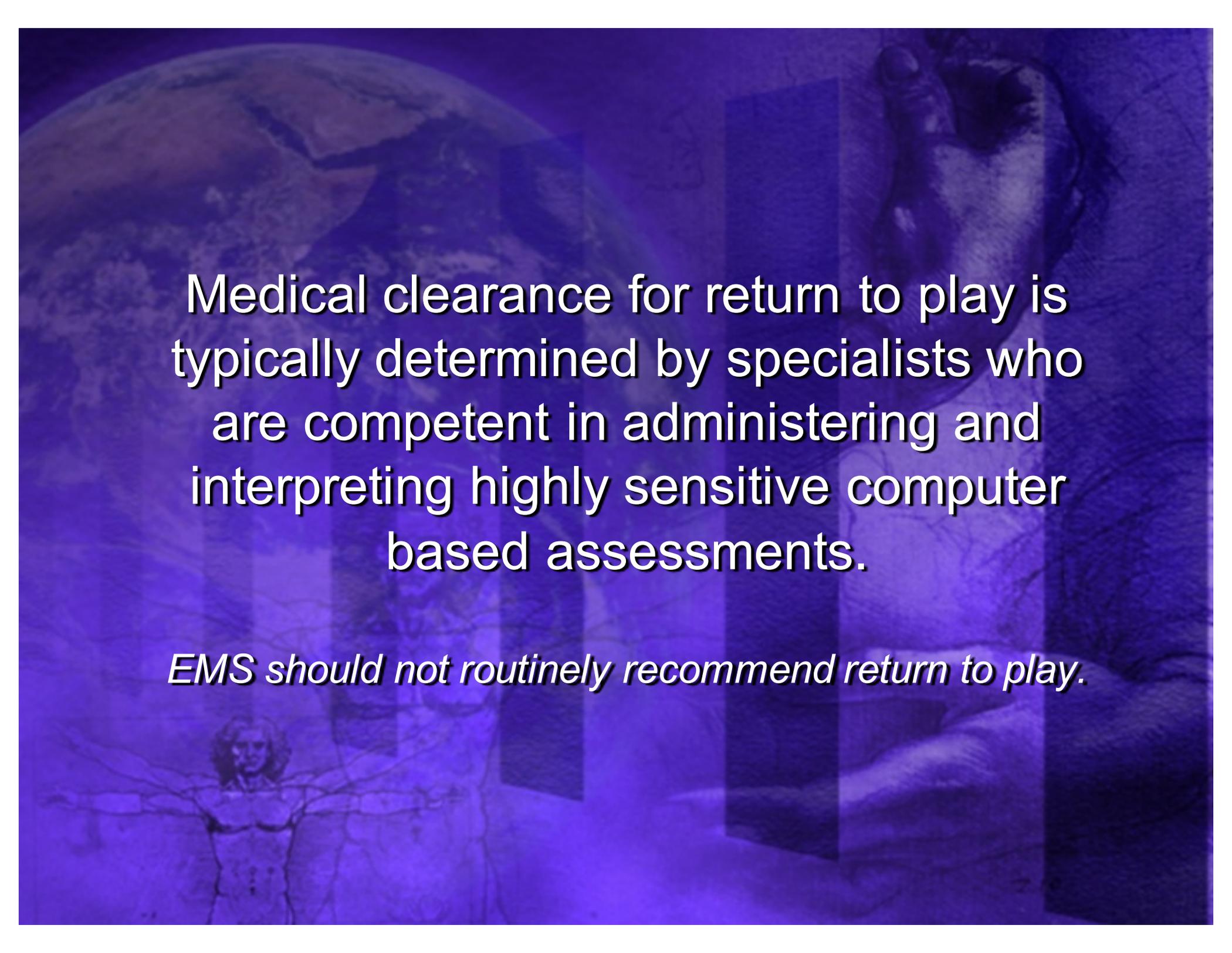


**BRAINSCOPE**



# 1 requested technology?





Medical clearance for return to play is typically determined by specialists who are competent in administering and interpreting highly sensitive computer based assessments.

*EMS should not routinely recommend return to play.*

# Concussion for EMS

## *The new journey...*

- We have become comfortable with informal assessment
- Routine “stand bys” have significant potential
- Assessment tools include consistent neuro examination, scoring and evolving bedside tests
- Critical importance of Second Impact Syndrome
- Concussion is a continuum

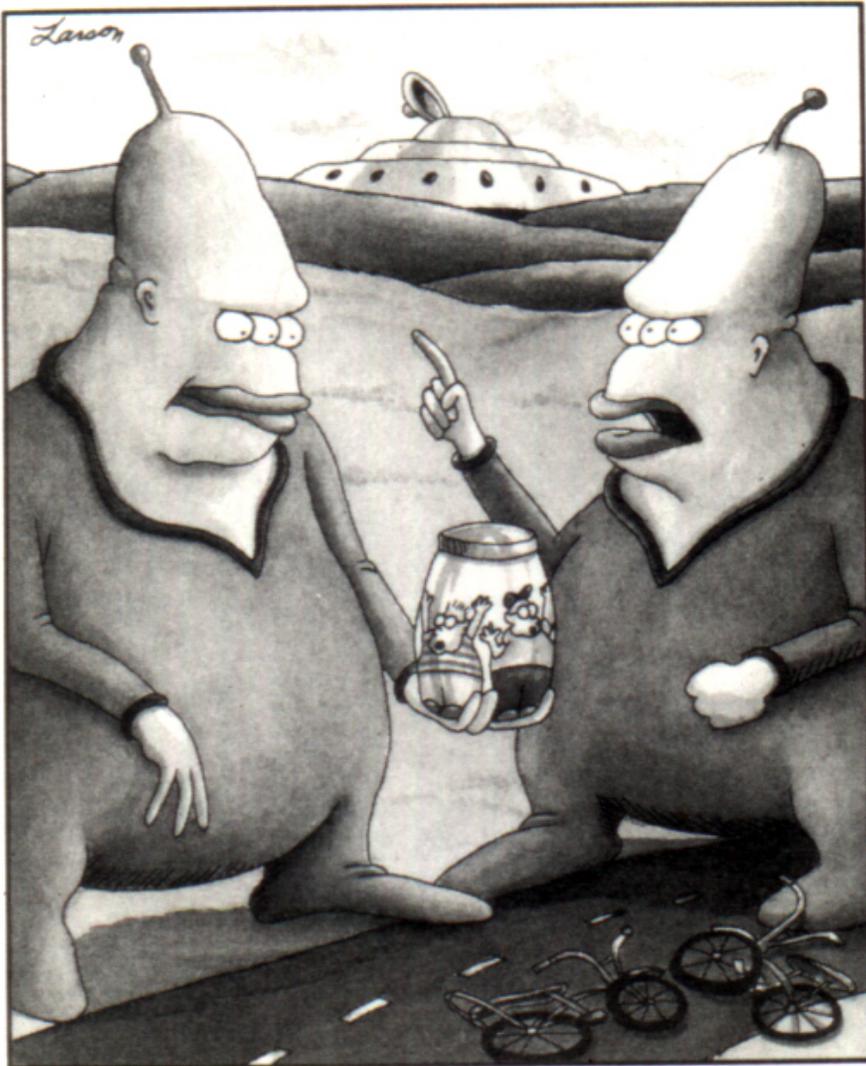
Thanks...

**I'VE GOT A CONCUSSION, BUT MY  
HEAD IS STILL ATTACHED TO ME NECK**

**SO I GOT THAT GOING FOR ME,  
WHICH IS NICE**

**WHICH IS NICE**

**SO I GOT THAT GOING FOR ME**



"Now don't forget, Gorok! . . . *This* time punch some holes in the lid!"