

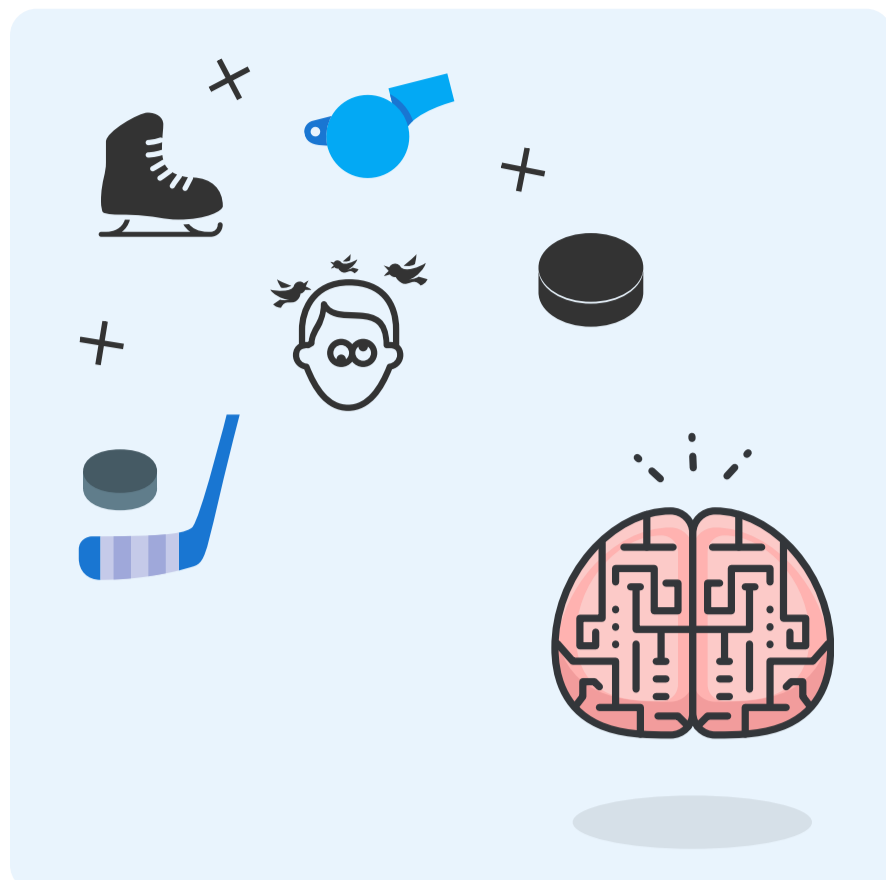
Concussions: General Information



What is a concussion?

A concussion is a form of traumatic brain injury caused by a bump, blow or jolt to the head, or by a hit to the body that causes the brain to move rapidly back and forth in the skull.

This movement creates chemical changes in the brain that temporarily affect brain function, memory, concentration, balance and coordination.

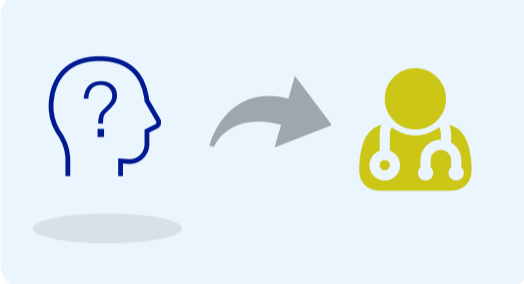


Signs and symptoms of a concussion

The signs and symptoms of a concussion can be subtle and may not show up immediately. Symptoms can last for days, weeks or even longer. Some signs or symptoms of concussions may include:

- Athlete appears dazed
- Moves clumsily
- Loss of consciousness
- Mood or personality changes
- Headaches
- Nausea or vomiting
- Bothered by light or noise
- Cannot recall event prior to or after the hit
- Ringing in the ears
- Slurred speech
- Dizziness or blurred vision
- Concentration or memory problems
- Not feeling yourself (sad/fatigued)
- Sleep disturbances

Who can diagnose a concussion?



If signs and symptoms of a concussion are shown following a bump, jolt, or blow to the head/body, see a **health care provider** immediately.



Only a health care provider should assess an athlete for a concussion and diagnose it if deemed necessary after performing several neurological and cognitive tests.



The decision for the athlete to **return to play** must later be made by the health care provider when symptoms have cleared.

Return To Play Guidelines

NEVER RETURN TO PLAY IF YOU STILL HAVE SYMPTOMS



An athlete who returns to play before full recovery is at high risk of getting another concussion with increased symptoms.

- Each step must take a minimum of one day, but could last longer depending on the injury and severity of symptoms
- If symptoms reappear while moving through the steps, go back to the previous step until the athlete is symptom free for at least 24 hours

1 Symptom Limited Activity

- After a short period of complete rest (24-48 hours), light physical or cognitive activities that will not worsen the symptoms are permitted

2 Light Aerobic Activity

- Lighter activities such as walking or stationary cycling
- The athlete should be supervised during this activity to monitor signs and symptoms
- The duration and intensity of exercise can increase over time if symptoms are clear

3 Sport Specific Activities

- Activities such as skating and puck handling
- No body contact or high speed motion

4 Begin Drills Without Body Contact

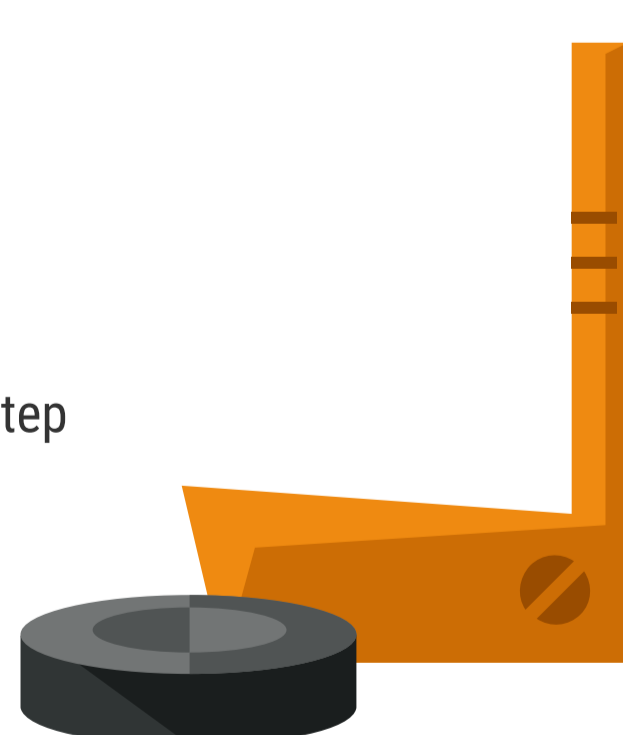
- Familiarize yourself with the game and techniques

5 On Ice Practice With Body Contact

- Must be cleared by a doctor in order to begin this step
- Take caution and stay protected

6 Game Play

- Return to competition



Protection

Although there is no such thing as a concussion-proof helmet, a proper helmet can help protect the athlete from a more serious head injury.



Get a good fit

- Helmet should fit snug with no spaces between the pads and the athletes head
- If the helmet is too tight it can cause headaches
- Cage or facemask should be no further than 1 inch from the face
- You should be able to see the athletes eyes - they should be able to see forwards and side to side
- Chin strap should be centered under the chin snugly

and

Take care of it

- Do not let the athlete use a cracked or broken helmet with missing pads or parts
- Clean the helmet often with warm water and mild detergent - do not soak or expose to high heat
- Store the helmet in a room temperature environment away from sunlight - do not leave in the car
- Helmets should be replaced no later than 10 years from the date of manufacture



Concussions:

Additional Information



Helmets: Selection Guide



Research shows that concussions are caused by internal accelerations of the brain. No hockey helmet can prevent or eliminate the risk of a concussion.

CCM

The Tacks helmet includes D30 foam implemented to manage impact and offer a comfortable fit. The foam is durable in cold and wet conditions, thus it will stay in tact as the athlete sweats during play. The Fitlite helmet contains D30 foam as well as low density EPP memory foam for a lightweight, shock absorbing fit. The helmet also features a Microdial III that allows the athlete to create a customizable fit.

Tacks: \$150-\$200
Fitlite: \$180-\$350

Bauer

The Re-akt helmet includes a "Suspend-Tech" liner that adapts to the players head for maximum comfort. The helmet moves around while the liner stays in place on the head. It has an occipital plate that can be adjusted to fit the back of the head comfortably. Bauer's "Seven" technology in their IMS helmets utilize cylindrical shaped structures in the foam to cushion the head and to dissipate high energy forces.

Re-akt: \$125-\$350
IMS: \$70-\$210

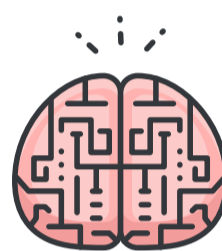
Warrior

The Krown has 3 layers of foam and a 360 customizable fit. The covert helmet utilizes both soft VN and firm EPP foam for comfort and protection. The EPP foam will visibly crack when the helmet has sustained a substantial impact. This is how you know it is no longer protective and it is time to get a new one. The Covert also has "toolless" adjustment for on the bench. Both helmets protect against low and high impact collisions.

Krown: \$70-\$170
Covert: \$80-\$200



Prevalence In Females



Female varsity hockey players are sustaining concussions at twice the rate of male varsity players, thus making head trauma the number one injury in women's hockey.

Females display more concussion symptoms than males and suffer with greater cognitive decline and slower reaction time.

Females have shown a greater willingness to report head injuries.

Females are more susceptible to recurring concussions due to weak head-neck strength. The head and neck are unable to counteract sudden acceleration, deceleration and rotational forces.



Concussion Testing: SCAT5 vs. CRT5



Only a healthcare professional can clinically diagnose a concussion and clear an athlete to return to play.

SCAT5

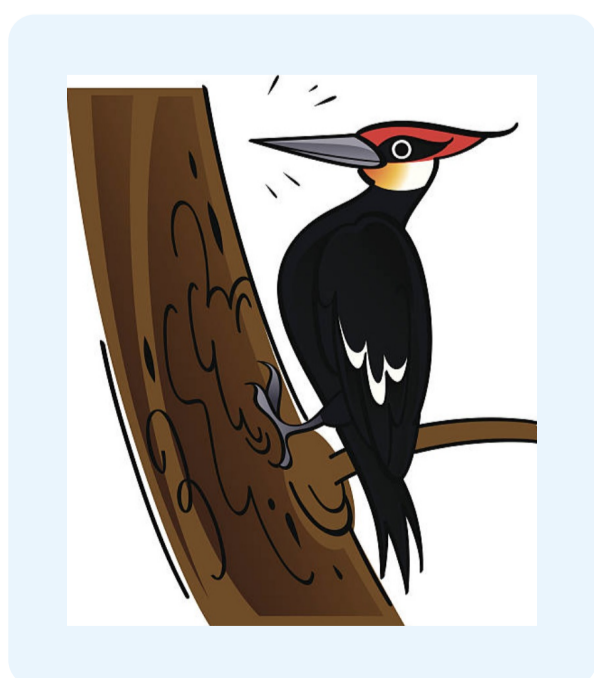
- A tool used by healthcare professionals to assess athletes suspected to have a concussion, over the age of 13.
- SCAT5 cannot be performed correctly in less than 10 minutes.
- SCAT5 should be used when the athlete is at rest [resting heart rate].
- The SCAT5 introduces the option of using a 10-word recall list instead of SCAT3's 5-word list.
- A "rapid neurological screen" is included. It evaluates speech, spinal alignment, reading ability, balance, gait, visual tracking and finger-to-nose coordination.
- Return to sport guidelines state the initial period of physical and cognitive rest should last 24-48hrs.

CRT5

- A recognition and removal tool used by non-health professionals like coaches. Can not be used to diagnose the athlete.
- Includes "Red Flags" to look for in an athlete. Red Flags= immediate medical attention.
- If there are no red flags present for the athlete then the coach can continue the concussion assessment.
- Includes a list of visible signs and symptoms of concussion [similar to SCAT5].
- Includes basic awareness questions to be used in persons over the age 12.



Developing Research



- Studies have investigated woodpecker's ability to prevent concussions while head-pounding against trees
- It was found that a woodpecker's brain is surrounded by thick spongy bone containing many compact trabeculae
- These trabeculae form the spongy platelike structure that acts as an armour to protect the brain
- Unlike humans, the woodpecker's brain has very little cerebrospinal fluid and is tightly packed in the skull, which reduces the motion of the brain within the skull upon impact
- Thus a woodpecker's biomechanics and their shock absorbing spongy bones may one day be implemented in creating advanced helmets to provide more safety for athletes

