



INTERNATIONAL LIFEGUARD TRAINING PROGRAM™

BASIC FIRST RESPONDER CARE SUMMARY MATRIX

MEDICAL EMERGENCIES – SIGNS/SYMPTOMS AND BASIC CARE SUMMARY

Heart Attack

Signs/Symptoms

- Chest Pressure/Pain that spreads to shoulders, neck, arms, or jaw
- Breathing difficulty, dizziness
- Nausea, fatigue

Care

- Activate EAP/Call EMS
- Have guest rest in most comfortable position
- Assist guest with medication such as nitroglycerin, or Aspirin
- Be ready to begin BLS at anytime

Stroke

Signs/Symptoms

- Weakness or numbness on one side of the body
- Vision problems / Speech problems
- Dizziness, loss of balance
- Confusion, nausea, fatigue
- Sudden extreme headache

Care

- Activate EAP/Call EMS
- Have guest rest in most comfortable position
- Place the guest into the recovery position if nausea or vomiting occurs
- Be ready to begin BLS at anytime

Heat Emergency

Signs/Symptoms

- Muscle cramps
- Dizziness, nausea, vomiting
- Fatigue, Headache
- Extreme thirst, hot dry skin or moist skin
- Rapid pulse, confusion
- Seizure

Care

- Have guest rest in a cool location
- Remove excess clothing
- Provide cool water (if conscious and not nauseous). Gently stretch cramped muscles
- Fan and place ice packs in the armpits, groin, and neck
- CALL EMS if the guest does not improve quickly or loses consciousness

Cold Emergency

Signs/Symptoms

- Shivering
- Confusion / Sluggishness
- Cold skin

Care

- Place the guest in a warm location, resting in a comfortable position
- Replace wet clothing with dry and cover with blankets
- Provide a warm, sugary beverage (if able to drink comfortably)
- Call EMS if condition does not rapidly improve or the guest loses consciousness

Fainting

Signs/Symptoms

- Weakness, confusion, dizziness
- Head and/or abdominal pain
- "Feeling like" they may faint

Care

- Have the guest lie down if they feel faint
- If already fainted, confirm CABs and check for signs of injury from the fall and place in the recovery position
- Be ready to begin BLS at anytime
- Call EMS if the guest does not regain consciousness quickly

Seizures

Signs/Symptoms

- Report of strange sensations, confusion, dizziness
- Unusual behavior, muscle rigidity, convulsions
- Altered levels of consciousness

Care

- Protect the guest's head and move items away from the guest to protect against injury (cushion the head with a towel)
- Place in the recovery position and monitor the airway
- Call EMS and be ready to begin BLS care

Shock Hypovolemic & Anaphylactic

Signs/Symptoms

- Anxiety, cool pale moist skin
- Rapid or difficulty breathing
- Rapid pulse, weakness
- Hives, itching, swelling

Care

- Activate EAP/Call EMS
- Place the guest on their back (no longer elevate the legs)
- Place in recovery position and maintain normal body temperature
- Provide supplemental oxygen
- Help the guest self-administer any medication for an allergic reaction

Diabetic Emergencies

Signs/Symptoms

- Diminished level of consciousness
- Weakness, hunger, thirst
- Vision and breathing difficulty
- Fruity breath odor

Care

- Activate EAP/Call EMS if the guest is unresponsive or unconscious
- For conscious guests who are able to swallow, ask them to provide any treatment needs or medication to self-administer. Offer sugary drinks if the conscious guest is unable to provide information concerning the diabetic condition

Asthma / Respiratory Distress

Signs/Symptoms

- Difficulty breathing, coughing, wheezing
- Shallow breathing
- Fatigue

Care

- Have the sit in an upright or slightly bent forward position in a comfortable location
- Retrieve/assist with any self-administered medication the guest may have
- Provide supplemental oxygen
- Call EMS the guest's condition does not improve quickly

Poison, Alcohol/Drug overdose

Signs/Symptoms

- Headache, nausea, vomiting, mouth burns
- Dizziness, altered levels of consciousness, drowsy
- Smell of alcohol or of the poison

Care

- Place the guest in the recovery position and contact EMS. Call poison control at 800-222-1222 - follow their directions
- Find out what was ingested or inhaled and consult MSDS books, labels, etc for care
- Provide oxygen and be ready to begin BLS



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BASIC FIRST RESPONDER CARE SUMMARY MATRIX

INJURIES – SIGNS/SYMPTOMS AND BASIC CARE SUMMARY

Suspected Head/Spinal Injuries (non-aquatic)

Signs/Symptoms	Care
<ul style="list-style-type: none"> Altered / loss of consciousness Pain, tenderness, deformity, bruising anywhere on head/back Paralysis Blood from ears or nose 	<ul style="list-style-type: none"> Activate EAP/Call EMS Minimize head and body movement. Encourage the guest to remain calm and not move Only move the guest if vomiting occurs and if so, log roll the guest into the recovery position as a single unit Control obvious bleeding

Muscle, Bone, Joint Injuries

Signs/Symptoms	Care
<ul style="list-style-type: none"> Deformity of body part, tenderness, pain, swelling Discoloration, bruising Crepitus Exposed bone ends Inability to move injured body part 	<ul style="list-style-type: none"> Activate EAP/Call EMS. Control bleeding Allow the guest to position the body part in the most comfortable position Stabilize the injured body part using an anatomical splint or with your hands until EMS arrives Cover open wounds with dressing Apply ice packs

Soft Tissue Emergency: External Bleeding

Signs/Symptoms	Care
<ul style="list-style-type: none"> External bleeding 	<ul style="list-style-type: none"> Activate EAP/EMS Apply direct pressure with sterile gauze pads. If blood soaks through, apply more gauze on top of it Use roll gauze to maintain pressure and cleanliness of wound No longer elevating or finding pressure point

Soft Tissue Emergency: Impaled object/amputation

Signs/Symptoms	Care
<ul style="list-style-type: none"> External bleeding Impaled object Amputation 	<ul style="list-style-type: none"> Activate EAP/EMS Apply direct pressure with sterile gauze pads as indicated for external bleeding If an imbedded object, leave in place and stabilize so movement is minimized Retrieve amputated part. Place in plastic bag and keep the part cool and dry. Give to EMS

Soft Tissue Emergency: Nose Bleed

Signs/Symptoms	Care
<ul style="list-style-type: none"> Blood flowing from the nose 	<ul style="list-style-type: none"> Have the guest sit down and lean slightly forward Have the guest pinch their nostrils together at the bridge of the nose for up to 10 minutes If bleeding is not controlled after 10 minutes or if there is any other injury or medical condition present (such as spinal injury or hypertension) contact EMS

Soft Tissue Emergency: Burns

Signs/Symptoms	Care
<ul style="list-style-type: none"> Red swollen skin (first degree) Blistering burn (second degree) Full thickness damage, little pain, multicolored skin (third degree) 	<ul style="list-style-type: none"> Cool first and second degree burns with water, leave third degree burns dry (clean dry chemical burns before applying water) Do not apply pressure to blisters and cover loosely with dry sterile dressing (second and third degree burns) Remove any smoldering clothing or jewelry Call EMS for second and third degree burns or severe first degree burns. Perform BLS if needed

Mouth Injuries

Signs/Symptoms	Care
<ul style="list-style-type: none"> Bitten/cut lip or tongue Knocked out tooth 	<ul style="list-style-type: none"> Apply direct pressure (see external bleeding) Apply ice pack - contact EMS if bleeding is not controlled quickly If a knocked out tooth, find the tooth and avoid touching the root. Place the tooth in a cup and have the guest provide saliva to keep it moist Advise the guest to see a dentist immediately

Eye Injuries: Object in the eye/penetrating injury

Signs/Symptoms	Care
<ul style="list-style-type: none"> Single or multiple objects/particles in the eye Sharp object penetrates the eye 	<ul style="list-style-type: none"> Activate EAP/EMS if the guest is in pain or if the injury is severe For particles in the eye, rinse with warm water or eye wash pulling the upper eye lid open. Use sterile gauze to remove any particle seen For an imbedded object, stabilize object with dressings, controlling bleeding and covering the other

Eye Injuries: Blow to the eye/cut to the eye

Signs/Symptoms	Care
<ul style="list-style-type: none"> Bleeding Bruising Eye avulsion (knocked out eyeball) 	<ul style="list-style-type: none"> Activate EAP/EMS if the injury is severe or if vision is compromised For blows to the eye, apply a coldpack for 15 min For a severe blow resulting in an avulsion, cover both eyes with loose dressing and protect the injured area with a paper cup secured to the head For cuts with or without bleeding, cover with sterile dressing, avoiding pressure directly on the eye

Eye Injuries: Chemicals in the eye

Signs/Symptoms	Care
<ul style="list-style-type: none"> Burn around the eye Pain 	<ul style="list-style-type: none"> Activate EAP/EMS (vision is at risk with this injury) Hold the eye wide open and flush with warm water for at least 20 min, continuously and gently. Irrigate from the nose side of the eye toward the outside to avoid flushing material into the other eye Loosely bandage both eyes with wet dressings Confirm that other burn injuries are not present, treat if found

Community CPR & AED Summary Matrix

Layperson Provider Level Care – 2020 ECC Guidelines

Key Areas of Care	Adults Older than 8 years of age* *Approximately adolescence & older	Children 1 year of age to 8 years of age* *Preadolescence onset	Infants Newborn* - 1 year of age *Home from the hospital
Scene safety & Responsiveness	Look for dangers, proceed with caution. Check for responsiveness: "Tap and shout"	Look for dangers, proceed with caution. Check for responsiveness: "Tap and shout"	Look for dangers, proceed with caution. Check for responsiveness: "Tap and shout"
Get help from others Call 911	If no response, ask for help from bystanders if available. Make sure 911 has been called & an AED retrieved if accessible before beginning care. <i>Place the 911 call on speaker as you proceed with care.</i>	If no response, ask for help from bystanders if available. Begin care, calling 911 ASAP or after 2 minutes of care. Retrieve an AED if accessible. <i>Place the 911 call on speaker as you proceed with care.</i>	If no response, ask for help from bystanders if available. Begin care, calling 911 ASAP or after 2 minutes of care. Retrieve an AED if accessible. <i>Place the 911 call on speaker as you proceed with care.</i>
Victim position for care	Carefully place adults on their backs, on a flat, hard surface.	Carefully place children on their backs, on a flat, hard surface.	Carefully place infants on their backs, on a flat, hard surface.
Check breathing	Look for chest rise and fall. Listen and feel for breathing for no more than 10 seconds.	Look for chest rise and fall. Listen and feel for breathing for no more than 10 seconds.	Look for chest rise and fall. Listen and feel for breathing for no more than 10 seconds.
Breathing absent Compression only CPR	Begin CPR: Use 2 hands, at the center of the chest. Provide continuous compressions with full recoil at a rate of 100 – 120 comp/min. Attach an AED if available.	Begin CPR: Use 1-2 hands, at the center of the chest. Provide continuous compressions with full recoil at a rate of 100 – 120 comp/min. Attach an AED if available.	Begin CPR: Use 2 fingers, at the center of the chest, just below the nipple line. Provide continuous compressions with full recoil at a rate of 100 – 120 comp/min. Attach an AED if available.
High Quality Chest Compressions	Depth: 2 – 2.4 inches (5 – 6 cm). Rate: 100-120 compressions/min (nearly 2 compressions per second). Allow full recoil. Limit interruptions to ≤10 sec.	Depth: 1.5 – 2 inches (about 5 cm). Rate: 100-120 compressions/min (nearly 2 compressions per second). Allow full recoil. Limit interruptions to ≤10 sec.	Depth: 1.5 inches (about 4 – 5 cm). Rate: 100-120 compressions/min (nearly 2 compressions per second). Allow full recoil. Limit interruptions to ≤10 sec.
Breathing absent Willing to provide Rescue Breaths with CPR	Begin CPR: Give 30 chest compressions, tilt back head, lift the chin & deliver 2 rescue breaths. Repeat this sequence until an AED is available.	Begin CPR: Give 30 chest compressions, tilt back head, lift the chin & deliver 2 rescue breaths. Repeat this sequence until an AED is available.	Begin CPR: Give 30 chest compressions, tilt head slightly into a neutral position & deliver 2 rescue breaths. Repeat this sequence until an AED is available.
High Quality Rescue Breaths	Duration: About 1 second. Volume: Achieve visible chest rise Airway: Head tilt, chin lift. Use barrier device if available; consider mouth to mouth if barrier device is unavailable.	Duration: About 1 second. Volume: Achieve visible chest rise Airway: Head tilt, chin lift. Use barrier device if available; consider mouth to mouth if barrier device is unavailable.	Duration: About 1 second. Volume: Achieve visible chest rise Airway: Slight head tilt, chin lift. Use barrier device if available; consider mouth to mouth if barrier device is unavailable.
Automated External Defibrillator (AED)	Retrieve first if accessible. Prepare the chest & attach pads. Follow prompts & provide CPR whenever the AED is not prompting to stand clear.	Retrieve ASAP, if accessible. Prepare the chest & attach pediatric pads (if available). Follow prompts & provide CPR whenever the AED is not prompting to stand clear.	Retrieve ASAP, if accessible. Prepare the chest & attach pediatric pads (if available). Follow prompts & provide CPR whenever the AED is not prompting to stand clear.

SIGNS & SYMPTOMS

Athletes who experience one or more of the signs or symptoms listed below after a bump, blow, or jolt to the head or body may have a concussion.

SIGNS OBSERVED BY COACHING STAFF

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

SYMPTOMS REPORTED BY ATHLETE

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

January 2021



CDC HEADS UP

SAFE BRAIN. STRONGER FUTURE.

ACTION PLAN

As a coach, if you think an athlete may have a concussion, you should:

- 1. Remove the athlete from play.**
- 2. Keep an athlete with a possible concussion out of play on the same day of the injury and until cleared by a healthcare provider.** Do not try to judge the severity of the injury yourself. Only a healthcare provider should assess an athlete for a possible concussion.
- 3. Record and share information about the injury,** such as how it happened and the athlete's symptoms, to help a healthcare provider assess the athlete.
- 4. Inform the athlete's parent(s) or guardian(s)** about the possible concussion and refer them to CDC's website for concussion information.
- 5. Ask for written instructions from the athlete's healthcare provider** about the steps you should take to help the athlete safely return to play.

Before returning to play an athlete should:

- Be back to their regular activities (such as school).
- Not have any symptoms from the injury when doing regular activities.
- Have the green-light from their healthcare provider to begin the return to play process.

For more information, visit www.cdc.gov/HEADSUP

The information provided in this document or through links to other sites is not a substitute for medical or professional care. Questions about diagnosis and treatment for concussion should be directed to a physician or other healthcare provider.



IT'S BETTER TO MISS ONE GAME THAN THE WHOLE SEASON.

HEADS UP CONCUSSION ACTION PLAN



IF YOU SUSPECT THAT AN ATHLETE HAS A CONCUSSION, YOU SHOULD TAKE THE FOLLOWING STEPS:

1. Remove the athlete from play.
2. Ensure that the athlete is evaluated by a health care professional experienced in evaluating for concussion. Do not try to judge the seriousness of the injury yourself.
3. Inform the athlete's parents or guardians about the possible concussion and give them the fact sheet on concussion.
4. Keep the athlete out of play the day of the injury. An athlete should only return to play with permission from a health care professional, who is experienced in evaluating for concussion.

▶ **"IT'S BETTER TO MISS
ONE GAME, THAN THE
WHOLE SEASON."**



CONCUSSION SIGNS AND SYMPTOMS

Athletes who experience one or more of the signs and symptoms listed below after a bump, blow, or jolt to the head or body may have a concussion.


SYMPTOMS REPORTED BY ATHLETE

- Headache or "pressure" in head
- Nausea or vomiting
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- Sensitivity to light
- Sensitivity to noise
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- Concentration or memory problems
- Confusion
- Just not "feeling right" or is "feeling down"

SIGNS OBSERVED BY COACHING STAFF

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

[INSERT YOUR LOGO]

JOIN THE CONVERSATION AT  www.facebook.com/CDCHeadsUp

TO LEARN MORE GO TO >> WWW.DDC.GOV/CONCUSSION

A FACT SHEET FOR Youth Sports Coaches



Below is information to help youth sports coaches protect athletes from concussion or other serious brain injury, and to help coaches know what to do if a concussion occurs.

What is a concussion?

A concussion is a type of traumatic brain injury caused by a bump, blow, or jolt to the head or by a hit to the body that causes the head and brain to move quickly back and forth. This fast movement can cause the brain to bounce around or twist in the skull, creating chemical changes in the brain and sometimes stretching and damaging brain cells.

What is a subconcussive head impact?

A subconcussive head impact is a bump, blow, or jolt to the head that *does not* cause symptoms. This differs from concussions, which *do* cause symptoms. A collision while playing sports is one way a person can get a subconcussive head impact. Studies are ongoing to learn about subconcussive head impacts and how these impacts may or may not affect the brain of young athletes.

How can I keep athletes safe?

As a youth sports coach, your actions can help lower an athlete's chances of getting a concussion or other serious injury. Aggressive or unsportsmanlike behavior among athletes can increase their chances of getting a concussion or other serious injury.³ Here are some ways you can help:

Talk with athletes about concussion:

- Set time aside throughout the season to talk about concussion.
- Ask athletes about any concerns they have about reporting concussion symptoms.
- Remind athletes that safety comes first and that you expect them to tell you and their parent(s) if they think they have experienced a bump, blow, or jolt to their head and "don't feel right."

Focus on safety at games and practices:

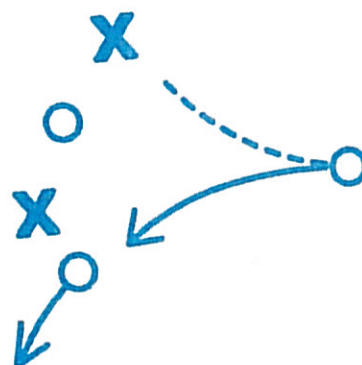
- Teach athletes ways to lower the chances of getting a hit to the head.
- Enforce rules that limit or remove the risk of head impacts.
- Tell athletes that good sportsmanship is expected at all times, both on and off the field.
- Bring emergency contact information for parents and healthcare providers to each game and practice in case an athlete needs to be seen right away for a concussion or other serious injury.

Multiple concussions

Athletes who have ever had a concussion have a higher chance of getting another concussion. A repeat concussion can lead to more severe symptoms and longer recovery.^{1,2}

Coach's to-do list:

- ✓ Talk with athletes about concussion.
- ✓ Teach athletes ways to lower their chances of getting a hit to the head.
- ✓ Encourage concussion reporting among your athletes.
- ✓ Know what to do if you think an athlete has a concussion.
- ✓ Learn how to help an athlete safely return to play after a concussion.



Make sure athletes do not perform these unsafe actions:

- Use their head or helmet to contact another athlete.
- Make illegal contact or check, tackle, or collide with an unprotected opponent.
- Try to injure another athlete.

Stay up to date on concussion information:

- Review your state, league, and organization's concussion plans and rules.
- Take a training course on concussion. The Centers for Disease Control and Prevention (CDC) offers free concussion training at cdc.gov/HEADSUP.
- Download CDC's HEADS UP app or another resource that provides a list of concussion signs and symptoms.

Check equipment and sports facilities:

- Make sure all athletes wear a helmet that is appropriate for the sport or activity; ensure that the helmet fits well and is in good condition.
- Work with the game or event manager to fix any concerns, such as tripping hazards or goal posts without proper padding.

One study found that nearly 70% of athletes continued to play with concussion symptoms.⁴



How can I spot a possible concussion?

Athletes who show or report one or more of the signs and symptoms listed below—or who simply say they just “don’t feel right”—after a bump, blow, or jolt to the head or body may have a concussion or other serious brain injury. Concussion signs and symptoms often show up soon after the injury, but it can be hard to tell how serious the concussion is at first. Some symptoms may not show up for hours or days.

Signs coaches or parents may observe:

- Seems confused
- Forgets an instruction or is unsure of the game, position, score, or opponent
- Moves clumsily
- Answers questions slowly or repeats questions
- Can’t remember events before or after the hit, bump, or fall
- Loses consciousness (even for a moment)
- Has behavior or personality changes

Symptoms athletes may report:

- Headache
- Nausea or vomiting
- Dizziness or balance problems
- Bothered by light or noise
- Feeling foggy or groggy
- Trouble concentrating or problems with short- or long-term memory
- Does not “feel right”

Signs of a more serious brain injury

In rare cases, a concussion can cause dangerous bleeding in the brain, which puts pressure on the skull. Call 9-1-1 if an athlete develops one or more of these danger signs after a bump, blow, or jolt to the head or body:

- A headache that gets worse and does not go away
- Significant nausea or repeated vomiting
- Unusual behavior, increased confusion, restlessness, or agitation
- Drowsiness or inability to wake up
- Slurred speech, weakness, numbness, or decreased coordination
- Convulsions or seizures (shaking or twitching)
- Loss of consciousness (passing out)

Some athletes may not report a concussion because they don’t think a concussion is serious.

They may also worry about:

- Losing their position on the team or losing playing time during a game,
- Putting their future sports career at risk,
- Looking weak,
- Letting down their teammates or the team, and/or
- What their coach or teammates think of them.⁵⁻⁷

What should I do if an athlete has a possible concussion?

As a coach, if you think an athlete may have a concussion, you should:

Remove the athlete from play.

When in doubt, sit them out! Record and provide details on the following information to help the healthcare provider or first responders assess the athlete after the injury:

- Cause of the injury and force of the hit or blow to the head or body
- Any loss of consciousness (passed out) and for how long
- Any memory loss right after the injury
- Any seizures right after the injury
- Number of previous concussions (if any)

Keep an athlete with a possible concussion out of play on the same day of the injury and until cleared by a healthcare provider.

Do not try to judge the severity of the injury yourself. Only a healthcare provider should assess an athlete for a possible concussion and decide when it is safe for the athlete to return to play.

Inform the athlete's parent(s) about the possible concussion.

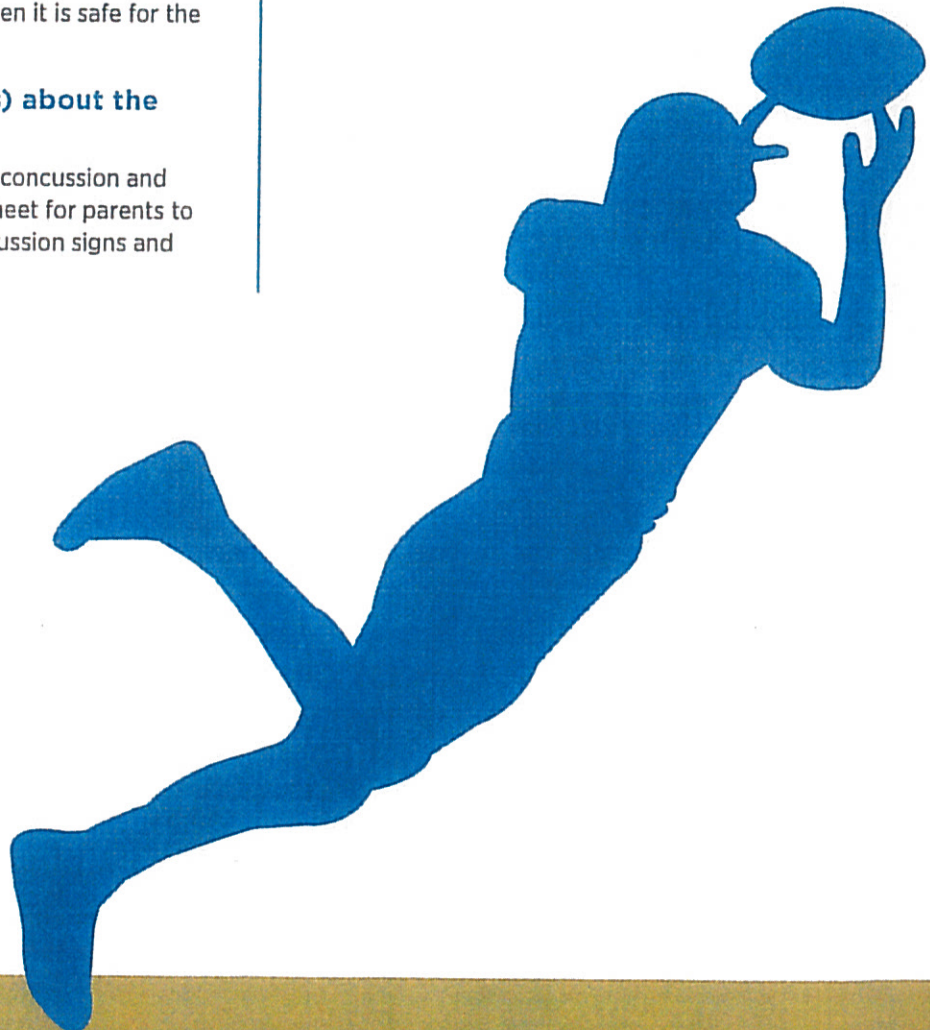
Let parents know about the possible concussion and give them the CDC HEADS UP fact sheet for parents to help them watch the athlete for concussion signs and symptoms at home.

Ask for written instructions from the athlete's healthcare provider on return to play.

This should include information about when the athlete can return to play and steps you should take to help the athlete safely return to play. Athletes who continue to play while having concussion symptoms have a greater chance of getting another concussion. A repeat concussion that occurs before the brain has fully healed can be very serious and can increase the chance for long-term problems. It can even be fatal.

Offer support during recovery.

An athlete may feel frustrated, sad, angry, or lonely while recovering from a concussion. Talk with them about it, and allow an athlete recovering from a concussion to stay in touch with their teammates, such as cheering on their team at practices and competitions.



What steps should I take to help an athlete return to play?

An athlete's return to school and sports should be a gradual process that is approved and carefully managed and monitored by a healthcare provider. When available, be sure to also work closely with your team's certified athletic trainer.

There are six gradual steps to help an athlete safely return to play. These steps should not be done in one day, but instead over days, weeks, or months. **An athlete should move to the next step only if they do not have any new symptoms at the current step.**

Step 1: Return to non-sports activities, such as school, with a greenlight from the healthcare provider to begin the return-to-play process

Step 2: Light aerobic exercise

- Goal: Increase the athlete's heart rate
- Activities: Slow to medium walking or light stationary cycling

Step 3: Sport-specific exercise

- Goal: Add movement
- Activities: Running or skating drills; no activities with risk for contact

Step 4: Non-contact training drills

- Goal: Increase exercise, coordination, and thinking
- Activities: Harder training drills and progressive resistance training

Step 5: Full-contact practice

- Goal: Restore confidence and have coaching staff assess functional skills
- Activities: Normal training activities

Step 6: Return to regular sports activity

Remember: It is important for you and the athlete's parent(s) to watch for concussion symptoms after each day's activities, particularly after each increase in activity. If an athlete's concussion symptoms come back, or if he or she gets new symptoms when becoming more active at any step, this is a sign that the athlete is working too hard. The athlete should stop these activities, and the athlete's parent should contact the healthcare provider. After the athlete's healthcare provider says it is okay, the athlete can begin at the step before the symptoms started.



1. Chrisman SP, Lowry S, Herring SA, et al. Concussion incidence, duration, and return to school and sport in 5- to 14-year-old American football athletes. *J Pediatr*. 2019;207:176-184. doi:10.1016/j.jpeds.2018.11.003.

2. Guskiewicz KM, McCrea M, Marshall SW, et al. Cumulative effects associated with recurrent concussion in collegiate football players: the NCAA Concussion Study. *JAMA*. 2003;290(19):2549-2555.

3. Collins CL, Fields SK, Comstock RD. When the rules of the game are broken: what proportion of high school sports-related injuries are related to illegal activity? *Inj Prev*. 2008;14(1):34-38.

4. Rivara FP, Schiff MA, Chrisman SP, Chung SK, Ellenbogen RG, Herring SA. The effect of coach education on reporting of concussions among high school athletes after passage of a concussion law. *Am J Sports Med*. 2014;42(5):1197-1203.

5. Kerr ZY, Register-Mihalik JK, Marshall SW, Evenson KR, Mihalik JP, Guskiewicz KM. Disclosure and non-disclosure of concussion and concussion symptoms in athletes: review and application of the socio-ecological framework. *Brain Inj*. 2014;28(8):1009-1021.

6. Register-Mihalik JK, Guskiewicz KM, McLeod TC, Linnan LA, Mueller FO, Marshall SW. Knowledge, attitude, and concussion-reporting behaviors among high school athletes: a preliminary study. *J Athl Train*. 2013;48(5):645-653.

7. Chrisman SP, Quitiquit C, Rivara FP. Qualitative study of barriers to concussive symptom reporting in high school athletics. *J Adolesc Health*. 2013;52(3):330-335.

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Revised August 2019

To learn more,
go to [cdc.gov/HEADSUP](https://www.cdc.gov/HEADSUP)

