



***Special
Olympics***

**SPECIAL OLYMPICS SPORTS SCIENCES:
SPORTS INJURY GUIDE FOR COACHES**

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Advancing the public well-being through improved communication

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Special Olympics welcomes your ideas and comments for future revisions of this guide. We apologize if, for any reason, an acknowledgement has been inadvertently omitted.

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Special Olympics Sports Sciences: Sports Injury Guide for Coaches

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Introduction

The following guide is meant to be an aid Special Olympics coaches. Special Olympics athletes are just as likely to experience injuries related to sports activities as any other athlete. In some cases, Special Olympics athletes may even be at greater risk. While this guide should in no way substitute for the assistance of trained medical personnel, it is recognized that such personnel are not always immediately available when such injuries occur. While the vast majority of sports injuries are minor, there are instances when every second counts. In these instances, a coach who is familiar with the various types of injuries and how to best respond to them may spare an injured athlete from significant injury or even death. It is our hope that as a Special Olympics coach, you will familiarize yourself with these various types of injuries, so that you may be better able to respond to them appropriately.

As you read this guide you will learn some specific methods to assess and manage athletes that have sustained various types of injuries, however, in general it is good to remember the following principles when responding to any injury situation:

1. Remain calm, which will also serve to keep the athlete and others calm.
2. Assess the situation as quickly as possible after an incident has occurred.
3. Quickly survey the athlete's airway, breathing, circulation and consciousness.
4. Then, survey the seriousness of all other injuries.
5. Assess the incident right where it occurred to determine whether the athlete can be safely moved.
6. Know the athlete's baseline personality and capabilities before an injury occurs.
7. Listen to the athlete describe what happened.
8. Ask simple, clarifying questions.
9. Observe the athlete's face and eyes while talking.
10. Observe for any asymmetry, trauma, general body alignment and functional abilities.
11. Survey the area where the injury occurred for any unsafe articles or terrain.
12. If no medical personnel are available, the coach may need to be prepared to take action alone.
13. When in doubt, do not put the athlete back into play.
14. Always refer to a health care professional for additional follow up.

Keep in mind, as you read this guide that the vast majority of sports injuries are minor and will heal on their own. The types of injury that are explored in this guide range from the minor and mundane to the relatively rare and severe. Some risk factors that are described here are often not considered in non-disabled athletes, but are quite significant and unique to Special Olympics athletes. Even if you are an experienced coach, athletic trainer, or physician, we hope you will learn something about sports injuries and people with intellectual disabilities that you didn't know before.

Special Olympics Sports Sciences: Sports Injury Guide for Coaches

Neurodevelopmental Disorders and Intellectual Disabilities

Neurodevelopmental Disorders and Intellectual Disabilities

While many Special Olympics athletes share common interests and life goals, many of them also share common health concerns. One characteristic that all Special Olympics athletes share is intellectual disability (ID). Intellectual disability is characterized by an IQ of less than 70 with significant limitations in both intellectual functioning and adaptive behavior as expressed in conceptual, social, and practical skills and originates before the age of 18. According to current neurobiological theory, all intellectual disability is a result of some kind of underlying biological process that disrupts the expected neurological development of the individual in question. These biological processes, as a group, are called neurodevelopmental disorders.

A neurodevelopmental disorder is a genetic or acquired biological process that occurs before adulthood and disrupts one or more of the expected functions of the brain, resulting in one or more common complications. The five most common complications of a neurodevelopmental disorder include: 1) intellectual disability, 2) neuromotor dysfunction, 3) sensory impairment, 4) seizure disorder, and 5) abnormal behavior. Neurodevelopmental disorders, depending upon their cause, can be associated with various syndrome-specific conditions, for example, cardiac or spinal abnormalities. Both the common complications and syndrome specific conditions can, and often do, lead to secondary health consequences. These secondary health consequences are often preventable with the proper health screening and preventive care.

So, while it is true that all Special Olympics athletes have intellectual disability, it can also be said that all Special Olympics have a neurodevelopmental disorder and, because of this, it is more likely that they will also have neuromotor impairment, sensory impairment, epilepsy and/or behavioral concerns. As a general rule of thumb, an athlete with intellectual disability has about a 25% chance of having at least one of these other four characteristics.

There are, literally, thousands of neurodevelopmental disorders and causes of ID. While many Special Olympics athletes may not know what the cause of their intellectual disability is, there are some medical diagnoses that are very commonly found in Special Olympics athletes. The six most common medical diagnoses found in Special Olympics athletes are: 1) Down syndrome, 2) Fragile X syndrome, 3) Fetal alcohol syndrome, 4) Autism, 5) Cerebral palsy and 6) Epilepsy. There are many other medical diagnoses that are common to Special Olympics athletes such as asthma and high blood pressure, but these tend to occur independently of ID, whereas the six diagnoses mentioned above are often, though not always, associated with ID.

What you need to know

Special Olympics athletes have intellectual disabilities and are also likely to have neuromotor dysfunction, sensory impairment, seizure disorders, abnormal behaviors and syndrome specific physical conditions. The most common diagnoses associated with (and sometimes confused with) intellectual disabilities include Down syndrome, Fragile X syndrome, Fetal Alcohol syndrome, Autism, Cerebral Palsy and Epilepsy.

Coaching an Athlete with Intellectual Disability

In essence, the term intellectual disability means that someone learns more slowly than other people their same age. While there are some additional medical concerns that might be more prevalent in people with intellectual disabilities, the most important thing to know as a coach in Special Olympics is that the athletes are individuals, and coaching them is just like coaching any other youth or community sports team. There are many more similarities than differences in teaching and coaching athletes with and without intellectual disabilities. Athletes are athletes; coaching is coaching; teaching is teaching and learning is learning.

When it comes to instructing athletes with ID, no single strategy works for every learner. An often-utilized strategy, however, is to "tell, show, help and remind". Some athletes learn best through visual cues, some through hearing instructions, and yet others may need to feel what it is like to do something before they can truly learn it. Regardless of the teaching method, it is proven that repetition is an effective strategy for everyone, including Special Olympics athletes. Additionally, everyone learns faster when they want to, so it is important to keep athletes motivated.

Regardless of the type of skill being taught, the basic levels of instruction are: verbal presentation, physical demonstration, physical prompting and physical assistance. Athletes may require a single method or a combination of these methods to learn a new skill. It is important to identify the methods that work best for individual athletes. For example, one athlete may require only verbal instruction to learn skills; another athlete may require both demonstration and physical assistance.

- ♦ **Verbal Presentation:** Coaches should explain very clearly to athletes the skills they are to be learning and the language should be clear and consistent throughout the lesson. Using simple words is essential, be clear, concise, consistent and command-oriented.
- ♦ **Physical Demonstration:** It is generally considered true that 80% of learning takes place through what it is seen. The basic visual methods in teaching simple skills are imitation and demonstration. Basically, athletes copy what you show them. If the imitation is accurate, immediate and positive feedback is a good way to confirm this to the athlete. This level of teaching is universal and can be used by the coach to assist with the verbal presentation of a skill. When a skill becomes too difficult for the athlete to verbally comprehend, demonstration should be used. For new skills, linking demonstration with verbal presentation is most effective.
- ♦ **Physical prompting:** is best used when verbal and demonstration methods are not working. Guidance by touch to prompt an athlete into proper position is an example of a physical prompt. Verbal presentation and physical demonstration are also good to use during physical prompting.
- ♦ **Physical assistance:** is used when all other levels of instruction have been exhausted. This level requires the coach to physically move the athlete into position and to physically assist the athlete to complete the skill. This method should be used with caution, especially if the athlete functions at a lower level and/or does not like to be touched.

What you need to know

Athletes with ID are capable of learning and integrating new information, though it is often necessary to present the information in simple terms, demonstrate it, and repeat the information periodically until the athlete has a firm grasp of the information. When presenting new information or skills to athletes often a combination of different techniques such as visual presentation, physical demonstration, physical prompting and physical assistance should be used. These techniques can be used in coaching sports skills and in teaching athletes about their health.

Special Olympics Sports Sciences: Sports Injury Guide for Coaches

Preparation for Prevention

Preparation for Prevention

The best type of sports injury is the sports injury that has been prevented from occurring. While not all sports injuries are preventable, preparation of coaches, athletes and the playing environment can drastically reduce the amount of and severity of sports injuries that occur.

Coach Preparation

It is the coach's job to maintain as safe an environment as possible. It is strongly recommended that coaches have certification in CPR and First Aid or that volunteers be recruited who already have first-aid training, medical athletic training or emergency care certification.

A coach should always know if an automatic electronic defibrillator (AED) is available at the sports venue. AEDs are becoming more and more common. If one exists at the sports venue, the coach should note its location prior to practice and make sure that there are no temporary or permanent obstacles that could slow down the retrieval of the AED. This knowledge should be in the coach's head and communicated to their assistants prior to commencement of practice in preparation for the unlikely event of an athletic cardiac arrest.

Athlete medical forms should be reviewed prior to the start of practice and available at all training and competitions. This information could be invaluable to emergency medical personnel in the event of an emergency.

Using the Coach's Safety Checklist will help to prevent injury by assuring adequate supervision, equipment, facility, warm-up and stretching. Coaches should also familiarize themselves with the most common and most severe types of sports injuries and there should be an emergency action plan for how to deal with each type of injury. When an injury does occur, stay calm, and administer basic first aid. When in doubt, or when more care is needed, consult the athlete's family and a physician.

Developing an Emergency Management Plan

It is important for all coaches to have an emergency management plan that can be activated when an athlete injury or emergency has occurred. After reading the rest of this injury prevention guide, considering the various types of injuries in it and thinking about the recommended responses to them, coaches should revisit this section and construct for themselves a plan that utilizes the resources known to them. The following are questions to consider when developing that plan:

- ♦ Who are the members of the Emergency Management Team?
 - ♦ Coach, physician, emergency medical technician, athletic trainer, physical therapist, etc.
- ♦ Who can quickly provide athletes' medical forms and any special instructions to medical personnel?
- ♦ How can the coaching staff manage different injuries until appropriate medical personnel are available?
- ♦ In the event of an emergency what are the roles of each member of the team in terms of:
 - ♦ Coordinating the response to the emergency
 - ♦ Contacting medical personnel
 - ♦ Assessing and attending to the athlete's injuries (including CPR and finding an AED)
 - ♦ Communicating to parents or caregivers
 - ♦ Communicating with and managing the other players on the team during the emergency

Establishing the roles and responsibilities of the various members of the emergency management team before a serious injury occurs will not only ensure that your team is as well prepared as it can be, it will also significantly decrease the time the athlete will face between the occurrence of their injury and the initiation of treatment.

Special Olympics Sports Sciences: Sports Injury Guide for Coaches Preparation for Prevention

Athlete's Medical Alert Card

Each athlete will have completed a Medical Release Form, in which it will be noted if there are any restrictions on activity, medications that may affect performance or unique situations. Based on this, each Coach must carry a Medical Alert Card for each of the athletes with the First Aid Kit, in which is included all the medical conditions the Athlete may have, such as allergies or others found in the Medical Release form, in order for the team to act effectively in a life-threatening situation.

Medical Alert Icons

The back of athletes' credentials may contain icons that note specific medical conditions that may need to be known in an emergency. Coaches should memorize the medical alert icons and check their athletes' badges for accuracy.

Medical icons for the back of the Athlete Credential

1. Wheelchair

Wheelchair in Chinese



2. Cardiac

Cardiac in Chinese



3. Seizures

Seizures in Chinese



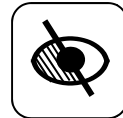
4. Hearing Impaired

Hearing Impaired In Chinese



5. Visual Impairment

Visual Impairment in Chinese



6. Diabetes

Diabetes in Chinese



7. Asthma

Asthma in Chinese



8. Allergies Food

Allergies Food in Chinese



9. Allergies Medicine

Allergies Medicine in Chinese



Special Olympics Sports Sciences: Sports Injury Guide for Coaches

Preparation for Prevention

Athlete Preparation

While most athletes will regulate the intensity of their activity naturally to avoid injury, athletes with ID are still athletes. They are competitive by nature and they want to win. The drive to win may overpower an athlete's natural self-protective abilities and cause them to ignore warning signs of potential injury. Moreover, many medications that Special Olympics athletes take may mask warning signs such that they are not readily apparent to the athlete until they have become more serious. The most serious warning signs to consider are as follows:

- ♦ Chest pain
- ♦ Shortness of breath or difficulty breathing
- ♦ Dizziness or lightheadedness
- ♦ Headache
- ♦ Fatigue
- ♦ Pain
- ♦ Rash
- ♦ Muscle soreness
- ♦ Itchiness
- ♦ Numbness
- ♦ Tingling
- ♦ Weakness
- ♦ Changes in coordination

Coaches should, to the greatest extent possible, ensure that athletes know what these warning signs are. In all situations, if an athlete experiences any of these warning signs, they should stop what they are doing and tell the coach immediately. In some situations, such as in an open-water swim, the athlete may not be able to completely stop their activity. In such cases, the athlete should reduce their activity to the greatest extent possible and communicate their concerns to the nearest available person who can help them. Coaches should periodically review these and other physical warning signs with their athletes.

Field Preparation

The field of play should be checked before and after all practices and events for any obstacles. An indoor court should be clear of any obstacles or obstructions surrounding the out-of-bounds areas. The actual playing surface should be clear, safe and dry. All lines should be clearly visible. Any indoor facility must have proper ventilation, especially in warm climates.

Outdoor facilities should be checked for uneven playing surfaces, including holes, uneven grade, or moisture. The playing area should be also checked for additional obstacles. Out-of-bounds areas should be clear of obstructions. All boundaries should be clearly marked.

Other areas being used by players, such as locker rooms and showers, should be reviewed for safety and accessibility. Floors should be properly drained and have nonslip surfaces.

Areas utilized by spectators, families and other nonparticipating players should be assessed for safety and accessibility.

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Preparation for Prevention

First Aid Kit

The Special Olympics teams must have access to the First Aid Kit at all competitions, trainings, clinics and other sporting functions. The Coach must be responsible for the content and usage of the First Aid Kit, as they are the ones that understand better the medical condition of the Athlete. Coaches must be trained in the usage of the different prescribed medications, as they may be the first response for the Athlete when an incident has occurred or in a life-threatening situation.

All first-aid kits should include the following items.

Contents of a First Aid Kit

- ♦ Acetaminophen
- ♦ Alcohol wipes
- ♦ Asthma Inhaler (if prescribed by a doctor for a specific athlete)
- ♦ Athletic tape
- ♦ Band-Aids
- ♦ Compression Bandages
- ♦ Epi-Pen (if prescribed by a doctor for a specific athlete)
- ♦ Ibuprofen
- ♦ Imodium
- ♦ Liquid diphenhydramine
- ♦ Other medications if prescribed by a physician
- ♦ Powdered Sports Drink
- ♦ Rectal Diazepam (if prescribed by a doctor for a specific athlete)
- ♦ Scissors
- ♦ Sugar pouches
- ♦ Sun Screen
- ♦ Thermometer

What you need to know

Proper preparation is the key to injury prevention. In order to prevent injuries, coaches, athletes and the playing environment should be as prepared as possible. Coaches should be trained in CPR and be familiar with basic first aid. Coaches should also have immediate access to athlete medical information and should have an emergency management plan. Coaches should periodically review physical warning signs with athletes and what to do if those physical signs occur. Coaches should familiarize themselves with the athlete medical alert icons and check to make sure that the icons on their athletes' badges are correct. Prior to competition or practice, a coach should check the field of play and sports equipment for safety. Additionally, the coach should have access to a well-stocked first-aid kit.

Special Olympics Sports Sciences: Sports Injury Guide for Coaches

Specific Sports Injuries

Specific Sports Injuries

Physician Clearance

While the types of injury discussed in this section should be concerning to every coach and while Special Olympics athletes are at a greater risk of certain types of injury than other athletes, it should be noted that catastrophic injury in the Special Olympics environment is a relatively rare phenomenon. Still, it is incumbent upon every Special Olympics coach and health volunteer to familiarize themselves with these particular risks. The major risk factors for catastrophic injuries that Special Olympics athletes are: 1) cardiac abnormalities, 2) spinal abnormalities, 3) active infection, 4) organ enlargement, 5) significant hypertension, 6) low blood oxygenation, and 7) uncontrolled seizures. Very basic medical clearance guidelines regarding these risks are listed below, some will be discussed in greater detail later in this text.

Listed below are concerns that may be raised in the athlete's medical history or upon physical examination of an athlete by a physician or other clinician. The concerns listed are not an exhaustive list, but if found would likely warrant further medical investigation or treatment before an athlete would be cleared for sports participation. Concerning history or physical exam findings for physicians or other clinicians include:

Cardiac

Grade 3/6 heart murmur or greater, irregular heart rhythm, hypertrophic cardiomyopathy, long QT syndrome or drug-induced long QT syndrome, other significant cardiac disease, or concerning cardiac history.

Spinal Cord

Any symptoms of spinal cord compression, including neurological signs and symptoms of atlantoaxial instability, especially if the symptoms are volatile or new in onset. Such symptoms include: change in control of bowels or bladder, change in gait, head tilt, spasticity, pain, weakness, numbness, tingling, or paralysis in the neck, arms, hands legs or feet.

Active Infection

Any symptoms of an acute bacterial or viral infection are often a temporary reason to limit participation in sports.

Organ Enlargement

Any physical signs of liver or spleen enlargement.

Significant Hypertension

Stage 2 hypertension or greater in either adults (greater than 160/100) or children (varies by age and other factors).

Low Blood Oxygenation

Less than 90% on room air can be an indication of more serious cardiac, pulmonary or hematological issues.

Uncontrolled Seizures

In the sports setting, this means that the athlete has had one or more seizures within the past year. This generally restricts the athletes from some sports, but not all sports.

Special Olympics Sports Sciences: Sports Injury Guide for Coaches Specific Sports Injuries

What you need to know

A physician may temporarily or permanently recommend that an athlete refrain from sports participation (some or all sports) based the pre-participation sports physical. While a physician may make this recommendation for myriad reasons, the most common include, cardiac or spinal column concerns, an active acute infection, organ enlargement, stage two hypertension or higher, low blood oxygenation, or an uncontrolled seizure disorder. If a coach becomes aware of any of these symptoms, the athlete should refrain from practice or competition until they are seen by a physician.

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Specific Sports Injuries

Athletic Cardiac Arrest

Athletic cardiac arrest (sometimes called sudden cardiac death or sudden athletic death) can occur anytime during exercise and up to twelve hours after exercise. There can be multiple physiologic pathways that lead to athletic cardiac arrest but the final result is that the athlete's heart has stopped. Usually within seconds of this occurrence, the athlete will lose consciousness and will eventually stop breathing. This is the most dire of medical emergencies, because without intervention the athlete will likely die.

The presence of an underlying cardiac defect or arrhythmia increases the likelihood that an athlete could have an athletic cardiac arrest. The three most common known causes of intellectual disability (Down syndrome, Fragile X syndrome and Fetal alcohol syndrome) as well as scores of other syndromes carry with them a much higher risk of defects of the heart and aorta. Though no conclusive studies have been done, experts believe that Special Olympics athletes are 10 to 50 times more likely to have a cardiac defect than other athletes. Additionally, because Special Olympics athletes are likely to have less access to appropriate health services throughout their lifespan, these cardiac concerns may often go undiagnosed. Ultimately, this means that Special Olympics athletes are likely at a higher risk of athletic cardiac arrest than other athletes at similar activity levels.

Warning Signs

Often times, there are no warning signs for athletic cardiac arrest. However, there are some warning signs that could be associated with an increased risk of athletic cardiac arrest happening in the future. If any of these symptoms are noticed in an athlete, they should be taken seriously. The athlete should stop exercising immediately and a physician should be notified, even if the symptoms go away

Cardiac Warning Signs

Dizziness during exercise	Headache during exercise
Chest pain during exercise	Shortness of breath during exercise
Irregular heart beat	Racing heartbeat
Skipping heart beat	Loss of consciousness

Managing a Cardiac Emergency

If an athlete has had a cardiac arrest, they will likely be unconscious, pulseless and not breathing. It is also possible that an athlete may have a seizure at this time. This can be confusing because supervising staff may think that the athlete is having a normal seizure, instead of a cardiac arrest-induced seizure, wasting precious time. In the heat of an emergency, especially to the untrained eye, it may be difficult to distinguish between the two. In this situation it is best to prepare for the possibility that the seizure is a cardiac-induced seizure and thus that the emergency at hand is a cardiac emergency.

From the moment the athlete's heart has stopped, their chances of survival decrease by 10% for every minute that passes without their heart beginning to beat again. It cannot be stressed enough that in this situation, time is of the essence. More than likely, the athlete will not survive if the only action that is taken is calling an ambulance. While the chances of athletic cardiac arrest are very low, it is important that a coach be mentally prepared for this scenario. The potentially life-saving action steps that can be taken are relatively simple and they must be made as quickly and as efficiently as possible, in order to give the athlete the best chance of survival.

Special Olympics Sports Sciences: Sports Injury Guide for Coaches Specific Sports Injuries

A coach should always know if an automatic electronic defibrillator (AED) is available at the sports venue. AEDs are becoming more and more common. If one exists at the sports venue, the coach should note its location prior to practice or competition and make sure that there are no temporary or permanent obstacles that could slow down the retrieval of the AED. This knowledge should be in the coach's head and communicated to any assistants, prior to commencement of practice in preparation for the unlikely event of an athletic cardiac arrest.

If a suspected athletic cardiac arrest has occurred, the following steps should be taken as close to simultaneously as possible:

1. Send the fastest person available to RUN for the AED and bring it to the athlete to initiate treatment
2. Send another person to call for emergency medical personnel
3. Confirm that the athlete has no pulse and/or is not breathing
4. Confirm that the airway is not blocked or that the athlete has not choked on something. If so, remove the obstruction
5. Begin CPR immediately

When the AED arrives, follow the instructions on the AED and continue administering CPR. Only stop CPR momentarily and stay clear of the patient when the AED is preparing to deliver its electrical shock. CPR should continue to be administered until emergency personnel can take over unless the athlete begins to breath on his own and his pulse returns. While administering CPR, it is likely the person giving the CPR will become fatigued, it is advised that CPR-trained personnel rotate every few minutes giving chest compressions in order to avoid this fatigue. Fatigue leads to less forceful compressions, which leads to less external compression of the heart, which leads to less circulation of blood and ultimately results in less chance of survival.

It is important to know that despite the best efforts of responding personnel, efforts to revive an individual who has had a cardiac arrest are often unsuccessful. CPR will typically be successful only around 10% of the time, whereas AEDs may be successful up to 40% of the time. This should not, however, discourage responding personnel from administering every potentially life-saving measure at their disposal until emergency medical personnel arrive.

What you need to know

Special Olympics athletes may be at greater risk of athletic cardiac arrest. Often there are no warning signs, but if warning signs present themselves, the athlete should stop exercising and a physician should be notified. If an athlete has a cardiac arrest event, the coach should send one person to retrieve the AED and another person to call emergency medical personnel, while the coach checks the athlete to confirm that he/she is pulseless, not breathing and does not have a blocked airway. The coach (with rotating assistance from other personnel) should perform CPR and use the AED as instructed until emergency medical personnel take over, pausing only when directed by the instructions on the AED.

Special Olympics Sports Sciences: Sports Injury Guide for Coaches

Specific Sports Injuries

Spinal Cord Injury

Spinal Cord Injuries are a rare, but devastating occurrence in the sports setting. Some spinal cord injuries occur in healthy people who have no preceding risk factors. However, some athletes may have pre-existing signs and symptoms of compression of the spinal cord. Compression of the spinal cord means that the bone of the spine is pressing firmly on the spinal cord. This has been proven to result in injury or severance of the spinal cord with motion or impact that can occur in the sports setting. Thus, detecting athletes who have signs and symptoms of spinal cord compression is important.

The most well-known type of spinal cord compression in Special Olympics is that of symptomatic atlantoaxial instability (AAI). AAI frequently occurs in athletes with Down syndrome. Approximately 1.5% of athletes with Down syndrome will have neurological signs of spinal cord compression or atlantoaxial instability.

Of course, spinal cord compression can occur at any vertebral level and is not limited to people with Down syndrome. In any case, signs and symptoms of spinal cord compression should be taken very seriously, as treating the compression could save the athlete from permanent or devastating injury. Some of the symptoms of spinal cord compression are:

- ♦ Numbness or tingling in the hands, feet, arms or legs
- ♦ Weakness in the hands, feet, arms or legs
- ♦ Abnormal gait changes
- ♦ Changes in coordination
- ♦ Spasticity
- ♦ Paralysis
- ♦ Difficulty controlling bowels or bladder
- ♦ Head Tilting
- ♦ Pain Burners, stingers, or pinched nerves in the arms, neck, should, hands or back.

If any of these symptoms are noticed, especially if they are new onset, the athlete could be at imminent risk of spinal cord injury. All sports activity should cease and a doctor should be contacted immediately in order to assess the athlete for potential risk and/or correct the underlying skeletal system issue.

Managing a Spinal Cord Emergency:

A spinal cord injury in the sports setting is usually preceded by a traumatic impact or sudden and severe movement of the athlete, followed by prolonged immobility of the athlete. If an athlete has had a potential spinal cord injury on the field, this is considered a medical emergency and emergency services should be called immediately. The athlete should be assessed quickly to determine the type and severity of the injury. Is the athlete conscious? Are they responsive? Are they breathing, do they have a pulse? Can they wiggle their fingers and wiggle their toes? All of this will be important information as to what you do next. If the athlete is pulseless and not breathing, then you must initiate CPR while taking care not to move the athlete or the athlete's neck.

The symptoms that the athlete experiences will be directly related to the vertebral level that was injured. Typically, the higher the damage level of the spine, the more severe the injury. If possible, the neck should be immobilized and the athlete should not be moved until professionals arrive on the scene. This point cannot be stressed enough. If an athlete has had a spinal cord injury, there is a possibility that the injury itself is precarious. The injury might be an unstable and incomplete compression instead of a complete severance of the spinal cord – in other words it may not yet be a permanent injury. If the athlete is moved improperly, the spinal cord could become severed, thus needlessly resulting in permanent injury.

Special Olympics Sports Sciences: Sports Injury Guide for Coaches Specific Sports Injuries

What You Need to Know

Spinal cord injuries are rare occurrences that may be preceded by warning signs of spinal cord compression. While athletes with Down syndrome may be at risk of having spinal cord compression, sign and symptoms may occur in other individuals as well. If an athlete exhibits signs or symptoms of spinal cord compression, the athlete should refrain from sports activity and should be referred to a physician for further evaluation immediately. If a spinal cord injury occurs emergency medical personnel should be contacted immediately and the athlete should not be moved until they arrive. If an athlete stops breathing after a spinal cord injury, CPR should be initiated and continued until emergency medical personnel arrive.

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Specific Sports Injuries

Drowning

Special Olympics athletes, like any other athlete who engages in aquatic activities may be at risk of drowning. The significant increase in the risk of drowning for Special Olympics athletes comes from the high frequency of seizure disorders found in this population. When an athlete has a seizure, they may lose consciousness or lose control of their muscles. If this occurs when they are in water, they may very quickly submerge. This is one of the most terrifying positions for a coach to be in, especially in open water, because of the amount of time it may take to rescue the athlete. For this reason it is recommended that athletes who have had a seizure within the past year not compete in aquatic sports.

When a person is drowning, the air passages typically close to prevent water from entering the lungs. Unfortunately, this also prevents air from entering the lungs, depriving the athlete of oxygen and eventually leading to unconsciousness or death. Because of the high frequency of seizures in the Special Olympics athlete population, coaches of aquatic sports should be prepared for two different drowning scenarios either one that is initiated with seizure activity or one that it not.

Managing a near Drowning

In managing a drowning situation with a conscious and struggling athlete, the first rule of rescuing a drowning athlete is to protect yourself. A person who is drowning and still conscious will strike out and pull down even the most competent swimmer; dirty water can hide dangers such as metal rubbish with sharp edges; and cold water can cause muscles to cramp very quickly. If the person is conscious, reach to the person from the safety using a pole, rope, or buoyancy aid to enable him to help himself out of the water.

If the person is not conscious or having a seizure then they will actually pose less of a threat to the rescuer but they will also be need unable to resist sinking in the water or consciously grasp any safety objects, thus the entire rescue relies upon the strength, speed and skill of the rescuer. In either case, a drowning athlete will need to be brought back to land as soon as possible, in order to initiate resuscitation efforts. Because of the second-by-second urgency of the situation, if a coach is the only person in the vicinity able to render help, he or she should immediately attempt to safely rescue the athlete before attempting to call emergency personnel at a remote location. If there are others in the vicinity who can assist the coach, the strongest swimmer, most familiar with in-water rescue techniques should initiate the rescue while others assist in the effort and/or call for emergency personnel.

A person who has nearly drowned is likely to vomit because of the large volume of water that may have entered their stomach. If the athlete vomits while being resuscitated, turn the athlete toward you, and clear out the mouth before turning him on to the back and resuming rescue breathing. If the victim vomits while in recovery position, clear out the mouth and keep a close eye on breathing to ensure that it has not stopped. If the victim is conscious and become sick encourage him to lean forward and give support while he is vomiting. Do not make any effort to remove water from the lungs by applying chest compressions or abdominal thrusts. The risk of water in the lungs is minimal, while compressing the chest or stomach will increase the risk of the victim choking on his own vomit.

In the event of near drowning, the athlete will be at risk of hypothermia. Hypothermia is a lowering of the body's core temperature and is very common secondary problem of near drowning. If untreated, hypothermia leads to the breathing and heart rate slowing down and eventually stopping. To reduce the risk of hypothermia in a case of near drowning, place the athlete on a blanket or layer of coats to insulate him from the ground. Remove wet clothing if you are able to replace it quickly with warm and dry clothing; if not, then cover the wet clothing with blanket and coats. Cover the head to prevent heat loss. Warm the external environment if possible as much as possible.

Special Olympics Sports Sciences: Sports Injury Guide for Coaches Specific Sports Injuries

What You Need to Know

Special Olympics athletes participating in aquatic sports are at risk for drowning. Having an uncontrolled seizure disorder will increase that risk. Thus, it is recommended that athletes who have had a seizure within the past year not participate in aquatic sports. If an athlete begins to drown, they must be brought out of the water while keeping the safety of the rescuer in mind. CPR may need to be initiated. Since vomiting may occur during resuscitation, rescuers should take precautions to ensure that neither the athlete nor the rescuer choke on it. Hypothermia is also a significant risk for near-drowning victims, thus athletes should be warmed as part of the rescue effort.

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Seizure Risk

As stated previously, about 20-25% of Special Olympics athletes have some kind of seizure disorder. In general and seizure is considered “well controlled” if the athlete has not had a seizure within the past year. In this case, athletes are generally cleared to participate in any sport of their choosing. A “poorly controlled” seizure disorder is one in which the athlete has had a seizure within the past year. In general, it is recommended that these athletes not participate in sports where having a seizure during the peak activity of the sport could result in significantly increase bodily harm. For example, sports such as swimming, sailing, downhill skiing, snowboarding, bicycling and equestrian should be avoided until the athlete’s seizures are well controlled.

It should be noted that athletes who generally have well-controlled seizures may still be at risk of developing seizures during competition events, even if they had not developed seizures during practices. The reason for this has to do with the games environment. Athletes often find the games to be exciting and distracting events. This might cause increases in adrenal activity, decreases in sleep, neglect of proper hydration leading to electrolyte imbalances or forgetting to take medications. Each of these factors could potentially trigger a seizure. Additionally, some athletes may engage in what is sometimes called anti-doping. Some athletes taking anti-seizure medications recognize the deleterious effect these drugs might have on their athletic performance. These athletes might decide to skip seizure medication doses in order to improve their performance in competitions. Unfortunately, this places the athlete at additional seizure risk during games events.

Managing a Seizure event

Generally, seizures are temporary, self-limiting events. If an athlete has a seizure, more than likely the seizure will stop within a few seconds to a few minutes. In this scenario, the best courses of action to take are comfort measures. Make sure the athlete’s head is cushioned, any tight clothes are loosened and the athlete is turned on their side to avoid choking risk. Additionally, during a seizure, nothing should be placed in the athlete’s mouth. It is not unusual for an athlete to be slightly disoriented following a seizure, so do not be alarmed if this occurs.

If the athlete’s seizure is prolonged, this could be a sign of something more significant. Status epilepticus occurs when a seizure lasts for a prolonged period of time. In the sports setting, if an athlete’s seizure lasts for more than 5 minutes, or if the athlete has multiple seizures within a 5 minute period without regaining consciousness, emergency personnel should be called. Status epilepticus can be a medical emergency that limits the athlete’s ability to breath. Some athletes who are prone to prolonged seizures may carry with them a suppository injector filled with medicated diazepam (valium) gel. In the US, this may go under the trade name Diastat. If an athlete is having prolonged seizures, and they also have this gel prescribed, the coach may need to administer this gel in order to save the athlete’s life. In this situation, the gel is injected directly into the rectum of the athlete. While responding personnel may not be comfortable administering this medication, doing so will often save the athlete from a potentially life-threatening situation.

What You Need to Know

Many Special Olympics athletes have seizure disorders. If an athlete has not had a seizure in over a year, it is generally considered safe for them to participate in any sport. If an athlete has had seizure within the past year, sports involving water, speed, or heights should be avoided. Generally, when seizures occur, they are self-limiting. In these cases, only comfort measures need to be taken and the athlete should be turned on their side until the seizure is complete. If the athlete experiences some confusion after the seizure, this is normal and will generally go away within a short period of time. If a seizure lasts for more than 5 minutes, emergency medical personnel should be contacted and administration of rectal diazepam (valium) gel may be indicated.

Asthma

Approximately 14% of Special Olympics athletes have asthma compared to 8% in the general population. Asthma attacks can result in breathing difficulty. They can be triggered by pollution, pollens, allergens and even by exercise. Generally, asthma attacks can be treated with inhalers and symptoms will subside. However, occasionally symptoms do not subside and may worsen. If this occurs, the athlete's asthma could be developing into a potentially life-threatening situation known as status asthmaticus. Symptoms of status asthmaticus include:

- ♦ Chest tightness
- ♦ Labored breathing
- ♦ Wheezing
- ♦ Progressively worsening shortness of breath
- ♦ Dry mouth
- ♦ Use of accessory muscles

While most asthma "attacks" are minor and will generally be relieved by the use of an inhaler, it is possible that the attack may become severe enough to warrant contacting emergency medical personnel. The use of accessory muscles in breathing should be an indication that emergency personnel should be called right away. The use of accessory muscles means that the athlete is using additional muscles in order to breathe than would usually be seen. This might mean using muscles of the neck, shoulders and back in order to facilitate greater airway movement. In these instances it is usually apparent that the athlete is visibly struggling to breathe. It should be noted that accessory muscles fatigue relatively quickly, so their use is an indication that a timely response is very important.

If an asthma attack or especially status asthmaticus is suspected, the athlete should stop physical activity immediately and use their inhaler as soon as possible. Multiple inhaler doses may be needed to bring the asthma attack under control. If the athlete appears to be in significant distress or the symptoms of the asthma attack do not begin to improve within a few minutes, the coach should contact emergency personnel or go to the nearest emergency room.

Prevention

It is important to note that athletes who are known to have exercise-induced asthma may benefit from taking one or two puffs from their inhaler prior to exercising. Such pre-medication may prevent asthma attacks from happening. It is important that these athletes have access to their inhalers at all times. Athletes who are known to have severe forms of exercise induced asthma should not participate in sports unless they have access to their inhaler.

What You Need to Know

Athletes who have asthma should have access to their inhalers at all times. Athletes who have exercise-induced asthma may benefit from taking two puffs of their inhaler prior to exercise. If an asthma attack occurs, it is generally treatable with the use of an inhaler. If an athlete appears to be struggling with breathing, is using accessory muscles to breath or has other signs of a status asthmaticus, emergency personnel should be called immediately.

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Specific Sports Injuries

Anaphylaxis (Allergic Reactions)

Generally, mild allergic reactions that result in a skin rash are not terribly concerning in the sports setting. However, some allergic reactions can produce very significant physical effects. In the sports setting the most common allergic reactions are due to medications, insect bites or stings or exposure to certain food products.

Symptoms of anaphylaxis may include:

High pitched breathing sounds	Difficulty breathing
Difficulty swallowing	Lightheadedness
Swelling in the face, eyes or tongue	Slurred speech
Wheezing	Unconsciousness
Abdominal pain	Anxiety
Chest Discomfort	Chest tightness
Cough	Diarrhea
Hives	Itchiness
Nasal Congestion	Nausea
Vomiting	Palpitations

If an athlete begins to experience the symptoms of anaphylaxis, this should be considered a medical emergency. Emergency personnel should be contacted immediately. If the allergic reaction is due to a sting or a bite, do NOT squeeze the affected area, as this will cause more allergenic venom to be released and could lead to a worsening of symptoms. If an athlete is highly allergic to something, there is a chance that the athlete might carry some kind of rescue medication with them. If the athlete is able to swallow, diphenhydramine liquid (also known as Benadryl) can be helpful. Occasionally the athlete will carry with them a product known as an EpiPen. This is a single shot dose of injectable epinephrine. If symptoms continue to worsen, and especially if the athlete is struggling significantly to breathe or loses consciousness, do not hesitate to use the EpiPen. It is important to note that the effects of epinephrine are almost immediate, however, they do not last for very long. If epinephrine is used, the athlete should be taken to the nearest emergency room immediately, before its effects wear off.

Prevention

The best way to prevent an anaphylactic allergic reaction is to know the allergy history of your athletes. Ask about insect or animal bites, foods, medications and any other substances to which the athlete is allergic. Though this history is often contained on the athlete's medical form, it is possible that the athlete may have developed new allergies since that history was taken.

In addition to knowing the allergy status of your athletes, it is also wise to be prepared for the inevitable allergic reaction. Any first aid kit that coaches maintain for their athletes should also contain liquid diphenhydramine (Benadryl). Additionally, if an athlete is known to have rescue medications, it's important to make sure that you have access to these rescue medications during your time with the athlete.

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What You Need to Know:

Severe allergic reactions may result in a medical emergency and could even obstruct an athlete's ability to breathe. Knowing what athletes are allergic to and taking the appropriate measures is the best way to prevent allergic reactions. If a severe allergic reaction occurs the use of liquid diphenhydramine or injectable epinephrine may be indicated. Severe allergic reactions should be considered a medical emergency. Even if rescue medications are used and symptoms appear to go away, emergency medical personnel should be contacted immediately.

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Specific Sports Injuries

Medication Side Effects

People with ID, including Special Olympics athletes, are prone to taking more medications than the average person. They are 25% more likely to get a prescription when visiting the doctor, but are 300% more likely to have that medication represcribed during the next office visit. These medications are used to treat chronic conditions, however, they may also, themselves, produce chronic side effects. In fact, it is estimated that approximately 25% of Special Olympics athletes are taking medications that could negatively effect sports participation.

Medications can produce any kind of side effect. Some side effects that are relevant to athletes include:

1. Long QT syndrome (or other cardiac arrhythmias)
2. Weight Gain
3. Osteoporosis
4. Constipation
5. Sun Sensitivity
6. Reflux
7. Dehydration
8. Hypoglycemia
9. Change in mental status or mood
10. Dental Cavities

Below you will find a brief explanation of the significance of each of the side effects.

Long QT syndrome

Long QT syndrome is a cardiac arrhythmia that can either be inherent in the heart or induced by medications. The general rule of thumb is that roughly 5% of Special Olympics athletes are taking medications that could potentially induce Long QT syndrome. Roughly 5% of those athletes (or 1 in 400 athletes) will actually develop long QT syndrome, and roughly 5% of those athletes (or 1 in 8000) will have an adverse cardiac event because of the side effect. Long QT syndrome is only identifiable with an EKG. Thus, it is recommended that if an athlete is taking a medication known to potentially induce Long QT syndrome, they should have at least one EKG as a precaution.

Weight Gain

Many Special Olympics athletes take medications that can induce weight gain. Athletes, who take these medications, on average, are likely to weigh an additional 5 to 10% more, on average, than their non-medication-taking counterparts. This can be compounded when junk food and high-carbohydrate beverages are used as a reward in the athlete's life. If an athlete is taking medications that can induce weight gain, it is recommended that they pay extra attention to the foods and drinks that they are consuming. Sometimes, this means that the coaches and the family of the athlete need to play a more active role in guiding the athlete's nutritional choices and portion sizes.

Low Bone Density

Approximately 20% of Special Olympics athletes have low bone density. 5% have Osteoporosis. As bone density decreases, the risk of fracturing a bone increases substantially. In fact, approximately 21% of Special Olympics athletes have broken a bone in their lifetime. While anti-seizure medications are notorious for lowering bone density, many medications can have this side effect – and the effect tends to get more pronounced with age. If an athlete is noted to be taking a medication that can induce low bone density, it is recommended that they periodically have their bone density checked.

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In the bone density screening that is done at Special Olympics Health Promotion venues, bone density is rated based on a numerical score. The average bone density score is 0.0, with the normal range being between -1.0 and +1.0. If an athlete has a score of less than -1.0, they are considered to have low bone density. If they have a score of less than -2.5, they are considered to have osteoporosis. In either case, the athlete should engage in more weight bearing exercise, ingest more vitamin D, ingest more calcium and try to receive 10 or 20 minutes of direct sunlight per day. It may also be a good idea for a physician to review the athlete's medications in order to determine if another medication (with less pronounced side effects) might be available. If an athlete has osteoporosis, it is recommended that the athlete not participate in sports that might have a high risk potential for impact trauma and, thus, bone fracture.

Constipation

A large number of medications that Special Olympics athletes take have the unpleasant side effects of constipation. Because of this, many athletes are also prescribed laxatives. Constipation, if serious enough, can even induce behavior changes in athletes. Often it is difficult to ask about constipation, but identifying this issue may be very beneficial to an athlete's athletic performance. The treatment of constipation relies mainly on prevention. This should take the form of increases in dietary fiber, proper hydration and may include the occasional use of laxatives as prescribed by a physician.

Sun Sensitivity

Approximately 20% of Special Olympics athletes are taking a medication that can induce sun sensitivity. Sun sensitivity occurs when an athlete is exposed to direct sunlight, often resulting in redness, rash, blistering or peeling of the skin on sun-exposed areas. Most athletes should take at least some precautions when exposed to sunlight, but this could be very important for athletes taking medicines which have sun sensitivity as a side effect. In these athletes, preventive measure such as the use of sunscreen, long sleeves, hats, pants, sunglasses and shaded rest areas are recommended. Additionally, discussing medication alternatives with a physician is recommended.

Gastroesophageal Reflux (GERD)

Also known simply as "reflux", GERD occurs when acid from the stomach travel up the esophagus. Depending on the person, the acid can at times enter the mouth. The most common symptom of GERD is the feeling of "heartburn" and it typically occurs after eating or when lying flat. In people with intellectual disabilities, GERD can become quite pronounced and may be undiagnosed for years. Complications of GERD include esophagitis, Barrett's esophagus, gastritis, esophageal cancer, tooth erosion and tooth loss. Up to 36% of Special Olympics athletes may have GERD. Some may even be taking medications which cause GERD, without taking the medications that treat it. Sometimes, dentists can identify serious cases of undiagnosed GERD by finding signs of enamel erosion in the posterior mandibular teeth. GERD can be treated with various medications. GERD also tends to lessen when stress is reduced, the athlete stops smoking, loses weight, decreases meal portion sizes, avoids soft drinks, avoids caffeine, avoids chocolate and avoids spicy foods. Any medication that an athlete is taking which could cause GERD, should be reviewed by a physician.

Dehydration

Athletes perspire during exercise, especially in the presence of a hot environment. When athletes perspire, they lose fluid. It is possible for a person to lose up to two kilograms (4.5 pounds) of fluid per hour while sweating. This can pose a significant risk for athletes. Generally, a loss of 2% of body weight will begin to impair physical performance, a loss of 3-5% will put significant stress on the cardiovascular system and may induce fatal arrhythmias, and a loss of 7% will likely cause an athlete to collapse.

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Specific Sports Injuries

Certain medications may speed up the dehydration process or may keep the athlete in a mild state of dehydration normally, resulting in less fluid reserve for them to utilize during exercise. Many athletes with intellectual disabilities are taking these types of medications, so it is important to pay attention to an athlete's hydration status. One very simple way to determine if an athlete is hydrating properly is to weigh them before exercise and after. If the athlete is hydrating properly, there will be very little difference between the weight of the athlete before and after exercise.

Symptoms of dehydration include: dry mouth, dizziness, inability to produce tears or saliva, inability to sweat or produce urine, a rapid heart rate, delirium, altered mental status, and loss of consciousness. In serious cases, dehydration can cause sudden cardiac arrest, seizures, kidney failure, hypovolemic shock, heat injury, cerebral edema and could ultimately result in death.

Dehydration in the sports environment is entirely preventable. Athletes should be encouraged to hydrate before, during and after exercise. For exercise lasting less than 30 minutes, hydration with water or other fluids is recommended. For exercise lasting longer than 30 minutes, hydration with fluids containing electrolytes is recommended.

When athletes sweat, they lose electrolytes such as sodium and potassium. These electrolytes are what help conduct nerve impulses, such as the nerve impulses that control the heartbeat. When the body sweats, fluids and electrolytes are lost in proportion with each other. For the most part, this means that there isn't much variation between the electrolyte concentrations of somebody before and after they exercise. However, if the athlete drinks only water for rehydration, the concentrations of electrolytes will decrease. Small changes in electrolyte concentrations are not harmful to the body, however, large decreases in electrolyte concentrations can be a serious medical concern. This is the reason why rehydration with water is recommended for exercise lasting less than 30 minutes, however, rehydration with water and electrolytes is recommended for exercise lasting over 30 minutes.

Hypoglycemia

Maintaining adequate energy for physical exercise is extraordinarily important. As athletes become more conditioned, their ability to sustain exercise for longer periods of time increase. However, some athletes especially if they are relatively unconditioned athletes, may have difficulty regulating the energy they need for continued physical exercise. Additionally, some Special Olympics athletes may be taking medications that cause the athlete to have lower blood sugar. Athletes with diabetes who take insulin or other diabetes medications are at particular risk.

If hypoglycemia occurs, the athlete may experience some of the following symptoms:

- ♦ Lethargy or weakness
- ♦ Nausea
- ♦ Dizziness
- ♦ Difficulty thinking clearly or speaking
- ♦ Headache
- ♦ Tremors
- ♦ Decreased balance
- ♦ Emotional outbursts or transient depression.

Often these symptoms appear suddenly. Generally, if they are not medication induced, they will pass even if left untreated. However, if an athlete is hypoglycemic, a quick dose of sugar should resolve these symptoms within minutes. In this case, a sweetened beverage, such as a sports drink is a great source of carbohydrates. In fact, any kind of sugary or carbohydrate-rich snack, such as fruit or candy will help. It is important that the athlete not be given any diet drinks or sugar free candy in this situation. Such diet foods will do nothing to improve the situation.

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Changes in Mental Status or Mood

Many medications that athletes with ID take may have effects on the mood or mental status of an athlete. Generally, these effects are fairly unnoticeable in a medication that the athlete has been taking for a long time. However, occasionally an athlete may be started on a new medication, or may accidentally take too much or too little of a medication. If mood changes or mental status changes occur, a physician should be contacted immediately as these may be signs of an accidental overdose of medications

What You Need to Know

Athletes with ID are likely to be prescribed more medications than athletes without ID. These medications may have long term side effects. If any potential side effects of medications are noticed, a physician should be contacted. Usually these side effects are not considered emergencies, however, if significant changes occur, this may be the sign of a medical emergency and medical personnel should be contacted immediately.

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Specific Sports Injuries

Heat Illnesses

Heat illnesses can be broken up into three types: heat cramps, heat exhaustion and heat stroke. Heat illnesses, in general, occur in athletes who exercise in hot environments. Typically, dehydration increases the likelihood of heat illness and can make the severity of the symptoms worsen.

Heat cramps and heat exhaustion are fairly self-explanatory and both are warning signs that exercise should cease immediately. In the case of heat exhaustion, that athlete may start to feel lethargic and tired. Again, this is a warning sign that the athlete should stop exercise.

In both cases, after the athlete stops exercising, they should immediately take measures to hydrate and cool the body. The athlete should be hydrated with fluids and electrolytes. Cool water may be placed on the athlete's head or body to help them cool off. Additionally, the athlete should immediately seek shade. If a shaded, air-conditioned environment is available, that may be helpful as well.

Heat stroke is a serious medical emergency. Typically, the an athlete experiencing heat stroke will have a body temperature that is at or above 40 degrees Centigrade or 104 degrees Fahrenheit. During heat stroke, the athlete will have hot, dry skin and will have very little or no ability to sweat. They may develop a headache and, worse, may have a seizure or lose consciousness.

If heat stroke is suspected, call for emergency medical personnel immediately. While you are waiting for medical personnel to arrive, it is imperative that the athlete's body be cooled as rapidly as possible. All excess clothing should be removed. Air conditioning or a fan should be set up to blow directly on the athlete and the athlete's body and head should be cooled with as much ice and water as possible. During this time, it is also important to monitor the athlete's breathing and pulse, to make sure that the situation is not worsening. It is important to mention that no attempt should be made to hydrate an athlete who is unconscious or having a seizure.

What You Need to Know

Heat-induced cramps or exhaustion are warning signs that should result in immediate cessation of exercise, cooling of the athlete and rehydration with fluid and electrolytes. If the athlete has a very high body temperature and feels hot and dry, these may be signs of heat stroke, which is a medical emergency. In the case of heat stroke, emergency medical personnel should be contacted immediately, the athlete should be actively cooled as quickly as possible and rehydration with fluid and electrolytes should occur as quickly as possible, provided that the athlete is not unconscious or having a seizure.

Concussion and Head Trauma

Concussion and its long-term effects are becoming more of a concern in sports. Concussion occurs when the brain impacts the interior boney surface of the skull as a result of a sudden change in velocity of the head. The symptoms of a concussion tend to vary significantly depending upon the severity of the injury. Symptoms may be barely noticeable or extraordinarily debilitating. Repeated concussions seem to be correlated with long-term psychiatric and neurological consequences, though those consequences do not seem to be significant in athletes who have had only one minor concussion in their lifetime.

About 4% of Special Olympics athletes have a medical history of sustaining a concussion, though it is suspected that concussion is both under-recognized and underreported in this athlete population. In Special Olympics, the highest risk sports for concussion are floor hockey, floorball, basketball, softball, football (soccer), equestrian sports, downhill skiing and bicycling, though concussion may occur while participating in any sport.

If an athlete sustains an injury to the head a concussion could occur. Symptoms of concussions include: Nausea, dizziness, headache, slurred speech, fatigue, sleepiness, ringing in the ears and loss of consciousness. Sometimes these symptoms can last for weeks or months. It should be noted that concussion is very rarely a life-threatening condition and that loss of consciousness occurs in only about 10% of cases. Though, if concussion is suspected, the athlete should be evaluated by medical personnel immediately.

Often following an impact in which the athlete was visibly affected, coaches must decide when an athlete can return to play. This is a very controversial and difficult decision to make. If an athlete has a concussion and they immediately return to play, they may exacerbate the concussion, especially if they are impacted again. While there are many methods to determining if an athlete can return to play, it is generally felt that if the athlete appears to be at their baseline neurological functioning, they can return to play. Conversely, if there is any suspicion at all that the athlete is not functioning at their neurological baseline, then they should not return to play.

While concussion itself is generally not a life threatening condition, there are other conditions that can arise due to head trauma that are life threatening such as: skull fracture, hematoma or stroke. Because of this, if an athlete has sustained a significant head trauma, physical activity should be ceased immediately and the athlete should be assessed.

If an athlete has head trauma, the following symptoms may indicate a more significant injury. It is important to note that these symptoms may not appear immediately. If these symptoms are noted at any time within a few days following a head trauma, it may be an indication of a medical emergency:

- ♦ **Pain :** Constant or recurring headache
- ♦ **Motor dysfunction:** Inability to control or coordinate motor functions, or disturbance with balance
- ♦ **Sensory Changes:** Changes in ability to hear, taste or see; dizziness; hypersensitivity to light or sound
- ♦ **Cognitive Changes:** Shortened attention span; easily distracted; overstimulated by environment; difficulty staying focused on a task, following directions or understanding information; feeling of disorientation, confusion and other neuropsychological deficiencies.
- ♦ **Speech Changes:** Difficulty finding the "right" word; difficulty expressing words or thoughts.

In assessing the neurological baseline of athletes with ID, it is important that the assessment takes their intellectual disability into consideration. It is equally important that the intellectual disability not be used as an "excuse" for the athlete being unable to perform a cognitive task that they were previously able to perform. In the event that concussion or head injury is suspected, activity should cease immediately and the athlete should be seen by a physician immediately.

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What You Need to Know

Athletes sustaining a head trauma should be evaluated. Head trauma may result in concussion, though, it may also result more significant medical emergencies. Symptoms of significant head trauma may not be readily apparent immediately following the trauma. If any symptoms are observed with a few days of the trauma, even if it appeared to be a minor incident, it could be an indication of a medical emergency and should be treated as such. Establishing a neurological baseline of functioning for individual athletes may help in assessing athletes after a head trauma.

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Specific Sports Injuries

Sprains, Strains, Contusions, Cramps, and Fractures

Minor traumatic injuries are the most frequently encountered type of sports injury. The causes of these types of injuries vary greatly but the treatment is generally the same.

Definitions

- ♦ **Sprain:** injury to the ligaments and/or joints
- ♦ **Strain:** injury to the muscles and/or tendons
- ♦ **Contusion:** blunt force trauma to soft tissue
- ♦ **Cramp:** muscular pain due to overuse or overexertion
- ♦ **Fracture:** injury to the bone that results in cracking or breaking of the bone

In almost all cases of sprain, strain or contusion, the following treatment is generally recommended:

Rest – stop athletic activity, rest the affected area

Ice – over affected area for 20 minutes at a time, over the next 24-36 hours

Compression – wrap with proximally decreasing tension

Elevation – above the heart

Often, when a sports injury results in a strain or sprain, coaches and athletes are concerned about the possibility of a fracture. While some fractures are obvious, most are not. In some cases, the only definitive way to diagnose a fracture is through x-ray. If there is any concern that an athlete may have sustained a bone fracture, not only should the “RICE” procedure above be implemented, but medical professionals should be contacted in order to assess the athlete.

What You Need to Know

Sprains, strains, contusions and fractures are the most common types of sports injuries. In the event of these types of injuries, coaches should employ the RICE treatment: Rest, Ice, Compression and Elevation. If a fracture is suspected, the athlete should be evaluated immediately by medical personnel.

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Specific Sports Injuries

Other minor injuries

Minor injuries can negatively impact sports performance. Though, by definition minor injuries should not result in significant or permanent effects, if they are not treated properly they can develop into more significant problems. Thus, it is important that these injuries be treated effectively and monitored for improvement. While athletes often compete with minor injuries, physical activity may exacerbate the injury or slow its rate of healing. If a minor injury does not appear to be healing properly it may be necessary for the athlete to temporarily cease physical activity until the injury is fully healed.

Blisters

- ♦ Keep pressure off new blisters using a felt "doughnut."
- ♦ Where the skin is torn, use extreme care.
- ♦ Keep it clean, and cut skin halfway around the perimeter without removing the skin.
- ♦ Apply antiseptic ointment and a sterile dressing.
- ♦ When underlying tissue toughens, cut away the remaining flap of skin.

Blisters most often occur at points of repetitive contact on the feet or hands. Aside from treating the blister as noted above, it may be advisable to observe the athlete's equipment for proper fit and possibly recommend that the athlete either adjust their playing style or change their equipment (e.g. different shoes or the addition of gloves).

Abrasions and contusions (floor burns and deeper bruises)

- ♦ Keep them clean.
- ♦ Expose them to the air when possible.
- ♦ Keep them dry.
- ♦ Encourage gentle activity.

Even clean abrasions may develop infections. Abrasions should be monitored for proper healing. If an abrasion is located on an area of the body that receives excessive pressure or movement during sports, the abrasion may reopen. In this instance, the athlete should temporarily cease the motion that causes this until the wound has healed properly.

Chronic knee pain, thigh muscle overload, tendonitis, stress fractures and ligament strain.

- ♦ Follow the doctor's directions, which will generally include:
- ♦ Rest for 5-7 days.
- ♦ Ice for pain.
- ♦ Stretch related muscles to strengthen them.
- ♦ Move gently, stopping at the point of pain.
- ♦ Exercise to strengthen afflicted area as it heals.

Like abrasions, strains and sprains may occur in areas of the body that are put under stress during sports and are therefore prone to re-injury. If this occurs, the re-injury may be more significant than the initial injury. Monitoring of the athlete's improvement along with following medical advice from a physician is recommended. Injuries to bones, joints or ligaments tend to heal slowly, it is not unusual for such injuries to take several weeks or months to heal.

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What You Need to Know

Coaches should be aware that areas of minor injury are prone to re-injury or exacerbation. Minor injuries should be treated effectively and monitored for improvement. If improvement does not occur or the injury worsens, cessation of physical activity and medical consultation are advised.