

Sports Specific Safety

Baseball

*Sports **M**edicine & **A**thletic **R**elated **T**rauma
SMART Institute*

Injury Statistics

- Nationally, an estimated 131,555 high school baseball-related injuries occurred during the 2005-2006 and 2006-2007 academic years, for an injury rate of 1.26 injuries per 1,000 athletic exposures.

- Am J Sports Med. 2008

The Most Commonly Injured Body Site:

- Shoulder- 17.6%
- Ankle- 13.6%
- Head/Face- 12.3%
- Hand/Finger- 8.5%
- Thigh/Upper leg- 8.2%

The Rotator Cuff

The rotator cuff muscles help stabilize the shoulder joint and are involved in the rotational movements of the shoulder. They are put under a significant strain when the arm goes through an overhead motion such as throwing or serving, making them susceptible to injury.

Rotator Cuff

The rotator cuff is a group of four muscles:

- Supraspinatus
- Infraspinatus
- Teres minor
- Subscapularis

TM

Rotator Cuff Strain Treatment

- Ice
- Activity modification
- NSAID – Anti – inflammatory medication
- Restore pain free range of motion
- Rehabilitation
 - Rotator cuff
 - Scapular stabilizers

Rotator cuff tear

- Most tears occur through repetitive overhead activities, like throwing a baseball.
- RTC tears can also occur with a single traumatic incident.

Signs & Symptoms

- Pain and weakness with lifting the arm, with lowering the arm
- Atrophy (muscle shrinkage)
- Crepitus (clicking and grinding)
- Pain that wakes a person up at night

Common treatment

- Rehabilitation: pain control, range of motion, strengthening.
- NSAID - Anti- inflammatory medication
- If the injury does not respond to the above, a surgical procedure may be required.

Ulnar Collateral Ligament (UCL)

- The UCL is located on the inside or medial side of the elbow.
- A UCL injury can be a career threatening injury.
- Most common in overhead throwing athletes.

UCL Injury Symptoms

- Medial elbow pain
- Pain with the acceleration phase of throwing.
- If Acute: A “pop” may be felt or heard.
- If Chronic: Decrease in strength, pitch control and accuracy

UCL Treatment

- Non-Throwing athletes:
 - Decrease pain / inflammation
 - Increase flexibility / strength of the elbow and shoulder complex
- For Throwing athletes:
 - UCL Reconstruction is the most common treatment.
(Tommy John surgery)

Suprascapular Nerve Palsy

- Often asymptomatic
- Traction on the nerve from overhead swing; 'floater' serve
- Infraspinatus atrophy

Ankle ligament sprain

- **Ankle Sprains:** lateral ankle injuries are more common than medial, sometimes the result of stepping on another's foot or base.
- **Acute Management:** Rest, Ice , Compression, Elevation.
- **Prevention:** Stretching (Achilles), strengthening, proprioceptive training, proper footwear, and taping/bracing when appropriate.

Ankle Sprain

- Prevention Techniques
 - Tape/Bracing
 - Ankle strengthening exercises
 - Balancing drills

TM

Knee cartilage & ligament

- Internal knee injuries: could consist of ligamentous damage or meniscal tears.
- Acute management: Rest, Ice, Compression, Elevation. Crutches could be warranted. Surgical repair may be needed.
- Prevention programs such as PEP can be instrumental in preventing ACL injuries.

Meniscal (Cartilage) Tears

- Caused by foot being planted and body twists
- “Pop”, may still be able to play, swelling next day
- Must address the swelling, pain and limited range of motion first
- Diagnosis may be based on history and/or medical imaging tests alone
- May require an “unlocking” of the joint
- Prevent quadricеп shutdown

Ligament Injuries - ACL

- > 200,000 new ACL injuries per year
- History
 - Non-contact injury with knee in extension (70%)
 - Hemarthrosis within a few hours
 - Audible pop in 50%
 - More common in females

Concussions

- Signs & Symptoms - it is important that the athlete understand the signs and symptoms of a concussion and the importance of reporting even the slightest incident.
- Acute management: seek medical attention.
- Prevention: reporting of each incident with proper medical care can prevent “Second Impact Syndrome.”

S & S of Concussion

Physical Symptoms

Headache
Vision difficulty
Nausea
Dizziness
Balance Difficulties
Light sensitivity
Fatigue

Emotionality Symptoms

Irritability
Sadness
Nervousness
Sleep disturbances

Cognitive

Memory loss
Attention disorder
Reasoning difficulty

People working with younger (pediatric) athletes should be aware that *recovery may take longer than in older athletes*. Additionally, these younger athletes are maturing at a relatively fast rate and will likely *require more frequent updates of baseline measures* compared with older athletes.

JAT 2004 Position Statement

Because damage to the maturing brain of a young athlete can be catastrophic (ie, *almost all reported cases of second-impact syndrome are in young athletes*), athletes under age 18 years should be managed more conservatively, using stricter RTP guidelines than those used to manage concussion in the more mature athlete.

JAT 2004 Position Statement

Field Safety

- Uneven playing surfaces
- Surfaces with greater than normal friction
- Slippery playing surfaces, fields with puddles
- Improper illuminated lighting for night events
- Irrigation systems not completely buried
- Fences that surround fields with protruding parts
- Goalposts and other fixed apparatus that are not properly protected with padding

Field/Playing Area Safety

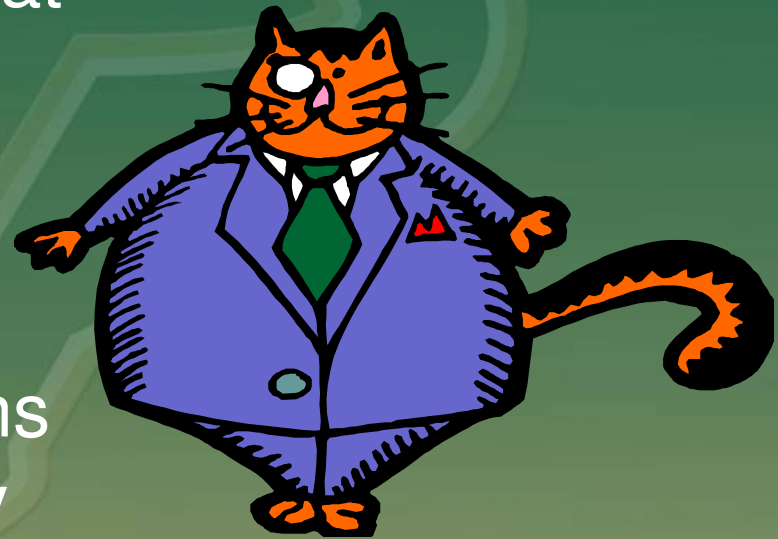
- Lightning
 - Flash to Bang or 30-30 Rule
 - If there is 30 seconds or less between the time that you see lightening and hear thunder then seek shelter immediately.
 - Wait at least 30 minutes after the last thunder is heard before resuming play. If you see further thunderstorm clouds building, you should wait at least another 30 minutes.
 - Seek shelter in an enclosed vehicle, restroom, or other nearby building. Golf carts, trees, or other “shaded” locations are not safe.
- Sun
 - Don’t forget sunscreen.

Prevention of Heat Illnesses (NCAA)

- Allow for 7-10 days to acclimatize
 - 80% acclimatization
- 2 months for full acclimatization

Who is at greatest risk?

- Unaccustomed to heat
- Overweight
- Intense athletes
- Sick athletes
- Recent immunizations due to elevated body temperature



General Information

- White → Reflects 30% of the heat
- Dark → Reflects 18% of the heat
(skin or clothing)
- Male: Lower % body fat
- Female: Higher % body fat
 - Core temperature must get higher before sweating occurs
- Core temperature: for every one degree of increased core temperature – there is an increase in heart rate (about 10 beats/1 degree)

General Information

Body Temperature



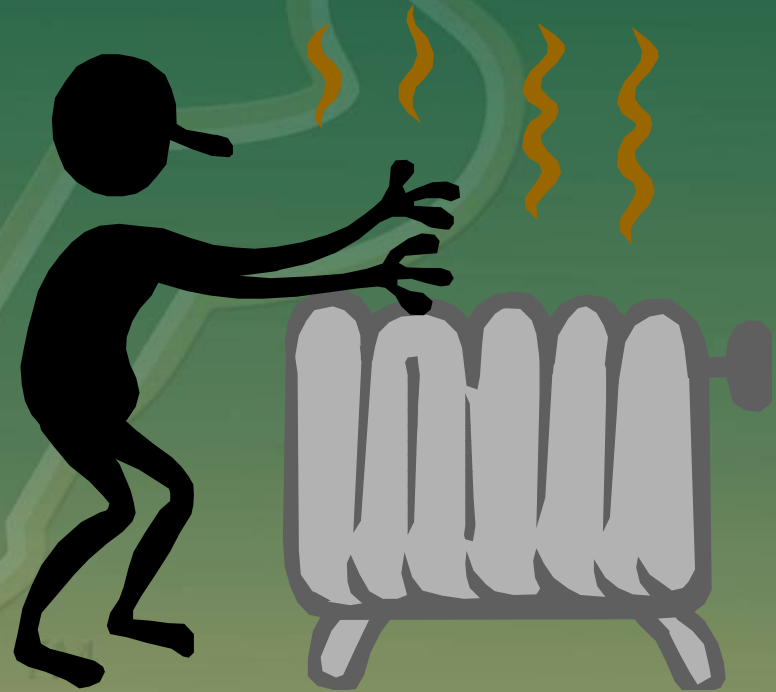
- Sweat increases
- Blood is pushed towards the skin
- Respiration increases
- Desire for food decreases
- Desire for fluids increases
- Desire for salt increases
- Muscle contraction decreases (willingness)

Heat Illnesses - Causes

- Dehydration
 - 60+ % of total body water
 - Sugar in the stomach prevents rehydration
 - Observe until urination occurs (key)
- Electrolyte Imbalance
 - Depletion occurs over a period of 2-5 days
 - Ion-chemical charge

Types of Heat Illnesses

- Heat rash
- Heat syncope
- Heat cramps
- Heat exhaustion
- Heatstroke



Monitoring

- Weight Change
- Symptoms
- Urine specific gravity
- Bioelectrical impedance
- CoreTemp
 - “Heat Pill”
 - Correlate with signs/symptoms
 - Ability to track rate of change
 - Monitor the whole team simultaneously
 - Cost?
 - Uncharted waters
 - Parameters?
 - Godek SF, Godek JJ, Bartolozzi AR, *Thermal Responses in Football and Cross Country Athletes During Their Respective Practices in a Hot Environment*, Journal of Athletic Training, vol 39, no 3, 235-240, 2004.
- Others

Fluid Replacement

- **Before exercise:** drink 17-20 oz. 2-3 hrs prior.
- 17-20 oz 10-20 min. prior to exercise.
- **During exercise:** 7-10 oz. every 10-20 min.
- **After exercise:** within 2 hrs, drink enough to replace weight loss from exercise.

MRSA

Methicillin-resistant Staphylococcus aureus

The Silent Killer

Ways to combat MRSA:

- Keep hands clean
- Shower immediately after exercise
- Keep cuts and scrapes covered
- Wear clean exercise clothes
- Don't share razors or other personal items
- Notify the athletic trainer of any unusual sores