



## Risk of Sport Related Illness

### Pre-participation Examinations:

PPE screenings are utilized in attempt to identify conditions that may place an athlete at increased risk and affect safe sport participation. The purpose of the PPE is to identify athletes that have medical conditions that place athletes at risk for sudden death and to not disqualify an athlete without identifying a significant compelling reason. PPEs should contain a medical and family history, physical examination which includes a general health screening, cardiovascular screening, neurologic screening, orthopedic screening, and general health screening. Student-athletes must complete PPEs every two years and be cleared by an appropriate medical profession in order to be able to participate in sports at the high school level.

### MD Clearance Note:

Once an athlete is seen by a medical provider for an injury the athletic trainer is no longer considered the primary provider for that injury and must follow the recommendations of the medical provider. For this reason, athletes seen by a physician with or without the knowledge of the ATC must present a medical clearance note for sports participation prior to being able to return to sports and/or engage in rehabilitation with the athletic trainer. The athletic trainer will review the medical clearance note and will notify the appropriate coach of an athlete's participation status. Coaches will not return athletes to participation without first consulting with the athletic trainer.

## **Overuse Injuries:**

It has been estimated that over half of the reported pediatric overuse injuries are preventable. Overuse injuries are often the result of:

- Training errors
- Improper technique
- Excessive sports training
- Inadequate rest
- Muscle weakness or imbalances
- Early specializations

Common overuse injuries in the pediatric population include growth-related disorders (such as Osgood-Schlatter's, Sever disease, and other apophyseal injuries) as well as injuries resulting from repetitive micro-trauma (such as stress fractures).

The pre-participation examination is the primary means of identifying at-risk athletes and initiating preventive measures. A thorough history questionnaire can help to identify many injuries and possible signs of overtraining.

### **Intrinsic factors of pediatric overuse injuries**

- Previous injury
- Malalignment
- Menstrual cycle
- Psychological issues
- Inflexibility
- Muscle weakness
- Instability
- Level of play
- Age
- Height
- Sex
- Tanner stage
- Laxity
- Experience

### **Extrinsic factors of pediatric overuse injuries**

- Training and recovery
- Equipment
- Poor technique
- Psychological issues
- Training errors
- Environment
- Sport-acquired deficiencies
- Conditioning

Example profiles of over-use injury prone male and female pediatric athletes:

## **Males**

Tall stature, endomorph body structure, less static strength, more explosive strength, decreased muscle flexibility, high degree of ligamentous laxity, large Q-angle

## **Females**

Tall stature, decreased upper extremity strength, less static strength, more explosive strength, high limb speed, increased muscle tightness, increased ligamentous laxity, greater leg-length discrepancy, pronation, large Q-angle

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Baseball has been the most widely studied group regarding pediatric overuse injuries and the following recommendations have been made for pediatric pitchers regarding sport modification and pitch count.

### **Recommendations for pitch counts on the first four days after a pitching event**

Age	1 d Rest	2 d Rest	3 d Rest	4 d Rest
9-10	21-33	34-42	43-50	51+
11-12	27-34	35-54	55-57	58+
13-14	30-35	36-55	56-69	70+
15-16	30-39	40-59	60-79	80+
17-18	30-39	40-59	60-89	90+

### **Suggested sport-modification recommendations for pediatric pitchers:**

1. Avoid pitching with a fatigued arm
2. Avoid pitching with arm pain
3. Avoid pitching excessively
  - No more than 80 pitches per game
  - Avoid competitive pitching in excess of 8 months per year
  - Avoid pitching more than 2500 pitches in a competition year
4. Pitchers with the following characteristics should be monitored closely for an injury:
  - Those than use anti-inflammatories regularly
  - Regularly starting pitchers
  - Pitchers who throw more than 85 mph
  - Taller and heavier pitchers
  - Pitchers who warm up excessively

### **Training and Conditioning**

Proper training and conditioning both before and during the season may prevent overuse injuries. All pediatric athletes should begin by establishing a good general fitness (encompassing strengthening, endurance, and flexibility) which should precede sport specific training. Training loads can be increased once a general foundation of fitness has been acquired. The 10% rule is recommended for pediatric athletes which indicates a 10% increase in the amount of time training, distance, repetitions, or load each week. The 10% rule allows the body to adjust gradually to increased training intensity.

### **Delayed Specialization**

Diversity of sport participation or delayed specialization is theorized to result in a decreased risk for repetitive micro trauma and overuse injuries in pediatric athletes. Multisport athletes and athletes that rest between seasons have a lower risk of overuse injuries. In addition, pediatric athletes that participate in 2 or more sports that emphasize the same body part are at higher risk for overuse injuries. In addition to a higher risk of

overuse injuries, early specialization may be associated with nutrition deficits and sleep disturbances, psychological or socialization issues, as well as burnout.

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## **Management of Chronic Illnesses**

### **Asthma**

Asthmatic reactions can be triggered by various stimuli including allergens, respiratory infections, aspirin, nonsteroidal anti-inflammatory drugs, inhaled irritants, household cleaning fumes, particulate exposure, and exposure to cold and exercise. Airflow limitations are often reversible but severe asthmatic reactions can lead to death. The PPE can reveal the presence of asthma but should be coupled with additional screening evaluations such as spirometry testing.

#### **Major signs and symptoms of asthma**

- Chest tightness
- Coughing
- Prolonged shortness of breathe
- Difficulty sleeping
- Wheezing
- Inability to catch one's breathe
- Physical activities affected by breathing difficulty
- Use of accessory muscles to breathe
- Breathing difficulty upon awakening
- Breathing difficulties when exposed to certain allergies or irritants
- Exercise-induced symptoms such as coughing or wheezing
- Well-conditioned athlete inability to perform
- Family history of asthma
- Personal history of atopy including atopic dermatitis or hay fever
- Family history of asthma

Management of asthma attacks should be incorporated into emergency action plans and include a plan for referring patients experiencing significant or life-threatening breathing difficulties.

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### **Type 1 Diabetic Mellitus**

The primary goal of diabetes management is to consistently maintain blood glucose levels in a normal or near-normal range without provoking hypoglycemia. The recommendation for management of athletes with type 1 diabetes mellitus are organized into the following categories:

- Diabetes care plan
- Supplies for athletic training kits
- Pre-participation examination
- Recognition, treatment, and prevention of hypoglycemia
- Recognition, treatment, and prevention of hyperglycemia
- Insulin administration
- Travel recommendations
- Athletic injury
- Glycemic control

Diabetic care plans and supplies should be available at all practices and games. Pre-participation examinations should include an exam for retinopathy, nephropathy, and neuropathy in addition to an annual foot exam for sensory function and ankle reflexes. Strategies to recognize, treat, and prevent hypoglycemia typically includes blood glucose monitoring, carbohydrate supplementation, and/or insulin adjustments. Athletes experiencing severe hypoglycemia (unable to swallow, follow directions, eat as directed or unconscious) require glucagon injections and emergency transport.

## **Travel Recommendations**

When traveling athletes with type 1 diabetes are advised to carry prepackaged meals and snacks in case food availability is interrupted. Travel that occurs over several time zones which affects eating and activity patterns may require adjustments in insulin therapy. In the event of air or extended travel, insulin should not be stored in cargo hold of airplanes due to extreme temperatures. Athletes should carry diabetic supplies and prescriptions with them in the event that supplies and medications need to be replaced.

## **Athlete Injury**

Injuries to type 1 diabetic athletes can often cause a hyperglycemic reaction. Since hyperglycemia is known to impair the wound healing process athletes, in the event of injury, an individualized blood glucose management protocol should be developed for use during injury recovery, including frequency of blood glucose monitoring.