

## CONCUSSION – WHAT IS IT?

A concussion is a brain injury that results in a temporary disruption of normal brain function. A concussion or “mild traumatic brain injury” (mTBI) ***is a metabolic injury affecting the brain chemistry and function; it is NOT a structural injury that can be detected on CT scan or MRI***. This injury is often the result of a direct blow to the head or body that causes a quick and violent whipping of the head. The result is neurological impairment resulting in one or more of the symptoms listed below:

### **Possible signs you may observe if your son/daughter sustains a concussion:**

Balance problems	Loss of consciousness
Nausea/vomiting	Slow, slurred speech
Abnormal or inappropriate emotions	Amnesia (memory loss)
Disorientation	Dazed appearance
Change in mental status	Sensitivity to light and/or noise

### **Possible symptoms your son/daughter may complain of following a concussion:**

Headache	Felling “Foggy” or “fuzzy” in the head
Dizziness	Lightheaded feeling
Feeling excessively tired or fatigued	Ringing in the ears
Double or blurred vision	Sensitivity to noise
Difficulty concentrating	Difficulty sleeping

A concussion causes an energy crisis in the brain. While the brain is requiring more energy to repair itself, the combination of decreased blood flow and limited energy stores creates a metabolic mismatch. Because of this mismatch, it is imperative that the athlete be removed from activity and be given the opportunity to rest. Complete physical and cognitive rest (*no schoolwork, video games, texting, internet use, noisy environments*) is critical to the healing process and is essential within the first few days of the concussion. An athlete does not need to lose consciousness (black out) to suffer a concussion. In fact less than 10% of concussed athletes lose consciousness.

Although less common, bleeding in the brain can occur with some head injuries. Loss of consciousness, mental status deterioration and worsening symptoms raise the concern for a bleeding injury and prompt evaluation at a trauma center would be indicated.

## WHAT CAN/SHOULD I DO IF I SUSPECT A CONCUSSION?

First, make sure to notify a healthcare professional (athletic trainer or school nurse) that you suspect a concussion and allow them to evaluate your son/daughter to assess the severity. Remember, there is an energy crisis in the brain and complete cognitive rest is crucial early in the recovery process. These symptoms **should** gradually dissipate. However, **if they get worse, or if new symptoms appear**, see your physician or report to the ER immediately.

### **It IS OK to:**

- Use acetaminophen (Tylenol) for headaches
- Use ice pack on head and neck for comfort
- Eat a light diet as tolerated
- Go to sleep, REST

### **There is NO need to:**

- Check eyes with flashlight
- Wake up every hour
- Test reflexes
- Obtain CT scan or MRI

## WHAT IS SECOND IMPACT SYNDROME?

Second Impact Syndrome is a dangerous condition that can occur if an athlete returns to sports before full recovery. If you receive a second blow to the head (even a relatively minor one) before the symptoms of the initial concussion have cleared, the consequences can be deadly.

A second blow to the head after a concussion can cause the brain to lose its ability to regulate blood flow properly. Engorgement of the blood vessels occurs, which places excessive pressure on the brain. This pressure can result in rapid respiratory failure, coma and even death. **To prevent second impact syndrome do not return to sports after a concussion until your symptoms have completely resolved and you have been cleared by a physician or athletic trainer.**

## CONCUSSION - FAQ

### **What are the most common signs and symptoms of a concussion?**

According to one study, the top 3 signs/symptoms among 396 concussed athletes were headache (40%), dizziness (15%) and confusion (9%). Loss of consciousness and amnesia occurred in only 4% and 6% of the cases, respectively. This is supported by another study, which found that headaches were the most commonly reported symptom following concussion, occurring in 70% to 86% of athletes.

### **Can my son or daughter take something for the headache?**

Concussed athletes should avoid medications containing aspirin or nonsteroidal anti-inflammatories (i.e.: Advil, Motrin), since these medicines thin the blood and may potentially increase the risk of intracranial bleeding. It is generally OK to take acetaminophen (Tylenol), but check with your physician before giving any medication. Most concussive headaches do not respond to these over-the-counter medications.

### **Do I need to wake my son or daughter every few hours during the night?**

There is still some considerable debate about the necessity of nighttime wake-ups. Wake-ups disrupt the athlete's normal sleep pattern, which can lead to increased symptoms the next day due to the combination of sleep deprivation and the concussion itself. However, you should wake your son or daughter to check for a decreased level of consciousness and persistent or worsening symptoms if: the athlete experienced any loss of consciousness, had a period of amnesia (memory loss or difficulty), he or she still has symptoms at bedtime, or advised to do by your physician or athletic trainer.

### **When can my son or daughter return to play?**

Return to play decisions are based on concussion severity and the athlete's history of prior head injuries. For most minor concussions, return to play may occur once the athlete meets the following criteria: he/she has completed a symptom-free period (and not taking any medications to mask headache and other symptoms), has completed the stepwise activity progression, passed their ImPACT test (if applicable) and has been

cleared by an appropriate medical professional. Adolescents are generally managed more conservatively than college-aged and professional athletes since they appear to be at a higher risk for Second Impact Syndrome. More severe head injuries and those who have had more than one concussion may need a longer recovery period. Concussed athletes should not return to activity until the physician or athletic trainer has cleared them to do so.

### **Does age affect how fast an athlete recovers from a concussion?**

Yes. One study that compared recovery rates between NFL football players and high school football players found that high school players took longer to recover from a concussion than the NFL players. A brain that is still developing may be more sensitive to trauma, which likely affects recovery time.

**More information can be found at:** <http://www.cdc.gov/Concussion>

## **WILLIAM PENN CHARTER CONCUSSION MANAGEMENT PROGRAM**

William Penn Charter employs a well-researched model put forth by the 2013 Zurich Concussion Consensus Statement:

### Return to School Guidelines

Concussed athletes with no loss of consciousness and signs/symptoms lasting less than 7 days may return to play when he/she meets the following criteria:

1. Asymptomatic for 24 hours (without use of medication to mask any symptoms).
2. Completes 4 symptom-free hours of schoolwork at home.
3. Completes a full day of school without symptoms returning.
4. Completes the Zurich Activity Progression (see below) once asymptomatic for 24 hours and medically cleared to do so.
5. ImPACT scores return to within normal limits of baseline (if applicable).

Physician clearance notes inconsistent with our concussion policy may not be accepted and such matters will be referred to our supervising physician.

### Zurich Return to Activity Progression

We follow a stepwise activity progression based on recommendations in the Zurich Consensus Statement from the 3rd International Congress on Concussion in Sport as follows:

- Step 1: Light aerobic exercise (i.e.: stationary piece of equipment, increase HR)
- Step 2: Moderate aerobic exercises (begin running program, dynamic movement)
- Step 3: Functional exercises (increase intensity, begin agilities, sport-specific drills)
- Step 4: Non-contact practice activities
- Step 5: Full contact practice activities
- Step 6: Full game play

Each step is separated by 24 hours. If any symptoms occur, the athlete will drop back to the previous level and try to progress again after 24 hours of rest has passed.

## **Neurocognitive Testing**

Penn Charter requires pre-season baseline and post-concussion neurocognitive testing using computer software program to assist in the management of head injuries. The 20-30 minute program is set up in a “video-game” format. It tracks neurocognitive information such as memory, reaction time, brain processing speed and concentration. We conduct a post-concussive test when the athlete is asymptomatic and continue to test the athlete until their scores return to normal. Please note that this program is used only as a tool in making return to play decisions.

**If you have any questions, feel free to contact a member of the concussion management team:**

Jessica Rawlings, MS, ATC | Head Athletic Trainer | (215) 844-3460 x151/ [jrawlings@penncharter.com](mailto:jrawlings@penncharter.com)

Debra Foley, RN, MSN, CRNP | School Nurse | (215) 844-3460 x142 | [dfoley@penncharter.com](mailto:dfoley@penncharter.com)