

## **SOME SIGNS OF CONFUSION/CONCUSSION:**

Confusion can be defined in many different ways and listed below are some of the signs and symptoms frequently associated with minor head trauma (a.k.a. “ding”, “bell rung”, dazed). Most categories of impairment appear to be deficits of attention, concentration, information processing speed and memory. We also have suggested some of the means of assessing these signs and symptoms to decide whether the athlete is “clear” to return to action.

1. **Thinking deficits:** Tests such as the Paced Auditory Serial Addition Task (PASAT), and Trails Making A & B Test have proven to be helpful in identifying post-head-trauma residual problems brain function.
2. **Lack of sustained attention:** Difficulty sustaining adequate focus to complete a task or persevere with a coherent stream of thought can be a sign of poor attention. Repeating digits forward and backward, stating the months of the year in reverse order or counting backwards by a certain interval are ways of identifying this lack of concentration ability.
3. **Confused mental status:** Disorientation to time, date, place, address and phone number may be helpful; however, recent studies suggest that information relating to the game such as opponent, score, quarter, play was injured on and individual assignment on the play are more relevant to identifying deficits after minor head trauma.
4. **Amnesia:** Retrograde amnesia usually represents a more serious deficit than post-traumatic amnesia.
5. **Dazed look or vacant stare.**
6. **Slurred or incoherent speech.**
7. **Vomiting and/or nausea.**
8. **Slow motor and verbal responses.**
9. **Emotional lability:** Reactions that seem out of proportion and inappropriate, as well as combative and/or aggressive behavior can be seen for a period of time after a concussion.
10. **Memory deficits (short-term and delayed memory):** A common manifestation is the repeated asking of the same questions over and over again. Asking for details of the contest, names of teams in prior contests, remembering three words or objects at 0 and 5 minutes and asking about significant recent news events are ways of evaluating memory status.

11. **Poor coordination:** A recent study indicated an individual’s balance was abnormal for three to five days after a concussion even without other residual signs and symptoms. Tests of strength, coordination and agility, such as finger-to-nose testing and tandem gait observations, can be helpful in analyzing the athlete’s state of coordination.

12. **Dizziness.**

13. **Headaches:** This is a very important symptom and has been one of the gold standards of clinical symptoms to help determine return to play.

14. **Restlessness:** Changing position frequently and having trouble resting or “finding a comfortable position” can be manifestations of post-head-trauma difficulties.

15. **Neurasthenia and hyperesthesias:** Neurasthenia, which is nervous weakness, exhaustion and irritability, and hyperesthesias, excessive sensitivity to various sensory stimuli such as touch, pain, light, sound, etc.

**It is very important that these assessments be done both in the resting state and, if the individual appears “clear,” to ask the athlete to perform many of them after sufficient exercise such as short sprints, push-ups, sit-ups and knee bends to raise the heart rate. If any abnormal signs return, the athlete should be withheld from participation.**



### **NATIONAL FEDERATION OF STATE HIGH SCHOOL ASSOCIATIONS**

PO Box 690

Indianapolis, Indiana 46260

Phone: 317-972-6900, Fax: 317.822.5700

[www.nfhs.org](http://www.nfhs.org)

*Prepared by Vito Perriello, M.D., a member of the NFHS Sports  
Medicine Advisory Committee.*



## SUGGESTED GUIDELINES FOR MANAGEMENT OF HEAD TRAUMA IN SPORTS

Head trauma is a common problem in sports that has the potential for serious complications if not managed correctly. Even what appears to be a "minor ding" or "bell ringer" without loss of consciousness, has the risk of catastrophic results in a youngster who is returned to action too soon. The medical literature and lay press are reporting instances of death from "second impact syndrome" even after mild concussions.

At many athletic contests across the country, there is a lack of trained and knowledgeable individuals making the decision to return concussed athletes to the game. Frequently, there is undo pressure from various sources (parents, player and coach) to return a valuable athlete to action A.S.A.P. In addition, often there is an unwillingness by the athlete who wants to play to report headaches and other symptoms that will prevent his/her return to play.

Outlined below are guidelines that may be helpful in establishing a protocol useful to those responsible for the return to play decision after a head injury, whether they are medically trained or not. These are general guidelines and are not meant to replace the judgment of a physician or certified athletic trainer present on the sideline. **IF THERE IS ANY OBVIOUS ABNORMALITY OR DETERIORATION OF SYMPTOMS, IMMEDIATE MEDICAL CARE SHOULD BE FOUND.** It is the relatively minor head injury with no obvious consequence where this protocol could be most helpful on the sideline.

### SIDELINE MANAGEMENT OF ACUTE HEAD INJURY

Following a head injury, an athlete should be returned to practice or a game **ONLY** if he/she meets **ALL** of the following criteria. (See schematic)

1. Head injury did not result in any loss of consciousness;
2. Any "confusion" or altered mental status clears in less than 15 minutes;
3. The injured athlete has had no other concussion or significant head injury during the present season;
4. The athlete checks out "clear" on mental status, orientation, concentration and memory tasks before and after exertional provocative tests. (See reverse side)

## MANAGEMENT OF HEAD INJURIES THAT INTERRUPT RETURN TO PLAY

Any athlete whose concussion involves loss of consciousness, doesn't "clear" in 15 minutes or who has had previous concussions should not return to play or practice until medical clearance is obtained. Generally, an athlete is advised not to return to play or practice in a contact sport until he/she is asymptomatic and clear for at least one week. This has traditionally meant no headache, confusion or any of the problems listed below. These recommendations have been based on the awareness of the increased vulnerability of the brain to concussions occurring close together and of the cumulative effects of multiple concussions on long-term cognitive function. Research is now revealing some fairly objective and relatively easy-to-use tests which appear to identify the subtle residual effects of concussion not found by traditional evaluation. These identifiable deficits frequently persist after the obvious signs of concussion are gone and appear to have relevance to whether an athlete can return to the game with relative safety. The significance of these deficits is still under study and the evaluation instruments represent a work in progress. They may be helpful to the professional determining return to play in conjunction with consideration of the severity and nature of the injury; the interval since the last head injury and the level of play.

The schematic below reflects the latest recommendations on concussion management in a form we believe should be helpful to schools, especially if no medically trained individual is available on the sideline.

## EXAMPLE OF A SPECIFIC INSTRUMENT THAT IS BEING USED TO DO SIDELINE ASSESSMENT OF ATHLETES WITH CONCUSSION:

Outlined in the included schematic is a fairly comprehensive list of signs, symptoms and observations that can be utilized to determine if an athlete is "clear" of any abnormalities that would prevent return to play. Several investigators have been working on quick and efficient checklists for sideline assessment that can be performed by individuals with varying degrees of training and could be an alternative if a professional is not on hand. Dr. Kutner and Dr. Barth are working on a Sideline Concussion Checklist (SCC) that looks very promising. Drs. McCrae, Kelly, Bartolic, et al have developed a Sideline Assessment of Concussion (SAC) instrument, which has been validated on hundreds of athletes. The test has a reasonable user-friendly system for grading concussions and utilizes tests that can be done on the sideline. In addition, a scoring system is included to serve as a guideline to help in decision-making and suggests a course of action to follow on return to play. A palm card, as provided by the Brain Injury Group and the Academy of Neurology, has summarized the experience and consensus of a number of researchers in this field. The palm card and a packet of test materials with information on scoring, etc. can be obtained from the Brain Injury Association, 800-321-7037.

