



Ten Steps and Commitments for an Effective Youth Sports Concussion Program

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Concussions, or mild traumatic brain injuries (mTBI), are becoming a better recognized reality in sports. Early identification, diagnosis, and individualized management of an mTBI have arguably greater importance than any other sports-related injury. Effective management of concussions in youth sports is essential to reduce long-term negative outcomes. Yet organized concussion management systems in youth sports are infrequent compared with collegiate and professional sports. To address the need to establish effective concussion management systems in youth sports, we present a brief synopsis of ten programmatic steps and commitments. Three goals must be considered in a sports concussion program. First, safeguard the student-athlete; brain injuries require the highest level of caution and conservative decision-making. Second, facilitate speedy recovery and return to sports and other life activities through proper treatment; early identification, immediate individualized treatment, and careful recovery monitoring are paramount. Third, reduce the athletic program's risk and liability; with current information regarding concussion management (e.g., Vienna statement, Aubry et al., 2002; NATA Position Statement, Guskiewicz et al., 2004; Lovell et al., 2004), there is no defensible argument for unawareness of risks of concussion to student-athletes (Osborne, 2001). Instituting a proper sports concussion program applying best practices is a reasonable means to safeguard student-athletes and reduce organizational risk.

Ten Steps in the Concussion Management Process

- 1. Pre-Injury Knowledge and Preparation:** A preseason educational program, directed toward coaches', players' and parents' informational needs (e.g., CDC Coaches and Physician's Toolkits) is an essential first step. A basic understanding of the injury, its evaluation and treatment, promotes compliance and investment.
- 2. Preseason Baseline Testing:** Baseline testing by properly trained professionals should be conducted for neuropsychological function, postural stability/ balance (Riemann & Guskiewicz, 2000), and pre-injury symptoms to serve as comparison with post-injury evaluation. Obtaining baseline symptom reports from parents is recommended for young athletes.
- 3. Injury monitoring system:** The *most challenging* step is instituting an active system for early recognition of concussion. Responsible person(s) must be defined for this role, ideally a certified athletic trainer (ATC) or, if unavailable, a trained alternative (e.g., parent or assistant coach). There are useful reference materials to assist recognition of signs/symptoms (e.g., CDC Coaches/ Physician's Toolkit sideline concussion cards).
- 4. Early On-Field/ Sideline Identification:** Once a concussion is suspected, a protocol must be initiated to evaluate the player, including an effective sideline evaluation tool. A trained health professional should conduct the evaluation. If not available, the student-athlete is removed from play with referral to an appropriate health professional for evaluation.
- 5. Informed Decision: Evidence of concussion?** Determining whether a concussion occurred is the first informed decision. Basic criteria include evidence of forcible blow to the head, and evidence of associated onset of signs or symptoms. With certain significant signs/ symptoms - loss of consciousness greater than several seconds, worsening level of consciousness, repeated vomiting, seizure, significant confusion - referral to the emergency room is warranted.
- 6. Post-Injury Clinical Evaluation:** Following diagnosis, the post-injury clinical evaluation is conducted, providing an in-depth assessment of the student-athlete's neurocognitive dysfunction (e.g., attention, working memory, new learning and memory, cognitive processing speed, reaction time), postural stability, and symptoms. The broad effects of injury upon school learning, home activity, social-emotional function, and sports participation must be evaluated.
- 7. Communication and Coordination:** With early diagnosis and evaluation, treatment plan coordination among family, medical, athletic, and school systems is essential to facilitate consistent management and recovery.
- 8. Comprehensive Treatment:** Appropriate recovery requires active management of the brain injury in all phases of the student-athlete's life. *Effective rest is the key to recovery.* Written treatment plans guide physical and mental activity in all activities - sports, social/recreational, and academics. Neuropsychological testing guides individualized data-driven

recommendations for treatment.

9. **Informed Decision: Return to Baseline Functioning?:** Return to baseline decisions require explicit criteria for recovery, and consistent application to the student-athlete's clinical condition. Published guidelines (e.g., NATA position statement, Guskiewicz et al., 2004; Aubry et al., 2002) define recovery as asymptomatic with return of neuropsychological and balance functions to pre-injury baseline levels, at rest and after the gradual exertional protocol.
10. **Gradual Return To Play (RTP) protocol:** With return to pre-injury baseline functioning at rest, an appropriately trained health care provider (e.g., athletic trainer) initiates the gradual RTP exertional protocol following established guidelines (e.g., Concussion in Sport Group, Aubry et al., 2002). Careful attention is paid to resumption of symptoms at each stage of exertion.

Ten Commitments to Program Success

To implement effectively the ten programmatic steps, the youth sports program must commit to the following:

1. **Top-down administrative commitment and support:** Successful program implementation requires strong support from the leadership of the youth sports program. Programs will face inconsistent implementation, at best, without full administrative support. Appropriate time and personnel must be committed to the necessary tasks for an effective program.
2. **Program buy-in at all levels of the organization:** The sports concussion program is only as effective as its weakest link. Any compromise in implementation will result in reduced effectiveness and increased risk to the student-athlete. All athletes, family members, coaches, and athletic/personal health professionals must accept the program goals and follow the policies and procedures to meet the program goals successfully.
3. **Modifying the “play with pain” culture:** When an injury to the brain is concerned, the athletic culture must not promote the “play with pain” mentality. An effective program demonstrates positive reinforcement for players' healthy reporting of concussion symptoms. Players are not viewed as weak for reporting concussion signs and symptoms.
4. **Developing the sports concussion team:** An effective program requires appropriate leadership, training and supervision from a team of healthcare and athletic professionals with expertise in managing sports concussions. This requires developing affiliations with athletic trainers, sports neuropsychologists, and sports medicine physicians, each providing an important and essential role to the evaluation and management of sports concussion.
5. **Orientation and training of all personnel:** All involved individuals participate in training in the knowledge and skills associated with their roles and responsibilities, including the student-athlete, family, athletic, academic, and medical personnel.
6. **Defining clear roles, policies and procedures, and criteria for decision-making:** Clearly written program policy and procedures are important to standardize the sports concussion program. Team member roles are clearly defined. Clear, specific criteria for decision-making are established for recognition/ diagnosis of concussion, removal from play, and recovery/return.
7. **Communication among key parties and processes:** An

effective program defines the appropriate means and timing of communications at various stages of recovery to clarify the student-athlete's needs and associated plan for recovery for all involved.

8. **Written documentation at each stage:** Written documentation of findings, decisions, and treatment plans are necessary at each stage of the process to facilitate effective care and recovery. Standardized assessment protocols, treatment plans, and progress monitoring tools are important to facilitate documentation.
9. **Definition and treatment of all post-concussion needs:** While the primary focus of the student-athlete may be a speedy return to sports participation, an effective program must commit to a broader focus including academic and social-emotional functioning.
10. **Program Evaluation: Systematic data collection and analyses of outcomes:** An effective program evaluates its effectiveness in meeting goals, making program adjustments as needed. Evaluation can be directed at specific program steps (e.g., success of pre-season educational program, application of decision rules) and/or at a broader set of outcomes (e.g., total number of student-athletes identified, mean length of recovery time, parent satisfaction).

Summary

Youth sports programs must take seriously the risks of traumatic brain injuries in student-athletes. Implementing an effective sports concussion management program is essential to safeguard young participants and reduce long-term risks. Toward this end, we describe ten steps and commitments necessary for an effective program. Management of this serious injury must consider the varied effects in the home, school, social, and sports environments. While specifics of program design and implementation may vary with the type of sport, age and level of the student-athlete, and availability of program resources, the ten steps and commitments will guide youth sports organizations in establishing early identification, diagnosis and coordinated, individualized management.

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