



Recommendations and Guidelines for Minimizing Head Impact Exposure and Concussion Risk in Football

National Federation of State High School Associations (NFHS) Report from the July 2014 NFHS Concussion Summit Task Force

The National Federation of State High School Associations (NFHS) and its member associations firmly believe that athletic participation by students promotes health and fitness, academic achievement, healthy lifestyles, and good citizenship. While there will always be a risk of injury, minimizing the risk of head trauma and concussion in all sports is a priority for the NFHS. Over the past several years, the NFHS and the NFHS Sports Medicine Advisory Committee (SMAC) have:

- 1) Produced a 20-minute online educational course with the Centers for Disease Control (CDC) on "Concussion in Sports."
- 2) Specifically addressed concussion management in the rules books of all sports, including football.
- 3) Written several Points of Emphasis in the football rules book focused on limiting helmet-to-helmet contact and blows to the head with the shoulder, forearm, and hand.
- 4) Disseminated multiple publications regarding concussion management to the member state associations.

In July of 2014, at the request of the NFHS Board of Directors, a task force of medical and scientific experts, high school football coaches, state association personnel, and representatives of several stakeholder organizations met to discuss strategies to reduce head impacts and minimize concussion risk in high school football players during contests and practices, as well as during activities conducted outside of the traditional fall football season (spring and summer practices). The Fundamentals outlined below represent the task force's recommendations and guidelines developed following two days of presentations and discussion of the relevant medical literature and current expert opinion.

The members of the task force fully acknowledge the present limited – though evolving – scientific evidence available to support the Fundamentals outlined below with absolute certainty and explicit detail. Accordingly, the outcomes and clinical relevance of an increasing number of research studies may eventually alter these recommendations and guidelines. Ideally, this emerging data will clarify the potential for long-term adverse cognitive, emotional, and/or neurologic effects from concussions and repetitive blows to the head that may not result in the clinical symptoms of concussion. Based on what is currently known, the guiding principles in developing this report for young athletes and those who oversee, support and administer high school football programs were to reasonably limit overall

exposure to multiple blows to the head and body (*head impact exposure*) and minimize concussion risk, while maintaining the integrity of the game and attempting to avoid unintended consequences.

The Fundamentals below are designed to allow flexibility for the state associations that collectively oversee the more than 15,000 high schools playing football across the country. The teams fielded by these schools may vary tremendously in the number of available players. Team size dictates numerous variables that may affect an athlete's potential head impact exposure. Those variables cannot be easily accounted for by stringent guidelines. For example:

- An athlete playing on offense, defense and special teams will have greater cumulative head impact exposure and will be at higher risk for injury than an athlete playing a single position.
- The fewer the number of players on a team, the greater the chance some players will need to participate in repeated drills, raising head impact exposure and potential injury risk.

As additional evidence emerges, these Fundamentals will evolve and may become more or less restrictive. While the current level of knowledge keeps this task force from making proposals that are specific and rigid, there is consensus that lessening the frequency of contact (and thus head impact exposure) is likely beneficial to overall brain health. The task force also recognizes multiple contributing factors that affect head impact exposure and the parallel effects on an individual football player's brain. For example:

- Position played (linemen receive more total blows than other positions)
- Two-way players versus those who only play offense or defense
- Tackling and blocking techniques
- Practice frequency and duration
- Players that practice and/or compete on multiple levels (such as varsity and sub-varsity)*
- Concussion history
- Genetic predisposition to concussion

***Note:** *This contributing factor was added to the document by the NFHS SMAC.*

It is very likely that each athlete has a unique level of resilience or susceptibility to concussion and further brain injury. While there is currently no definitive way to measure or quantify this resilience or susceptibility, the task force recommends reasonably limiting head impact exposure through the Fundamentals presented below. Individual risk factors that are modifiable, such as position played, total time spent on field, and sport technique, must be also considered when implementing contact limitations.

Fundamentals for Minimizing Head Impact Exposure and Concussion Risk in Football

1. Full-contact should be limited during the regular season, as well as during activity outside of the traditional fall football season. For purposes of these recommendations and guidelines, full-contact consists of both "Thud" and "Live Action" using the USA Football definitions of *Levels of Contact*.

Rationale: By definition, "Thud" involves initiation of contact at, or up to, full speed with no pre-determined winner and no take-down to the ground. Accordingly, the task force supports that initial contact, particularly with linemen, is just as violent with "Thud" as with "Live Action." However, the task force also recognizes that "Live Action" likely carries a higher risk for other

injuries to the body than does “Thud.” The USA Football *Levels of Contact* “Air,” “Bags,” and “Control” are considered no- or light-contact, and thus no limitations are placed on their use.

2. Member state associations should consider a variety of options for limiting contact in practices. ~~The task force strongly recommends full-contact be allowed in no more than 2-3 practices per week.~~ Consideration should also be given to limiting full-contact on consecutive days and limiting full-contact time to no more than 30 minutes per day and no more than 60-90 minutes per week.

Rationale: The task force acknowledges that there are insufficient data to specify with certainty a research-validated “best practices” standard for contact limitations. Several states (Alabama, Arizona, Maryland, and Texas) adopted varying limitations on contact prior to the 2013 football season. Preliminary *High School RIO* injury surveillance data suggest these states have seen a statistically significant decrease in concussion rates during practices, with no increase in concussion or other injuries during games.

3. Pre-season practices may require more full-contact time than practices occurring later in the regular season, to allow for teaching fundamentals with sufficient repetition.

- A. Pre-season acclimatization protocols and regulations regarding heat and hydration take precedent and should always be followed.
- B. While total full-contact practice days and time limitations may be increased during the pre-season, the emphasis should focus on the proper principles of tackling and blocking during the first several practices, before progressing to “Thud” and “Live Contact.”

Rationale: The task force acknowledges regular season practice limitations may need to be revised during the pre-season. This should be done in a specific and systematic manner to allow coaches to spend sufficient time teaching proper tackling and blocking techniques. Emphasis should be placed upon inexperienced players, as they slowly work through tackling and blocking progressions with “Air,” “Bags,” and “Control” using the USA Football definitions of “*Levels of Contact*.”

4. During pre-season twice-daily practices, only one session per day should include full contact.

Rationale: The adolescent brain needs sufficient recovery time following full-contact practices. In addition, concussion signs and/or symptoms may not develop for several hours after the initial injury.

5. Each member state association should review its current policies regarding total quarters or games played during a one-week time frame.

Rationale: *High School RIO* injury surveillance data consistently show that competition presents the highest risk for concussion. The task force is concerned that participation in games at multiple levels of competition during a single week increases risk for head injury and unnecessarily increases head impact exposure. In addition, games played on consecutive days or those scheduled on the same day (Freshman and Junior Varsity games or Junior Varsity and Varsity games) may not allow the brain an opportunity to adequately recover. Consideration should be given to moderating these situations as much as possible.

6. Consistent with efforts to minimize total exposure to full-contact, head impact exposure, and concussion risk, member state associations with jurisdiction over football outside of the traditional fall football season should review their current policies to assess if those policies stand in alignment with the Fundamentals discussed within this report and, if needed, modify the policies accordingly.

Rationale: Football played outside of the traditional fall football season presents an opportunity for learning, physical activity, and skill development. However, athletes are at further risk for head impact exposure and concussion during any full-contact activity. Consideration should be given to significantly limiting the total time of full contact. Other factors to consider include time elapsed since the previous football season and whether individual athletes have recently been, or are currently, participating in other contact/collision sports (e.g., Ice Hockey, Lacrosse, Soccer and Wrestling).

7. Each member state association should reach out to its respective state coaches' association on designing and implementing a coach education program that appropriately integrates youth, middle school, and high school football programs in every community. USA Football and the NFHS Fundamentals of Coaching courses should be the primary education resources for all coaches. Education for coaches should also include the proper fitting and care of helmets.

Rationale: The game of football continues to evolve and proper coaching technique at each level is fundamental to keeping the game safe and enjoyable. A proper fitting helmet may help decrease, but not eliminate concussion risk.

8. Each member state association should regularly educate its schools on current state concussion law and policies and encourage schools to have a written Concussion Management Protocol. Schools should also be encouraged to share this information with coaches, parents, and students annually.

Rationale: Many schools experience frequent turnover of Athletic Directors and coaches. Frequent "refreshers" on state concussion laws and policies as well as sample concussion management protocols should be made available to ensure all schools are current on, and prepared for, safe and effective concussion management.

9. An Emergency Action Plan (EAP) with clearly defined written and practiced protocols should be developed and in place at every high school. When possible, an athletic trainer should be present at all practices and games.

Rationale: An effective EAP should be in place, as a prompt and appropriate response to any emergency situation can save a life. The EAP should be designed and practiced to address all teams (Freshman, Junior Varsity, and Varsity) and all practice and game sites. An athletic trainer is a key component in any strategy to minimize injury risk and optimize safety for all participants.

Resources:

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DISCLAIMER – NFHS Position Statements and Guidelines

The NFHS regularly distributes position statements and guidelines to promote public awareness of certain health and safety-related issues. Such information is neither exhaustive nor necessarily applicable to all circumstances or individuals, and is no substitute for consultation with appropriate health-care professionals. Statutes, codes or environmental conditions may be relevant. NFHS position statements or guidelines should be considered in conjunction with other pertinent materials when taking action or planning care. The NFHS reserves the right to rescind or modify any such document at any time.



2014 NFHS Concussion Summit Task Force

Julian Bailes, MD

*American Association of Neurological Surgeons
and Congress of Neurological Surgeons*

Michael Bergeron, PhD

American College of Sports Medicine

John Black

NFHS Staff

Javier Cardenas, MD

AIA Sports Medicine Advisory Committee

Bob Colgate

NFHS Staff

Dawn Comstock, PhD

*NFHS Sports Medicine Advisory
Committee*

Henry Feuer, MD

NFL – Indianapolis Colts

Bob Gardner

NFHS Staff

Brad Garrett

NFHS Football Rules Committee

Gerry Gioia, PhD

Children's National Health System

Bill Heinz, MD

NFHS Sports Medicine Advisory Committee

Nick Inzerello

USA Football

Cary Keller, MD

*American Orthopaedic Society
of Sports Medicine*

Michael Koester, MD

OSAA Sports Medicine Advisory Committee

Jeff Kutcher, MD

American Academy of Neurology

Mark Lahr, ATC

*NFHS Sports Medicine Advisory
Committee*

Tory Lindley, ATC

National Athletic Trainers Association

Steve McInerney, ATC

*National Interscholastic Athletic
Administrators Association*

Jeff Myers

Head Football Coach – Kingfisher High School

Tom Mezzanotte

NFHS President and RIIL Executive Director

Gary Musselman

*NFHS Board of Directors and KSHSAA Executive
Director*

Josh Niblett

Head Football Coach – Hoover High School

Mike Papadopoulos

Head Football Coach – Vacaville High School

John Parsons, PhD, ATC

NCAA Sport Science Institute

Jim Tenopir, EdD

NFHS Staff

Todd Tharp

NFHS Football Rules Committee

Kevin Walter, MD

American Academy of Pediatrics

Brian White

*Head Football Coach – Hilliard Davidson High
School*



NATIONAL FEDERATION OF STATE HIGH SCHOOL ASSOCIATIONS (NFHS)

Current and Future Concussions–Related Actions January 2015

New Plans:

- This February 2015, the NFHS will distribute a new free sports medicine handbook (5th edition) to nearly 20,000 high schools.
- At all of its larger meetings, the NFHS will provide forums at which school and state association personnel can exchange ideas about "changing the culture," as recently urged by the Institutes of Medicine.
- The NFHS will encourage state and federal legislators to enact "Good Samaritan" measures that would encourage volunteerism by health care providers at games and practices.
- The NFHS will explore new outlets, including the NFHS Network and its revised website, for PSA's and other messaging about concussion recognition and response.

Ongoing Efforts:

- The NFHS Sports Medicine Advisory Committee has developed a free 20-minute online course called "Concussion in Sport"
 - a) The course is regularly updated and maintained.
 - b) More than 1.7 million people have taken the course, and it has received excellent reviews.
 - c) The course is a joint endeavor by the NFHS and the CDC.
 - e) The NFHS believes the course is having a positive impact on the nation's high school sports culture.
- The NFHS is communicating with the nation's high school coaches, officials and administrators by including numerous articles on concussion-related topics in its various publications.
 - a) *High School Today* reaches 75,000 superintendents, principals, athletic directors and school board presidents, eight times a year.
 - b) The NFHS Football Rules Book, which contains a point of emphasis about concussions, reaches 100,000 coaches and game officials.
- The NFHS is staying in touch with its membership and with other rule makers about potential playing rules modifications that would preserve the essence of the various sports while reducing inherent risks.

- The NFHS has conferred with the CDC, CPSC, NATA, Department of Defense, NCAA, NFL, and other organizations about their respective efforts to address concussion recognition, treatment and prevention.
- The NFHS has noted with approval the enactment of concussion-related legislation in all 50 states.
- The NFHS has promulgated a set of concussion guidelines that its member state associations have utilized in the formation of their concussion protocols.
- The NFHS has helped to fund the collection of longitudinal injury surveillance data over some eight (8) years by Dr. Dawn Comstock, first at Ohio State University and now at the University of Colorado-Denver. She regularly shares her findings with all NFHS rules committees, and with the NFHS Sports Medicine Advisory Committee.
- For several decades, the NFHS has assisted in data collection by the National Center for Catastrophic Sports Injury Research at the University of North Carolina.
- The NFHS continues to promulgate voluntary playing rules and educational materials on a national level.
 - a) Because of its limited jurisdiction and modest resources, the NFHS is not in a position to direct staffing, equipment or budgetary decision-making at individual high schools.
 - b) However, the NFHS believes in its educational mission, and is eager to work with all stakeholders on this important venture.
- In July 2014, the NFHS hosted a concussion summit focusing on “best practices” to minimize injury risks to high school athletes. The NFHS Concussion Summit Task Force finalized a position paper with recommendations for minimizing the risk of concussions and head impact exposure in high school football. The recommendations have been shared with the 51 NFHS-member state high school associations.



**NFHS FOOTBALL RULES CHANGES AFFECTING RISK
(1932-2014)**

- 1932 Publication of NFHS football rules.
- 1935 Required helmets.
- 1954 Legalized the use of plastic face masks.
- 1955 Urged the use of face and mouth protectors.
- 1957 Grasping the face mask illegal.
- 1960 Face protectors required.
- 1962 Tooth and mouth protector required.
- 1969 It is unsportsmanlike conduct for not properly wearing required equipment.
- 1971 Defined "spearing."
- 1973 Included chin strap as part of required head protector.
- 1974 Adopted NOCSAE standards for helmets to be mandatory in 1978.
- 1975 Defined spearing as a disqualifying personal foul. Helmets which met NOCSAE standard when manufactured are mandatory in 1980.
- 1976 "Butt blocking" and "face tackling" are personal fouls. Required hip and shoulder pads.
- 1980 A player shall wear a NOCSAE certified head protector. All helmets must have NOCSAE seal.
Foul to grasp helmet opening.
- 1981 Spearing definition revised-use of the helmet to punish an opponent.
- 1983 Spearing penalty same as other illegal helmet contact fouls.
- 1985 Prohibit any player from positioning himself on the back or shoulders of a teammate or opponent to gain an advantage.
- 1986 Helmet must have a visible exterior warning label regarding the risk of injury.
- 1987 Tooth protectors must cover all upper teeth.

- 1989 Goal posts must be padded by 1990.
- Face protector must have met NOCSAE standard in 1992.
- 1991 An unconscious or apparently unconscious player may not return to the game without written authorization from a physician.
- 1992 NOCSAE mark required on face mask.
- 1994 Allows hard material on forearm, hand, wrist cast/splint if padded to specifications and authorized by licensed medical doctor.
- 1997 Prohibits use of eye shields which prevent visual examination of an injured player's eyes.
- 1998 Prohibit the use of eye shields with less than 100% allowable light transmission.
- 1999 Clarified that if an eye shield is used, it must be clear.
- 2000 Made face-mask foul either 5 or 15 yard penalty
- 2005 Beginning in 2006 helmets shall be secured by 4 snaps and mouth guards shall be a color, not clear or white.
- 2006 Removed the word "intentional" from the spearing definition
- 2007 Three revisions dealing with illegal helmet contact were made to the existing rules and definitions by bringing them under one heading
- The NFHS worked with the National Athletic Trainers' Association (NATA) in mailing out a DVD entitled "Heads Up – Reducing the Risk of Head and Neck Injuries in Football" to an estimated 16,000 high schools across the country.
- 2008 Four of the five Points of Emphasis that were addressed by the NFHS Football Rules Committee for the 2008 football season addressed risk minimization. MRSA and Communicable Skin Conditions; Purpose of a Football Helmet; Altering Legal Football Equipment; and Sideline Management and Control.
- 2009 It is now illegal to grasp the opponent's chin strap.
- The horse-collar tackle has been added to the list of illegal personal contact fouls, regardless of where it occurs on the field. It is illegal to grasp the inside back or side opening of the collar of the jersey or shoulder pads of the runner and subsequently pull the runner to the ground.
- Four of the six Points of Emphasis that were addressed by the NFHS Football Rules Committee for the 2009 football season were: NFHS Guidelines on Handling Contests During Lightning Disturbances, Illegal Personal Contact, Blocking and Illegal Blocks, and Helmet and Face Mask.
- 2010 Concussion rule revised.
- Horse-collar clarified.

Three of the six Points of Emphasis that were addressed by the NFHS Football Rules Committee for the 2010 football season were: Concussion Recognition and Management; Heat Illness and Hydration; and Illegal Helmet Contact.

2011 Provisions for removal of injured players standardized.

~~One Point of Emphasis was addressed by the NFHS Football Rules Committee for the 2011 football season: Concussions, Contact Both to and With the Helmet, and Helmet Technology and Proper Helmet Fitting.~~

2012 Player required to be removed if helmet comes off during the down and it is not due to a foul.

Restrictions added to blocking on free kicks.

It is now illegal to grasp the tooth and mouth protector that is attached to the face mask.

Horse-collar rule modified to further clarify the direction the opponent is pulled.

Four Points of Emphasis were addressed by the NFHS Football Rules Committee for the 2012 football season dealing with risk minimization: Concussions, Contact to and With the Helmet, Helmet Technology and Proper Helmet Fitting; Heat Acclimatization and Preventing Heat Illness; Hurdling; and Illegal Blocking Below the Waist.

2013 If the helmet comes completely off during subsequent dead-ball action related to the down, and is not directly attributable to a foul by the opponent, the player must leave the game for at least one down (unless half-time or overtime intermission occurs).

A new provision added to the existing rule stipulates the kicking team may initiate contact once the receiving team has initiated a block within the neutral zone on a free kick.

A new illegal personal contact foul was added and is charged to a player who initiates contact with an opposing player whose helmet has come completely off.

A new illegal participation foul was added for a helmet-less player that blocks, tackles or otherwise participates beyond the immediate action in which the player is engaged when the helmet came completely off.

Three Points of Emphasis were addressed by the NFHS Football Rules Committee for the 2013 football season dealing with risk minimization: Prohibition on contact to and with the helmet; Reconditioning and recertification of football equipment; Free blocking zone enforcement – consistent enforcement of blocking below the waist.

2014 Targeting definition and foul added. Continuing with the focus on risk minimization, the committee determined that taking aim at an opponent with the helmet, forearm, hand, fist, elbow or shoulder, to initiate contact above the shoulders with an intent that goes beyond making a legal tackle, a legal block or playing the ball is prohibited. Furthermore, the committee feels it is important to separate and draw specific attention to this illegal act.

The committee added the definition of a defenseless player in an attempt to continue concentrating on risk minimization. A defenseless player is a player who, because of his physical position and focus of concentration, is especially vulnerable to injury.

Two new provisions were added to adjust the free kick. One provision balances the kicking team's formation and the other limits the maximum distance of the run up for the kicking team.

Two Points of Emphasis were addressed by the NFHS Football Rules Committee for the 2014 football season dealing with risk minimization: High School Football – State of the Game; Risk Minimization.

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