Bill as Introduced

SB 95 – AS INTRODUCED

2011 SESSION

11-0923
04/09

SENATE BILL ***95***

AN ACT establishing a committee to study youth sports concussions.

SPONSORS: Sen. Houde, Dist 5; Sen. D'Allesandro, Dist 20; Sen. Kelly, Dist 10; Sen. Merrill, Dist 21; Sen. Larsen, Dist 15; Sen. Boutin, Dist 16; Sen. Carson, Dist 14

COMMITTEE: Health and Human Services

ANALYSIS

This bill establishes a committee to study youth sports concussions.

Explanation: Matter added to current law appears in ***bold italics.***
Matter removed from current law appears [~~in brackets and struckthrough.~~]
Matter which is either (a) all new or (b) repealed and reenacted appears in regular type.

11-0923
04/09

STATE OF NEW HAMPSHIRE

In the Year of Our Lord Two Thousand Eleven

AN ACT establishing a committee to study youth sports concussions.

Be it Enacted by the Senate and House of Representatives in General Court convened:

1 Committee Established. There is established a committee to study youth sports concussions.

2 Membership and Compensation.

I. The members of the committee shall be as follows:

(a) One member of the senate, appointed by the president of the senate.

(b) Three members of the house of representatives, appointed by the speaker of the house of representatives.

II. Members of the committee shall receive mileage at the legislative rate when attending to the duties of the committee.

3 Duties. The committee shall study:

I. Youth sports concussions and how those adults involved in youth sports should educate young athletes and their parents or guardians about the nature and risk of head injury and concussion and how best to identify and handle suspected and confirmed youth concussions and brain injuries.

II. The logistics of implementing a so-called "return-to-play" system, including who can provide medical clearance in a return-to-play system.

III. What training or certification is necessary to certify that a youth is safe to return to play.

IV. The impact, including but not limited to costs, on municipalities and school-based athletic activities of implementing a return-to-play system.

4 Chairperson; Quorum. The members of the study committee shall elect a chairperson from among the members. The first meeting of the committee shall be called by the first-named senate member. The first meeting of the committee shall be held within 45 days of the effective date of this section.

5 Report. The committee shall report its findings and any recommendations for proposed legislation to the president of the senate, the speaker of the house of representatives, the senate clerk, the house clerk, the governor, and the state library on or before November 1, 2011. The committee shall submit an electronic copy of the signed final report to the office of information technology which shall post the report on the state of New Hampshire's website.

6 Effective Date. This act shall take effect upon its passage.

SB 95 – AS AMENDED BY THE SENATE

02/23/11 0295s

2011 SESSION

11-0923
04/09

SENATE BILL ***95***

AN ACT establishing a commission to study youth sports concussions and other concussions received while at school.

SPONSORS: Sen. Houde, Dist 5; Sen. D'Allesandro, Dist 20; Sen. Kelly, Dist 10; Sen. Merrill, Dist 21; Sen. Larsen, Dist 15; Sen. Boutin, Dist 16; Sen. Carson, Dist 14

COMMITTEE: Health and Human Services

AMENDED ANALYSIS

This bill establishes a commission to study youth sports concussions and other concussions received while at school.

Explanation: Matter added to current law appears in ***bold italics.***
Matter removed from current law appears [~~in brackets and struckthrough.~~]
Matter which is either (a) all new or (b) repealed and reenacted appears in regular type.

SB 95 – AS AMENDED BY THE SENATE

02/23/11 0295s

11-0923
04/09

STATE OF NEW HAMPSHIRE

In the Year of Our Lord Two Thousand Eleven

AN ACT establishing a commission to study youth sports concussions and other concussions received while at school.

Be it Enacted by the Senate and House of Representatives in General Court convened:

1 Commission Established. There is established a commission to study youth sports concussions and other concussions received while at school.

2 Membership and Compensation.

I. The members of the commission shall be as follows:

(a) A physician licensed in New Hampshire or other health care professional, appointed by the governor.

(b) A member from the New Hampshire School Boards Association, appointed by that association.

(c) A member from the New Hampshire Athletic Trainers' Association, appointed by that association.

(d) A member from the Brain Injury Association of New Hampshire, appointed by that association.

(e) An athletics coach from a New Hampshire high school, appointed by the governor.

(f) The director of the division of parks and recreation, or designee.

(g) A member from the New Hampshire Interscholastic Athletic Association, appointed by that association.

(h) A member from the New Hampshire School Nurses' Association, appointed by that association.

(i) The president of a New Hampshire company specializing in head impact biomechanics, or designee, appointed by the governor.

(j) The bureau chief of the bureau of developmental services, department of health and human services, or designee.

II. Members of the commission shall serve without compensation.

3 Duties.

I. The commission shall study:

(a) Youth sports concussions and other concussions received while at school and how the adults involved should educate youths and their parents or guardians about the nature and risk of head injury and concussion, and how best to identify and handle suspected and confirmed youth concussions and brain injuries.

(b) The logistics of implementing a so-called "return-to-play" system, including who can provide medical clearance in a return-to-play system.

(c) What training or certification is necessary to certify that a youth is safe to return to play.

(d) The impact, including but not limited to costs and liabilities, on municipalities and school-based athletic activities of implementing a return-to-play system.

II. The commission shall solicit the advice and expertise of helmet manufacturers on concussion-related issues and any other issue that the commission deems appropriate.

4 Chairperson; Quorum. The members of the commission shall elect a chairperson from among the members. The first meeting of the commission shall be called by the first-named senate member. The first meeting of the commission shall be held within 45 days of the effective date of this section.

5 Report. The commission shall report its findings and any recommendations for proposed legislation to the president of the senate, the speaker of the house of representatives, the senate clerk, the house clerk, the governor, and the state library on or before November 1, 2011. The commission shall submit an electronic copy of the signed final report to the office of information technology which shall post the report on the state of New Hampshire's website.

6 Effective Date. This act shall take effect upon its passage.

Amendments

Sen. Houde, Dist. 5
January 31, 2011
2011-0119s
04/05

Amendment to SB 95

Amend the title of the bill by replacing it with the following:

AN ACT relative to the management of concussion and head injury in youth sports.

Amend the bill by replacing all after the enacting clause with the following:

1 Concussion and Head Injury. The general court finds that:

I. Concussions are one of the most commonly reported injuries in children and adolescents who participate in sports and recreational activities. The Centers for Disease Control and Prevention estimates that as many as 3,900,000 sports-related and recreation-related concussions occur in the United States each year. A concussion is caused by a blow or motion to the head or body that causes the brain to move rapidly inside the skull. The risk of catastrophic injuries or death are significant when a concussion or head injury is not properly evaluated and managed.

II. Concussions are a type of brain injury that can range from mild to severe and can disrupt the way the brain normally works. Concussions can occur in any organized or unorganized sport or recreational activity and can result from a fall or from players colliding with each other, the ground, or with obstacles. Concussions occur with or without loss of consciousness, but the vast majority occurs without loss of consciousness.

III. Continuing to play with a concussion or symptoms of head injury leaves the young athlete especially vulnerable to greater injury and even death. The legislature recognizes that, despite having generally recognized return to play standards for concussion and head injury, some affected youth athletes are prematurely returned to play resulting in actual or potential physical injury or death to youth athletes in the state of New Hampshire.

2 New Subdivision; Youth Sports Injuries. Amend RSA 189 by inserting after section 64 the following new subdivision:

Youth Sports Injuries

189:65 Liability for Youth Sports Injuries.

I. A school district shall not be liable for an injury to or the death of a person due to action or inaction of persons employed by or under contract with a youth program if:

(a) The action or inaction takes place on school property and during the delivery of services of the youth program;

(b) The youth program using school property provides proof of being insured, under an

accident and liability policy issued by an insurance company authorized to do business in this state, that covers any injury or damage arising from delivery of its services. Coverage for a policy meeting the requirements of this section shall be at least $50,000 due to bodily injury or death of one person, or at least $100,000 due to bodily injury or death of 2 or more persons in any incident. The youth program shall also provide a statement of compliance with the policies for the management of concussion and head injury in youth sports as set forth in this subdivision; and

(c) The youth program provides proof of such insurance before the first use of the school property. The immunity granted shall last only as long as the insurance remains in effect.

II. Immunity under this section shall not apply to any youth program before January 1, 2000.

III. As used in this subdivision, "youth programs" means any program or service, offered by a private nonprofit group, that is operated primarily to provide persons under the age of 18 with opportunities to participate in services or programs.

IV. Nothing in this subdivision shall impair or change the ability of any person to recover damages for harm done by:

(a) Any contractor or employee of a school district acting in his or her capacity as a contractor or employee; or

(b) The existence of unsafe facilities or structures or programs of any school district.

189:66 Guidelines for Concussion and Head Injury.

I. The school board of each school district in this state shall work in concert with the New Hampshire Interscholastic Athletics Association to develop the guidelines and other pertinent information and forms to inform and educate coaches, youth athletes, and their parents or guardians of the nature and risk of concussion and head injury including continuing to play after concussion or head injury. On an annual basis, each school board shall require all youth athletes participating in school district athletic programs and the youth athlete's parent or guardian to sign and return a concussion and head injury information sheet prior to permitting the youth athlete to initiate practice or competition.

II. Each school board shall adopt a policy requiring that a youth athlete who is suspected of sustaining a concussion or head injury in a practice or game shall be removed from competition at that time and that a youth athlete who has been removed from play shall not be returned to play until the athlete is evaluated by a licensed health care provider trained in the evaluation and management of concussion and receives written clearance to return to play from that health care provider. The health care provider may be a volunteer. A volunteer who authorizes a youth athlete to return to play shall not be liable for civil damages resulting from any act or omission in the rendering of such care, other than acts or omissions constituting gross negligence or willful misconduct.

3 Effective Date. This act shall take effect 60 days after its passage.

2011-0119s

AMENDED ANALYSIS

This bill establishes requirements for school boards regarding the management of children who sustain concussions and head injuries in youth sports.

Sen. Bradley, Dist. 3
February 7, 2011
2011-0212s
04/10

Amendment to SB 95

Amend the title of the bill by replacing it with the following:

AN ACT establishing a commission to study youth sports concussions and other concussions received while at school.

Amend the bill by replacing all after the enacting clause with the following:

1 Commission Established. There is established a commission to study youth sports concussions and other concussions received while at school.

2 Membership and Compensation.

I. The members of the commission shall be as follows:

(a) A physician licensed in New Hampshire or other health care professional, appointed by the governor.

(b) A member from the New Hampshire School Boards Association, appointed by that association.

(c) A member from the New Hampshire Athletic Trainers' Association, appointed by that association.

(d) A member from the Brain Injury Association of New Hampshire, appointed by that association.

(e) An athletics coach from a New Hampshire high school, appointed by the governor.

(f) The director of the division of parks and recreation, or designee.

(g) A member from the New Hampshire Interscholastic Athletic Association, appointed by that association.

(h) A member from the New Hampshire School Nurses' Association, appointed by that association.

(i) The president of Simbex, L.L.C., or designee.

(j) The bureau chief of the bureau of developmental services, department of health and human services, or designee.

II. Members of the commission shall serve without compensation.

3 Duties.

I. The commission shall study:

(a) Youth sports concussions and other concussions received while at school and how the

adults involved should educate youths and their parents or guardians about the nature and risk of head injury and concussion, and how best to identify and handle suspected and confirmed youth concussions and brain injuries.

(b) The logistics of implementing a so-called "return-to-play" system, including who can provide medical clearance in a return-to-play system.

(c) What training or certification is necessary to certify that a youth is safe to return to play.

(d) The impact, including but not limited to costs and liabilities, on municipalities and school-based athletic activities of implementing a return-to-play system.

II. The commission shall solicit the advice and expertise of helmet manufacturers on concussion-related issues and any other issue that the commission deems appropriate.

4 Chairperson; Quorum. The members of the commission shall elect a chairperson from among the members. The first meeting of the commission shall be called by the first-named senate member. The first meeting of the commission shall be held within 45 days of the effective date of this section.

5 Report. The commission shall report its findings and any recommendations for proposed legislation to the president of the senate, the speaker of the house of representatives, the senate clerk, the house clerk, the governor, and the state library on or before November 1, 2011. The commission shall submit an electronic copy of the signed final report to the office of information technology which shall post the report on the state of New Hampshire's website.

6 Effective Date. This act shall take effect upon its passage.

2011-0212s

AMENDED ANALYSIS

This bill establishes a commission to study youth sports concussions and other concussions received while at school.

Sen. Bradley, Dist. 3
February 10, 2011
2011-0270s
04/05

Amendment to SB 95

Amend the title of the bill by replacing it with the following:

AN ACT establishing a commission to study youth sports concussions and other concussions received while at school.

Amend the bill by replacing all after the enacting clause with the following:

1 Commission Established. There is established a commission to study youth sports concussions and other concussions received while at school.

2 Membership and Compensation.

I. The members of the commission shall be as follows:

(a) A physician licensed in New Hampshire or other health care professional, appointed by the governor.

(b) A member from the New Hampshire School Boards Association, appointed by that association.

(c) A member from the New Hampshire Athletic Trainers' Association, appointed by that association.

(d) A member from the Brain Injury Association of New Hampshire, appointed by that association.

(e) An athletics coach from a New Hampshire high school, appointed by the governor.

(f) The director of the division of parks and recreation, or designee.

(g) A member from the New Hampshire Interscholastic Athletic Association, appointed by that association.

(h) A member from the New Hampshire School Nurses' Association, appointed by that association.

(i) The president of a New Hampshire company specializing in head impact biomechanics, or designee, appointed by the governor.

(j) The bureau chief of the bureau of developmental services, department of health and human services, or designee.

II. Members of the commission shall serve without compensation.

3 Duties.

I. The commission shall study:

(a) Youth sports concussions and other concussions received while at school and how the adults involved should educate youths and their parents or guardians about the nature and risk of head injury and concussion, and how best to identify and handle suspected and confirmed youth concussions and brain injuries.

(b) The logistics of implementing a so-called "return-to-play" system, including who can provide medical clearance in a return-to-play system.

(c) What training or certification is necessary to certify that a youth is safe to return to play.

(d) The impact, including but not limited to costs and liabilities, on municipalities and school-based athletic activities of implementing a return-to-play system.

II. The commission shall solicit the advice and expertise of helmet manufacturers on concussion-related issues and any other issue that the commission deems appropriate.

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5 Report. The commission shall report its findings and any recommendations for proposed legislation to the president of the senate, the speaker of the house of representatives, the senate clerk, the house clerk, the governor, and the state library on or before November 1, 2011. The commission shall submit an electronic copy of the signed final report to the office of information technology which shall post the report on the state of New Hampshire's website.

6 Effective Date. This act shall take effect upon its passage.

2011-0270s

AMENDED ANALYSIS

This bill establishes a commission to study youth sports concussions and other concussions received while at school.

Health and Human Services
February 11, 2011
2011-0295s
04/05

Amendment to SB 95

Amend the title of the bill by replacing it with the following:

AN ACT establishing a commission to study youth sports concussions and other concussions received while at school.

Amend the bill by replacing all after the enacting clause with the following:

1 Commission Established. There is established a commission to study youth sports concussions and other concussions received while at school.

2 Membership and Compensation.

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(b) A member from the New Hampshire School Boards Association, appointed by that association.

(c) A member from the New Hampshire Athletic Trainers' Association, appointed by that association.

(d) A member from the Brain Injury Association of New Hampshire, appointed by that association.

(e) An athletics coach from a New Hampshire high school, appointed by the governor.

(f) The director of the division of parks and recreation, or designee.

(g) A member from the New Hampshire Interscholastic Athletic Association, appointed by that association.

(h) A member from the New Hampshire School Nurses' Association, appointed by that association.

(i) The president of a New Hampshire company specializing in head impact biomechanics, or designee, appointed by the governor.

(j) The bureau chief of the bureau of developmental services, department of health and human services, or designee.

II. Members of the commission shall serve without compensation.

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I. The commission shall study:

(a) Youth sports concussions and other concussions received while at school and how the adults involved should educate youths and their parents or guardians about the nature and risk of head injury and concussion, and how best to identify and handle suspected and confirmed youth concussions and brain injuries.

(b) The logistics of implementing a so-called "return-to-play" system, including who can provide

medical clearance in a return-to-play system.

(c) What training or certification is necessary to certify that a youth is safe to return to play.

(d) The impact, including but not limited to costs and liabilities, on municipalities and school-based athletic activities of implementing a return-to-play system.

II. The commission shall solicit the advice and expertise of helmet manufacturers on concussion-related issues and any other issue that the commission deems appropriate.

4 Chairperson; Quorum. The members of the commission shall elect a chairperson from among the members. The first meeting of the commission shall be called by the first-named senate member. The first meeting of the commission shall be held within 45 days of the effective date of this section.

5 Report. The commission shall report its findings and any recommendations for proposed legislation to the president of the senate, the speaker of the house of representatives, the senate clerk, the house clerk, the governor, and the state library on or before November 1, 2011. The commission shall submit an electronic copy of the signed final report to the office of information technology which shall post the report on the state of New Hampshire's website.

6 Effective Date. This act shall take effect upon its passage.

2011-0295s

AMENDED ANALYSIS

This bill establishes a commission to study youth sports concussions and other concussions received while at school.

Committee Minutes

AMENDED

Printed: 01/26/2011 at 2:39 pm

SENATE CALENDAR NOTICE

HEALTH AND HUMAN SERVICES

Senator Jeb Bradley Chairman
Senator Tom De Blois V Chairman
Senator Molly Kelly
Senator Gary Lambert
Senator Andy Sanborn

For Use by Senate Clerk's Office ONLY

☐ Bill Status

☐ Docket

☐ Calendar

Proof: ☐ Calendar ☐ Bill Status

Date: January 26, 2011

HEARINGS

Thursday **2/3/2011**

(Name of Committee)	(Place)	(Time)
HEALTH AND HUMAN SERVICES	LOB 102	1:00 PM

EXECUTIVE SESSION MAY FOLLOW

Comments: In addition to SB 51, hearings for Senate Bills 93, 95, and 102 have been added to schedule for February 3rd.

1:00 PM	SB51	relative to the establishment of a state leadership team to resolve issues concerning certain adults with developmental disabilities who may present a degree of risk to the community.
1:20 PM	SB93	relative to pharmacist administration of vaccines.
1:40 PM	SB102	establishing a commission to study the effects of post-traumatic stress disorder and traumatic brain injury suffered by New Hampshire soldiers and veterans returning from Iraq and Afghanistan.
2:00 PM	SB95	establishing a committee to study youth sports concussions.

Sponsors:

SB51
Sen. Amanda Merrill, Rep. Stephen Shurtleff, Sen. Molly Kelly

SB93
Sen. John Gallus, Rep. Frank Case, Rep. Kenneth Kreis, Rep. Herbert Richardson
Rep. Ross Terrio

SB102
Sen. Sharon Carson, Sen. John Barnes, Jr., Sen. Gary Lambert, Rep. Alfred Baldasaro
Rep. David Lundgren, Rep. Daniel Tamburello, Rep. Robert Theberge

SB95
Sen. Matthew Houde, Sen. Lou D'Allesandro, Sen. Molly Kelly, Sen. Amanda Merrill
Sen. Sylvia Larsen, Sen. David Boutin, Sen. Sharon Carson

Robyn Dangora 271-7585

Sen. Jeb Bradley
Chairman

Health and Human Services Committee

Hearing Report

TO: Members of the Senate

FROM: Robyn Dangora, Legislative Aide

RE: Hearing report on SB 95 – **establishing a committee to study youth sports concussions.**

HEARING DATE: February 3, 2011

MEMBERS OF THE COMMITTEE PRESENT: Senator Bradley, Senator De Blois, Senator Lambert, Senator Sanborn, Senator Kelly

MEMBERS OF THE COMMITTEE ABSENT: No one

Sponsor(s): Sen. Houde, Dist 5; Sen. D'Allesandro, Dist 20; Sen. Kelly, Dist 10; Sen. Merrill, Dist 21; Sen. Larsen, Dist 15; Sen. Boutin, Dist 16; Sen. Carson, Dist 14

What the bill does: This bill establishes a committee to study youth sports concussions.

Who supports the bill: Sen. Houde, Dist. 5; Sen. Merrill, Dist 21; Sen. Larsen, Dist 15; Sen. D'Allesandro, Dist 20; Sen. Boutin, Dist 16; Scott Colby, New Hampshire Medical Society; Liesl Lindley, New Hampshire Athletic Trainers Association; Steven Wade, Brain Injury Association; Stuart Glassman

Who opposes the bill: None

Summary of testimony received:
Hearing opened at 2:40 PM

<u>Senator Matthew Houde, D. 5</u>: Prime Sponsor
- The bill was drafted following an informal meeting between medical professionals, the New Hampshire Interscholastic Athletic Association, legislators and parents last year to discuss the problem of youth sports concussions

- Just yesterday, NHPR ran a story on this topic. Numerous other articles in the media have focused on this issue at both the youth sport level and the professional level, especially in the NFL.
- 10 states have enacted legislation to address this issue and other states have bills written this year regarding sports concussions
- Over 60,000 male and female high school student athletes sustain concussions each year
- Continuing to play with a concussion can lead to further injury and possibly even death
- This bill calls for a study committee, but I have an amendment for the committee's consideration that would be the policy legislation
    - -It is based on a Washington law that was named after a student athlete who sustained a concussion, was allowed to return to play, sustained a second concussion which resulted in a sever brain injury
- Unresolved issues to be addressed by a study committee prior to enacting policy, cited in original bill, include:
    - -How to educate student athletes, parents, coaches, and all involved of the risks of concussions and how to identify and handle concussions
    - -How to implement a "return-to-play" system and decide who provides the medical clearance
    - -The implications, including costs, on municipalities and school districts
- Senator Sanborn asked: Are we duplicating any efforts on the national level?
    - -Response: Legislation on the national level has not been acted on and it would not be acceptable to New Hampshire student athletes to wait for the federal government to act on this important issue
- Senator De Blois asked: Do we have trauma centers now to address concussions?
    - -Response: I believe we do, but these centers are now located in every community where there are student athletes who may sustain concussions and we need this information and assistance to be available to all of our student athletes.
    - -Senator De Blois: A study committee will resolve this?
    - -Response: It will hopefully address how to provide assessment to all of our student athletes, including in areas where this is not provided.
- Senator Kelly asked: What is the priority, the original bill for the study committee or the amendment for policy?
    - -Response: The amendment is a result of hopeful optimism that the concerns I brought forth for the study committee may be resolved and in that case, this would be the policy that would be enacted.
- Senator Bradley asked: If the amendment is the priority and it provides for a liability waiver and rigorous protocol, particularly in lines 20-36 of the amendment, is this based on professional sports protocol, which would necessitate that a medical professional make return to play decisions,

-Response: This is based on the Washington law. The NFL has supported legislation like this, but I am unsure if it would support this particular bill.

Senator Lou D'Allesandro, D. 20

•Cosponsor, after reaching out to Dr. Russell Warren, team physician for the NY Giants NFL team, we received all NFL protocol

•Our goal now is to study the current system in New Hampshire, the effect of concussions, and what plan works here and then decide what will be the next step to take

•As a former high school and college football player, I know protocols have improved, but still need study

•About 100 school in New Hampshire play football, where these injuries are mostly attributed, and most have a clearance process, though it is not standardized

•Supports studying the issue before enacting policy

-Costs associated will be addressed in a study committee

-the best equipment and medical assistance will be addressed as well

•The health and safety of our students is paramount and that is why we need to study this issue

•Senator Kelly asked: Since the amendment provides policy to move forward, would it meet your needs to address the issue ASAP?

-Response: The study is imperative and others around the state are in sync on the idea of studying the issue

Senator David Boutin, D. 16

•Cosponsor, this is an important issue that we must study

•The brain has over 1 million circuits and being such an important part of the anatomy, once it is injured, it is hard to repair

•It is important that all the stakeholders, coaches, athletes, parents, ought to have input and an amendment may be premature

Liesl Lindley, President, New Hampshire Athletic Trainers Association

•In support, athletic trainers are on the forefront of concussion injuries

•Concussions are not just a football injury, which should be made clearer

•Young brains are more at risk and developing brains are more symptomatic, so it is extremely important to address the issue with student athletes

-Developmentally, multiple concussions are most problematic

•It is important that coaches be well-trained because not all schools have athletic trainers

-Connecticut law calls for online training of coaches

•The study is important also to address costs that will be associated with additional training and the "return-to-play" (RTP) decision-maker is vitally important

-In the Connecticut law the RTP decision-maker is physicians, physician assistants, registered nurses, or athletic trainers because they are qualified and well-trained in concussion injuries

- The Rhode Island law states that only physicians may make the RTP decision, which is an undue burden when others are qualified

- The association would like to help in the development of the study
  - In places where there is no trauma center it should be a mandate that any athlete suspected to have sustained a concussion be removed from play until they have been examined

Steven Wade, Executive Director, Brain Injury Association of New Hampshire

- In support, 2-3 years ago, the Brain Injury Association brought together many of the stakeholders established a privately funded New Hampshire Council on sports-related concussions
  - We have been working on a consensus statement on return to play and return to school, which may be more important, since the brain needs cognitive rest as much as the body needs physical rest
- It is important that we focus on sports beyond football
- The Brain Injury Association has 10 pilot schools in a baseline program
  - At the beginning of the season, students are tested for their baseline levels and until they return to their baseline after a brain injury they cannot return to play
- A concussion is a brain injury and athletes and parents need more education on this issue

Stuart Glassman, M.D.

- In support, on behalf of his current patients and the brain injury patients treated over the past 20 years.
- Concussion specialist for Concord High School, Bishop Guertin High School, Bedford High School and Rundlett Middle School
  - Over 2,000 baseline studies have been done this year
- There have been a lot of articles about this issue lately
  - examples in provided packet: NHPR show yesterday, Time Magazine article last week, Sports Illustrated 3 months ago, ESPN online article last month, National Geographic article this month
- Competitive student athletes have a 10% chance of a concussion
- Study bill is only the start
  - The academic component is crucial because concussions can cause grades to drop and without a way to handle concussions within the school system it can harm the student's education
- Currently, NHIA has guidelines, but schools are not required to follow them
- It is the second concussion that we must prevent. It's important that a second concussion not occur until the first heals, which is why return-to-play protocol is important.
  - Second-impact syndrome could lead to months of injury
- Nationally, two bills are being proposed to the federal legislature
  - The bill being proposed out of New Jersey is the result of a teenager who died as a result of a brain injury sustained during a football game in 2008

- Lawsuits that have resulted from injuries such as this have cost states upwards of $10Million if families believe concussions have been mismanaged

- This issue affects every community in the state and youth team programs
  -Ex: there is a youth lacrosse program in New Hampshire today that has 100 teams from 7-8 New Hampshire towns and about 1,000 youths. They have no policy or evaluation requirements for any youth suspected of sustaining a concussion.
- Senator Kelly asked: The duties of the study committee focus on what to do after the injury, is there anything we should study related to prevention?
  -Response: In terms of preventing concussions the only studies that have been performed are how to best tackle. There have also been studies on helmets, but helmets cannot prevent concussion completely. Training coaches, teachers, and athletes of signs and symptoms of a concussion are important. Even in one of our baseline pilot program schools, a student with concussion symptoms was taken out, but put back the next day and received a second concussion; even in the best situations right now, more training and guidelines are necessary.
- Senator De Blois asked: This legislation is focused solely on student athletes, what about encompassing other concussions sustained by school-aged children?
  -Response: Yes, I've seen children who have sustained injuries from accidents not related to sports. Their likelihood of a second impact is slim, but they do require the same academic accommodations (staying out of gym class and staying home from school).

- Senator Bradley recommended amending the committee to a commission with appointees from the organizations and speakers present as well as others suggested by the committee members and audience members, including the NH Park and Recreation Association, New Hampshire Interscholastic Association, and the School Nurses Association
- Senator Sanborn suggested studying helmet companies and technology to the duties of the commission
- Committee members, Prime Sponsor Senator Houde and organization representatives present agreed to the idea of creating a commission rather than a committee.

Hearing closed at 3:25 PM
Funding: N/A

Action: Pending

RMD
[file: SB 95 report]
Date: 2/7/11

Speakers

Senate Health and Human Services Committee: Sign-In Sheet

Date: Feb. 3, 2011 Time: 2:00 PM Public Hearing on SB 95

SB 95 establishing a committee to study youth sports concussions.

Name	Representing	Support	Oppose	Speaking? Yes	Speaking? No
Senator Merrill	SD # 21	X			X
Senator Larson	SD # 15	X			X
Senator Dallesandro	SD #20	X		X	
Scott Colby	NH Medical Society	X			X
Sen. Dallesandro	SD #20	✓		✓	
Liesl Lindley	NHATA	X		✓	
Steven Wade	Brain Injury Assn	✓		✓	
~~Jack Barnes, Jr~~	~~#17~~	X		✓	
Sen. [illegible]	SD 16	X		X	

Senate Health and Human Services Committee: Sign-In Sheet

Date: Feb. 3, 2011 Time: 2:00 PM Public Hearing on SB 95

SB 95 establishing a committee to study youth sports concussions.

Name	Representing	Support	Oppose	Speaking? Yes	Speaking? No
STUART GLASSMAN	PRIVATE PATIENTS	☒	☐	☒	☐
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Testimony

Duncan, Susan

From: Duncan, Susan
Sent: Wednesday, February 02, 2011 5:36 PM
To: Houde, Matthew
Subject: Story from National Public Radio. Audio version will be available after 7 p.m.

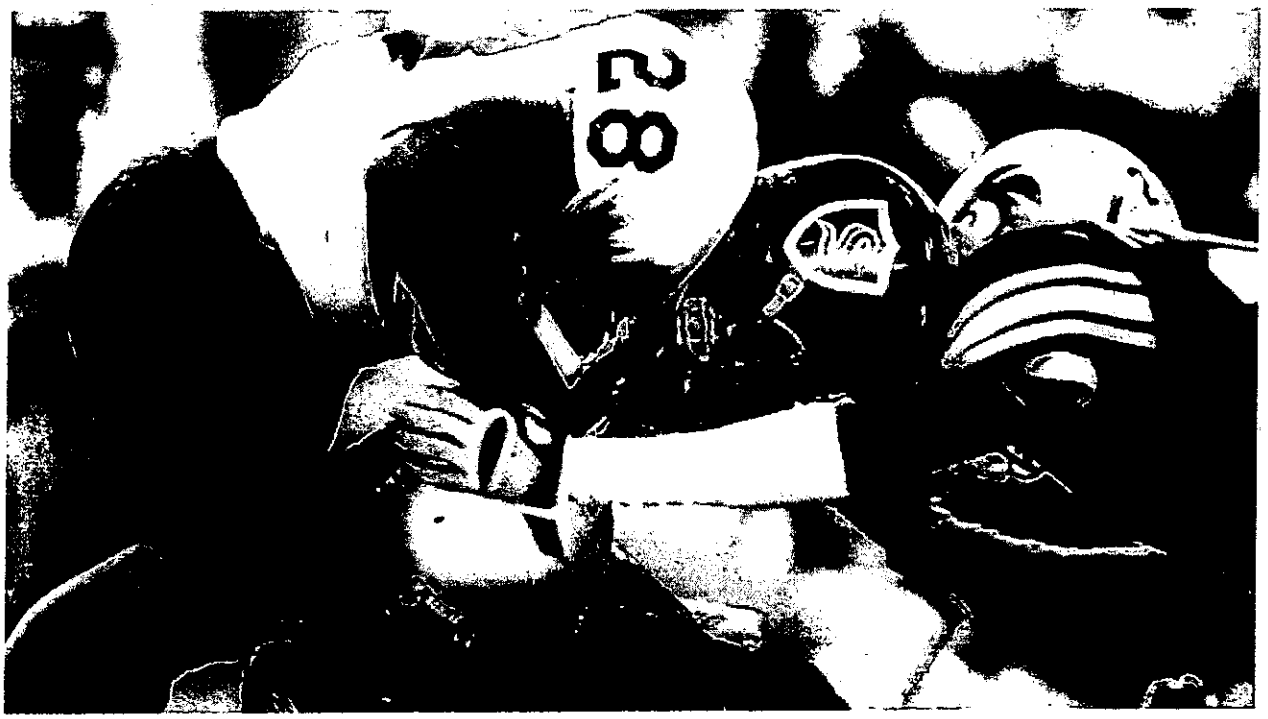
Doctors Throw Flags On High School Concussions

by Jon Hamilton

February 2, 2011

Audio for this story from All Things Considered will be available at approx. 7:00 p.m. ET

- Transcript



Matt Strasen/AP

Malcom Brown (left) is hit by Jake Smith on a kickoff return during a high school state championship game in Arlington, Texas, in December. Sports medicine professionals and the NFL are calling for tougher regulations on head injuries sustained by young athletes.

text size A A A
February 2, 2011

In the Super Bowl this weekend, any player who takes a shot to the head and shows signs of a concussion will be taken out of the game. But it's a different story for high school athletes, who sometimes play on despite a head injury.

So the NFL, the American College of Sports Medicine and a long list of other groups are joining together to support state laws designed to protect the brains of young athletes.

Enlarge Bill Pugliano/Getty Images

Steve Cohen, a member of the House Judiciary Committee, examines the helmet of Lem Barney, a former player for the Detroit Lions. A committee hearing last year evaluated steps taken at the professional, college and high school levels to deal with football brain injuries.

Bill Pugliano/Getty Images

Steve Cohen, a member of the House Judiciary Committee, examines the helmet of Lem Barney, a former player for the Detroit Lions. A committee hearing last year evaluated steps taken at the professional, college and high school levels to deal with football brain injuries.

The groups say they're concerned because each year more than 60,000 high school athletes sustain a concussion. It's an injury that temporarily affects brain function, though it may or may not cause a person to lose consciousness.

It's not just football players who get concussions — it's male and female athletes involved in soccer, wrestling, basketball, baseball, field hockey — even volleyball. Many of these athletes never get an evaluation that would reveal their injury.

"Unfortunately, kids at the youth sports level don't have neurosurgeons, neurologists and some of the finest doctors on the sidelines," says Jeff Miller, a senior vice president of the National Football League. "It's just not practicable."

The coalition wants every state to have a law like the Lystedt Law passed in Washington in 2009, named after Zackery Lystedt, a teenager who sustained a serious brain injury during a middle school football game in 2006. Lystedt's head struck the ground in the first half, but he was allowed to keep playing. When he took another shot to the head late in the game, the result was devastating.

You don't want coaches making medical decisions. That isn't their core competency.

- Jim Whitehead, executive vice president, American College of Sports Medicine

The Lystedt Law says an athlete suspected of having a head injury must be removed from competition. That's because even a minor injury to the brain can make it highly vulnerable to further damage.

Easing Back Into The Classroom

A concussion law might have helped Sarah Rainey, a high school soccer player in Alexandria, Va., who took a violent hit during a game 10 months ago.

"I thought I just got the wind knocked out of me, and I told my coaches and the trainer that I was OK," she says. "I passed the sideline evaluation. I played the remaining five minutes and then two overtime periods."

But after the game, Rainey began experiencing headaches, nausea and fuzzy thinking. Her father took her to an emergency room where doctors told her she'd suffered a concussion and sent her home.

Damien Meyer/AFP/Getty Images

Not only football players are at risk for head injuries — soccer, basketball and volleyball players can sustain

concussions, too. Michael Ciani, a defender for the French soccer team Bordeaux, heads the ball during a French Cup match on Jan. 22.

When she returned to school just a few days after the injury, she found that trying to read small print, looking at a computer screen and even her teacher's voices could trigger headaches and nausea.

It was two months before Rainey could get through a full day of school and four months before her brain was back to normal.

She was treated by Gerry Gioia, who runs the Safe Concussion Outcome Recovery & Education (SCORE) Program at Children's National Medical Center in Washington, D.C. Gioia is also part of the coalition pushing for concussion laws.

No law could have prevented Rainey's concussion, Gioia says. But a law might have helped limit the damage.

Unfortunately kids at the youth sports level don't have neurosurgeons, neurologists and some of the finest doctors on the sidelines.

- Jeff Miller, senior vice president, NFL

"The problem is that she was let back into the game later on," he says. "It's hard to know exactly the contribution of that. She didn't take another hit, but certainly she was overworking that body and brain during the period of this metabolic crisis."

Rainey also returned to class too soon — something else a law could have prevented, Gioia says. He says an injured brain is like a sprained ankle. It heals faster if you don't use it too much.

"As you're learning and thinking and doing all that good performance activity in the school, that's demanding more from your brain than it can handle," Gioia says. "It's taking away the important energy toward recovery, and it basically then is affecting negatively your recovery."

The coalition wants concussion laws to include provisions for easing injured students back into the classroom.

Relying On Medical Professionals

But for any of the laws to work, athletes who take a blow to the head need a proper evaluation from a trained medical professional, says Jim Whitehead, executive vice president of the American College of Sports Medicine.

Otto Greule Jr./Getty Images

Seahawks defensive end Chris Clemons (right) hits Brandon Gibbons during a game on Jan. 2 in Seattle. Clemons' head-first hit drew a personal foul.

"You don't want coaches making medical decisions," he says. "That isn't their core competency. So you want to take any of those things out of the hands of people who really aren't qualified to make those judgments, and put it

in the hands of professionals who are."

That's why the coalition supports laws that call for training coaches and others on the sideline not to diagnose a concussion, but to recognize subtle signs in an athlete that could mean a concussion.

"And if there's any doubt whatsoever, you sit the athlete until he or she has been cleared by a health professional," Whitehead says.

About 10 states, including Virginia, have passed youth concussion laws. The coalition's goal is to get laws in at least 10 more states by the end of the year.

Related NPR Stories

Brain Injuries Haunt Football Players Years Later Jan. 20, 2011
Football's Brain Injury Lessons Head To Battlefield Oct. 12, 2010
Concussion Worries Renew Focus On Football Safety Sept. 24, 2010
A Brain Battered By Football Oct. 23, 2009

Substitute Senate Bill No. 456

Public Act No. 10-62

AN ACT CONCERNING STUDENT ATHLETES AND CONCUSSIONS.

Be it enacted by the Senate and House of Representatives in General Assembly convened:

Section 1. (NEW) (*Effective from passage*) (a) (1) For the school year commencing July 1, 2010, and each school year thereafter, any person who holds or is issued a coaching permit by the State Board of Education and is a coach of intramural or interscholastic athletics shall complete an initial training course regarding concussions and head injuries, developed or approved pursuant to subdivision (1) of subsection (b) of this section, prior to commencing the coaching assignment for the season of such school athletics.

(2) For the school year commencing July 1, 2011, and each school year thereafter, and after completion of the initial training course described in subdivision (1) of this subsection, such coach shall annually review current and relevant information regarding concussions and head injuries, prepared or approved pursuant to subdivision (2) of subsection (b) of this section, prior to commencing the coaching assignment for the season of such school athletics. Such annual review shall not be required in any year when such coach is required to complete the refresher course, pursuant to subdivision (3) of this subsection, for reissuance of his or her coaching permit.

(3) For the school year commencing July 1, 2015, and each school year thereafter, a coach shall complete a refresher course, developed or approved pursuant to subdivision (3) of subsection (b) of this section, not later than five years after completion of the initial training course, as a condition of the reissuance of a coaching permit to such coach. Such coach shall thereafter retake such refresher course at least once every five years as a condition of the reissuance of a coaching permit to such coach.

(b) (1) On or before July 1, 2010, the State Board of Education, in consultation with (A) the governing authority for intramural and interscholastic athletics, (B) an appropriate organization representing licensed athletic trainers, and (C) an organization representing county medical associations, shall develop or approve a training course regarding concussions and head injuries. Such training course shall include, but not be limited to, (i) the recognition of the symptoms of a concussion or head injury, (ii) the means of obtaining proper medical treatment for a person suspected of having a concussion or head injury, and (iii) the nature and risk of concussions and head injuries, including the danger of continuing

to play after sustaining a concussion or head injury and the proper method of allowing a student athlete who has sustained a concussion or head injury to return to athletic activity.

(2) On or before July 1, 2011, and annually thereafter, the State Board of Education, in consultation with the organizations described in subdivision (1) of this subsection, shall prepare or approve annual review materials regarding current and relevant information about concussions and head injuries.

(3) On or before January 1, 2014, the State Board of Education, in consultation with the organizations described in subdivision (1) of this subsection, shall develop or approve a refresher course regarding concussions and head injuries. Such refresher course shall include, but not be limited to, (A) an overview of key recognition and safety practices, (B) an update on medical developments in the field of concussion research and prevention, and (C) an update on new relevant federal, state and local laws and regulations.

(c) The State Board of Education may revoke the coaching permit, in accordance with the provisions of subsection (j) of section 10-145b of the general statutes, of any coach found to be in violation of this section.

Sec. 2. (NEW) (*Effective July 1, 2010*) (a) (1) The coach of any intramural or interscholastic athletics shall immediately remove a student athlete from participating in any intramural or interscholastic athletic activity who (A) is observed to exhibit signs, symptoms or behaviors consistent with a concussion following an observed or suspected blow to the head or body, or (B) is diagnosed with a concussion, regardless of when such concussion or head injury may have occurred.

(2) The coach shall not permit such student athlete to participate in any supervised team activities involving physical exertion, including, but not limited to, practices, games or competitions, until such student athlete receives written clearance to participate in such supervised team activities involving physical exertion from a licensed health care professional trained in the evaluation and management of concussions.

(3) Following clearance pursuant to subdivision (2) of this subsection, the coach shall not permit such student athlete to participate in any full, unrestricted supervised team activities without limitations on contact or physical exertion, including, but not limited to, practices, games or competitions, until such student athlete (A) no longer exhibits signs, symptoms or behaviors consistent with a concussion at rest or with exertion, and (B) receives written clearance to participate in such full, unrestricted supervised team activities from a licensed health care professional trained in the evaluation and management of concussions.

(b) The State Board of Education may revoke the coaching permit, in accordance with the provisions of subsection (j) of section 10-145b of the general statutes, of any coach found to be in violation of this section.

(c) For purposes of this section, "licensed health care professional" means a physician licensed pursuant to chapter 370 of the general statutes, a physician assistant licensed pursuant to chapter 370 of the general statutes, an advanced practice registered nurse licensed pursuant to chapter 378 of the general statutes or an athletic trainer licensed pursuant to chapter 375a of the general statutes.

Sec. 3. (*Effective from passage*) The Department of Education shall consider a coach of intramural or interscholastic athletics as having successfully completed the initial training course regarding concussions and head injuries required pursuant section 1 of this act if such coach completes a course that is offered by the governing authority for intramural and interscholastic athletics and is substantially similar, as determined by the department, to the training course required pursuant to section 1 of this act, provided such substantially similar course is completed on or after January 1, 2010, but prior to the date the State Board of Education approves the training course pursuant to section 1 of this act.

Approved May 18, 2010

NH STATE ADVISORY COUNCIL ON SPORT-RELATED CONCUSSION

BRAIN INJURY ASSOCIATION OF NEW HAMPSHIRE

109 N. State Street * Concord, NH 03301 * 603-225-8400
Help Line: 1-800-773-8400 * Fax: 603-228-6749 * www.bianh.org

MISSION:

IMPROVE CONCUSSION-RELATED SAFETY YOUNG ATHLETES IN NEW HAMPSHIRE

Bureau of Developmental Services, NH Department of Health and Human Services

Children's Hospital at Dartmouth Injury Prevention Program

Injury Prevention Program, NH Department of Health and Human Services

New Hampshire Association of School Psychologists

New Hampshire Athletic Directors Association

New Hampshire Athletic Trainers Association

New Hampshire Department of Education

New Hampshire Interscholastic Athletic Association Sports Medicine Committee

New Hampshire Musculoskeletal Institute

New Hampshire Pediatric Society

New Hampshire School Learning Incentives Concussion 911

New Hampshire School Nurses Association

Northern New England Neurological Society

Traumatic Brain Injury Program-Dartmouth

Sport-Related Concussion

Consensus Statement

Laura C. Decoster, ATC
Consensus Committee Chair/
Advisory Council Vice Chair

NOTE: Members of the Council are available to educate and assist the NH public with implementing and/or updating concussion management protocols. Please contact the NH Brain Injury Association office: 603-224-8400.

Version 2.0, January, 2011

Sport-Related Concussion Consensus Statement

Preamble

The New Hampshire State Advisory Council on Sport-Related Concussion was created to provide guidance for school and youth league administrators, coaches, parents and athletes on this very important topic. The purpose of this consensus statement is to guide the creation and implementation of a best-practice model for sport-related concussion management including safe return to sports and return to school. This statement does not include specific protocols but serves as the basis for such protocols. Medical science concerning sport-related concussion is a rapidly growing field; the most recent research was used in the preparation of this statement. Statements are based on evidence but users should be aware that there are still many areas of controversy in this relatively young research field. Because of this fact, this document will be reviewed at least yearly to take advantage of advances in our knowledge about concussions.

Consensus Topics

Definition of concussion; Signs and symptoms of concussion

Concussion grading scales

Significance of loss of consciousness & amnesia in determining the severity of concussion

Special considerations: pediatric concussion, gender differences

Multiple concussions, second impact syndrome

Role of baseline testing (neurocognitive performance, balance, concussion signs and symptoms) in management of concussion; appropriate administration of neurocognitive baseline testing

Return to sport after concussion

Return to school after concussion

Certified athletic trainers at the high school level

Education of coaches, parents and athletes (s/s, ding/bell ringer, need to report)

Education of physicians

Feasibility

The Council recognizes that schools and youth leagues have varying degrees of resources for implementing the recommendations contained herein. However, it is important for administrators to express and demonstrate support for adherence to best-practice sports medicine to the extent possible.

NOTE: Throughout the document, citations within quoted material are references from the source article.

Executive Summary

- A concussion is a serious injury. Colloquial terms such as "ding" or "bell ringer" minimize and trivialize an injury that may have lasting consequences. Those terms should be eliminated from the concussion vocabulary. All injuries to the brain, regardless of how apparently minor they seem, should be managed appropriately.

- Neither loss of consciousness nor amnesia is a required element for the diagnosis of a concussion. In the majority of concussions, neither is present.

- A young athlete (through high school) who experiences concussion signs or symptoms after a direct or indirect blow to the head should not return to activity on the same day. Some brain injuries evolve slowly and the true severity of an injury may not be apparent initially.

- Signs and symptoms of concussion may fall into multiple categories in somatic, cognitive and emotional domains. Headache, fatigue, irritability, difficulty concentrating and sleep disturbance are a few examples. Coaches, athletes, parents and school officials should be familiar with common signs and symptoms so concussions and/or their sequelae do not go unrecognized.

- Each concussion is unique. Concussion grading scales fail to account for the individuality of this injury and may result in an athlete being sent back to activity too soon or held out too long. In place of concussion grading scales, healthcare providers are advised to manage concussions on an individual basis including careful monitoring of clinical symptoms, physical signs, behavior, balance, sleep and cognition in the assessment and monitoring of concussion. Once all signs and symptoms have resolved, a monitored gradual, structured return to activity is recommended.

- School personnel (nurse, guidance, teachers) should be informed of the occurrence of a concussion and student-athletes who have suffered a concussion should be monitored at school for academic performance difficulties and behavior changes.

- Evidence suggests that pediatric athletes may be more vulnerable to concussion, may require a longer recovery period and may suffer more long-term sequelae than adults. There may also be an increased risk of second-impact syndrome, an often-fatal brain swelling, which has almost exclusively been documented in young athletes.

- Neurocognitive baseline assessment of athletes who participate in collision or contact sports is recommended whenever it is feasible as it can be used by healthcare providers as objective evidence of an injured athlete's return to cognitive normalcy. However, neurocognitive testing is only one element of what should be a multipronged approach to assessing and managing sport concussion. Computerized or formal neurocognitive test administration should be appropriately supervised and test results should be interpreted by neuropsychologists.

- Athletic programs, both school and community-based, should adopt a sport concussion management protocol. The NH Council has developed a template for such a program that should be adapted according to each program's resources and in consultation with team physicians.

- Coaches, athletes and interested parties (parents, administrators, etc.) should receive current basic education on the topic of sport-related concussion.

- Physicians must stay abreast of current practice guidelines and topics regarding the appropriate management of athletes who have suffered a concussion, especially return-to-play decision-making.

Definition of Concussion

Experts present at the First International Conference on Concussion in Sport (2001)[2] agreed on the following components of the definition of concussion. Major statements published since that date[7,9,12,13] have agreed and provided minor updates. The definition from the recent 3rd International Conference on Concussion in Sport (Zurich, 2008) is:

> Concussion is defined as a complex pathophysiological process affecting the brain, induced by traumatic biomechanical forces. Several common features that incorporate clinical, pathologic and biomechanical injury constructs that may be utilized in defining the nature of a concussive head injury include:
>
> 1. Concussion may be caused either by a direct blow to the head, face, neck or elsewhere on the body with an "impulsive" force transmitted to the head.
> 2. Concussion typically results in the rapid onset of short-lived impairment of neurologic function that resolves spontaneously.
> 3. Concussion may result in neuropathological changes but the acute clinical symptoms largely reflect a functional disturbance rather than a structural injury.
> 4. Concussion results in a graded set of clinical symptoms that may or may not involve loss of consciousness. Resolution of the clinical and cognitive symptoms typically follows a sequential course however it is important to note that in a small percentage of cases however, postconcussive symptoms may be prolonged.
> 5. No abnormality on standard structural neuroimaging studies is seen in isolated concussion.

Signs and Symptoms of Concussion

The diagnosis of acute concussion usually involves the assessment of a range of domains including clinical symptoms, physical signs, behavior, balance, sleep and cognition (3). A detailed concussion history is an important part of the evaluation both in the injured athlete and when conducting a pre-participation examination. The suspected diagnosis of concussion can include one or more of the following clinical domains:

(a) Symptoms—somatic (e.g. headache), cognitive (e.g. feeling like in a fog) and/or emotional symptoms (e.g. emotional lability);
(b) Physical signs (e.g. loss of consciousness, amnesia);
(c) Behavioral changes (e.g. irritability);
(d) Cognitive impairment (e.g. slowed reaction times);
(e) Sleep disturbance (e.g. drowsiness);
If any one or more of these components is present, a concussion should be suspected and the appropriate management strategy instituted.

Several symptom checklists or scales exist and are useful; all are very similar. The following list was published in the National Athletic Trainers' Association Position Statement: Management of Sport Related Concussion.[7]

Blurred Vision
Drowsiness
Easily Distracted
Feel "In a Fog"
Headache
Irritability
Loss of Orientation
Nausea
Personality Change
Poor Concentration
Sadness
Sensitivity to Light
Sleep Disturbance
Vomiting
Dizziness
Excess Sleep
Fatigue
Feel "Slowed down"
Inappropriate Emotions
Loss of Consciousness
Memory Problems
Nervousness
Poor Balance/Coordination
Ringing in Ears
Seeing "Stars"
Sensitivity to Noise
Vacant Stare/Glassy Eyes

Many symptoms of concussion are subjective and may be misunderstood, or deliberately hidden, by concussed athletes. Education of athletes about concussion signs and symptoms is imperative. Schools and youth sports programs should consider implementing a policy similar to the NCAA's, which requires education followed by the athletes' signed acknowledgement of receipt of educational materials and agreement to honestly report all possible concussion signs and symptoms to coaches and/or team medical personnel.

Concussion Grading Scales

More than 20 concussion grading scales have been devised to date.[10] One significant motivation for the creation of these scales was to provide guidance regarding return-to-play decision-making (e.g., the worse the concussion "grade," the longer athletes would be held out of sports). Knowledgeable experts in the field have been responsible for most of the scales; however, it is important to note that these scales are based on experience and anecdotal evidence rather than research-based evidence. Further, many make grading decisions based on the occurrence of loss of consciousness. However, research published since the development of these scales has shown that loss of consciousness is not always predictive of post-concussion sequelae. (See sections on the significance of loss of consciousness and amnesia.) A consensus of experts at the Vienna[2] and Prague[12] international conventions on sport-related concussion experts stated, "... that injury grading scales be abandoned in favor of combined measures of recovery to determine injury severity (and/or prognosis) and hence individually guide return to play decisions received continued support."[12]

Dr. Robert Cantu, creator of one of the more widely used grading scales and an internationally-recognized expert on sport-related concussion has stated regarding the Vienna[2] consensus, "In place of a single grading scale and in the absence of any scientifically validated return-to-play guidelines, the participants recommended the use of a clinical construct based on an assessment of recovery from injury and graded return to play.... **I believe that these recommendations are sound and are not controversial.**"[3] The authors of a review article published in Pediatrics also expressed their agreement with this concept, "Given the substantial individual variation in responses to concussions, most experts would now agree that the initial "grade" of a concussion is less important than the systematic tracking of each athlete's recovery course over time."

Demonstrating true international consensus on this issue, the Zürich statement[13] makes no mention whatsoever of concussion grading scales.

The NH State Advisory Council on Sport-Related Concussion agrees with the individual-athlete management and decision-making approach and supports the use of careful monitoring of clinical symptoms (somatic, cognitive, emotional), physical signs, behavior, balance, sleep and cognition in the assessment and monitoring of concussion.

Significance of Loss of Consciousness & Amnesia in Determining the Severity of Concussion*

Arguably, the two most readily identifiable signs of concussion are loss of consciousness and amnesia. Recognition that neither is required for an injury to be diagnosed as a concussion is very important. In fact, research has shown they actually present rather infrequently, in 9% and 27% respectively, in one study.[8] That study found that symptoms such as headache, dizziness, confusion and disorientation were much more common. Further, when brief loss of consciousness does occur in sport related concussion it appears to be a weak predictor of outcome as evident in research cited in the NATA position statement[7]:

> Studies involving high school and collegiate athletes with concussion revealed no association between (1) [loss of consciousness] and duration of symptoms or (2) [loss of consciousness] and neuropsychological and balance tests at 3, 24, 48, 72, and 96 hours postinjury.[21,28,29] In other words, athletes experiencing [loss of consciousness] were similar to athletes without [loss of consciousness] on these same injury severity markers.

There is continuing support in the Zürich statement[13] for the concept that there is limited value associated with using the presence or absence of loss of consciousness of less than one minute in length as a predictor of outcome. (They did, however, suggest that loss of consciousness for more than one minute should be considered in the management of concussion.)

> In the overall management of moderate to severe traumatic brain injury, duration of [loss of consciousness] is an acknowledged predictor ofoutcome.[79] While published findings in concussion describe [loss of consciousness] associated with specific early cognitive deficits it has not been noted as a measure of injury severity.[80,81]

Because of this, the experts at the Zürich (2008)[13] Conference recommended that, despite its association with early neuropsychological deficits, loss of consciousness should not be relied upon as a measure of acute concussion severity.

Experts in Zürich made a similar recommendation regarding amnesia:

> Published evidence suggests that the nature, burden and duration of the clinical post-concussive symptoms may be more important than the presence or duration of amnesia alone.[8,15,17]

It is important to note, however, that while loss of consciousness and amnesia may not be good predictors of ultimate injury severity, they must still be respected. The NATA[7] advised that, "Athletes who experience loss of consciousness or amnesia should be disqualified from participating on the day of the injury." This recommendation was expanded in the Zürich statement[13] which concluded that pediatric athletes (through high school) experiencing *any* signs or symptoms of concussion should not return to play on the day of injury.

The NH State Advisory Council believes it is important for all concerned to realize that loss of consciousness and amnesia, although often apparent and sometimes dramatic, are present in

only a small percentage of concussions. Concussions characterized by other signs and symptoms may be equally or more significant and warrant appropriate care.

*References within quoted material are from the original text.

Special Considerations:

Pediatric Concussion*

A general tenet of pediatrics is that children should not be treated as or considered to be small adults. This concept extends to the management of concussion, though not without some controversy. Until the facts of pediatric concussion risk are elucidated by research, the NH Council considers it best to err on the side of caution. The Zurich[13] consensus includes this general statement:

> The panel strongly endorsed the view that children should not be returned to practice or play until clinically completely symptom free, which may require a longer time frame than for adults. In addition, the concept of 'cognitive rest' was highlighted with special reference to a child's need to limit exertion with activities of daily living and to limit scholastic and other cognitive stressors (e.g. text messaging, videogames, etc.) while symptomatic. School attendance and activities may also need to be modified to avoid provocation of symptoms.

Specific areas of concern regarding pediatric concussion are noted below. There is some evidence that concussion is more prevalent among younger athletes[6,8] and concern exists that their injuries have the potential to be of greater severity and take longer to resolve. Kirkwood, et al's[10] review of the management of pediatric concussion provides a nice summary about the possibility of increased vulnerability:

> Traditionally, young age at the time of brain injury has been thought to have protective benefits; the "Kennard principle" holds that the young brain's plasticity would allow for more recovery after insult.[56] However, a growing literature, including studies of more severe TBI, strongly indicates that the immature brain is more vulnerable, not more plastic, to diffuse injury.[57–67] Several hypotheses have been put forth to help explain this increased vulnerability: skills not yet well established at the time of insult could be more susceptible to disruption than well-established ones; the brain systems responsible for skill acquisition could be affected directly by diffuse injury; functional recovery may be restricted by the injured child's smaller repertoire of existing skills; and an injury to the immature brain could interfere neurobiologically with the intricate sequence of chemical and anatomic events necessary for normal development.[44,68–70]

In addition to increased vulnerability, there is concern that children suffering concussion may require longer recovery periods. Field, et al[5] compared concussed high school and collegiate athletes and found that the high school athletes demonstrated prolonged memory dysfunction compared with the collegiate athletes. Lovell, et al[11] have found that high school athletes sustaining mild injuries may experience symptoms that can last for days post-injury.

Another area of concern relates to the heightened demands of school and learning. This was recognized during the Second International Conference on Concussion in Sport[12] where the, "... concept of "cognitive rest" was introduced with special reference to a child's need to limit

exertion with activities of daily living and to limit scholastic activities while symptomatic." This area of concern is also nicely summarized by Kirkwood, et al.[10]

> The contextual or environmental demands faced by children and adults differ as well. Adults have already learned and mastered much of the knowledge and many of the skills they need to function successfully in everyday settings. In contrast, children are continually expected to acquire new information and skills, especially during the school months. Thus, they are often expected to use a set of neurobehavioral skills that are vulnerable to [mild traumatic brain injury], such as the ability to focus and sustain attention, rapidly process information, and hold information in mind while generating a response.[16,72,73] As a result, clinical management of pediatric concussion requires an understanding of the contextual demands that children face across development[74] to allow for the provision of suitable assistance.

Finally, several reasons exist for increased conservatism in making the return-to-play decision concerning concussed pediatric athletes. Once again, Kirkwood[10] provides a nice summary:

> In the pediatric athlete, a number of additional reasons exist to suggest that the return-to-play decision should be made with ample care. First, we do not yet have a clear understanding of how repeated brain insult could change neurobiological or neurobehavioral development over the long run. Second, the risk-benefit analysis in younger athletes is often considerably different from that in adults, weighted much more heavily toward potential loss or future functional disruption as opposed to immediate gain from returning to competition. Third, although extremely rare, second-impact syndrome has been documented almost exclusively in immature brains, suggesting that the young athlete is at heightened risk for the potentially catastrophic consequences that have been reported after repeated injury.

Authors of the NATA Statement[7] agree that the potential for second-impact syndrome is of concern and they have included the following recommendation. "Because damage to the maturing brain of a young athlete can be catastrophic (i.e., almost all reported cases of second-impact syndrome are in young athletes), athletes under age 18 years should be managed more conservatively, using stricter [return-to-play] guidelines than those used to manage concussion in the more mature athlete."

Gender Differences

There are several studies that seem to indicate that females may be more vulnerable to concussion and may recover from concussion at different rates compared to males. A current review of these studies is provided by Covassin and Elbin.[4] These possible differences reinforce the recommendation that all concussions should be managed based on individual presentation.

The NH State Advisory Council on Sport-Related Concussion agrees that school personnel and primary-care physicians need to be informed of the occurrence of a concussion. Further, student-athletes who have suffered a concussion should be monitored at school for academic-performance difficulties in addition to monitoring for return to play. In general, the younger the concussed athlete, the more conservative the management approach should be.

*References within quoted material are from the original text.

Multiple Concussions*

Research on athletes at both the high school and college levels has demonstrated that a history of previous concussions lowers the threshold for sustaining a subsequent concussion. Recovery may also be slower in those with a history of previous concussions. Guskiewicz et al provided an excellent review of this research in the NATA Position Statement.[7]

> Once an athlete has suffered a concussion, he or she is at increased risk for subsequent head injuries.[21,43,86] Guskiewicz et al[21,23] found that collegiate athletes had a 3-fold greater risk of suffering a concussion if they had sustained 3 or more previous concussions [self-reported] ... and that players with 2 or more previous concussions required a longer time for total symptom resolution after subsequent injuries.[21] Players also had a 3-fold greater risk for subsequent concussions in the same season,[23] whereas recurrent, in-season injuries occurred within 10 days of the initial injury 92% of the time.[21] In a similar study of high school athletes, Collins et al[82] found that athletes with 3 or more prior concussions were at an increased risk of experiencing LOC (8-fold greater risk), anterograde amnesia (5.5-fold greater risk), and confusion (5.1-fold greater risk) after subsequent concussion...Most important is that these data provide evidence for exercising caution when managing younger athletes with concussion and athletes with a history of previous concussions.

Increased susceptibility to subsequent concussions and prolonged recovery (e.g. post-concussion syndrome) are also concerns related to multiple *current* concussions (i.e., a second trauma prior to resolution of an existing concussion). Athletes who suffer a second blow to the head prior to resolution of the first are at risk for more severe acute problems and longer recovery periods. The most dramatic potential consequence, though rare, of continuing or returning to play prior to concussion resolution is second impact syndrome.

Second Impact Syndrome*

Second Impact Syndrome is defined as: a condition where the brain swells rapidly after receiving a second concussion before the symptoms/sequelae of the first concussion have subsided. This extremely rare condition has most often been reported in adolescents, and is thought to be related to failure of the neurological control of blood flow to the brain. The time from second impact to critical, life-threatening brain swelling is reported to be quite short, taking two to five minutes. If swelling of the brain leads to critically high pressure on the centers that regulate respiration in the brain stem, respiratory failure occurs and leads to death without life support. Despite its extreme rarity, the dramatically life-threatening nature of Second Impact Syndrome is enough to cause concern and heightened awareness of the need to insure complete resolution of concussion before exposure to further risk. The Council espouses this approach.

From Kirkwood et al:[10]

> Clinical evidence also suggests that physiologic responses are age-dependent after [mild traumatic brain injury]. Most prominently, age-based differences are seen in "second-impact syndrome," which, as commonly described, results from a second blow to the head while a youth is still symptomatic from a previous concussion.[47,48] Disruption to autoregulation of the brain's blood supply is thought to underlie second-impact syndrome, the symptoms of which may include vascular engorgement, diffuse cerebral swelling, increased intracranial pressure, brain herniation, and ultimately coma and death.[49] Although controversy continues about whether the second impact actually plays a role in triggering the neurologic consequences,[50,51] agreement exists that diffuse cerebral swelling or malignant cerebral edema does occur in very rare cases after [mild traumatic brain injury] and that immaturity of the brain is a clear risk factor.[52–55]

The NH State Advisory Council on Sport-Related Concussion recognizes that insuring resolution of concussion prior to allowing return to sport activity is the basis of safe management of sport concussion. The Council further recognizes that a history of multiple concussions should prompt more conservative management and may warrant consideration of the advisability of continued participation in contact or collision sports.

*References within quoted material are from the original text.

Role of Baseline Testing (Neurocognitive Performance, Balance, Concussion Signs and Symptoms) in Management of Concussion; Appropriate Administration of Neurocognitive Testing

The body of literature in this area is growing rapidly. Briefly, the theory behind baseline testing is that examining an athlete prior to injury (i.e., at baseline) will allow healthcare providers to compare post-injury to pre-injury performance. This would provide an objective assessment to help identify resolution of concussion effects. Other current means of assessing the progression and resolution of a concussion are subjective, and are unfortunately therefore vulnerable to the [misguided] efforts of those motivated to return an athlete as soon as possible regardless of the risk (or perhaps in ignorance of the risk). Certainly the clinical impression of experienced health-care providers is an important factor, but in the absence of other objective means (e.g., a molecular marker) the Council believes that athletes are best served by this approach. When logistically feasible, school-based sports medicine providers (certified athletic trainers) should be trained in, and implement a multi-faceted baseline testing program for contact/collision sports with high concussion risk. The addition of this data to the healthcare provider's clinical impression only serves to enhance the decision-making process.

While it is possible for individual athletes to take a web-based neurocognitive test at home, this approach is not appropriate. Test administration should be supervised by trained administrators to insure valid test results. Appropriate supervision allows confirmation of the named test taker, clarification of test instructions and resolution of confusion and misunderstandings frequently encountered in test sessions.

The NH State Advisory Council on Sport-Related Concussion recommends baseline assessment of all relevant athletes with validated assessment tools. Training and supervision in the use of these tools is a critical component of best practice standards. Baseline assessments should be repeated every two years. Baseline testing results should be reviewed to screen for effects of poor effort or other suspicious results. Neurocognitive test administration should be appropriately supervised and results of computerized or formal neurocognitive test should be interpreted by neuropsychologists.

The Council recognizes that schools and youth leagues have varying degrees of resources for implementing the recommendations contained herein. However, it is important for administrators to express and demonstrate support for adherence to best-practice sports medicine to the extent possible.

Return to Sport after Concussion

There is expert consensus[13] that for injured children and adolescents, a more conservative return-to-play approach is recommended. One specific area of conservative management is the recommendation that it is not appropriate to return a young athlete to play on the day of the concussive injury.[13] Experts[2,7,12] further agree that the earliest any athlete should return to play is when:

- no concussion-related signs or symptoms of any kind are apparent at rest or during exertion (no athlete should return to play while still symptomatic in any way); and
- neurologic examination is normal.

Experts[2,7,12] also agree that once all signs and symptoms have resolved (including test results back to/near baseline), a stepwise progression beginning with light aerobic activity and culminating with a return to game play should be employed. Progression through this protocol should take several days; athletes who experience a return of symptoms during the protocol should stop exercising and resume the protocol the next day or after the subsequent resolution of symptom, whichever is LATER.

- Schools (and their associated healthcare providers) that employ baseline testing should seek neuropsychological consultation regarding the interpretation of neuropsychological test protocols and scores, as recommended by the Zurich statement. Further, schools should endeavor to insure that their team physician has appropriate training and knowledge in the management of sport-related concussion. Physicians and other healthcare providers who assume responsibility for managing athletes who have suffered a concussion, must stay abreast of current practice guidelines and topics, especially return-to-play decision-making.

The NH State Advisory Council on Sport-Related Concussion recommends that athletes be returned to play only after symptoms and objective test results have returned to their baselines, and an appropriate sequence of graded exertional exercises is completed with no return of signs or symptoms.

Return to School after Concussion

Experts convened at the international concussion in sport meetings[12,13] agreed that the scholastic demands regularly place on school-age children are cause for concern during concussion recovery. Kirkwood[10] points out several non-sport related considerations that should be implemented when dealing with concussed athletes:

- Provide general concussion education to patient, parents, and school personnel
- Ensure appropriate support in place for transition back to school
- Treat each medical problem symptomatically
- Expect positive outcome for most children
- When recovery is not proceeding as expected, promptly refer to specialists (e.g., in neuropsychology, neurology, rehabilitation, sports medicine, pain management, education, behavioral health)

There are several modifications that might be made to ease the transition back to school including a gradual return, reduced workload and adequate rest/breaks.[10] Temporary accommodations may be needed to allow for 'cognitive rest.' While it is possible that some students could use this as an excuse for reducing expectations, the Advisory Council believes it is better to err on the side of caution. Ongoing monitoring and communication with school personnel should reduce risks to the athlete.

The NH State Advisory Council on Sport-Related Concussion recommends systematic involvement of school personnel such as nurse, counselor, and/or psychologist to advocate for and support appropriate accommodations for athletes who have suffered a concussion.

Medical Personnel in the Schools

Certified Athletic Trainers

There should be a qualified allied healthcare provider available to student athletes at the school on a daily basis. A qualified healthcare provider is educated in the prevention, immediate care, treatment and rehabilitation of athletic injuries. The IDEAL choice would be a Certified Athletic Trainer.[1] The American Medical Association believes that school administrators, athletic directors, and coaches should work with local physicians, medical societies, and medical specialty societies, as well as government officials and community groups to undertake appropriate measures to ensure funding to provide the services of a certified athletic trainer to all high school athletes. The Council agrees with this statement.

Athletic training is not the same profession as personal training. Athletic trainers are healthcare professionals who collaborate with physicians to optimize activity and participation of patients and clients. Athletic training encompasses the prevention, diagnosis, and intervention of emergency, acute, and chronic medical conditions involving impairment, functional limitations, and disabilities.

To become certified athletic trainers, students must graduate with bachelors or masters degree from an accredited professional athletic training education program and pass a comprehensive test administered by the Board of Certification. Once certified, they must meet ongoing continuing education requirements in order to remain certified. More than 70 percent of certified athletic trainers hold at least a master's degree.

The NH State Advisory Council on Sport-Related Concussion recommends schools have appropriate coverage by AT's for all athletic teams, and contact/collision teams in particular. As part of their role, the AT will identify and assess concussions, and manage the return-to-play protocols.

Team Physicians

All certified athletic trainers are required to work under the supervision of a physician. Generally this physician assumes the role of team physician and provides direction to the AT regarding the management of injuries, including concussion. Frequently there are written standing orders regarding management of specific types of injuries. The management of concussion should be discussed and included in management directives. In schools or programs with no AT, the school administration should enlist the services of a qualified (preferably one with sports medicine and/or team physician training) physician to provide direction for their

athletic programs. Physicians and other healthcare providers who assume responsibility for managing athletes who have suffered a concussion must stay abreast of current practice guidelines and topics, especially return-to-play decision-making.

The NH State Advisory Council on Sport-Related Concussion recommends that team physicians have appropriate training and knowledge in the management of sport-related concussion.

School Nurses

School nurses have long been the front-line of medical care in the schools. In the context of sports-related concussions, schools can provide important monitoring and communication functions as a liaison between the AT and the school faculty. Nurses can also serve as advocates for obtaining accommodations for students who have academic or behavioral difficulty as a consequence of concussion.

The NH State Advisory Council on Sport-Related Concussion recommends involvement and training of school nurses.

Neuropsychologists

Neuropsychologists are licensed as clinical psychologists and have additional training in neurology, neuroanatomy, brain-behavior relationships, psychometrics and treatment. Neuropsychology is a specialty recognized by the American Psychological Association and requires specific course work, pre-doctoral and post-doctoral training. Neuropsychological tests should be appropriately supervised and results of computerized or formal neurocognitive tests should be interpreted by neuropsychologists.

The NH State Advisory Council on Sport-Related Concussion recommends that neuropsychologists review and supervise neuropsychological and cognitive testing as part of the best-practice protocol.

Education of Coaches, Parents and Athletes

Research has demonstrated a significant general lack of knowledge about the signs and symptoms and potential sequelae of concussion. Significant risk is attached to that ignorance because injuries that are not recognized by the athlete or those around him cannot be properly managed; the injured athlete cannot be protected from potential second impact if he is still playing. Many symptoms of concussion are subjective and may be misunderstood, or deliberately hidden, by concussed athletes. Education of athletes about concussion signs and symptoms is imperative.

Athletes, coaches and parents should all be educated about the signs and symptoms and about the importance of reporting them to appropriate medical personnel. Web-based concussion training programs for coaches are available at no charge; at least two offer certification upon completion of training. Schools and youth sports programs should consider implementing a policy requiring education followed by the athletes' signed acknowledgement of receipt of educational materials and agreement to honestly report all possible concussion signs and symptoms to coaches and/or team medical personnel. Another education effort should focus around updating the language of concussion to ensure appropriate respect for the injury. For example, the NATA recommends elimination of the use of words like "ding" and "bell ringer" to describe concussive episodes because they tend to minimize the importance of the injury, which may preclude appropriate management.[7] In light of the recent tragic death of Natasha Richardson, one of the NATA's recommendations is particularly timely: "It is essential that this injury be reevaluated frequently to determine if a more serious injury has occurred, because often the evolving signs and symptoms of a concussion are not evident until several minutes to hours later."

The NH State Advisory Council on Sport-Related Concussion recommends that coaches, athletes and interested parties (parents, administrators, etc.) receive current basic education on the topic of sport-related concussion. The Council also recommends that governing bodies and individual schools/youth leagues consider requiring coaches to complete training within one month of hire or the implementation of this requirement. Schools and youth programs should also consider implementing a policy which requires athletes to take responsibility (e.g., via signed agreement) for honestly reporting concussion signs and symptoms to team/ medical personnel.

Education of Physicians

It is sometimes difficult for busy physicians to stay abreast of rapidly changing research in a very specific area like sport-related concussion. This is especially true of physicians with broad responsibility for healthcare (e.g., pediatricians, primary care physicians) but is also true of specialists like neurologists whose daily practice may be largely filled with the management of

traumatic brain injuries which have different characteristics and management requirements. Physicians who accept the responsibility of determining appropriate return-to-play timing for athletes who have suffered concussions must educate themselves and stay abreast of current practice guidelines on this topic.

The NH State Advisory Council on Sport-Related Concussion recommends that physicians who accept the responsibility of caring for concussed athletes stay up-to-date on current practice guidelines and consensus statements (e.g., Zurich) released on the topic of sport-related concussion.

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Youth Concussion Education, Awareness and Advocacy

AMERICAN COLLEGE of SPORTS MEDICINE

USA Football — Football's National Governing Body

NFL

BRAIN INJURY ASSOCIATION OF WASHINGTON

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The National Football League, USA Football, the Brain Injury Association of Washington, and the American College of Sports Medicine, among many other organizations, strongly support the adoption of laws to prevent traumatic brain injury in youth athletes in all fifty states. The Zackery Lystedt law, passed in Washington state, through the efforts and hard work of advocates in the medical, educational and athletic fields represents model legislation. The bill includes three elements essential to protecting youth athletes in all sports:

(1) Inform and educate youth athletes, their parents and guardians and require them to sign a concussion information form;
(2) Removal of a youth athlete who appears to have suffered a concussion from play or practice at the time of the suspected concussion; and
(3) Requiring a youth athlete to be cleared by a licensed health care professional trained in the evaluation and management of concussions before returning to play or practice.

This packet of materials includes information about the Zackery Lystedt law and frequently asked questions regarding it. In addition, educational materials on the topic of youth concussions are included. These documents published by the Centers for Disease Control and Prevention and USA Football and endorsed by the American College of Sports Medicine, the National Football League, USA Football, and the Brain Injury Association of Washington will provide significant information about youth concussions.

As of November 2010, nine states have adopted laws containing the three key provisions of the Zackery Lystedt law. We encourage you to adopt a similar law in your state and encourage you to reach out to our organizations if we can be of assistance.

Sincerely,

Jeffrey A. Miller
Vice President
Government Relations and Public Policy
National Football League

Stanley A. Herring, M.D.
Chairman
Advocacy and Education Subcommittee
NFL Head, Neck and Spine Committee

Richard Adler
Chairman/President
Executive Board
Brain Injury Association-Washington

James R. Whitehead
Executive Vice President and CEO
American College of Sports Medicine

Scott Hallenbeck
Executive Director
USA Football

FREQUENTLY ASKED QUESTIONS ABOUT CONCUSSION-PREVENTION LAWS

How widespread are concussions among youth athletes?

An estimated 400,000 high school athletes sustained concussions while participating in five major male sports and four major female sports during the 2005-2008 school years[i]. In addition, experts believe that the prevalence of sports-related concussions among young people in all sports is significantly higher than reported.

Moreover, the number of youth athletes taken to emergency rooms with sports-related concussions doubled during the 10-year-period from 1997 to 2007[ii]. Meanwhile, among youth aged 14 to 19, emergency room visits for concussions sustained during team sports more than tripled over the same period[iii].

What dangers do these head injuries pose to young athletes?

A concussion is a type of traumatic brain injury, or TBI, which changes the way the brain normally works. Recognizing and responding to concussions when they first occur help to aid recovery and to prevent prolonging concussion symptoms, chronic brain damage or even death. Yet, a recent study estimated that more than 40 percent of high school athletes return to participate in school athletics before they have fully recovered from these serious head injuries[iv].

Do concussions involve youth athletes in all sports and at any age or is it just an injury sustained by boys who play football?

Concussions can occur in athletes of any age and in any sport or recreational activity. In fact, each year, U.S. emergency departments treat an estimated 135,000 sports-related and recreation-related TBIs, including concussions, among children ages 5 to 18[v]. In addition, children and teens are more likely to get a concussion and take longer to recover than adults. While youth sports concussions often are associated with football, the rate of concussions in girl's high school soccer is almost as high. Research also indicates that there may be gender differences in how boys and girls recover from concussions.[vi]

How many states have enacted laws related to concussion-awareness, prevention and management?

As of October 2010, eight states have adopted similar concussion-awareness and prevention laws initially adopted in Washington, known as the Zackery Lystedt law, including Oregon, New Mexico, Connecticut, Oklahoma, Virginia, Massachusetts and Rhode Island. In many other states, active coalitions are pushing to enact similar legislation.

What are the key elements of a concussion-prevention and management bill?

An effective concussion-prevention bill follows the example of the State of Washington's Zackery Lystedt law. It includes three essential elements: (1) inform and educate student athletes, their parents and guardians and require them to sign a concussion information form; (2) removal of a student-athlete who appears to have suffered a concussion from play or practice at the time of the suspected

concussion; and (3) requiring an athlete to be cleared by a licensed medical professional trained in the evaluation and management of concussions before returning to play or practice.

There is an international consensus on return to play guidelines for youth, adopted at the 3rd International Conference on Concussion in Sport in Zurich, in November 2008, which states that "It is not appropriate for a child or adolescent athlete with concussion to RTP on the same day as the injury regardless of the level of athletic performance."[vii]

What is the cost of implementing a concussion prevention and awareness bill?

Zero. The bill is revenue neutral. There are no mandates in the bill and no requirements that resources be spent to hire or train medical professionals or to purchase equipment. Free information on concussions for high school and youth coaches, parents, athletes, as well as school professionals is publicly available on the Centers for Disease Control and Prevention's (CDC) website at www.cdc.gov/Concussion, including a youth concussions poster found at www.cdc.gov/concussion/pdf/poster_Eng.pdf designed to hang in every locker room across the country.

What are the penalties for violating the concussion prevention and awareness law? Who is liable if the law is not followed?

There is no liability attached to Washington's Zackery Lystedt law. It does not mandate any civil or criminal penalties, nor does it create greater liability for individuals and/or organizations. Indeed, the education and awareness efforts and requirement of medical clearance before return to play has decreased the variability of care and decreased liability. Wherever the law is passed, the community can determine if and how to monitor and enforce the law.

What about implementing the law in rural areas where it may be more challenging to find medical professionals?

The law does not require a specific medical specialist to participate in every evaluation. Rather, the language of the Washington statute requiring an athlete "to be cleared by a licensed medical professional trained in the evaluation and management of concussions before returning to play or practice" permits a wide range of qualified individuals to determine a youth athlete's suitability for returning to play. For example, in Washington State, the Washington Interscholastic Activities Association decided that qualifying medical professionals included: medical doctors, osteopaths, nurse practitioners, athletic trainers, and physician assistants.

What is the impact of concussion-prevention laws on private sports organizations?

These laws may be written in such a way as to apply not only to public sports organizations but also to private sports organizations, many of which maintain public-sector connections/affiliations (such as the use of public facilities). For example, in Washington private sports groups are required by law to carry insurance to play on publicly-owned playing fields. The Zackery Lystedt law amended that insurance-based law to require private nonprofits to comply with the policies on the management of concussions and head injuries in youth sports.

What impact have concussion-prevention laws had in states that have passed them?

The Zackery Lystedt law was the first concussion-prevention state law to pass in 2009. While no comprehensive and detailed assessment can yet be made, early and anecdotal data suggests that the law is having an immediate and positive impact. It is helping meet a critical goal -- preventing preventable brain injuries and making sports and recreational activities safer for youth.

What organizations have supported such measures?

A broad coalition of groups representing teachers and parents, sports medicine, medical professionals, school administrators, the disability community and athletic organizations have supported concussion-prevention legislation at the state and federal level. These organizations include the National Football League, American College of Sports Medicine, USA Football, National School Boards Association, Parent Teacher Association, National Association of School Nurses, National Council of Youth Sports, The Sarah Jane Brain Foundation, National Disability Rights Network, National Athletic Trainers' Association, National Association of Health and Fitness, the Brain Injury Association of America, the Brain Injury Association of Washington, and many others.

What law, if any, has Congress proposed or passed regarding concussion prevention and awareness?

The "Protecting Student Athletes from Concussions Act of 2010" incorporates the same core principles of the Lystedt law and was introduced in Congress in September of 2010. If passed, the bill would require school districts to develop and implement a minimum standard, community-based plan for concussion safety and management. Of course, states would be able to implement standards far exceeding these basic, minimum standards.

Where may I find/read a copy of the Zackery Lystedt law?

The Zackery Lystedt law may be found in this packet. It may also be found online by visiting: http://www.leg.wa.gov/CodeReviser/documents/sessionlaw/2009pam3.pdf

Where may I find more information about the dangers of concussions and passing a law in my state?

More information about concussions may be found on the website of the CDC. You also may watch an NFL-produced video about enacting a concussions-prevention law in your state, which is available at NFL.com/youthconcussions and on the CDC's website as well.

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CERTIFICATION OF ENROLLMENT

ENGROSSED HOUSE BILL 1824

Chapter 475, Laws of 2009

61st Legislature
2009 Regular Session

YOUTH SPORTS--HEAD INJURY POLICIES

EFFECTIVE DATE: 07/26/09

Passed by the House April 20, 2009
Yeas 98 Nays 0

FRANK CHOPP

Speaker of the House of Representatives

Passed by the Senate April 2, 2009
Yeas 45 Nays 0

BRAD OWEN

President of the Senate

Approved May 14, 2009, 11:24 a.m.

CHRISTINE GREGOIRE

Governor of the State of Washington

CERTIFICATE

I, Barbara Baker, Chief Clerk of the House of Representatives of the State of Washington, do hereby certify that the attached is **ENGROSSED HOUSE BILL 1824** as passed by the House of Representatives and the Senate on the dates hereon set forth.

BARBARA BAKER

Chief Clerk

FILED

May 18, 2009

Secretary of State
State of Washington

ENGROSSED HOUSE BILL 1824

AS AMENDED BY THE SENATE

Passed Legislature - 2009 Regular Session

State of Washington 61st Legislature 2009 Regular Session

By Representatives Rodne, Quall, Anderson, Liias, Walsh, Pettigrew, Priest, Simpson, Kessler, Rolfes, Johnson, Sullivan, and Morrell

Read first time 01/30/09. Referred to Committee on Education.

AN ACT Relating to requiring the adoption of policies for the management of concussion and head injury in youth sports; amending RCW 4.24.660; and adding a new section to chapter 28A.600 RCW.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF WASHINGTON:

Sec. 1. RCW 4.24.660 and 1999 c 316 s 3 are each amended to read as follows:

(1) A school district shall not be liable for an injury to or the death of a person due to action or inaction of persons employed by, or under contract with, a youth program if:

(a) The action or inaction takes place on school property and during the delivery of services of the youth program;

(b) The private nonprofit group provides proof of being insured, under an accident and liability policy issued by an insurance company authorized to do business in this state, that covers any injury or damage arising from delivery of its services. Coverage for a policy meeting the requirements of this section must be at least fifty thousand dollars due to bodily injury or death of one person, or at least one hundred thousand dollars due to bodily injury or death of two or more persons in any incident. The private nonprofit shall also

provide a statement of compliance with the policies for the management of concussion and head injury in youth sports as set forth in section 2 of this act; and

(c) The group provides proof of such insurance before the first use of the school facilities. The immunity granted shall last only as long as the insurance remains in effect.

(2) Immunity under this section does not apply to any school district before January 1, 2000.

(3) As used in this section, "youth programs" means any program or service, offered by a private nonprofit group, that is operated primarily to provide persons under the age of eighteen with opportunities to participate in services or programs.

(4) This section does not impair or change the ability of any person to recover damages for harm done by: (a) Any contractor or employee of a school district acting in his or her capacity as a contractor or employee; or (b) the existence of unsafe facilities or structures or programs of any school district.

NEW SECTION. **Sec. 2.** A new section is added to chapter 28A.600 RCW to read as follows:

(1)(a) Concussions are one of the most commonly reported injuries in children and adolescents who participate in sports and recreational activities. The centers for disease control and prevention estimates that as many as three million nine hundred thousand sports-related and recreation-related concussions occur in the United States each year. A concussion is caused by a blow or motion to the head or body that causes the brain to move rapidly inside the skull. The risk of catastrophic injuries or death are significant when a concussion or head injury is not properly evaluated and managed.

(b) Concussions are a type of brain injury that can range from mild to severe and can disrupt the way the brain normally works. Concussions can occur in any organized or unorganized sport or recreational activity and can result from a fall or from players colliding with each other, the ground, or with obstacles. Concussions occur with or without loss of consciousness, but the vast majority occurs without loss of consciousness.

(c) Continuing to play with a concussion or symptoms of head injury leaves the young athlete especially vulnerable to greater injury and

even death. The legislature recognizes that, despite having generally recognized return to play standards for concussion and head injury, some affected youth athletes are prematurely returned to play resulting in actual or potential physical injury or death to youth athletes in the state of Washington.

(2) Each school district's board of directors shall work in concert with the Washington interscholastic activities association to develop the guidelines and other pertinent information and forms to inform and educate coaches, youth athletes, and their parents and/or guardians of the nature and risk of concussion and head injury including continuing to play after concussion or head injury. On a yearly basis, a concussion and head injury information sheet shall be signed and returned by the youth athlete and the athlete's parent and/or guardian prior to the youth athlete's initiating practice or competition.

(3) A youth athlete who is suspected of sustaining a concussion or head injury in a practice or game shall be removed from competition at that time.

(4) A youth athlete who has been removed from play may not return to play until the athlete is evaluated by a licensed health care provider trained in the evaluation and management of concussion and receives written clearance to return to play from that health care provider. The health care provider may be a volunteer. A volunteer who authorizes a youth athlete to return to play is not liable for civil damages resulting from any act or omission in the rendering of such care, other than acts or omissions constituting gross negligence or willful or wanton misconduct.

(5) This section may be known and cited as the Zackery Lystedt law.

Passed by the House April 20, 2009.
Passed by the Senate April 2, 2009.
Approved by the Governor May 14, 2009.
Filed in Office of Secretary of State May 18, 2009.

(INSERT SCHOOL/ORGANIZATION NAME HERE)
Concussion Information Sheet

A concussion is a brain injury and all brain injuries are serious. They are caused by a bump, blow, or jolt to the head, or by a blow to another part of the body with the force transmitted to the head. They can range from mild to severe and can disrupt the way the brain normally works. Even though most concussions are mild, **all concussions are potentially serious and may result in complications including prolonged brain damage and death if not recognized and managed properly.** In other words, even a "ding" or a bump on the head can be serious. You can't see a concussion and most sports concussions occur without loss of consciousness. Signs and symptoms of concussion may show up right after the injury or can take hours or days to fully appear. If your child reports any symptoms of concussion, or if you notice the symptoms or signs of concussion yourself, seek medical attention right away.

Symptoms may include one or more of the following:	
◦ Headaches ◦ "Pressure in head" ◦ Nausea or vomiting ◦ Neck pain ◦ Balance problems or dizziness ◦ Blurred, double, or fuzzy vision ◦ Sensitivity to light or noise ◦ Feeling sluggish or slowed down ◦ Feeling foggy or groggy ◦ Drowsiness ◦ Change in sleep patterns	• Amnesia • "Don't feel right" • Fatigue or low energy • Sadness • Nervousness or anxiety • Irritability • More emotional • Confusion • Concentration or memory problems (forgetting game plays) • Repeating the same question/comment

Signs observed by teammates, parents and coaches include:
◦ Appears dazed ◦ Vacant facial expression ◦ Confused about assignment ◦ Forgets plays ◦ Is unsure of game, score, or opponent ◦ Moves clumsily or displays incoordination ◦ Answers questions slowly ◦ Slurred speech ◦ Shows behavior or personality changes ◦ Can't recall events prior to hit ◦ Can't recall events after hit ◦ Seizures or convulsions ◦ Any change in typical behavior or personality ◦ Loses consciousness

What can happen if my child keeps on playing with a concussion or returns too soon?

Adapted from the CDC and the 3rd International Conference on Concussion in Sport
Document created 6/15/2009

(INSERT SCHOOL/ORGANIZATION NAME HERE)

Concussion Information Sheet

Athletes with the signs and symptoms of concussion should be removed from play immediately. Continuing to play with the signs and symptoms of a concussion leaves the young athlete especially vulnerable to greater injury. There is an increased risk of significant damage from a concussion for a period of time after that concussion occurs, particularly if the athlete suffers another concussion before completely recovering from the first one. This can lead to prolonged recovery, or even to severe brain swelling (second impact syndrome) with devastating and even fatal consequences. It is well known that adolescent or teenage athletes will often fail to report symptoms of injuries. Concussions are no different. As a result, education of administrators, coaches, parents and students is the key to student-athlete's safety.

If you think your child has suffered a concussion

Any athlete even suspected of suffering a concussion should be removed from the game or practice immediately. No athlete may return to activity after an apparent head injury or concussion, regardless of how mild it seems or how quickly symptoms clear, without medical clearance. Close observation of the athlete should continue for several hours. The new "Zackery Lystedt Law" in Washington now requires the consistent and uniform implementation of long and well-established return-to-play concussion guidelines that have been recommended for several years:

> "a youth athlete who is suspected of sustaining a concussion or head injury in a practice or game shall be removed from competition at that time"
>
> and
>
> "...may not return to play until the athlete is evaluated by a licensed heath care provider trained in the evaluation and management of concussion and received written clearance to return to play from that health care provider".

You should also inform your child's coach if you think that your child may have a concussion. Remember it's better to miss one game than miss the whole season. And when in doubt, the athlete sits out.

For current and up-to-date information on concussions you can go to:
http://www.cdc.gov/ConcussionInYouthSports/

Student-athlete Name Printed	Student-athlete Signature	Date
Parent or Legal Guardian Printed	Parent or Legal Guardian Signature	Date

Adapted from the CDC and the 3rd International Conference on Concussion in Sport
Document created 6/15/2009

CHRISTINE O. GREGOIRE
Governor

STATE OF WASHINGTON
OFFICE OF THE GOVERNOR
P.O. Box 40002 • Olympia, WA 98504-0002 • (360) 753-6780 • www.governor.wa.gov

December 8, 2010

Roger Goodell, Commissioner
National Football League
280 Park Avenue, Floor 12W
New York, NY 10017-1206

Dear Commissioner Goodell:

From the time I was first approached to support a law to protect youth athletes from the risks of concussions, I have focused on, and learned much about, this important issue. We all share the desire to protect our children from serious, yet preventable, health risks. This is why I am pleased to share Washington State's experience with the Zackery Lystedt Law.

I feel it is my responsibility to protect the health and safety of our young athletes while carefully limiting the cost to Washington State taxpayers. Our state, like many others in our country, is facing significant budget challenges, so any new expenditures have to be carefully scrutinized.

I am thrilled to report that the Zackery Lystedt Law is working. We are seeing a decrease in concussions and other head injuries in our student athlete population. I believe the adoption of this important legislation has saved our state money in emergency medical care, rehabilitation, and other services children need when they suffer the consequences of untreated brain injuries. In addition, school districts have not been required to hire medical professionals or trainers, and no additional significant investments were needed to comply with this law.

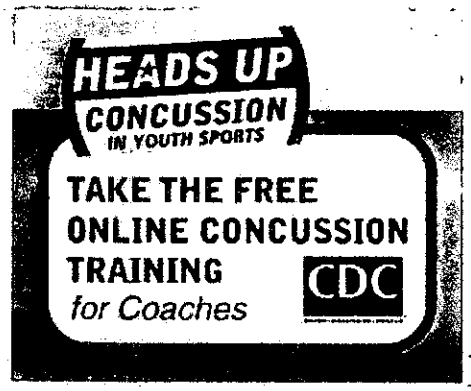
Thank you for your leadership in working to have a version of the Zackery Lystedt Law adopted around the country. Please feel free to share this with other states as you work to keep our country's children active and safe.

Sincerely,

Christine O. Gregoire
Governor

Happy holidays!

Centers for Disease Control and Prevention
Your Online Source for Credible Health Information



Heads Up Online Training Course

Heads Up: Concussion in Youth Sports is a free, online course available to coaches, parents, and others helping to keep athletes safe from concussion. It features interviews with leading experts, dynamic graphics and interactive exercises, and compelling storytelling to help you recognize a concussion and know how to respond if you think that your athlete might have a concussion.

What You Will Learn

This course will help you:

- Understand a concussion and the potential consequences of this injury,
- Recognize concussion signs and symptoms and how to respond,
- Learn about steps for returning to activity (play and school) after a concussion, and
- Focus on prevention and preparedness to help keep athletes safe season-to-season.

You can help make your league and school sports safer and healthier for all athletes. Learn when to make the call to pull an athlete off the field, ice, court, or track, and work with athletes, parents, and league and school officials to implement a concussion action plan and prevention strategies.

Course Highlights

Concussion Basics

- Understand concussion and what happens to the brain,
- Discover what causes a concussion, and
- Learn the potential consequences of concussion.

Recognize and Respond to a Suspected Concussion

- Focus on what to look for and when to pull athletes out of play,
- Watch for danger signs and seeking immediate medical attention, and
- Learn the four-step, "Heads Up" action plan when a concussion is suspected.

Helping Athletes Get Back to Play and to School

- Characterize the gradual steps for returning to activity (play and school), and
- Review a concussion preparedness checklist to guide you through pre-, mid-, and post-seasons.

Resource Center

- Access additional concussion information, videos, presentations by leading experts, fact sheets, communication strategies for talking with parents and athletes, and other tools.

Click here to take the training

Follow us on Facebook and learn more about concussion: www.cdc.gov/Concussion.

Page last reviewed: August 24, 2010
Page last updated: August 24, 2010
Content source: Centers for Disease Control and Prevention, National Center for Injury Prevention and Control

Centers for Disease Control and Prevention 1600 Clifton Rd. Atlanta, GA 30333, USA
800-CDC-INFO (800-232-4636) TTY: (888) 232-6348, 24 Hours/Every Day - cdcinfo@cdc.gov

HEADS·UP CONCUSSION IN HIGH SCHOOL SPORTS

A FACT SHEET FOR PARENTS

What is a concussion?

A concussion is a brain injury. Concussions are caused by a bump, blow, or jolt to the head or body. Even a "ding," "getting your bell rung," or what seems to be a mild bump or blow to the head can be serious.

What are the signs and symptoms?

You can't see a concussion. Signs and symptoms of concussion can show up right after the injury or may not appear or be noticed until days after the injury. If your teen reports ***one or more*** symptoms of concussion listed below, or if you notice the symptoms yourself, keep your teen out of play and seek medical attention right away.

Signs Observed by Parents or Guardians	Symptoms Reported by Athlete
◦ Appears dazed or stunned	• Headache or "pressure" in head
◦ Is confused about assignment or position	• Nausea or vomiting
◦ Forgets an instruction	• Balance problems or dizziness
◦ Is unsure of game, score, or opponent	• Double or blurry vision
◦ Moves clumsily	• Sensitivity to light or noise
◦ Answers questions slowly	• Feeling sluggish, hazy, foggy, or groggy
◦ Loses consciousness *(even briefly)*	• Concentration or memory problems
◦ Shows mood, behavior, or personality changes	• Confusion
◦ Can't recall events *prior* to hit or fall	• Just not "feeling right" or is "feeling down"
◦ Can't recall events *after* hit or fall	

How can you help your teen prevent a concussion?

Every sport is different, but there are steps your teens can take to protect themselves from concussion and other injuries.

- Make sure they wear the right protective equipment for their activity. It should fit properly, be well maintained, and be worn consistently and correctly.
- Ensure that they follow their coaches' rules for safety and the rules of the sport.
- Encourage them to practice good sportsmanship at all times.

What should you do if you think your teen has a concussion?

1. **Keep your teen out of play.** If your teen has a concussion, her/his brain needs time to heal. Don't let your teen return to play the day of the injury and until a health care professional, experienced in evaluating for concussion, says your teen is symptom-free and it's OK to return to play. A repeat concussion that occurs before the brain recovers from the first—usually within a short period of time (hours, days, or weeks)—can slow recovery or increase the likelihood of having long-term problems. In rare cases, repeat concussions can result in edema (brain swelling), permanent brain damage, and even death.
2. **Seek medical attention right away.** A health care professional experienced in evaluating for concussion will be able to decide how serious the concussion is and when it is safe for your teen to return to sports.
3. **Teach your teen that it's not smart to play with a concussion.** Rest is key after a concussion. Sometimes athletes wrongly believe that it shows strength and courage to play injured. Discourage others from pressuring injured athletes to play. Don't let your teen convince you that s/he's "just fine."
4. **Tell all of your teen's coaches and the student's school nurse about ANY concussion.** Coaches, school nurses, and other school staff should know if your teen has ever had a concussion. Your teen may need to limit activities while s/he is recovering from a concussion. Things such as studying, driving, working on a computer, playing video games, or exercising may cause concussion symptoms to reappear or get worse. Talk to your health care professional, as well as your teen's coaches, school nurse, and teachers. If needed, they can help adjust your teen's school activities during her/his recovery.

If you think your teen has a concussion:
Don't assess it yourself. Take him/her out of play. Seek the advice of a health care professional.

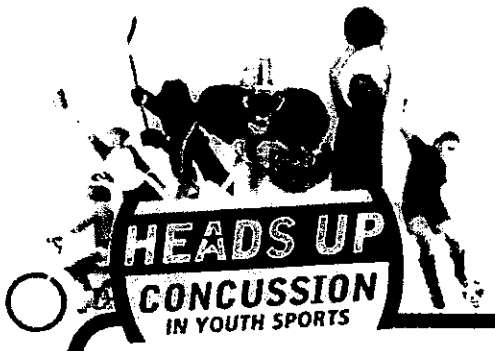
It's better to miss one game than the whole season.

For more information and to order additional materials ***free-of-charge***, visit: **www.cdc.gov/Concussion.**

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
CENTERS FOR DISEASE CONTROL AND PREVENTION

June 2010

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention



A Fact Sheet for **ATHLETES**

WHAT IS A CONCUSSION?

A concussion is a brain injury that:

- Is caused by a bump or blow to the head
- Can change the way your brain normally works
- Can occur during practices or games in any sport
- Can happen even if you haven't been knocked out
- Can be serious even if you've just been "dinged"

WHAT ARE THE SYMPTOMS OF A CONCUSSION?

- Headache or "pressure" in head
- Nausea or vomiting
- Balance problems or dizziness
- Double or blurry vision
- Bothered by light
- Bothered by noise
- Feeling sluggish, hazy, foggy, or groggy
- Difficulty paying attention
- Memory problems
- Confusion
- Does not "feel right"

WHAT SHOULD I DO IF I THINK I HAVE A CONCUSSION?

- **Tell your coaches and your parents.** Never ignore a bump or blow to the head even if you feel fine. Also, tell your coach if one of your teammates might have a concussion.

Get a medical check up. A doctor or health care professional can tell you if you have a concussion and when you are OK to return to play.

Give yourself time to get better. If you have had a concussion, your brain needs time to heal. While your brain is still healing, you are much more likely to have a second concussion. Second or later concussions can cause damage to your brain. It is important to rest until you get approval from a doctor or health care professional to return to play.

HOW CAN I PREVENT A CONCUSSION?

Every sport is different, but there are steps you can take to protect yourself.

- Follow your coach's rules for safety and the rules of the sport.
- Practice good sportsmanship at all times.
- Use the proper sports equipment, including personal protective equipment (such as helmets, padding, shin guards, and eye and mouth guards). In order for equipment to protect you, it must be:
  - The right equipment for the game, position, or activity
  - Worn correctly and fit well
  - Used every time you play

July 2007

It's better to miss one game than the whole season.

For more information and to order additional materials **free-of-charge**, visit:
www.cdc.gov/ConcussionInYouthSports

For more detailed information on concussion and traumatic brain injury, visit:
www.cdc.gov/injury

CONCUSSION

A Must Read for Young Athletes | Let's Take Brain Injuries Out of Play

CONCUSSION FACTS

- A concussion is a brain injury that affects how your brain works.
- A concussion is caused by a blow to the head or body:
  - from contact with another player, hitting a hard surface such as the ground, ice, or court, or
  - being hit by a piece of equipment such as a lacrosse stick, hockey puck, or field hockey ball.
- A concussion can happen even if you haven't been knocked unconscious.
- If you think you have a concussion, you should not return to play on the day of the injury and until a health care professional says you are OK to return to play.

CONCUSSION SYMPTOMS

- Concussion symptoms differ with each person and with each injury, and may not be noticeable for hours or days. Common symptoms include:
  - Headache
  - Confusion
  - Difficulty remembering or paying attention
  - Balance problems or dizziness
  - Feeling sluggish, hazy, foggy, or groggy
  - Feeling irritable, more emotional, or "down"
  - Nausea or vomiting
  - Bothered by light or noise
  - Double or blurry vision
  - Slowed reaction time
  - Sleep problems
  - Loss of consciousness

During recovery, exercising or activities that involve a lot of concentration (such as studying, working on the computer, or playing video games) may cause concussion symptoms to reappear or get worse.

WHY SHOULD I REPORT MY SYMPTOMS?

- Unlike with some other injuries, playing or practicing with concussion symptoms is dangerous and can lead to a longer recovery and a delay in your return to play.
- While your brain is still healing, you are much more likely to have another concussion. Repeat concussions can increase the time it takes for you to recover and the likelihood of long term problems.
- In rare cases, repeat concussions in young athletes can result in brain swelling or permanent damage to your brain. They can even be fatal.

www.cdc.gov/Concussion

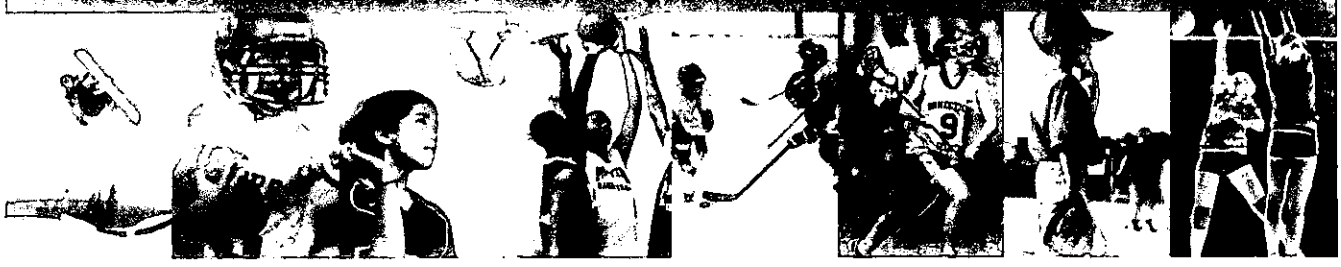
What Should I Do if I Think I Have a Concussion?

DON'T HIDE IT. REPORT IT. Ignoring your symptoms and trying to "tough it out" often makes symptoms worse. Tell your coach, parent, and athletic trainer if you think you or one of your teammates may have a concussion. Don't let anyone pressure you into continuing to practice or play with a concussion.

GET CHECKED OUT. Only a health care professional can tell if you have a concussion and when it's OK to return to play. Sports have injury timeouts and player substitutions so that you can get checked out and the team can perform at its best. The sooner you get checked out, the sooner you may be able to safely return to play.

TAKE CARE OF YOUR BRAIN. A concussion can affect your ability to do schoolwork and other activities. Most athletes with a concussion get better and return to sports, but it is important to rest and give your brain time to heal. A repeat concussion that occurs while your brain is still healing can cause long-term problems that may change your life forever.

All concussions are serious. Don't hide it, report it. Take time to recover.
It's better to miss one game than the whole season.



Football's National Governing Body

USA Football serves as the sport's national governing body on youth and amateur levels. An independent non-profit based in downtown Indianapolis, USA Football leads the game's development, inspires participation and ensures a positive experience for all youth and amateur players. USA Football was endowed by the NFL Youth Football Fund in 2002.

Working in partnership with the Centers for Disease Control and Prevention since 2007 as well as other credentialed medical organizations and doctors regarding player health and safety, USA Football stands among leaders in youth sports concussion education, particularly in youth football. The organization has built the first football-specific online youth football coaching course that includes chapters and comprehension quizzes encompassing concussion education and management, heat and hydration preparedness and equipment fitting guidelines. USA Football's members – youth football coaches, players, league commissioners and game officials – reside in all 50 states.

USA Football partners with collegiate athletic conferences, the NFL and its teams to promote concussion education through its 80-plus annual football training events and national campaigns. Dozens of articles, downloadable online resources and video promoting concussion education and management reside at usafootball.com and are available at no cost. Approximately 1 million visitors reach usafootball.com annually.

What Youth Football Coaches Should Know About Concussions

By Michael D. Goodlett, M.D., Lawrence J. Lemak, M.D.
March 11, 2009, revised December 28, 2009

Recognize the signs and symptoms of a concussion to ensure your players' safety. An easy rule of thumb to follow is when in doubt, sit them out

WHAT COACHES SHOULD KNOW

*A concussion is any change in an athlete's behavior, awareness, and/or physical feelings caused by a direct or indirect blow to the head.

*Any concussion has the potential to be a serious injury.

*Before letting an athlete go back to play, a concussion should be evaluated by a doctor.

*An athlete should never return to play while exhibiting any signs or symptoms of a concussion either at rest or with exertion. When in doubt, sit them out!

*There is an increased risk of suffering subsequent concussions after a first concussion.

*Any head injury associated with loss of consciousness must be treated as a suspected head, neck, or back injury.

*The only instances in which an athlete's helmet and shoulder pads should be removed is when a medical authority believes that it is necessary for the care of the athlete, or if the equipment interferes with the rescuers' ability to provide required CPR.

Knowing the signs and symptoms of a concussion will help a youth football coach feel more comfortable and be more prepared in case of an emergency.

*If necessary to provide care for life-threatening conditions, it is recommended that the facemask be removed rather than the whole helmet. A tool to remove the facemask should be in the first aid kit.

*For any head injury, activate the Emergency Action Plan and follow the emergency action steps, Check-Call-Care.

When a player is hit, he may receive a blow to the head and become unconscious or demonstrate changes in behavior. If the player regains consciousness, seems to be alert and oriented, and is eager to play, a coach may feel the player is fully recovered and allow him back into the game or practice. However, the player has suffered a concussion. Failure to recognize a concussion can potentially lead to coma and death particularly if a second impact occurs. Coaches need to be aware of the signs of concussions and treat the situation properly.

Concussions are caused by a force being transmitted to the head. The force may be caused by any direct or indirect hit to the head or body and can cause changes in behavior, awareness, or physical feeling in the injured person. Concussions often go unrecognized by coaches because they are underreported by athletes who want to continue competing. Athletes often will minimize or deny symptoms. Maintaining a high level of suspicion and having some knowledge of the individual athlete's personality helps coaches in early detection of the signals of concussion. This awareness can prevent additional concussive injury, potential long-term brain damage, or other possible catastrophic outcomes.

On-The-Field Evaluations

If there is a forceful blow to the head, with or without loss of consciousness, the coach should suspect a head injury and also be concerned that the neck or back has been injured. When caring for the player on the field, tell him not to nod or shake his head during the assessment, but to say yes or no. The player's helmet should also be left in place. The goal is to minimize movement. If the head impact has caused the player to become unconscious or show the signs of concussion listed below, activate the Emergency Action Plan and follow the emergency action steps, **Check-Call-Care. Check** the scene for safety and check the ill or injured athlete, **Call** 9-1-1 or the local emergency number when needed, and

Care for the injured player until EMS personnel arrive.

To Care For Serious Injuries To The Head, Neck, And Back
Follow basic precautions to prevent disease transmission.

Minimize movement of the player's head, neck, and back by putting your hands on both sides of the player's helmet or head. Maintain an open airway using a jaw-thrust maneuver. Have the player remain in the position that you found him until EMS personnel arrive and take over.

Monitor the player's airway, breathing, and circulation.

If life-threatening symptoms are present, it is recommended that the facemask of the athlete's helmet be removed, rather than removing the entire helmet. This will allow access to an airway should the athlete stop breathing.

A tool for removing the facemask should be in the team's first aid kit.

The coach should evaluate the symptoms listed below if he suspects a player may have a concussion requiring immediate care.

The only instance in which an athlete's helmet and shoulder pads should be removed is when a medical authority believes that it is necessary for the care of the athlete, or if the equipment interferes with the rescuers' ability to provide CPR.

Symptoms that require immediate activation of the Emergency Action Plan and immediate removal to a medical facility are:

- *Period of unconsciousness;
- *Confusion, disorientation to time and place;
- *Severe headache or vomiting;
- *Appears sleepy, pale, and is sweating;
- *Blurred vision, slurred speech, and muscle weakness;
- *Neck pain.

Checking For Concussion
If the player is removed from the field after receiving a head impact, it is important to continue evaluating the player every five minutes for at least 30 minutes.

Look at the facial expression of the athlete.

- *Does the athlete have a vacant stare or a confused facial expression?

Check the athlete's behavior.

- *Is the athlete easily distracted or slow to answer questions or follow directions?
- *Does the athlete display unusual emotional reactions, such as *crying or laughing?
- *Does the athlete have a headache or complain of nausea?
- *Is the athlete irritable and easily frustrated?
- *Does the athlete appear unusually anxious or depressed?
- *Does the athlete appear sleepy?
- *Does the athlete have significantly decreased playing ability from earlier in the contest?

Check the athlete's orientation and memory.

- *Is the athlete aware of the time of day and date?
- *Is the athlete generally confused? Questions to ask
- *Which quarter or period is it?
- *Where are we? Which field or arena?
- *Which team are we playing?
- *Which side scored the last points?
- *Which team did the athlete play in the last game?
- *Did the athlete's team win or lose in the last game?

Check for posttraumatic amnesia (the athlete's ability to remember events after the injury).

- *Ask the athlete how he got injured?
- *Ask the athlete the first thing he remembers after the injury?
- *Ask the last thing the athlete remembers before the injury?

Medical attention is required if the athlete's expression, behavior, or memory is affected. Attention should be immediate if symptoms show a deteriorating situation. When an athlete has had a concussion, he should not be allowed to return to the current game or practice, and should not be left alone. Medical evaluation following the concussion is required before a return to participation is permitted.

Postconcussion syndrome
After a player is removed from the field, he may develop symptoms of postconcussion syndrome. This can occur immediately after the injury or many hours or days later. Symptoms of postconcussion syndrome include:

- *Blurred vision
- *Fatigue
- *Ringing in the ears
- *Trouble falling asleep
- *Dizziness

- *Sleeping more or less than usual
- *Headache
- *Increased sensitivity to light and noise
- *Nausea and vomiting
- *Feeling more emotional than normal
- *Poor coordination or balance
- *Difficulty concentrating
- *Increased irritability
- *Difficulty remembering
- *Slurred speech
- *Feeling dazed or stunned
- *Seeing stars or flashing lights
- *Having double vision.

A physician may conduct neuropsychological testing or neuroimaging to assess exactly when the athlete has recovered from a concussion. No athlete should go back to play before being free of all symptoms and signs, both at rest and during exertion, and a physician has indicated the player is ready to return to competition.

CDC, NFL unite national governing bodies of sport to teach young athletes about concussions

By Joe Frollo
October 11, 2010, revised October 28, 2010

Free poster available for download and distribution to all youth leagues

The Centers for Disease Control and Prevention (CDC), the NFL and 14 national governing bodies of sport, including USA Football, are promoting a free poster designed to increase concussion awareness among young athletes, parents and coaches.

The poster, created by the NFL's Head, Neck and Spine Medical Committee, the CDC and the NFL Players Association, is similar to the one displayed in NFL locker rooms but geared toward a younger audience. It stresses the importance of recognizing a concussion, taking time to recover and not returning to play too soon. By walking through the steps to recognize if the athlete - or a teammate - has suffered a concussion, the goal is increased concussion awareness in all sports.

Players, coaches and parents can better recognize concussion symptoms thanks to a poster being distributed by the Centers for Disease Control and Prevention, NFL, USA Football and other national governing bodies of sport.

"The NFL understands its obligation to educate and inform parents, teachers, coaches and especially young athletes about the risks of concussions," NFL Commissioner Roger Goodell said. "This poster is one element of the NFL's program to assist in the development and broad dissemination of reliable medical information on concussions, which will give players, parents, coaches and others the information they need."

The poster is available online for download and order at no cost at CDC's website or by calling (800) CDC-INFO. Information on recognizing and reacting to concussions also can be found at usafootball.com and through USA Football's Play Smart, Play Safe Player Safety program as well as through the following national governing bodies:

USA Football's Certified Coaching Education Program, employed by youth football coaches in all 50 states, includes chapters on concussion awareness and management as well as hydration and proper equipment fitting. Health and safety videos also are available at USA Football's Health and Safety page.

"Having more than one dozen different sports be part of this initiative underscores the point that coaches, athletes and parents across all youth athletics need to be informed about this issue," USA Football Executive Director Scott Hallenbeck said.

"USA Football has worked with the CDC on concussion education since 2007, and we will continue to emphasize it while teaching coaches and players proper football fundamentals for fun and safe play."

Links related to this article:

NFL and CDC create poster to educate young athletes about concussions

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HEALTH & SAFETY

Concussion Awareness

Redskins and USA Football Welcome High School Coaches for Concussion Education

By Steve Alic
April 23, 2010, revised April 29, 2010

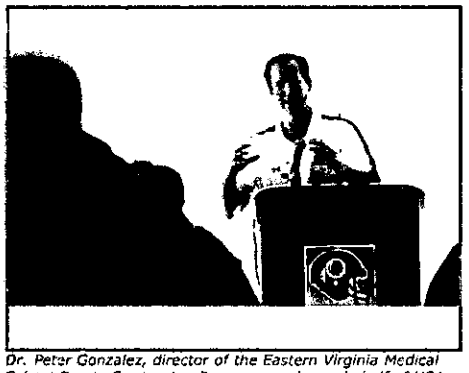
The Washington Redskins and USA Football partnered for the Redskins' inaugural Concussion Awareness and Education Forum on April 17 at Redskins Park.

Redskins Park has a history of preparing football teams for success.

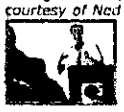
Successful preparation at the football training facility earned a new and vital definition on April 17 when the Washington Redskins and USA Football partnered for the Redskins' inaugural Concussion Awareness and Education Forum for Maryland, Virginia and Washington, D.C. high school head football coaches.

Nearly 200 high school coaches traveled to Redskins Park as guests of the team to watch minicamp practice and participate in a 90-minute concussion education seminar led by USA Football's Peter Gonzalez, M.D.

Dr. Gonzalez is the director of the Eastern Virginia Medical School Sports Concussion Program in Norfolk, Va.



Dr. Peter Gonzalez, director of the Eastern Virginia Medical School Sports Concussion Program, spoke on behalf of USA Football regarding concussion awareness and management to 170 high school head football coaches at Redskins Park. The session was part of a full-day minicamp invitation that the Washington Redskins extended to high school coaches throughout Maryland, Virginia and Washington, D.C. (Photo courtesy of Ned Dishman/Washington Redskins)



Redskins General Manager Bruce Allen opened the day by welcoming the coaches and introduced Dr. Gonzalez. Each coach received a USA Football/CDC concussion awareness clipboard sticker listing concussion signs, symptoms and an action plan. This same material is given to thousands of coaches who attend USA Football's full-day coaching schools across the country. Concussion-related information is available at no cost throughout usafootball.com.

"The coaches asked good questions," Dr. Gonzalez said after the presentation. "The Redskins are to be commended - this was a great discussion and also was the largest group of high school coaches I've spoken to at any one time."

"I came to learn all I can," said Jason Meade, head football coach of Lee-Davis High School in Mechanicsville, Va., a two-hour drive from Redskins Park. Coach Meade enters his eighth season as head coach this fall. "Learning more when it comes to putting our players in a better, safer situation is important to us."

"We can't allow high school athletes who suffer concussions to return to play too soon," Dr. Gonzalez added. "If there's one thing a coach takes away from our session today, it's not allowing an athlete to return to play while still possessing the symptoms of a concussion.

"And if we even suspect someone to have suffered a concussion, there is no same-day return to play."

Concussion awareness and management is an important part of USA Football's online coaching education courses and its 80-plus training events held across the country for players, coaches and youth league commissioners.

USA Football is the official youth football development partner of the NFL, its 32 teams and the NFL Players Association. More than 60 of USA Football's events in 2010 are conducted in partnership with NFL clubs.

National Athletic Trainers' Association
Health Care for Life & Sport

For Immediate Release
Tuesday, December 7, 2010

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NATIONAL FOOTBALL LEAGUE AND THE NATIONAL ATHLETIC TRAINERS' ASSOCIATION TEAM TO PASS STATE LAWS TO PROTECT YOUTH ATHLETES FROM THE RISKS OF CONCUSSIONS

Washington, D.C., December 7, 2010 – The National Football League and the National Athletic Trainers' Association today announced a joint effort to promote legislation to raise awareness and protect youth athletes from the risks of concussions. The new partnership was announced during the Youth Sports Safety Summit in the nation's capital.

"We are pleased to team with the National Athletic Trainers' Association on a state-based legislative effort to protect youth athletes," said Jeff Miller, the NFL's vice president of government relations. "We will advance a simple, but significant shared goal -- to help prevent concussions and make sports and recreational activities safer for young athletes around the country."

The NFL and NATA have agreed to work together to pass concussion awareness and prevention laws in every state throughout the country. The league and the association will promote laws modeled on the Zackery Lystedt law in Washington State, which contains three key elements: (1) concussion education for young athletes, parents and coaches on an annual basis; (2) immediate removal of a student athlete who appears to have suffered a concussion from play or practice; and (3) mandatory clearance of that student by a health care professional who is trained in the evaluation and management of concussions before returning to play or practice.

Marjorie J. Albohm, MS, ATC, president of the National Athletic Trainers' Association added, "We know from recent cases and studies that far too many youth athletes are either playing with undiagnosed symptoms of concussions or returning to play before fully recovering from them. That's why our organization of trained health care professionals supports legislation in every state that will help coaches, youth athletes, their parents and school officials to recognize and respond appropriately to concussions. Doing so will help prevent injury, chronic impairment and even death."

-more-

The NFL and NATA also have pledged to encourage and enlist the participation of other stakeholders and advocates. Organizations already supporting the adoption of such laws include USA Football, the American College of Sports Medicine and the Brain Injury Association of Washington. To date, nine states have enacted adequate concussion awareness and prevention laws including Washington, Oregon, New Mexico, Virginia, Rhode Island, Massachusetts, Oklahoma, Connecticut and New Jersey.

National Athletic Trainers' Association (NATA) – Health Care for Life & Sport

Athletic trainers are health care professionals who specialize in the prevention, diagnosis, treatment and rehabilitation of injuries and sport-related illnesses. They prevent and treat chronic musculoskeletal injuries from sports, physical and occupational activity, and provide immediate care for acute injuries. Athletic trainers offer a continuum of care that is unparalleled in health care. The National Athletic Trainers' Association represents and supports 32,000 members of the athletic training profession. Visit www.nata.org

# # #

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< Doctors Throw Flags On High School Concussions

Heard on All Things Considered

February 2, 2011 - ROBERT SIEGEL, host:

From NPR News, it's ALL THINGS CONSIDERED. I'm Robert Siegel.

MICHELE NORRIS, host:

And I'm Michele Norris.

In the Super Bowl this weekend, any player who takes a shot to the head and shows signs of a concussion will be taken out of the game, but it's a different story for high school athletes who sometimes play on despite a head injury.

NPR's Jon Hamilton reports on a new effort to pass laws that will protect the brains of young athletes.

JON HAMILTON: Each year, more than 60,000 high school athletes sustain a concussion. It's an injury that temporarily affects brain function, though it may or may not cause a person to lose consciousness.

And it's not just football players who get concussions. It's male and female athletes involved in soccer, wrestling, basketball, baseball, field hockey, even volleyball. And many of these athletes never get an evaluation that would reveal their injury.

Jeff Miller of the National Football League says there's a simple reason.

Mr. JEFF MILLER (National Football League): Unfortunately, kids at the high school level, the youth sports level, don't have neurosurgeons, neurologists and some of the finest doctors on the sidelines. It's just not practicable.

HAMILTON: So the NFL, the American College of Sports Medicine and a long list of other groups are joining forces to require other measures to protect young athletes. Miller says the coalition wants every state to have a law like the one passed in Washington in 2009.

Mr. MILLER: Washington state was the first to pass a law named after a youth football player named after Zackery Lystedt, who was a terrific kid and suffered some debilitating injuries as a result of a concussion suffered in a youth football game.

HAMILTON: Lystedt's head hit the ground in the first half, but he was allowed to keep playing. And when he took another shot to the head late in the game, the result was devastating.

The Lystedt law says an athlete suspected of having a head injury must be removed from competition. That's because even a minor injury to the brain can make it highly vulnerable to further damage.

A concussion law might have helped Sarah Rainey, a high school soccer player in Alexandria, Virginia. During a game 10 months ago, she took a violent hit.

Ms. SARAH RAINEY: And I thought I just got the wind knocked out of me, and I told my coaches and the trainer that I was OK. I passed the sideline evaluation, and I played the remaining five minutes and then two overtime periods.

HAMILTON: But after the game, she began experiencing headaches, nausea and fuzzy thinking. Rainey tried to go back to school, but everything about it made her symptoms worse.

Health Overhaul: You Want Fries With That?

Why Keeping Little Girls Squeaky Clean Could Make Them Sick

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+ CHECKLIST
Concussed Kids
A child's brain is a fragile thing, and too many are getting hurt

+ DR. OZ
Keeping It Safe
It's up to parents and coaches to know when a kid needs to sit it out

Headbanger Nation. Concussions are clobbering U.S. kids. Here's why

BY JEFFREY KLUGER

I DIDN'T GET A GOOD LOOK AT THE little boy who injured my daughter in the science museum in Mexico City. He seemed to be about 7, my daughter Elisa was not yet 3, and the two of them were part of a scrum of kids playing on an indoor patio. At precisely the wrong moment, she turned left, he turned right, and they collided. Physics being physics, the smaller mass yielded to the larger one, and my daughter fell down. She landed first on her bottom, then tipped backward and hit her head on the floor.

The sound was one that parents dread: the singular clunk of skull striking cement. I winced, Elisa wailed, and I gathered her up. Soon she stopped crying and went off to play, but even as she did, a dangerous process had begun to unfold inside her skull.

When Elisa's head hit the floor, the deceleration was sudden, but—physics again—her brain stayed in motion for an instant, moving through the small intracranial space until it collided with the back of the inside of her skull. Concussive energy radiated through the tissue. As it did, channels in the neurons opened wide, allowing calcium ions to flow into the cells, depressing their ability to metabolize energy. Brain tissue began swelling, but with nowhere to go, it squeezed up against the skull wall. Shearing forces tore axons connecting the cells, damaging their myelin sheathing, which can disrupt nerve signals. All of that was the best-case scenario. The worst case was a brain bleed, which could be fatal without immediate surgery.

Within 20 minutes, Elisa grew withdrawn. An hour later, back in our hotel, she vomited and then began thrashing convulsively. We rushed her to a hospital, where doctors struggled to get a line into one of the tiny veins in her arm, shouting at her to stay awake.

"Open your eyes!" I shouted at her in English. *"Abre tus ojitos!"* my wife echoed. Elisa understood both languages; she answered in neither.

Finally, the doctors got her into a CT scanner, then administered an EEG. There

3.8 MILLION
Number of Americans who sustain concussions per year—and there may be untold others that go unreported

see without a postmortem exam, but three noninvasive techniques can help sidestep that problem. Magnetic resonance spectroscopy measures not direct damage to the brain but its metabolic activity—a good way to evaluate the very system that breaks down first when a brain is concussed. Diffusion tensor imaging can observe transmission along nerve-fiber tracks, providing a sense of the integrity of the neural wiring. And resting fMRI allows physicians to watch the brain when it's not performing a task, providing a look at basic function.

Changing the Rules

SMART MEDICINE, OF COURSE, CAN DO ONLY so much to reverse the number of concussions. Smart policy must do the rest. To keep kids from hurting themselves—and to prevent coaches from enabling them—10 states, including New Jersey, Oregon, Virginia and football-mad Oklahoma, have passed return-to-play laws requiring kids who have sustained even a suspected concussion in any sport to be pulled from play and not returned until a doctor or certified athletic trainer declares them fit. A handful of other states are considering similar legislation, and last year two separate bills along the same lines were introduced in the House of Representatives. Both will have to be resubmitted under the new GOP majority. Still, the national trend is clear: "When in doubt, sit them out" is how the advocates put it.

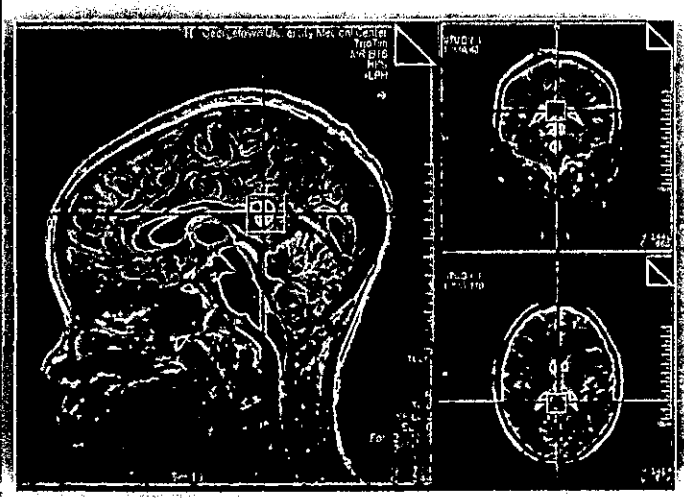
Most major professional sports leagues in the U.S., as well as most large universities and 4,000 high schools, now also use a computer program known as ImPACT (for Immediate Post-Concussion Assessment and Cognitive Testing) that measures such basic skills as memory, word recognition and pattern recognition. Players are required to take a baseline test at the beginning of the season and are periodically retested, especially post-concussion, to determine if there's been any erosion of skills. "I used to sit across from athletes doing paper-and-pencil memory tests," says ImPACT developer Mark Lovell, a neuropsychologist at the University of Pittsburgh Medical Center. "That would never work with large groups of kids. There aren't that many neuropsychologists alive."

The football helmet was designed to prevent lacerations and fractures—which it does very well—but it does little or nothing to prevent concussions

Reform is also coming—slowly—to the major manufacturers of football helmets, driven mostly by the NFL, which has imposed much stricter concussion and tackling rules in the past season. The NFL is anxious both to protect its players and to shake its image as a weekly tutorial for student athletes learning all the wrong safety lessons from pros who should know better. Currently, the group that certifies helmets is the National Operating Committee on Standards for Athletic Equipment (NOCSAE), which sounds reassuringly official except for the fact that it's essentially funded by the manufacturers themselves. NOCSAE has come under fire not only for this seeming conflict of interest but also for what critics consider unreliable testing. The larger problem, though, is that the standard football helmet was designed to prevent only lacerations and fractures—a job it does very well—and to do little or nothing to prevent concussions. "The science just isn't there today," says Dr. Robert Cantu, a neurosurgeon at Boston University and a member of NOCSAE's board.

That's not NOCSAE's or the NFL's fault, but they're trying to do something about it. In December the league and the helmet manufacturers convened a sort of head-injury summit in New York—a gathering that also included officials from NASCAR and the military—to consider helmet modifications that could reduce the concussive carnage. For football, those modifications could include better padding, stronger chin straps and redesigned face masks that distribute shock differently. Kids' helmets must also be more than simply smaller versions of those used by adults. The padding inside all helmets is designed to compress at the forces generated by colliding adult bodies. With the smaller forces kids produce, the padding stays rigid, essentially becoming one more hard surface for the head to strike. Innovations introduced in football could ripple out to other sports' playing fields, to say nothing of battlefields.

Athletics will never be stripped of all danger, and terrible as the blown knee or wrecked elbow may be, there is always an assumption of those risks when you elect to play the game. But the brain is more than a joint or a limb. It's the seat of the self. We overlook that fact at our peril and—much worse—at our children's. ■



A Look Inside. New brain scans are making it easier to spot concussions

Magnetic resonance spectroscopy (MRS) Traditional magnetic resonance imaging (MRI) is not able to pick up the microscopic physical changes caused by a concussion. MRS *(left)* can't either, but it can assess the brain's metabolic function. That's key, since the metabolic system falters when a brain is concussed. Unhealthy metabolism means an injured brain

Diffusion tensor imaging (DTI) Axons, which transmit impulses between brain cells, can be damaged by a concussion. Those fibers are too small to see, but DTI reveals how well they're functioning by tracking the movement of water along them. For the brain to function well, water must move smoothly among its various regions

Resting functional magnetic resonance imaging (fMRI) Ordinary fMRI reveals how the brain functions when it's presented with a cognitive task such as reading or problem solving. Resting fMRI looks at the brain in its quiet state—when it's being asked to do nothing at all. That provides a better look at its underlying integrity

THE DAMAGE DONE

WHILE CONCUSSIVE HITS DOMINATE THE DEBATE, A GROUNDBREAKING NEW STUDY SUGGESTS THAT MINOR BLOWS—AND THERE CAN BE HUNDREDS EACH GAME—ARE JUST AS TRAMAUTIC

By David Epstein

Photograph by ANDREW HANCOCK

YOU WOULDN'T GUESS that Jefferson High football players Joel Ripke and Brandon Stumph are part of a scientific breakthrough. Purdue researchers who put sensors in the helmets of the seniors from Lafayette, Ind., certainly didn't. Ripke, a mountainous 17-year-old at 6' 6" and 260 pounds, is the Bronchos' starting right tackle. His buddy Stumph, a starter at defensive end, is a more mundane 6' 1" and 190 pounds, but with a thirst for contact. His black helmet looks like one of those chipped and gouged bowling balls that hasn't beaten a straight path in years.

Despite their easy camaraderie and Penn-and-Teller size difference, Ripke and Stumph line up across from each other in practice and get after it, with Stumph breaking out every duck, dodge, chop or bull rush he knows to get past Ripke's forklift arms and Frisbee-sized mitts. "If I'm not bigger than the dude, I like to hit him with my helmet," Stumph says, "and then use a move so I can get his hands off me." Nor does Ripke shy away from putting hat on hat. He's been taught that effective run blocking requires three points of contact on the defender: hand, hand, helmet.

Despite their frequent bell-ringings and clock-cleanings, neither Ripke nor Stumph has suffered a concussion in practice or in a game. That would be unequivocally gratifying news, except that the Purdue researchers' data, to be published in the *Journal of Neurotrauma*, tell a far more troubling story. The findings suggest that while the NFL is going to unprecedented lengths to control the violent collisions that produce concussions, brain trauma in football may start much earlier, and much less conspicuously, with hits that never raise an eyebrow, much less a penalty flag.

Before the 2009 football season the group of Purdue engineering professors, athletic trainers and graduate students fitted 23 of the Bronchos' helmets with accelerometers and gave players both the ImPACT test—a computerized neurocognitive exam that tests memory and concentration—and tests of working memory while their brains were monitored with magnetic resonance imaging (MRI). The idea was to establish a baseline for each player against which he could be reexamined after a concussion. Says Thomas Talavage, a Purdue associate professor of biomedical engineering and electrical and computer engineering, "We were looking to understand what kinds of hits cause a concussion and what the consequences are."

Using NFL-sponsored studies as a guide, the researchers figured that hits in excess of 80 times the force of gravity (heading a soccer ball produces around 20 Gs) would cause concussions. So the Purdue researchers were stunned when, on the first day of full-contact practice, they started seeing hits of 100 Gs or more. "I thought, Oh, my god, we're going to be carrying these kids off the field," says Eric Nauman, associate professor of mechanical and biomedical engineering.

It turned out, however, that no particular magnitude of hit correlated with a concussion. One player holding the line on an extra-point attempt took 289 Gs to the helmet from a converging pair of would-be kick blockers. "You could hear the hit in the subdivision next door," says Evan Breedlove, a biomedical engineering grad student and member of the study team. But the lineman was fine. In fact, three weeks into the season the Purdue team had just one concussion for its study. (There were concussions among Bronchos players who were not part of the test.) So the researchers had players from the study who had never suffered concussions retake the ImPACT test and get their brains scanned with functional MRIs (fMRI), which image

cerebral blood flow to pinpoint active areas in the brain. The players were meant to serve as a control group for later comparison to concussed teammates. But the first lineman who came in as an ostensible control subject surprised the researchers when, compared with the preseason, he scored 20% lower on the visual memory section of the ImPACT test, which requires rapid identification of recurring patterns. The player had no trouble with the verbal section, though, and Talavage began to think there might be something wrong with the test itself, which is used by the NFL and many college and high school teams to gauge whether a player has recovered from a concussion.

A few concussions did arise as the season went on, but the researchers continued to bring in nonconcussed players for ImPACT tests and fMRIs. And then they saw it again: Another kid who had never suffered a concussion flubbed the visual memory section could tell, but whose visual memory was more impaired than his amnesic, headachy, light-sensitive, concussed teammates.

Says Talavage, "We started having weekly meetings to debate whether we were seeing something real."

AND THEN THEY looked at the fMRIs. Those brain snapshots had been done while players took two versions of a working memory test. In the first version a subject must click a button each time a flashing letter repeats in sequence. D, A, B, B—*click*. The second version requires more brainpower: React when the letter that flashed two characters ago repeats. A, J, F, J—*click*.

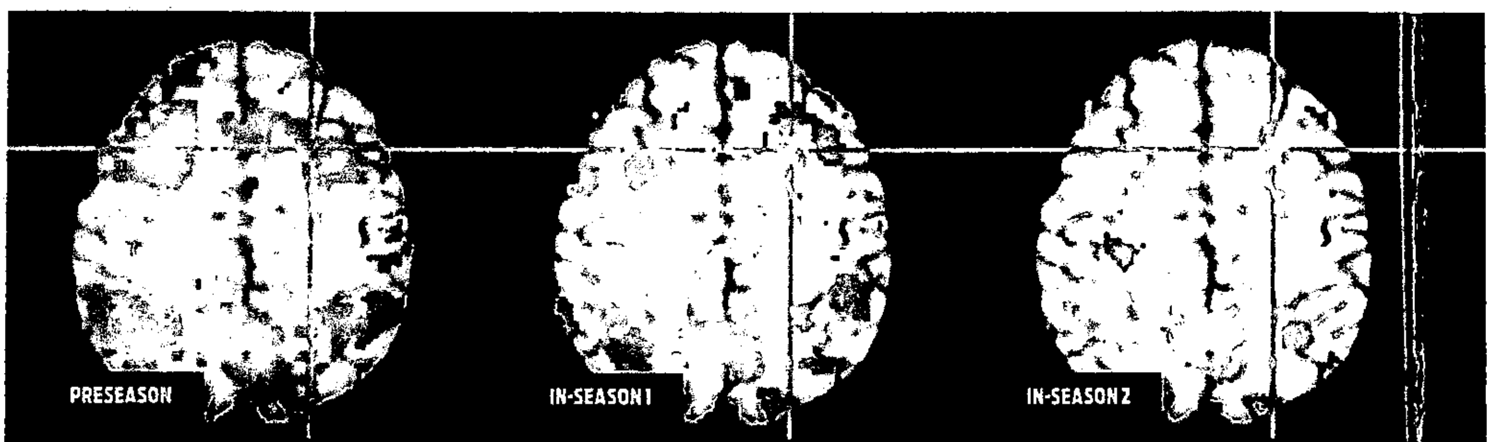
LINEMATES Ripke (left) and Stumph have been knocking heads for years.

All of the players were able to complete the test with relative accuracy, but the brain activity of the four players who took a lot of middling hits—but suffered no concussions—changed dramatically. When each one took the harder version of the test, there was an unmistakable decline in activity in an area of the brain just behind the forehead called the dorsolateral prefrontal cortex, which is critical to visual memory. "It's like a horse race," says Talavage. "When the brain starts a task, it starts all the horses running, and one wins, or gets the task done. But when the brain is already taxed, it prevents some of those horses from starting. There are fewer resources available."

Talavage has seen an interesting parallel in an unrelated study that compares gifted children with reading-impaired and average children. The gifted kids show relatively low brain activity on a reading test, presumably because they aren't challenged and need not summon all their mental horsepower. The average children start all the horses. But the reading-impaired subjects, like the gifted children, keep some of the starting gates closed—not because the task is too easy but because it is too difficult. A single week of 150 hits turned the four "functionally impaired" Jefferson High players, as the Purdue team calls them, into equivalents of the reading-impaired children, except that the damage was to visual memory.

Yet every method of sideline diagnosis for concussions relies on self-reported symptoms like headaches or dizziness, in addition to tests of verbal—not visual—memory. The NFL, for example, now mandates that a concussed player is done for the day if, after a hit, he can't carry on a coherent conversation or remember the last play or his gap assignment. The four functionally impaired Bronchos, however, showed absolutely nothing that would be categorized as a symptom. "You wouldn't even know to examine them," says Larry Leverenz, an athletic trainer and Purdue clinical professor of health and kinesiology who is on the study team. "There's nothing until you give them an fMRI or test the visual memory."

Even in the gladiator culture of football, the growing awareness of brain injury has transformed the act of hiding a concus-



TELLTALE A sequence of fMRIs from a "functionally impaired" player showed that brain activity (orange) declined noticeably, especially in the front lobe, th

of the ImPACT test. Of 11 players who took midseason testing, three had suffered concussions during the season and eight had never had concussions. Of those eight, four nevertheless showed significant declines in visual memory. In fact, the players with the most impaired visual memory skills were not coming from the concussed group but from a group that in the week preceding the test had taken a large numbers of hits—around 150—mostly in the 40 to 80 G range.

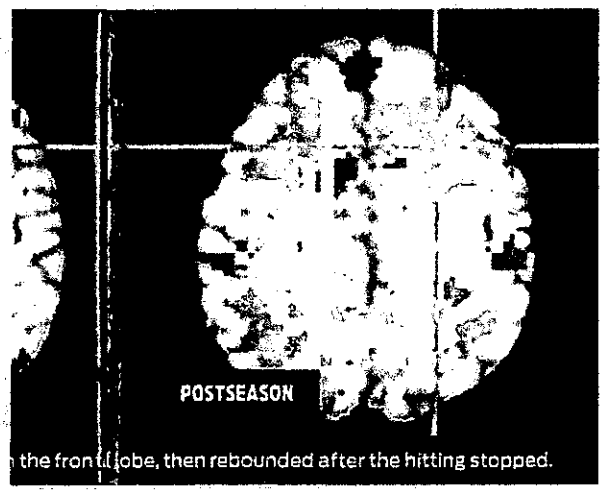
If the test scores were accurate, the researchers had inadvertently documented, in real time, a new classification of high school athlete: a player who was never concussed, was not verbally impaired and was asymptomatic even as far as his parents

ANDREW HANCOCK (RIPKE AND STUMPH)

BRAIN IMAGERY COURTESY OF THE PURDUE ACUTE NEURAL INJURY CONSORTIUM

sion from one signifying bravery to one of stupidity. The functionally impaired four didn't hide symptoms; they never knew they had any.

BEYOND THE FACT that the best predictor of impaired visual memory was not concussions but the number of hits absorbed in the previous week, one other bit of data jumped out at the Purdue researchers. While the players who were diagnosed with concussions tended to take heavy hits on the side of the helmet, the functionally impaired four tended to get hit on the front, essentially in the upper forehead, which houses the dorsolateral prefrontal cortex—where linemen get hit, play in and play out. It wasn't the rare, excessively violent collision between the wide receiver and the free safety, the Patriot missile intercepting the Scud, that mattered most, but rather the milder, more frequent kind of hits that replicated two adolescent rams knocking heads.



the frontal lobe, then rebounded after the hitting stopped.

BRAIN IMAGERY COURTESY OF THE PURDUE ACUTE NEURAL INJURY CONSORTIUM

Consider this: Concussions as we know them involve a hit that rattles a part of the brain involved in language processing or motor skills. Hits to the forehead that might be every bit as damaging hide their nefarious effects in the frontal lobe, a part of the brain primarily involved in visual memory, planning and cognition, rather than motor or sensory function, and thus not taxed by sideline concussion exams. Indeed, it's possible that all along, while brain trauma questions have focused on concussions, the real damage is being inflicted by minor impacts that chip away at the brain. A 2009 study by researchers including Ann McKee, the Boston University neurologist who

BRAIN TEASERS

CONCUSSION DIAGNOSIS IS AN INEXACT SCIENCE, BUT NEW TESTS AND TECHNOLOGIES MAY CHANGE THAT

By David Epstein

EVEN AS doctors have learned more about brain trauma, the definition of a concussion remains frustratingly vague. The injury is diagnosed through a mishmash of symptoms, some of which may or not be present in any particular case. Bone breaks have X-rays and muscle tears have MRIs, but no form of medical imaging has yet been able to quickly and reliably confirm a concussion diagnosis. But a number of promising tests are in the medical pipeline.

ONE PROMISING TEST IDENTIFIES SUBSTANCES THAT SPILL INTO THE BLOOD FROM DAMAGED BRAIN TISSUE

Last month the U.S. Army, in partnership with the Alachua, Fla.–based company Banyan Biomarkers, announced a potential breakthrough in the development of a blood test for brain trauma. The test—which accurately diagnosed traumatic brain injury among 34 patients in a study conducted by Banyan and the Army—identifies substances that spill into the blood from injured brain tissue. For example, the proteins SBDP145 and SBDP120 appear to enter the blood as a result of damage to brain cells. "It's going to change medicine entirely," says Col. Dallas Hack, an Army doctor and the director of the Combat Casualty Care Research Program. The next step is a study of 1,200 patients that will take several years to complete.

Randall Benson, a neurologist at Wayne State in Detroit who has studied former NFL players, is hopeful but cautioned that the biomarker test results are preliminary. "The data look very compelling for moderate to severe injuries, but for mild injuries they have very little data," he says. Benson himself has been working on technology that may lead to effective and immediate diagnosis of mild brain injuries using a special type of MRI called diffusion tensor imaging, which creates images of water flow in the brain and could pick up anatomical irregularities.

In addition to diagnostic tests, advances in genetics suggest a way to predict how well a person will—or won't—recover from a concussion. A burgeoning field of research suggests that people who carry one or two copies of a version of a gene known as ApoE may be at increased risk of suffering brain-trauma-induced dementia. The ApoE4 variant (one of three common variations that a person can carry) is known to increase an individual's risk of developing Alzheimer's. However, the gene increasingly appears to have a role in slowing or preventing recovery from all manner of brain injury. For example, car accident victims who have the ApoE4 variant are more likely to die or suffer long-term brain damage. And studies of boxers and football players suggest that ApoE4 carriers take longer to recover from head trauma and are more likely to suffer serious dementia later in life.

In 2002, Barry Jordan, then chief medical officer of the New York State Athletic Commission, considered screening all boxers for the ApoE4 variant before deciding that more study was needed. As with biomarker research, genetic screens are a potentially promising tool in the fight against athletic brain trauma—but the science is in its infancy. □

WATCHFUL EYE Every hit loomed large for LaSala, who wore a hat honoring LeGrand.

CARRYING ON

A FORMER PLAYER'S PARALYSIS FROM A HEAD-ON HIT CAUSED A COACH TO CONSIDER GIVING UP THE GAME *By L. Jon Wertheim*

WHEN COLONIA (N.J.) HIGH coach Ben LaSala—an old-school, ass-kicker-but-teddy-bear type—received the news that Rutgers junior defensive tackle Eric LeGrand had been paralyzed from the neck down in an Oct. 16 game against Army, he froze. LaSala will tell you that LeGrand, who graduated from Colonia High in 2008, wasn't simply the best player he's ever coached; he might have been the best kid. LeGrand had been trying to make a tackle and led with his helmet. He collided with a Black Knight's shoulder and fell to the ground, unable to move anything other than his head. "You're 51 years old, you've coached 29 years, you have sons and daughters, you figure there's not a lot you haven't seen," LaSala, whose son Joseph is LeGrand's best friend, said last Friday. "Let me tell you, I had no idea how to react."

Football had been LaSala's life; now the game had betrayed him. Could he continue to coach? "I've thought about it a lot," he told the Newark *Star-Ledger* that weekend. "I don't even know how I'm going to deal with this." LaSala gave his players the option of taking a break from football. None did. Their coach had a harder time moving on. "I'm crying 20 times a day and I'm not a crier," said LaSala, after nearly losing it again during the tackling drills. "I heard every sound, watched every kid. It was all so magnified. All because of Eric."

In the end LeGrand was the reason LaSala stuck it out. "Football is also what put me into contact with people like Eric," he says, pausing to collect himself, his voice suddenly toneless. "I'm trying to see football's positives outweighing negatives. Does that make sense?"

At the Patriots' homecoming game last Saturday, LaSala and athletic director Ronn Weisenstein wanted to acknowledge LeGrand's injury without diverting too much attention from the kids on the field. "You don't want to ignore it," says Weisenstein. "You also don't want a freak injury, horrible as it was, to become [a referendum] on football."

Before the game, a P.A. announcement was made about LeGrand's injury. (As of Monday, he remained paralyzed.) Most of the 1,500 or so fans wore buttons and rubber bracelets in LeGrand's honor. Like 16,000 other players around the state, the Patriots wore decals of LeGrand's Rutgers number 52 jersey on their helmets. LeGrand's Colonia jersey hung behind the Patriots' sideline. In the stands, parents were palpably nervous. Some prayed. Some held hands. Some took long, hard looks at the 10-foot backboard—the type of plastic stretcher on which LeGrand was taken from the field—jutting out from the back of the fieldside ambulance.

The Patriots beat South Plainfield 28–18; more important, there were no serious injuries. "We were lucky to get that one," LaSala said while walking off the field, unshaven, a Rutgers 52 cap pulled low over his eyes. "This game, it wasn't easy."

He was right. It was uneasy. □

has autopsied the damaged brains of deceased former NFL players, noted that long-term brain deterioration did not strictly correspond to the history of concussions.

Randall Benson, a neurologist at Wayne State in Detroit who has studied former NFL players suffering from cognitive impairment and depression, says that some of them never suffered a concussion. Benson thinks the Purdue researchers may have taken a real-time snapshot of the early stages of the corrosive creep that wears away the frontal lobe, a part of the brain involved in navigating social situations. Too much erosion and victims reach a breaking point—like former Steelers offensive lineman Terry Long, who died in 2005 from drinking antifreeze. "It's an insidious progression," Benson says, "and it's not obvious when you talk to [players]." Benson has seen MRIs that show the brain drifting in the head with a movement as routine as a twisting of the neck. "It would defy the laws of physics if the brain didn't have a shearing injury when you stick your face into a 275-pound defensive lineman," he says.

But what if it doesn't take a 275-pound lineman? What if it takes only a 190-pound Brandon Stumph, the likes of whom many of the 1.1 million high school football players will encounter regularly on the field? Or what if it doesn't take even that? What if it just takes a one-pound soccer ball? In a 2003 study from the Florida Institute of Technology, subjects were briefly shown a design and directed to redraw it. Only one of 12 non-soccer-playing control subjects scored below the normal range, compared with seven of 21 soccer players who had a history of frequent headers. That cohort also scored worse on an IQ test than the control group, and lower than players who did not head the ball as frequently.

The mounting evidence suggests that some people—perhaps a lot—simply cannot play these games without being damaged, concussion or no concussion. "You can break something by hitting it hard once," says Katie Morigaki, a Purdue graduate assistant athletic trainer who worked on the study, "or you can break it by hitting it softer many times."

AND NOW THE GOOD NEWS. "There are issues we can address without changing football or racking up costs," says Nauman. If it's simply the number of hits that predict whether a player will suffer brain damage,

LOU CAPOZZOLA

ERICK W. RASCO

then, like pitch counts, that can be managed. Instead of full-contact practice on Tuesdays and Wednesdays, high schools could take a cue from the pros. "If a school can't afford all this stuff"—like fMRI, which they invariably can't—"if they hit one fewer day a week, they're probably in better shape," Nauman says. Even simpler would be a cultural shift from the headbutt back to the high-five. The Purdue team found the Jefferson players' celebratory helmet-knocks registered 80 to 100 Gs near the frontal lobe.

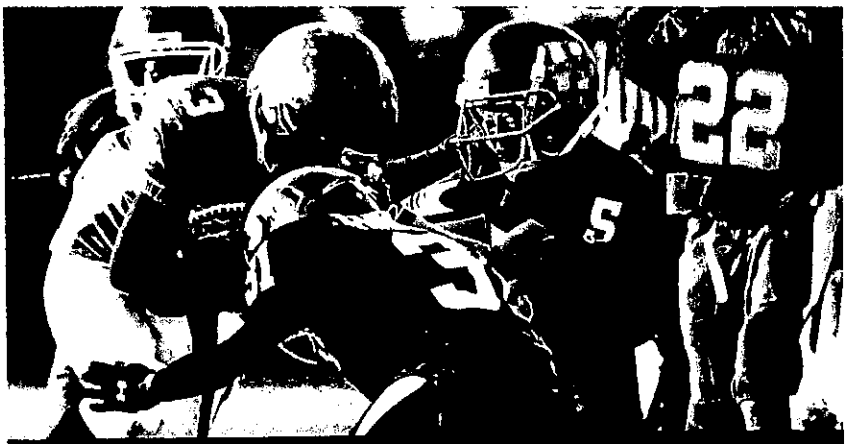
More good news: Though the Bronchos were not told their test results, several, like Ripke and Stumph, figured out that they were in the high-hits group by virtue of getting called in for more fMRIs than their teammates. The Purdue researchers say one Jefferson High player who was in the impaired group last season seems to have figured that out and has played with better, heads-up technique this season, reducing the number of hits he's taken on the forehead.

And the best news: After nine months off from football, the functionally impaired players who were back for the 2010 season (one had graduated) returned to their baseline ImPACT scores. So perhaps the youthful brain is able to completely heal itself, or at least make up for any deficit.

Critical chronological windows are known to exist for recovery from particular brain injuries. For example, in the rare case when a very young child has a stroke and loses the ability to speak, a different part of the brain is able to take over speech, and the child invariably recovers full language ability. But if the stroke occurs after the age of nine, the brain is not as flexible, and the recovery may be longer and less complete. If it occurs after puberty, some symptoms will be permanent.

The Purdue study is continuing this fall at Jefferson High, with 32 Bronchos players now taking part, and it shortly will expand by adding the reigning Indiana Class 3A state champion West Lafayette High. Researchers hope to track players through high school and even college.—Ripke hopes to play at the next level—to see at what point deficits become irreversible. That is, if they are not already looking at it. "Are these kids really coming all the way back to baseline?" Leverenz asks. "Or are they just a little bit off one year, and just a little bit off the next year, and pretty soon it's significant?"

Let's hope for good news. □



ERICK W. RASCO

TACKLING ISSUES Despite the Jets' training, helmet hits were in evidence last Saturday.

EARLY WARNING

EVEN AT THE PEEWEE LEVEL, COACHES STRUGGLE TO BALANCE SAFETY CONCERNS WITH TEACHING TOUGHNESS

By Farrell Evans

IN MIKE SINGLETARY'S first training camp as 49ers coach, he used the hitting drill called nutcrackers to set a tone of physicality. For the Harlem Jets, the youth football organization for which I'm a defensive coordinator, nutcrackers is also one of the coaches' favorite drills. In our version two kids lie on their backs between two rows of teammates. When a coach blows the whistle, both players scramble to their feet, taking turns as ball-carrier or tackler. The drill is meant to teach speed and technique—and to weed out bad habits. The boys are told to lead with their shoulders and to keep their heads up through contact. Not a practice goes by that a coach doesn't stop the nutcrackers drill to correct a player for hitting with his head down.

I admit that as a defensive coach nothing excites me more than seeing one of my players deliver a big hit. When I tell my players, "I want to *hear* some football," they know I want them to raise the intensity. That might seem a primal way of cultivating toughness in an 11-year-old kid, but football is a violent and emotional game. Yet I realize I'm coaching at a time when the sport is being scrutinized as it hasn't been since Theodore Roosevelt contemplated banning football in 1905, a year when 18 players died from hits on the field. I have to balance my desire to produce little Ray Lewises or James Harrisons with my ultimate responsibility: ensuring the safety of these 10- to 12-year-olds.

In practical terms the best way to keep our kids safe is by teaching proper technique and making sure that they have effective equipment. Each year the Jets organization (which operates under the auspices of American Youth Football) ships its helmets to the Riddell company to be reconditioned and recertified under national guidelines.

Parents can help too. In the spring Erik Baker had his son, Jackson, 12, undergo the baseline cognitive testing that has become widespread at higher levels. "I wanted to make sure that if Jackson took a blow to the head, we wouldn't let him play again until he scored within the normal range of his preconcussive state," says Baker. "I know the risks, but to let him play I needed to have this done." Says Allan Ludgate, the father of Lucas, 10, "My concern is whether I know well enough and the coaches know well enough when a kid has had a concussion." At CPR training, coaches received information along those lines and were told to err on the side of caution—take the player out until he can be seen by a health professional.

One parent, however, isn't rattled by the talk of rules changes and safety concerns. "[The NFL has] looked at a few hits, and now they're going to tell a guy who has hit a certain way all his life to stop doing it," says Lamont Edwards, the father of 10-year-old Lamont Jr. "I want my son to learn the fundamentals, but I also want him to play it as a tough, physical game, because that's what separates it from most other sports." □

[PRINT] **ESPN.com:** NFL [Print without images]

Thursday, January 6, 2011

Political football

By Peter Keating
ESPN The Magazine

Some 400,000 school-age kids each year suffer a concussion. Worse, 40.5% of high school athletes return to the field too soon. Worse still, only 10 states currently have sports concussion safety laws, and they vary widely in strictness and enforcement.

But now several bills that target the epidemic are working their way through Congress. The strongest of the bunch is the Protecting Student-Athletes from Concussions Act, sponsored by Congressman George Miller (D-Calif.), a former chairman of the House Education and Labor Committee. It requires educating students about brain injury and keeping injured athletes out of play until cleared, in writing, by a health-care professional. "The harm befalling kids, both athletically and academically, can't continue," says Miller. "We want the states to handle this, but there has to be a deadline to get it done."

Concussion Sidebars

- Medication for concussions
- Matt Schaub on concussion awareness
- Reviewing NFL helmet models
- On-field concussion tests
- How a father protects his son
- Congress and concussions

More than 100 organizations support Miller's bill, including the NFL, but that hasn't shielded it from the partisan meat grinder. Not one Republican, including newly elected Jon Runyan (R-N.J.) -- a former Pro Bowl tackle who suffered multiple concussionshas stepped forward to support it. Runyan's office told *The Mag* that while he "strongly supports" plans to increase student-athlete awareness and "looks forward" to being an experienced voice in the debate, "he ran on a pledge to closely scrutinize every tax dollar being spent and every mandate being handed down by politicians in Washington, no matter how well-intentioned." Asked what further information he would need to hone his opinion, Runyan declined to comment.

So for now, Miller's bill remains bottled up in committee, and that's a shame. "If families can't get justice on the field or from the government," the lawmaker says, "they'll find an attorney who will ask the question nobody wants to answer: What did you do to protect these children?"

Is concussion testing good enough?

December, 2, 2010
12/02/10
8:21
PM ET

Insider

Skating gingerly, Marc Savard took to Boston's practice ice for the first time this season on Oct. 26, 233 long days after a savage blindside elbow by Pittsburgh's Matt Cooke knocked the Bruins center unconscious. But it was clear that Savard -- somber and out of shape -- still wasn't fully himself. And his injury has become a case study in how complicated and frustrating it can be for an athlete to come back from a concussion.

*Getty Images*Bruins C Marc Savard was off the ice for almost a year after a vicious elbow from the Penguins Matt Cooke knocked him unconscious.

When it comes to the official rules governing sports concussions, we live in a drastically changing world. The most shocking shift has taken place in football. For years, the NFL had insisted there was no evidence that it was dangerous to return brain-injured athletes to the field as soon as symptoms subsided, and in the early 2000s, more than half of players who suffered concussions -- including a quarter of those knocked out -- went back into the same game, according to the NFL's own research. Then, last December, the league changed its tune: Now, a player with signs of a concussion must be kept out of that game and evaluated by an independent neurological consultant, not just the club doctor. "It's like night and day from where we were a couple of years ago with the NFL," says Robert Cantu, chief of neurosurgery and director of sports medicine at Emerson Hospital in Concord, Mass. "And other leagues and federations tend to follow the NFL's lead." This past year, the NCAA and National Federation of State High School Associations beefed up return-to-play rules. We're a long way from the days of "dings" and smelling salts.

But too many athletes still come back from concussions far too soon. For one thing, leagues, teams and school districts are increasingly investing in and relying on computerized neuropsychological tests to deal with return-to-play issues. These tests display images and strings of words or digits to grade memory and reaction time, and can quickly compare postinjury results to baseline scores. And they offer a technological answer to some tough questions surrounding brain injury. One such test, ImPACT, markets itself as "the best approach to concussion management" and is used as part of treatments by all teams in the NFL and NHL. But there's little independent evidence that ImPACT is reliable, and inaccurate or incomplete testing can be dangerous. "Neuropsychological testing is important, but it's just one part of managing concussions," says Jill Brooks of Head to Head Consultants in Gladstone, N.J., which specializes in treating young athletes. "You don't want it to give you a false sense of security."

High school trainers often administer or interpret the tests incorrectly. According to a 2009 study at Michigan State University, just half of the trainers check to make sure baseline scores are valid, and 13.5 percent of them told the researchers they would or might return athletes to play even if they scored below baseline.

More important, athletes are still pressured -- by coaches, teammates, media, fans and themselves -- to get back into games. Last spring, Savard said he felt good enough, and convinced doctors he was well enough, to return for Boston's playoff series against the Flyers. He even scored the game-winner in Game 1. But he now admits he was still suffering from concussion symptoms, particularly severe fatigue, which left him vulnerable to another injury. By late summer, Savard was beset by headaches, nausea and depression so severe that he couldn't skate. Thing is, his tale isn't that unusual. Flyers right wing Ian Laperriere says he came back too soon from a concussion so he could skate in last year's playoffs. Paul Kariya missed six games after taking an elbow to the head in December 2009. He returned for the second half of the season and is now sitting out this entire year with ongoing concussion-related problems.

Tough new return-to-play guidelines won't really have teeth until resources keep pace with rules, so that certified athletic trainers evaluate injured players in all high schools, not just in the 40 percent of schools that have them today, and all youth programs have full concussion management programs, not just testing software; until pro leagues and NCAA conferences have zero tolerance for coaches who act like TCU's Gary Patterson, who berated team doctor Sam Haraldson during a September game against SMU for keeping running back Ed Wesley out of play after a concussion; until the officials in charge of disciplining players who cause concussions act swiftly, harshly and without conflicts of interest, unlike the NHL's Colin Campbell, who called Savard a "little faker" in a 2007 e-mail and who didn't fine or suspend Penguins left wing Cooke last March; and until athletes learn that one concussion leads to another, that multiple concussions can lead to long-term brain damage and that every individual recovers differently.

Savard went through his last round of examinations to get cleared for play just before Thanksgiving, but he is still taking it slowly. "I have to get up to speed and feel what it's like to get bumped around," he said the day before the test. "I know there's still time and work to be put in."

Every shift, every check, will bring its own new test. And the only concrete results will be a lifetime in the making. Like Savard, the rest of us have come far, but we still have a long way to go.

Published: February 2011

Lasting Impact

New research suggests that even small hits to the head may lead to brain deterioration over time. So what can be done?

By Luna Shyr

Football draws as much attention lately for the knocks that players take as it does for their drives down the field. The emergence of research linking head collisions with behavioral and cognitive changes similar to those seen in Alzheimer's patients puts the pummeling in a new context. Whether ramming opponents head-on or butting helmets, athletes may face the risk of long-term brain injury from hits accumulated over time.

Brain degeneration from repeated blows to the head has been known in boxers since the 1920s as dementia pugilistica, or punch-drunk syndrome. "Football is the current poster child for that," says H. Hunt Batjer, a Northwestern University neurosurgeon who co-chairs the National Football League Head, Neck, and Spine Committee. "What's come to the fore is the risk of repetitive minor hit injuries." Recent research indicates that small impacts can cause damage as much as big ones, widening the field of concern to young athletes, hockey players—and soldiers subject to head-rattling blasts.

At the University of North Carolina, where football players receive an average of 950 hits to the head each season, neuroscientist Kevin Guskiewicz and colleagues have spent six years analyzing impact data from video recordings and helmets equipped with accelerometers. He and Batjer note that there are plans to test similar technologies on various NFL teams starting this year. "Are you better with five higher-end impacts or 50 lower-end ones? We don't know," says Guskiewicz. "We're trying to see what the real issues are in the concussion puzzle."

Guskiewicz believes that on-field monitoring and education are paths to progress. Already the spotlight on football-related brain trauma has resulted in new NFL practices, state laws, and congressional hearings on ways to protect young athletes. Batjer adds that military experts working on better helmets for soldiers are collaborating with the NFL. New helmet materials, and technology for on- and off-field testing, were the focus of a recent NFL conference in New York City.

On the medical side, there is hope for advanced brain-imaging techniques, experimental blood or spinal fluid tests, and even a genetic marker that would enable doctors to identify chronic traumatic encephalopathy (the same as punch-drunk syndrome, but not limited to boxers) early on. At the moment, the definitive mark of the disease—clumps of abnormal tau protein in the brain—can be seen only when the brain is sliced, stained, and studied under a microscope. CTE typically appears years after head traumas, and "we don't want to diagnose a disease after death," says Ann McKee, co-director of Boston University's Center for the Study of Traumatic Encephalopathy.

Guskiewicz envisions databases that track all the hits athletes take throughout their playing years to help explain neurologic changes later in life. But, he says, "it'll probably be my grandchildren who are analyzing that data."

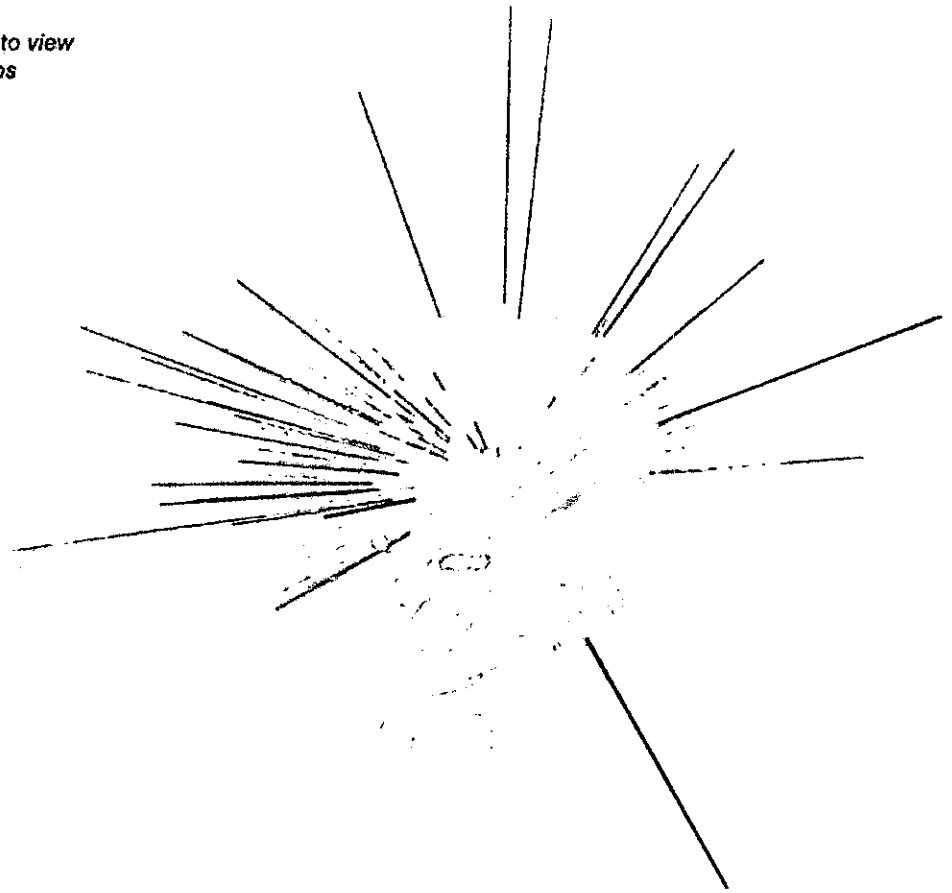
Feature Article | Interactive Graphic

A Season of Collisions

One 21-year-old defensive end took 537 hits to the head during a season of football games and practices at the University of North Carolina. Of those, 417 had magnitudes of 10 g or more (shown). Two resulted in concussion. Click and drag on the graphic below to rotate it and get a clearer sense of the location and magnitude of all the recorded impacts.

Swipe image to view head collisions

Hit below 80 g
Hit above 80 g
Concussion

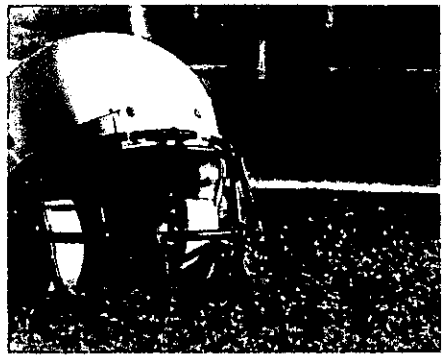


Online Extras

NFL-backed concussion legislation has ties to upcoming RRC initiatives

PROPOSED California state legislation to protect against and prevent sports-related concussions in student athletes participating in youth sports programs was recently introduced by a bipartisan group of lawmakers. An accompanying press conference featured the bill's authors and brain injury advocates along with National Football League representatives and individual team executives from California NFL franchises as well as retired players including a number of Hall of Famers.

This legislative effort is related to two activities currently being supported by the Rehabilitation Research Center and described in this issue of **Further Analysis**: the first is the Walk for Thought (see page 3) in which brain injury survivors, family members, providers and a diverse range of advocates will be joined by former NFL players who will help bring attention to brain injury in general while also highlighting the growing concern about



competitive athletics and concussive head injuries.

The second RRC initiative related to the California legislative proposal involves Eleanor M. Perfetto, PhD, one of the featured plenary speakers at the Santa Clara Valley Brain Injury Conference: Building on the Legacy of Coma to Community (see **Further Analysis** page 1). Dr. Perfetto is a healthcare and public policy research specialist whose husband, Ralph R. Wenzel, was diagnosed in 1999 with dementia attributed to the concussions and head trauma he experienced during his seven year career as an NFL offensive lineman. Since that time, during which Mr. Wenzel's condition has progressed, Dr. Perfetto became a strong advocate for NFL retirees with head trauma-related dementia and their caregivers. Among other areas of interest, her presentation will include specific information that associates sports-related head trauma and chronic traumatic encephalopathy (CTE) as well as the long term impact of CTE on cognition, function and behavior.

Our hope is that this particular convergence of events will help create a growing synergy around the issue of sports and head injuries and will contribute to a greater awareness regarding this important health issue that affects thousands of recreational, amateur and professional athletes.

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The Seattle Times Winner of a 2010 Pulitzer Prize

Originally published Monday, January 10, 2011 at 4:08 PM

Utah lawmaker seeks concussion law for amateurs

A bill to be considered by the Utah Legislature would require high school athletes and anyone under 18 who suffers a concussion to get medical clearance in order to continue playing.

By JOSH LOFTIN

Associated Press

SALT LAKE CITY —

A bill to be considered by the Utah Legislature would require high school athletes and anyone under 18 who suffers a concussion to get medical clearance in order to continue playing.

State Rep. Paul Ray, R-Clearfield, the sponsor of House Bill 204, said the law would also require amateur adult sports organizations to create concussion policies. The state Legislature convenes Jan. 24.

"We are learning that concussions are serious, and can cause traumatic brain injuries," Ray said. "So if you're going to have organized sports, we're saying that this is the policy you have to follow."

Ray modeled the law after a Washington state law that was passed in 2009, known as Lystedt's Law. Zackery Lystedt, a Washington middle school football player, suffered brain damage in 2006 after he had a concussion and returned to the game.

The proposed law closely mirrors the Utah High School Athletic Association's policy, said assistant Bart Thompson.

Thompson said that some private organizations do not have concussion policies, and those that do are not consistent.

The UHSAA policy doesn't regulate activities such as cheerleading, but the planned measure would. Thompson said they have seen concussion injuries with high school cheerleaders.

Because of the attention that athletes' concussions have received, Thompson said that the policy has not been opposed among high school coaches. The only problem it has caused was with athletes or their parents trying to get premature clearance.

"We're seeing parents and students going physician shopping," Thompson said. "It's not widespread, but it is happening."

The National Conference of State Legislators said about a dozen states have concussion laws. Other states considering similar laws this year include Wyoming and Indiana.

National Football League commissioner Roger Goodell has sent letters to governors urging them to support legislation to prevent concussions.

fox13now.com/news/kstu-utah-lawmakers-move-concussion-law-amateurs,0,7002592.story

KSTU

Utah lawmakers move concussion law for amateurs

Associated Press

8:27 AM MST, January 27, 2011

SALT LAKE CITY (AP)

Utah lawmakers have advanced a proposal to require high school athletes and anyone under 18 who suffers a concussion to get medical clearance in order to continue playing.

The House Health and Human Services Committee unanimously approved HB 204 on Wednesday.

Bill sponsor Rep. Paul Ray, R-Clearfield, says the bill would also require amateur adult sports organizations to create concussion policies.

The bill is modeled after a Washington state law that was passed in 2009, known as Lystedt's Law. Zackery Lystedt, a Washington middle school football player, suffered brain damage in 2006 after he had a concussion and returned to the game.

Opponents say the Washington law has prompted some students and parents to seek clearances to play in advance from physicians.

H.B. 204

PROTECTION OF ATHLETES WITH HEAD INJURIES

2011 GENERAL SESSION

STATE OF UTAH

Chief Sponsor: Paul Ray

Senate Sponsor: _____

LONG TITLE

General Description:

This bill enacts the Protection of Athletes With Head Injuries Act within the Utah Health Code.

Highlighted Provisions:

This bill:

- defines terms;
- requires an amateur sports organization to:
  - adopt and enforce a concussion and head injury policy; and
  - inform a parent or guardian of the policy and obtain the parent's or guardian's signature on the policy before permitting a child to participate in a sporting event;
- describes the requirements of a concussion and head injury policy;
- requires removal of a child from a sporting event when the child is suspected of sustaining a concussion or head injury; and
- prohibits a child described in the preceding paragraph from participating in a sporting event of the amateur sports organization until the child receives medical clearance from a health care provider trained in the evaluation and management of a concussion.

Money Appropriated in this Bill:

None

Other Special Clauses:

None

Utah Code Sections Affected:

ENACTS:

26-53-101, Utah Code Annotated 1953

26-53-102, Utah Code Annotated 1953

26-53-201, Utah Code Annotated 1953

26-53-301, Utah Code Annotated 1953

Be it enacted by the Legislature of the state of Utah:

Section 1. Section **26-53-101** is enacted to read:

CHAPTER 53. PROTECTION OF ATHLETES WITH HEAD INJURIES ACT

Part 1. General Provisions

26-53-101. **Title.**

This chapter is known as the "Protection of Athletes With Head Injuries Act."

Section 2. Section **26-53-102** is enacted to read:

26-53-102. **Definitions.**

As used in this chapter:

(1) "Agent" means a coach, teacher, employee, representative, or volunteer.

(2) (a) "Amateur sports organization" means, except as provided in Subsection (2)(b):

(i) a sports team;

(ii) a public or private school;

(iii) a public or private sports league;

(iv) a public or private sports camp; or

(v) any other public or private organization that organizes, operates, manages, or sponsors a sporting event for its members, enrollees, or attendees.

(b) "Amateur sports organization" does not include a professional:

(i) team;

(ii) league; or

(iii) sporting event.

(3) "Child" means an individual who is under the age of 18.

---

(4) "Licensed health care provider" means:

(a) a physician or surgeon licensed under:

(i) Title 58, Chapter 67, Utah Medical Practice Act; or

(ii) Title 58, Chapter 68, Utah Osteopathic Medical Practice Act;

(b) a physician assistant, licensed under Title 58, Chapter 70a, Physician Assistant Act;

or

(c) an athletic trainer, as defined in Section 58-40a-102 .

(5) "Sporting event" means any of the following athletic activities that is organized, operated, managed, or sponsored by any organization:

(a) a game;

(b) a practice;

(c) a sports camp;

(d) a physical education class;
(e) a competition; or
(f) a tryout.
Section 3. Section **26-53-201** is enacted to read:

Part 2. Concussion and Head Injury Policy

26-53-201. **Adoption and enforcement of concussion and head injury policy -- Notice of policy to parent or guardian.**
Each amateur sports organization shall:
(1) adopt and enforce a concussion and head injury policy that:
(a) is consistent with the requirements of Section 26-53-301 ; and
(b) describes the nature and risk of:
(i) a concussion or head injury; and
(ii) continuing to participate in a sporting event after sustaining a concussion or head injury;
(2) ensure that each agent of the amateur sports organization is familiar with, and has a copy of, the concussion and head injury policy; and
(3) before permitting a child to participate in a sporting event of the amateur sports organization:
(a) provide a written copy of the concussion and head injury policy to a parent or legal guardian of a child; and
(b) obtain the signature of a parent or guardian of the child, acknowledging that the parent or legal guardian has read, understands, and agrees to abide by, the concussion and head injury policy.
Section 4. Section **26-53-301** is enacted to read:

Part 3. Medical Clearance

26-53-301. **Removal of child suspected of sustaining concussion or head injury -- Medical clearance required before return to participation.**
An amateur sports organization, and each agent of the amateur sports organization, shall:
(1) immediately remove a child from participating in a sporting event of the amateur sports organization if the child is suspected of sustaining a concussion or head injury; and
(2) prohibit the child described in Subsection (1) from participating in a sporting event of the amateur sports organization until the child:
(a) is evaluated by a licensed health care provider who is trained in the evaluation and management of a concussion; and
(b) provides to the amateur sports organization written clearance from the

licensed

health care provider described in Subsection (2)(a) for the child to resume participation in the

sporting event of the amateur sports organization.

Legislative Review Note
as of 11-22-10 6:54 AM

Office of Legislative Research and General Counsel

[Bill Documents][Bills Directory]

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A Fact Sheet for Teachers, Counselors, and School Professionals

THE FACTS:

* All concussions are serious.
* Most concussions occur without loss of consciousness.
* Recognition and proper response to concussions when they first occur can help aid recovery and prevent further injury, or even death.

To download this fact sheet in Spanish, please visit: www.cdc.gov/Concussion.
Para obtener una copia electrónica de esta hoja de información en español, por favor visite: www.cdc.gov/Concussion.

What is a concussion?

A concussion is a type of brain injury that changes the way the brain normally works. A concussion is caused by a bump, blow, or jolt to the head. Concussions can also occur from a fall or blow to the body that causes the head and brain to move rapidly back and forth. Even what seems to be a mild bump to the head can be serious.

Children and adolescents are among those at greatest risk for concussion. The potential for a concussion is greatest during activities where collisions can occur, such as during physical education (PE) class, playground time, or school-based sports activities. However, concussions can happen any time a student's head comes into contact with a hard object, such as a floor, desk, or another student's head or body. Proper recognition and response to concussion can prevent further injury and help with recovery.

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

May 2010

What are the signs and symptoms of concussion?

The signs and symptoms of concussion can show up right after an injury or may not appear or be noticed until hours or days after the injury. Be alert for any of the following signs or symptoms. Also, watch for changes in how the student is acting or feeling, if symptoms are getting worse, or if the student just "doesn't feel right."

SIGNS OBSERVED BY TEACHERS AND SCHOOL PROFESSIONALS

- Appears dazed or stunned
- Is confused about events
- Answers questions slowly
- Repeats questions
- Can't recall events *prior* to the hit, bump, or fall
- Can't recall events *after* the hit, bump, or fall
- Loses consciousness (even briefly)
- Shows behavior or personality changes
- Forgets class schedule or assignments

SYMPTOMS REPORTED BY THE STUDENT

Thinking/Remembering:

- Difficulty thinking clearly
- Difficulty concentrating or remembering
- Feeling more slowed down
- Feeling sluggish, hazy, foggy, or groggy

Physical:

- Headache or "pressure" in head
- Nausea or vomiting
- Balance problems or dizziness
- Fatigue or feeling tired
- Blurry or double vision
- Sensitivity to light or noise
- Numbness or tingling
- Does not "feel right"

Emotional:

- Irritable
- Sad
- More emotional than usual
- Nervous

Sleep*:

- Drowsy
- Sleeps *less* than usual
- Sleeps *more* than usual
- Has trouble falling asleep

**Only ask about sleep symptoms if the injury occurred on a prior day.*

What are concussion danger signs?

Be alert for symptoms that worsen over time. The student should be seen in an emergency department right away if s/he has:

- One pupil (the black part in the middle of the eye) larger than the other
- Drowsiness or cannot be awakened
- A headache that gets worse and does not go away
- Weakness, numbness, or decreased coordination
- Repeated vomiting or nausea
- Slurred speech
- Convulsions or seizures
- Difficulty recognizing people or places
- Increasing confusion, restlessness, or agitation
- Unusual behavior
- Loss of consciousness (even a brief loss of consciousness should be taken seriously)

! Children and teens with a concussion should NEVER return to sports or recreation activities on the same day the injury occurred. They should delay returning to their activities until a health care professional experienced in evaluating for concussion says they are symptom-free and it's OK to return to play. This means, until permitted, not returning to:

- Physical Education (PE) class,
- Sports practices or games, or
- Physical activity at recess.

For more information and tool kits for youth sports coaches and high school coaches, visit www.cdc.gov/Concussion.

How can I recognize a concussion?

Teachers and school counselors may be the first to notice changes in their students. The signs and symptoms can take time to appear and can become evident during concentration and learning activities in the classroom.

Send a student to the school nurse, or another professional designated to address health issues, if you notice or suspect that a student has:

1. *Any* kind of forceful blow to the head or to the body that results in rapid movement of the head,

-and-

2. *Any* change in the student's behavior, thinking, or physical functioning. (See the signs and symptoms of concussion.)

What do I need to know about my students returning to school after a concussion?

Supporting a student recovering from a concussion requires a collaborative approach among school professionals, health care providers, and parents, as s/he may need accommodations during recovery. If symptoms persist, a 504 meeting may be called. Section 504 Plans are implemented when students have a disability (temporary or permanent) that affects their performance in any manner.

What to look for after a concussion

When students return to school after a concussion, school professionals should watch for:

- Increased problems paying attention or concentrating
- Increased problems remembering or learning new information
- Longer time needed to complete tasks or assignments
- Difficulty organizing tasks
- Inappropriate or impulsive behavior during class
- Greater irritability
- Less ability to copy with stress or more emotional

Services and accommodations for students may include speech-language therapy, environmental adaptations, curriculum modifications, and behavioral strategies.

Students may need to limit activities while they are recovering from a concussion. Exercising or activities that involve a lot of concentration, such as studying, working on the computer, or playing video games, may cause concussion symptoms (such as headache or tiredness) to reappear or get worse.

Students who return to school after a concussion may need to:

- Take rest breaks as needed,
- Spend fewer hours at school,
- Be given more time to take tests or complete assignments,
- Receive help with schoolwork, and/or
- Reduce time spent on the computer, reading, or writing.

It is normal for students to feel frustrated, sad, and even angry because they cannot return to recreation or sports right away, or cannot keep up with their schoolwork. A student may also feel isolated from peers and social networks. Talk with the student about these issues and offer support and encouragement. As the student's symptoms decrease, the extra help or support can be removed gradually.

For more information on concussion and to order additional materials for school professionals **FREE- OF-CHARGE**, visit: **www.cdc.gov/Concussion**.

CURRICULUM VITAE

Stuart J. Glassman, MD, FAAPMR, MROCC, CIME
Granite Physiatry, PLLC
60 Commercial Street, Suite 303
Concord, NH 03301

Telephone: (603) 223-8145 (work)
(603) 223-8146 (fax)

Date of Birth: June 14, 1964

Place of Birth: Brooklyn, NY

Citizenship: United States

Post Graduate Training:

Residency, Physical Medicine and Rehabilitation
New York University Medical Center, New York, N.Y.
PGY-2, PGY-3, PGY-4 July 1990 - June 1993

Clinical Base/Internship
PGY-1, Internal Medicine/Surgery
New York University Medical Center/Bellevue Hospital/
Manhattan V.A. Medical Center, New York, N.Y. July 1989 - June 1990

Education:

State of University of New York at StonyBrook Health
Science Center, StonyBrook, N.Y. Sept. 1985 - May 1989
Degree: M.D. M.D. May 1989

State University of New York at Binghamton/Harpur
College, Binghamton, N.Y. Sept. 1981 - May 1985
Degree: B.S. - Biology B.S. May 1985

Licensures:

New York State -- #182880	July 1990
Massachusetts -- #77512	April 1993
New Hampshire -- # 9153	May 1994
New Jersey -- # 61732	January 1995
DEA # BG 2389321	July 1990
DEA # BG 4039942	May 1994
NJ CDS # D065759	March 1995

Certifications:

Diplomate, National Board of Medical Examiners July 1990
Diplomate, #4426, American Board of Physical
Medicine and Rehabilitation May 1994
Re-certification June 2014

Fellow, American Academy of PM & R	October 1994
AAPM & R Disability Evaluation Certification Course	October 1996
Fellow, American Association if Cardiovascular and Pulmonary Rehabilitation	November 1997
Medical Review Officer Certification Council, Certificate Number 06-07015	November 2006
American Board of Independent Medical Examiners	June 2007

Awards and Honors:

Phi Beta Kappa, Harpur College/SUNY Binghamton	May 1985
Outstanding Academic Performance, Harpur College	May 1985
Physician's Recognition Award, American Medical Association	1997-present

Professional Society Membership:

American Academy of PM & R	July 1990 - Present
American Medical Association	July 1990 - Present
New England Society of PM & R	Nov. 1993 - March 1995
American Association of Cardiovascular and Pulmonary Rehabilitation	Jan. 1994 - 2002
Massachusetts Association of Cardiovascular and Pulmonary Rehabilitation	Jan. 1994 - March 1995
New Jersey Society of PM & R	July 1995 - April 1997
Tri-State Society of Cardiovascular and Pulmonary Rehabilitation	June 1995 - April 1997
American College of Sports Medicine	June 1995- July 2000
American Association of Electrodiagnostic Medicine	Nov. 1995 - Present
Diplomate, Association of Academic Physiatrists	May 1996 - Present
President, New Hampshire Society of PM & R	July 1997 - Present
New Hampshire Medical Society	April 1997 - Present
Executive Committee, Council of State Society Presidents, AAPM & R	Nov. 1997 - 2000, 2003, 2005
Health Policy and Legislative Committee, AAPM & R	Nov. 1997 - 2000, 2003, 2005, 2008-2009
Physiatric Association of Spine, Sports and Occupational Rehabilitation (PASSOR)	July 2000- March 2009
American College of Occupational and Environmental Medicine	Dec. 2006-present
Best Doctors Occupational Health Institute (NH/MA)	Apr. 2007-present

Clinical Appointments:

Medical Review Officer, Concord Hospital	Dec. 2006-present
Medical Director Concord Hospital Occupational Health Services Concord, NH	Oct. 2006-present
President, Granite Physiatry, P.L.L.C.	Jan. 2003 - present
Consulting Physiatrist St. Joseph's Hospital	

Nashua, NH — Nov. 1998 - Present

HEALTHSouth Sports Medicine Center
Manchester, NH — Oct. 1999 - Sept. 2004

HEALTHSouth Sports Medicine Center
Durham, NH — Sept. 2000 - Jan. 2008

HEALTHSouth Sports Medicine Center
Salem, NH — Sept. 2001 - Jan. 2003

Medical Director
HEALTHSouth Outpatient and Sports Medicine Center
Nashua, NH — June 1997 - June 2005
Keene, NH — Nov. 1998 - June 2004

Medical Director
HEALTHSouth Rehabilitation Hospital
Concord, NH
- Medical Director: Orthopaedic/Trama, Amputee, Oncology, Spinal Cord Injury Rehabilitation
- Medical Director, Inpatient Phase 1B Cardiac Rehabilitation — April 1997 - Jan. 2006
- Chairman, Institutional Review Board — May 1998 - Jan. 2006
- President, Medical staff — July 1998 - Dec. 2000

Consulting Physiatrist
Concord Hospital
Concord, NH — April 1997 - Present
- Trauma Services Committee — April 1999 - 2003

Consulting Physiatrist
Elliot Hospital / Catholic Medical Center
Manchester, NH — April 1997 - Present

Attending Physiatrist
Shore Memorial Hospital
Somers Point, NJ — Oct. 1995 - April 1997

Attending Physiatrist
Atlantic City Medical Center
Atlantic City, NJ — May 1995 - April 1997
- Level II Trauma Team physician
- Electrodiagnostic Clinic physician

Attending Physiatrist
Mainland Manor Nursing Facility
Pleasantville, NJ — March 1995 - April 1997
- Subacute Rehabilitation Program physician

Attending Physiatrist
Bacharach Institute for Rehabilitation
Pomona, NJ — March 1995 - April 1997
- Medical Director, Inpatient Cardiac Rehabilitation
- Medical Director, Orthopaedic Rehabilitation

- Medical Director, Pediatric Rehabilitation
- Medical Director, Post – Polio Center
- Electrodiagnostic Center physician
- Disability Evaluation physician
- Medical Director, Outpatient Cardiac Rehabilitation

Attending Physiatrist
New England Rehabilitation Hospital
Woburn, MA — July 1993 – March 1995

- Medical Director, Inpatient Cardiac Rehabilitation
- Medical Director, NERH Outpatient Spine Center, Nashua, NH
- Assistant Medical Director, NERH Outpatient Center, Billerica, MA
- Medical Director, NERH Outpatient Center, Salem, NH

Consulting Physiatrist
Cheshire Medical Center/Farnum Rehabilitation Center
Keene, NH — March 2000 – Present

Medical Director
HealthSouth New England Rehabilitation Center
St. Joseph's Hospital, Nashua, NH — May 2000 – October 2000

Academic Appointments:

Faculty, On Doctoring Program, Dartmouth Medical School — Sept, 2010-present

Adjunct Assistant Professor, Dartmouth Medical School, Dept. of Community and Family Medicine
Hanover, NH — Oct. 1998 – present

Clinical Assistant Professor, University of Medicine and Dentistry of New Jersey, Robert Wood Johnson Medical School, Dept. of PM & R, Boston, MA — March 1996 – April 1997

Adjunct Clinical Instructor, Boston University School of Medicine, Dept. of PM & R, Boston, MA — Feb. 1995 – Dec. 2005

Clinical Instructor, Tufts University School of Medicine, Dept. of PM & R, Boston, MA — Nov. 1993 – Present

Sports Medicine Medical Appointments:

Concussion Physician Specialist:

--Concord High School/Rundlett Middle School, Concord, NH — August 2010-present
--Bedford High School, Bedford, NH — July 2010-present
--Bishop Guertin High School, Nashua, NH — March 2010-present

Concussion Physician Consultant:

New England College, Henniker, NH — January 2010-present

Tilton School, Tilton, NH	January 2010-present
Credentialed ImPACT Consultant, ImPACT Corp. (Pittsburgh, PA)	Nov. 2009
New Hampshire Advisory Council on Sports Related Concussions (NH Medical Society representative)	Nov. 2009-present
Concussion Advisor, Bedford Jaguars American Youth Football Program, Bedford, NH	August 2009-present

Team Physician:

Bishop Elite AAU Basketball Program (13U-17U), Manchester, NH	August 2009-present
Preceptor, Concord Hospital/Dartmouth Family Practice Residency Program Pre-Season Athletic Physicals	August 2009-present
Attending Physician, Concord/Dartmouth Family Practice Residency Program, Musculoskeletal Medicine/Sports Medicine Rotation	Oct. 2008-present
Screening Physician, New Hampshire Musculoskeletal Institute/ Safe Sports Network Pre-season participation examinations, Manchester, NH	June 2008, June 2009
Physician, Crane Clinic, Waterville Valley Ski Area, Waterville, NH	Nov. 2006-March 2008
Medical Staff, Boston Marathon/Boston Athletic Association	April 1994, April 1996
Physician, New York City Marathon Medical Corps	Nov. 1990, Nov. 1991, Nov. 1992, Nov. 1993

Professional Committees:

NH Attorney General's Office, Prescription Opioid Abuse Summit Work Group	Oct. 2009-present
New Hampshire Medical Society Prescription Drug Task Force	Oct. 2009-present
Quality Practice and Policy Committee, AAPM&R	Oct. 2009-present
Program Planning Committee, AAPM&R Vice Chair, Practice Management Tract	Oct 2009-present
Treasurer, NH Medical Society	Sept. 2009-present
Medical Education Committee, AAPM&R (VA Education Initiative)	2009

ACOEM Alternate Delegate, NECOEM	March 2008-present
Member-at-Large, Executive Committee, New Hampshire Medical Society	January 2008-Sept. 2009
Member, ACOEM State Government Affairs Committee	December 2007-present
Chair, New Hampshire Medical Society Task Force On Community Care for Returning Soldiers	November 2007-present
Member, Discussion Group, United States Department of Defense Subcommittee on Returning Soldier Care	October 2007
Chairman, Injured Soldier Work Group, AAPM&R Chairman, Injured Soldier Task Force, AAPMR	May 2007-Nov. 2008 Dec. 2008-present
Member, Work Group, Rehabilitative Care of the Returning Soldier (AAPMR)	Nov. 2006-May 2007
Clinical Quality Improvement Committee, Anthem Blue Cross/Blue Shield NH	2007-present
Diagnostic Imaging Committee Anthem Blue Cross/Blue Shield, NH	2006-2007
Occupational Medicine SIG, AAPM&R	2006-present
Sports Medicine SIG, AAPM&R	2006-present
Chairperson, HealthSouth National Physician Advisory Board	Jan 2003 – Jan. 2006
Member, HealthSouth National Physician Advisory Board	April 2001 – Jan. 2003
Business/Medical Practice Committee, AAPM&R	Nov. 2000 – Present
Oral Board Examiner, The American Board of Physical Medicine and Rehabilitation	May 2000
Medical Director, Worker's Compensation Managed Care Program Holland CompCare, Concord, NH	Jan. 2000 – 2003
Chairman, Council of State Society Presidents, AAPM & R	Nov. 1999 – Oct. 2000 Oct. 2004 – Oct. 2005
Faculty Facilitator, Study Guide Subcommittee, 2008 Chronic Pain Group, Archives of PM&R	March 2006-present
2001 Study Guide Subcommittee, Cardiopulmonary Rehabilitation, AAPM & R	1999 – 2000
Fiscal/Budgetary Task Force, AACVPR	1999 – 2000
Program Planning Committee, AACVPR	1999 – 2000

Board of Governors, Ex-Officio Member, AAPM & R	1999 - 2000 2004 - 2005
Business/Practice Task Force, AAPMR	1999 - 2000
New Hampshire Trauma Medical Review Committee	April 1999 - 2005
President, NH Society of PM&R	1997 - Present
Governor's Commission on Disability Concord, NH	Sept. 1998 - 2003
Board of Directors, American Association of Cardiovascular and Pulmonary Rehabilitation	Sept. 1998 - 2000
Cardiac Rehabilitation Task Force, HEALTHSouth Corporation	1997
Chairman, Pharmacy and Therapeutics Committee, HEALTHSouth Rehabilitation Hospital	May 1997 - Jan. 2006
Physician Reviewer Northeast Health Care Quality Foundation - NH	June 1997 - Present
Carrier Advisory Committee C & S Administrative Services for Medicare New England States	April 1997 - Present
Journal Reviewer	
- American Journal of Physical Medicine and Rehabilitation	1999 - Present
- Archives of Physical Medicine and Rehabilitation	1997 - Present
- Guidelines for Cardiac Rehabilitation Programs, 3rd edition, AACVPR	1998
Associate Recertification Item Writer American Board of Physical Medicine and Rehabilitation	1994 - 1997, 2000-2001
Americana Academy of Physical Medicine and Rehabilitation Liaison to the American Association of Cardiovascular and Pulmonary Rehabilitation	1995 - 2003
CardioPulmonary Rehabilitation SIG, AAPM&R	1994 - Present
- Practice Guidelines Chair	1995 - 2003
- Education Program Chair	1996
Chairman, Pharmacy and Therapeutics Committee Bacharach Institute for Rehabilitation	1996 - 1997
AACVPR Professional Liaison Committee	1996 - 2000
AACVPR Credentials Committee	2000 - 2002
Institutional Review Board, Bacharach Institute for Rehabilitation	1996 - 1997

Board Member, Northern New England, ALS Association	2003 – 2006
President, NNEALS Association Board of Directors	2004- 2005
Member, NNEALS Community Leadership Council	2008
Member Board of Trustees, Amyotrophic Lateral Sclerosis Association Calabasas Hills, California	Oct. 2001 – April 2003
Regional Medical Director, Northeast Region, HEALTHSouth Corporation	April 2001 – 2003
Board of Governors, Fairlawn Rehabilitation Hospital, Worcester, MA	July 2002 – Jan. 2006
Medical Advisory Panel, Advance for Medical Directors In Rehabilitation Journal	January 2002 – Present
Faculty Facilitator, Archives of PM&R 2008 Study Guide on Chronic Pain	May 2006-Dec. 2007
Faculty Facilitator, Archives of PM&R 2010 Study Guide On Pediatric Rehabilitation	April 2008-March 2010

Research Activities:

Founder, Hilda Glassman Clinical Management Research Grant Program, Amyotrophic Lateral Sclerosis Association, Calabasas, CA	1998 – Present
Co-investigator, Multi-Center Study for Long Term Follow up after Inpatient Phase 1B Cardiac Rehabilitation	1999- 2001
Co-investigator, BOTOX Clinical Trial for Upper Limb Spasticity in Stroke Patients, sponsored by Allegran, Inc.	1996
Alternate Panel Reviewer, NIH/National Heart, Lund, and Blood Institute Grant Proposal, "Lund Volume Reduction Surgery Multi-Center Study"	1996

Professional Presentations:

"Spinal Functional Restoration", Boston Occupational Health Nurses Association, Woburn, MA	1994
"Fibromyalgia: Current Management and Treatment"	
- Nashua, NH Arthritis Support Group	1995
- Atlantic County Fibromyalgia Support	
- Group, Pomona, NJ	1995
"Cardiac Rehabilitation for Lower Extremity Amputee Patients", JFK-Johnson Rehabilitation Institute, Edison, NJ	1996

"Electrodiagnosis of Post Polio Syndrome", JFK-Johnson Rehabilitation Institute, Edison, NJ 1996

"Post-Polio Syndrome: Current Trends in Prognosis and Treatment", Atlantic County Post-Polio Support Group Annual Meeting, Mays Landing, NJ 1996

"CardioPulmonary Rehabilitation in the Acute Rehabilitation Hospital Setting". AACVPR Annual Meeting, Baltimore, MD 1996

"Cardiac and Pulmonary Rehabilitation in the Spinal Cord Injured Patient", JFK-Johnson Rehabilitation Institute, Edison, NJ 1996

"Disability Evaluation in Post-Polio Syndrome" International Polio Network Symposium, St. Louis, MO 1997

"Impact of Cardiac Disease on Outcomes of Physical Rehabilitation", AACVPR Annual Meeting, Dallas, TX 1997

Session Chair, "Cardiac Rehabilitation for Physically Challenged Populations", AACVPR Annual Meeting, Dallas, TX 1997

"Oncology Rehabilitation", HealthSouth Rehabilitation Hospital Concord, NH 1997

"Stroke Rehabilitation", NH/Concord Family Practice Residency Program, Concord, NH 1997

"Rehabilitation of the Complex Cardiopulmonary Patient", AAPM&R Annual Assembly, Seattle, WA 1998

"Administrative Concerns in Phase 1B Cardiac Rehabilitation Programs", AAPM&R Annual Assembly, Seattle, WA 1998

"Post-Operative Acute and Subacute Pain Management",
St. Joseph's Hospital, Nashua, NH
Eastern Maine Medical Center, Bangor ME
VA Hospital, Manchester, NH 1998

"Legislative Advocacy for Physical Medicine and Rehabilitation" AAPM& R, Annual Assembly, Washington, D.C. 1999

"Cardiac Rehabilitation - Update 2002" 2002
JFK Johnson Rehabilitation Institute, Edison, NJ

"Stroke Rehabilitation" 2004
Dartmouth Medical School, Hanover, NH

"The Physiatric Model for Care of the Worker's Compensation Patient" 2006
Lorman Education Series, Manchester, NH

"Independent Medical Exams/Permanent Impairment Ratings" 2005
New Hampshire Legal Conference, Concord, NH

"Narcotic Drug Testing in Worker's Compensation Cases", 2007
Comp-Sigma Corp., Concord, NH

"How to Develop an Independent Medical Exam", Lorman 2007
Education Series, Manchester, NH

"Permanent Impairment Ratings", Lorman Education Series, 2007
Manchester, NH

"Cardiac Rehabilitation", "Independent Medical Exams" 2007
Tufts University Dept. of PM&R, Resident Lecture Series,
Woburn, MA

"Physiatry Input to the Community Care of the Returning Soldier
from Iraq and Afghanistan"
AAPM&R Annual Assembly, Boston, MA 2007

New Hampshire Medical Society Annual Scientific Meeting 2007
Gilford, NH

"Occupational Injury Management – A Physiatry Perspective 2008
as Medical Director"
Dartmouth Medical School Family Practice Residency Lecture,
Concord, NH

"Public Policy 101 – Dartmouth Advocacy" – NH Medical Society/ 2008
Dartmouth Medical School presentation
Hanover, NH

"Medical Guidelines for Work Injury Treatment" 2008
Concord Hospital Grand Rounds, Concord, NH

"Permanent Impairment Ratings Update 2008" 2008
Harvard Medical School, Occupational and Environmental
Medicine Residency Program Career Seminar Lecture,
Boston, MA

"The Anatomy of the Independent Medical Exam"
Department of Labor, Concord, NH 2008

New Hampshire Association of Justice Worker's 2008
Compensation CLE meeting, Bedford, NH

"Chronic Pain Management – A Physiatry Perspective" 2008
Dartmouth Medical School Family Practice
Residency Lecture, Concord, NH

"Advocacy 101 – The New Hampshire Experience"

AAPM&R Annual Assembly, San Diego, CA	2008
AAPM&R Annual Assembly, Austin, TX	2009

"Concussion Management in the Adolescent/Teenage Athlete"

Merrimack High School, Merrimack, NH	Oct. 2009
Alvirne High School, Hudson, NH	Oct. 2009
Soughegan High School, Amherst, NH	Oct. 2009
Concord Hospital Grand Rounds, Concord, NH	Jan. 2010
Dartmouth Hitchcock Family Practice Residency Program, Concord, NH	March 2010
Merrimack Valley High School, Penacook, NH	March 2010
Franklin Regional Hospital, Franklin, NH	April 2010
Pembroke Academy, Pembroke, NH	April 2010
Concord Hospital PT North Rounds, Concord, NH	May 2010
Concord High School Administration meeting, Concord, NH	May 2010
Concord Hospital CAMP program, Concord, NH	June 2010
Concord Emergency Medicine Associates meeting, Concord, NH	June 2010
John Stark Regional High School, Weare, NH	June 2010
Concord Hospital Trauma Review Committee meeting	August 2010
Bedford High School 'Meet The Coaches Night'	August 2010
AAPM&R Annual Assembly, Seattle, WA	Nov. 2010

" Concussion Assessment Tools"
The Management of Sports Related Concussion Symposium
Bedford, NH — Sept. 2010

"Management of Concussions" — Oct. 2010
New Hampshire Medical Society Annual Scientific Meeting
Kennebunkport, Maine

"Advocacy Workshop: A Hands-On Approach to Real Life Advocacy Interactions"

AAPM&R Annual Assembly, Austin, TX	Oct. 2009
AAPM&R Annual Assembly Seattle , WA	Nov. 2010

"Advocacy 201: The New Hampshire Concussion Experience"
AAPM&R Annual Assembly, Seattle, WA — Nov. 2010

"Becoming an Occupational Health Medical Director: The Evolution of a Physiatry Career"
AAPM&R Annual Assembly, Seattle, WA — Nov. 2010

Publications:

Glassman SJ: Pulmonary Rehabilitation in the Acute Inpatient Rehabilitation Hospital. Respiratory Care Clinics of North America. Volume 4, 1: 47-57, 1998.

Glassman SJ: Pulmonary Dysfunction. In Shankar (ed): Exercise Prescription. Philadelphia, Hanley and Belfus, 1998, pp. 133-144.

Glassman SJ: Cardiac Rehabilitation After Left Ventricular Volume Reduction Surgery: A Case Study.

Arch Phys Med Rehabil. 79:1158, 1998.

Glassman SJ. Bilateral radial artery conduits for coronary artery bypass grafting: a case report of effective rehabilitation outcomes in a patient with previous lower extremity venous stripping. Arch Phys Med Rehabil. 81: 1303, 2001. (abstract)

Glassman SJ. Two stage elephant trunk repair for aortic aneurysm in a 55 year old woman with marfan's syndrome: a case study of surgical and rehabilitation issues. Arch Phys Med Rehabil. 81: 1303, 2000. (abstract)

Glassman SJ, Rashbaum IG, Walker WC. Cardiopulmonary rehabilitation and cancer rehabilitation. 1. Cardiac rehabilitation. Arch Phys Med Rehabil 2001;82 Suppl 1:S47-51.

Rashbaum IG, Walker WC, Glassman SJ. Cardiopulmonary rehabilitation and cancer rehabilitation. 2. Cardiac rehabilitation in disabled populations. Arch Phys Med Rehabil 2001;82 Suppl 1:S52-5.

Walker WC, Glassman SJ, Rashbaum IG. Cardiopulmonary rehabilitation and cancer rehabilitation. 3. Pulmonary rehabilitation. Arch Phys Med Rehabil 2001;82 Suppl 1:S56-62.

Worsowicz GM, Glassman SJ. Impairment rating of the cardiovascular system. Phys Med Rehab Clin N. Amer. 12:3; 659-665.. Aug 2001.

Glassman, SJ. Forward Thinking Examining the past and future impact of the 75 percent rule. Advance Oct 2005; 29-32

Reviewer/Contributor, AMA Guidelines to the Evaluation of Permanent Impairment 6th Edition—The Guides Casebook Third Edition. USA, American Medical Association, 2008

References:
Furnished upon request.

Committee Report

STATE OF NEW HAMPSHIRE

SENATE

REPORT OF THE COMMITTEE

Date: February 11, 2011

THE COMMITTEE ON Health and Human Services

to which was referred Senate Bill 95

AN ACT establishing a committee to study youth sports concussions.

Having considered the same, the committee recommends that the Bill:

OUGHT TO PASS WITH AMENDMENT

BY A VOTE OF: 4-0

AMENDMENT # 0295s

Senator Andy Sanborn
For the Committee

Robyn Dangora 271-7585

New Hampshire General Court - Bill Status System

Docket of SB95

Docket Abbreviations

Bill Title: (New Title) establishing a commission to study youth sports concussions and other concussions received while at school.

Official Docket of **SB95**:

Date	Body	Description
1/19/2011	S	Introduced and Referred to Health and Human Services, **SJ 3**, Pg.35
1/26/2011	S	Hearing: 2/3/2011, Room 102, LOB, 2:00 p.m.; **SC9**
2/14/2011	S	Committee Report: Ought to Pass with Amendment **#2011-0295s**, NT, 2/23/11; **SC12**
2/23/2011	S	Committee Amendment 0295s, NT, AA, VV; **SJ 7**, Pg.73
2/23/2011	S	Ought to Pass with Amendment 0295s, NT, MA, VV; OT3rdg; **SJ 7**, Pg.73
2/23/2011	S	Passed by Third Reading Resolution; **SJ 7**, Pg.77
3/16/2011	H	Introduced and Referred to Education; **HJ 28**, Pg.882
4/26/2011	H	Public Hearing: 5/10/2011 1:00 PM LOB 207
4/27/2011	H	Executive Session: 5/17/2011 1:00 PM LOB 205-207
5/18/2011	H	Committee Report: Inexpedient to Legislate for May 25 (Vote 13-3; CC); **HC 41**, PG.1391
5/25/2011	H	Removed from Consent Calendar (Rep Gile); **HJ 46**, PG.1579
5/25/2011	H	Inexpedient to Legislate: MA DIV 289-83; **HJ 46**, PG.1600-1601

NH House NH Senate

Other Referrals

COMMITTEE REPORT FILE INVENTORY

SB 95 ORIGINAL REFERRAL _____ RE-REFERRAL

1. THIS INVENTORY IS TO BE SIGNED AND DATED BY THE COMMITTEE AIDE AND PLACED INSIDE THE FOLDER AS THE FIRST ITEM IN THE COMMITTEE FILE.
2. PLACE ALL DOCUMENTS IN THE FOLDER FOLLOWING THE INVENTORY IN THE ORDER LISTED.
3. THE DOCUMENTS WHICH HAVE AN "X" BESIDE THEM ARE CONFIRMED AS BEING IN THE FOLDER.
4. THE COMPLETED FILE IS THEN DELIVERED TO THE CALENDAR CLERK.

✓ DOCKET (Submit only the latest docket found in Bill Status)

✓ COMMITTEE REPORT

✓ CALENDAR NOTICE

✓ HEARING REPORT

✓ HANDOUTS FROM THE PUBLIC HEARING

✓ PREPARED TESTIMONY AND OTHER SUBMISSIONS

✓ SIGN-UP SHEET(S)

ALL AMENDMENTS (passed or not) CONSIDERED BY COMMITTEE:

✓ - AMENDMENT # 1195 ✓ - AMENDMENT # 2705

✓ - AMENDMENT # 2125 ✓ - AMENDMENT # 2955

ALL AVAILABLE VERSIONS OF THE BILL:

✓ AS INTRODUCED ___ AS AMENDED BY THE HOUSE

___ FINAL VERSION ✓ AS AMENDED BY THE SENATE

___ OTHER (Anything else deemed important but not listed above, such as amended fiscal notes): _____

IF YOU HAVE A RE-REFERRED BILL, YOU ARE GOING TO MAKE UP A DUPLICATE FILE FOLDER

DATE DELIVERED TO SENATE CLERK 8/11/11 Robyn (by Susan)

BY COMMITTEE AIDE

Revised 2011