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Concussion Policy Development at the YMCA of Missoula

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CONCUSSION POLICY IMPLEMENTATION FOR THE YMCA OF MISSOULA

By

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Concussion Policy Implementation for the YMCA of Missoula

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Abstract: This professional paper addresses the implementation of concussion policy for the YMCA of Missoula. Specifically, evaluating concussion policy throughout the United States and determining key aspects of implementation. Evaluating the role of all people who that are influenced by concussion policy is imperative to developing a sound policy. Athletes, parents, coaches and health care providers each play essential roles when considering the effectiveness of policy implementation. While exploring varying concussion policies and research, this professional paper recognizes each of these essential aspects and incorporates them into the final Concussion Policy by the YMCA of Missoula.

Chapter 1

Purpose Statement

This project's purpose is to create a concussion policy for the YMCA of Missoula. In addition, we assessed YMCA coaches' knowledge of concussions and examined adherence to the policy. A secondary goal for this project is to apply the policy template to other sport organizations, creating additional concussion policies in Montana athletic communities.

Introduction

Concussions have become a major concern in athletics due to long term health effects exposed by health care professionals and the media. In the previous 10 years, research has significantly advanced regarding brain injuries. With these advances, researchers have discovered and defined injuries such as mild traumatic brain injuries (mTBI), second impact syndrome, and sub-concussive forces.[1] Collectively, these injuries can contribute to diseases such as chronic traumatic encephalopathy (CTE) and Alzheimer's disease.[2] Although there is much more research needed to solidify these etiologies, the connection between brain injuries and chronic brain diseases is clear. Because of the public interest in athletic concussions protective policies concerning brain injuries have been implemented in professional, collegiate, and high school athletics. These policies are enforced by governing bodies such as the National Football League, National Hockey League, National Collegiate Athletic Association, and state-wide legislation.

Due to recent discoveries about the consequences of brain injuries, concussions in the youth population are a growing medical concern. The Brain Injury Research Institute (BIRI) reports that approximately 1.3-3.8 million mTBI are diagnosed annually. This accounts for

approximately 10% of youth athletes participating in contact sports acquiring a concussion.[3] Due to these elevated numbers many states have developed policies for mTBIs related to athletics.

State laws address concussion concerns through three avenues: 1) requiring education for coaches, parents, and athletes, 2) requiring removal from play if a concussion is suspected, 3) and medical clearance from a licensed heath care provider.[4] In addition to the basic aspects of state legislation, the Korey Stringer Institute outlines nine guidelines to develop policies that meet the minimum of best practice: 1) creation of an Emergency Action Plan covering life threatening injuries and concussions, 2) requiring the use of certified helmet/equipment, 3) use of a preparticipation exam (PPE) adequately covering concussions, 4) adequate education for parents, athletes, and coaches, 5) removal from participation of athletes suspected of a concussion, 6) to return to participation athletes must be cleared by a licensed health care professional, 7) athletes are not permitted to return to participation until they have returned to school, 8) athletes must complete a graduated return to participation protocol, 9) and a medical-management plan for acute care of head or cervical injuries.[5]

California, Texas, and Tennessee currently have the strongest concussion policies, implementing six of the nine guidelines provided by the Korey Stringer Institute (KSI). On the other side of the spectrum, Colorado and Illinois have the least restrictive concussion policies, implementing only two of the nine guidelines described by the KSI. The rest of the states have between three and six of these policies embedded in their legislation.[5] Although these guidelines from the KSI provide a measure of the strength of each state's legislation, the definitions of health care providers and concussions given in each state's law determine the strictness of the law.

Language used in concussion legislation creates confusion as to who can evaluate concussions, what medical care is needed for an athlete who sustains a concussion, and when an athlete can return to participation. Because each state varies in their wording, it is vital for health care providers, coaches, and parents to be educated about their state's legislation. Each of these individuals shoulder different roles in the process of evaluation, treatment, and return to play.

The first state to pass concussion legislation was Washington, creating the Zachary Lystedt Law in 2009.[6] Zach Lystedt was a junior high football player who suffered a concussion ending the first half of a game. By the third quarter Zach was put back into the game where he suffered several more blows to the head before collapsing and being flighted to an emergency department for surgery to relieve the pressure on his brain. Three months later Zach awoke and began the long recovery process to living a normal life.[7] This incident led the nation to develop legislation protecting athletes against the harmful effects of mistreating concussions. From the implementation of the Zach Lystedt Law in 2009 to the present, all 50 states have implemented concussion policies.[5]

Implementation of the Dylan Steigers Act

The Dylan Steigers Protection of Youth Athlete Act (DSPYAA) of Montana has three main components: 1) concussion education for athletes, coaches and officials, 2) removal from competition if a concussion is suspected, and 3) a return to participation protocol once the athlete is cleared by a medical professional. This act was implemented in 2013, and has been important for athlete health by providing increased recognition for the consequences of a mistreated concussion.[8]

The implementation of this policy has resulted in recognition, diagnosing, and treating concussions.[9] The educational component of this law has provided coaches, parents and athletes

with training regarding recognition of symptoms and how to seek medical attention.[10] Accessing the correct medical personnel provides the athletes with the correct treatment and return to play protocols. However, there are aspects of the law that fall short of protecting all Montana athletes from injury.

Currently, the DSPYAA only enforces these protocols for events sanctioned by the school district or Montana High School Association (MHSA).[8] The Centers for Disease Control and Prevention (CDC) reported that 55% of youth concussions occur in athletes under the age of fourteen.[11] This reveals that over half of youth athletes suffering from concussions are not protected by DSPYAA. Due to this shortcoming, the University of Montana Athletic Training Department has worked with the YMCA of Missoula to develop a policy that protects youth athletes participating in YMCA athletics. The YMCA Concussion Policy contains the same aspects as the Dylan Steigers Act: education for coaches, parents, and athletes, removal from competition in the event of a concussion, and an appropriate return to play protocol.

The Athlete

Concussion policies charge the athlete with two responsibilities: recognizing the signs and symptoms of a concussion, and reporting these signs and symptoms to a coach, parent, or medical professional.[5] A study by Chrisman et al.[12] showed that athlete education regarding concussions in the United States is devastatingly low. Only 34.7% of athletes could correctly identify the signs and symptoms of a concussion.[12] However, other studies showed that athletes provided with education were better able to identify the signs and symptoms of a concussion in short term and long term retention (34% increase of passing rate).[13] Educating these athletes to recognize the signs and symptoms of concussions is imperative to protecting the athlete from

further harm. The inability to recognize a cognitive impairment makes self-reporting difficult for the athlete.

Self-reporting a concussion brings into light another aspect of education. Currently, sport culture encourages athletes to continue participation when injured, believing that it shows mental and physical toughness. This is a cultural practice that needs to be diverted from concussions. A concussion can turn into a life altering event if mistreated, a fact that seems to be lost on most athletes. Research shows that athletes who undergo education seminars on the reporting of symptoms respond positively in short term; however, follow-up surveys report no effect regarding the athlete's attitude about reporting of signs and symptoms to their parents or coaches.[14] Because athletes show hesitation in reporting these signs and symptoms they put themselves at risk for greater injury that could be life altering. To avoid this scenario, it is crucial to provide frequent education for the athlete regarding the consequences of under-reporting symptoms.[15]

The athlete needs to understand that these legislative measures are in place for their well-being. Parents, coaches, and health care professionals are concerned for their future health, and following these policies works to ensure the best practice of care is provided for them.

The Parent

The parent is charged with three responsibilities in concussion legislation: recognizing the signs and symptoms of a concussion, reporting these signs and symptoms, and understanding the athlete's need for medical clearance to return to participation.[5] Studies show that the parents are the least educated party in regard to concussions. Only 16% of parents in the Chrisman et al.[12] study participated in any form of education, even though 57.9% of those surveyed parents signed documentation that they were educated on the topic.[12] This shows that the parent

population is grossly under educated on their responsibilities. It is imperative to properly educate parents so they can recognize the signs and symptoms of a concussion and seek the appropriate medical attention.

Reporting the signs and symptoms of a concussion often involves a conversation with both the coach and health care provider. Ideally, the coach and health care provider work cohesively to provide the athlete with the correct treatment and time to heal from a concussion. However, circumstances are not always ideal for the athlete to receive consistent medical coverage, or oversight from the coaching staff. Staffed medical professional are not common in youth athletics, and some teams only meet on a weekly, or biweekly basis for practice. These circumstances place the parent as the most responsible party for the athlete's health, meaning they must be an advocate for their child to follow the policy.

Although the parent plays a significant role, each state defines the responsibilities of the parents differently. Cremer et al[16] outlined six parental responsibilities that were found across all state legislations: 1) Parents must receive handouts or documentation regarding concussion signs, symptoms and management, 2) Parents must sign documentation that they received information from the school annually, 3) Parents must receive formal education regarding concussions, 4) Parents have a duty to remove their child from play if they are exhibiting signs or symptoms of a concussion, 5) Parents must inform the school if their child has received a concussion and, 6) The school must inform parents if their child receives a concussion.[16]

Collectively, these requirements show an immense level of involvement from the parent; however, no state policy implements all of these responsibilities. In fact, the last three parental responsibilities are minimally enforced. Only two states require the parent to remove the child from play if they suspect a concussion, four states require the parent to inform the school if their

child received a concussion, and five states require the school to inform the parent if the child received a concussion. Four states; Arkansas, Indiana, Oregon and Vermont, fail to mention the role of the parent completely.[16] Because the parent makes the final decisions regarding the athlete's health, it is imperative to educate them on the best practice of care for their children. Failing to educate and inform the parent population reveals major shortcomings in policy development.

The Coach

According to legislation, the coach and the parent have these similar responsibilities: receiving an education on concussions, recognizing signs and symptoms of concussions, referring the athlete to the appropriate medical professional, and enforcing a return to participation protocol.[5] Furthermore, the coach determines if the athlete is going to play or sit out. Traditionally, coaches encourage athletes to fight through the pain of an injury. Coaches teach athletes to obey their instructions, and motivate athletes to perform at their highest level, even when battling an injury. While a motivational quality is often present in successful coaches, it is vital that coaches do not encourage athletes with concussions to continue playing through their symptoms. Legislation has implemented liability on the coaches to insure they will refrain from this behavior.[8]

Coaches are the most educated demographic excluding health care providers. Nearly 100% of coaches undergo concussion training.[12] Research shows that coach education is effective; however, there are still misguided assumptions surrounding concussions. Forty-two percent of coaches thought loss of consciousness was necessary to sustain a concussion, and thirty-two percent of coaches believed that a low grade concussion was not grounds for removal from competition. Furthermore, 26% of coaches would let athletes who were symptomatic of a

concussion return to play. Of the coaches in this study 3.2% were familiar with assessment tools for a concussion, and 1.9% understood the use of a return to play protocol. These alarming numbers suggest that coaches need a focused education.[17]

When creating policies for concussion patients, legislation removed doubt if an athlete with concussion symptoms able participate. All state laws require that the athlete with a suspected concussion is removed from play and evaluated by a trained health care provider.[4] At that point, the coach no longer has authority over the athlete. It is up to the health care provider to determine if the athlete can return to play. This concept has been difficult for coaches to accept, and has resulted in an under reporting of signs and symptoms from the coaches to the medical staff.

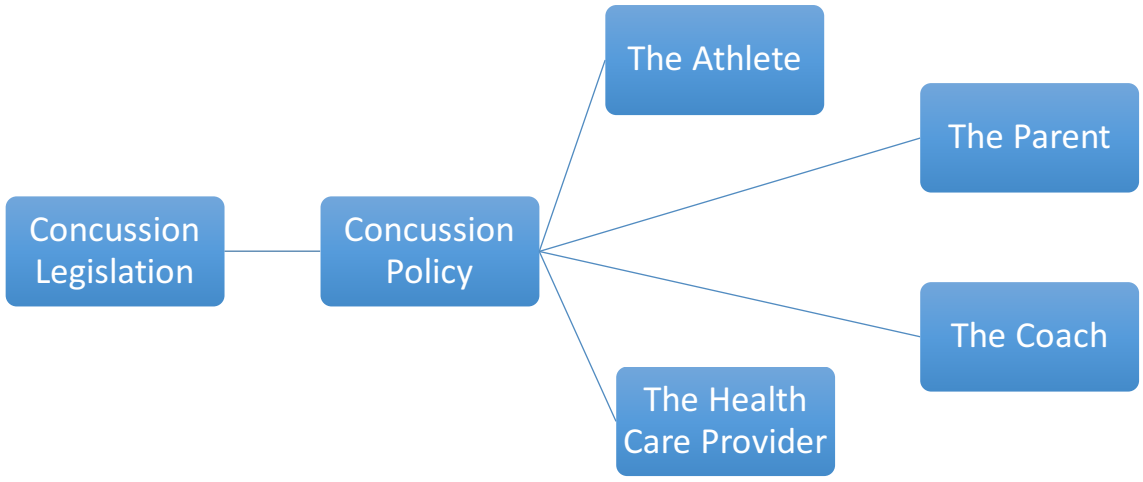
The Health Care Provider

The definition of a health care provider varies from state to state. In seven states (AL, DE, KS, ME, ND, RI, TX) a physician is the only medical provider able to evaluate an athlete with a concussion.[18] Other states allow athletic trainers, registered nurses, and physical therapists to diagnose and treat concussions.[4] In some states, the health care providers are required to take the same training courses as the coaches and parents, and other states require continuing education credits. Because of these changing stipulations, it is imperative for health care providers to be educated on their scope of coverage within the state they are practicing.[4]

Regardless of their title, health care providers have only one responsibility; return athletes to their sport healthy.[4] While this sounds like common sense, evaluating athletes who want to return to their sport prematurely can be difficult. These difficulties are expounded when the athlete neglects advice from medical professionals and refuses to be present at treatment times. Because of difficulties with patient compliance, and the time necessary for the brain to

heal from a concussion, most return to play protocols have a five-day progression. This five-day process allows the medical professional to evaluate the athlete at different levels of exertion, while comparing scores to the baseline testing that was collected before the season began.

It is also important for the health care provider to understand that not every head contact results in a concussion. To gain trust from the athletes, parents, and coaches the health care provider needs to have justification for their decisions. The players truly concussed might refrain from seeking treatment if every athlete to hit their head in a game was suspected of a concussion and therefore removed from play. Coaches could under report athletes who are experiencing signs and symptoms, because they are worried the athlete will be removed from play based on poor judgement. To avoid these scenarios, it is important for the health care provider to have functional relationships with the coaches and supervisors.[19]



Graphic showing the relationship between concussion legislation and the effected populations.

YMCA of Missoula Concussion Policy

Staff at the YMCA of Missoula recognizes that youth athletes are at risk for sustaining concussions during soccer, basketball, and other organized events. Recognizing the current legislation, and that the law could, in time, include YMCA sports, they sought the development of a policy that would make them compatible to the DSPYAA of Montana. Through the help of

the Athletic Training Department at the University of Montana, a policy was developed. The intention of this professional paper is to outline the steps to implementation of the concussion policy with the Missoula YMCA.

Chapter 2

Winter 2016

Policy Development

The management at YMCA of Missoula approached the Athletic Training Department at the University of Montana created a concussion policy that coincided with the DSPYAA. To begin the policy development, we outlined the needs of a concussion policy, deciding these documents were necessary:

1) Educational handout for parents and athletes (Appendix 1)
2) Educational handout for coaches (Appendix 2)
3) Flow chart in the event of a concussion (Appendix 3)
4) Referral/Clearance Form (Appendix 4)
5) Documentation of Parent Education (Appendix 5)
6) Written Policy (Appendix 6)

These documents were created in December of 2015 and finalized in March of 2016. The policy was then approved by the YMCA of Missoula management to be implemented for the 2016 spring YMCA youth soccer season.

The University of Montana Athletic Training Department also provided the YMCA of Missoula additional educational material. This included the distribution of a concussion signs and symptoms chart on a large sticker that could be placed on a clipboard or whiteboard for the coaches to have during practices and games.

Spring 2016

Policy Implementation for the Pilot Season

The pilot season of the YMCA Concussion Policy was tracked through the soccer season by YMCA staff. The policy was provided to the YMCA in March, as registration for the 2016 spring soccer season was beginning, and added to the registration forms for parents to receive and sign upon registration. Coaches were informed of their educational responsibilities via email and instructed to submit their educations certificates to the YMCA for documentation. During the pilot season they focused on compliance from the coaches and parents concerning the educational materials, and correct referrals in the event of a concussion.

Summer 2016

Policy Adjustments

After the pilot season concluded the management of the YMCA and University of Montana Athletic Training Department met to discuss the concussion policy; collectively examining the functionality of the policy, difficulties with implementation of the policy, if coaches were compliant with the policy requirements, if the provided resources were used, if changes needed to be made with the policy, and if an educational seminar provided to the parents and coaches would be beneficial.

Functionality of the policy: The YMCA reported that the policy was working well. In the event of a concussion, coaches and parents followed the correct procedures in clearing the athlete in question before returning to participation. However, they expressed concern that compliance was difficult to attain from both coaches and parents regarding education. Coach compliance was diminished because of two major factors. First and foremost, the YMCA has difficulty requiring volunteer coaches to participate in extra training. This problem stems from the fact that

consequences for volunteer coaches are difficult to enforce. Secondly, the YMCA's need for volunteer coaches is very high. The YMCA reported approximately 15 coaching positions vacant the week prior to the start of practice. Combine, these circumstances create an environment with little authority over coaches. Parent education was met with different obstacles. Due to the availability of online registrations, some parents never received the educational documents. This lapse in documentation occurred because the YMCA's online platform for registration is incompatible for document uploads.

Difficulties with Policy Implementation: Some of the difficulties with the new concussion policy related to "heading" in youth soccer. The YMCA allows heading in older age groups which created discrepancies for the officials who officiated multiple age groups. Several coaches participated in multiple age groups as well. Because of these crossovers, it became necessary for coaches and officials to communicate prior to the beginning of games to ensure the correct ruling was implemented.

Compliance from Coaches: The YMCA staff reported that coaches were compliant with the policy. However, the YMCA expressed concern in documenting that coaches had completed the required training. Distinguishing between certified and uncertified coaches and was difficult. Coaches who completed concussion training for other organizations was a contributing factor to confusion between the YMCA and their coaches.

Use of Resources: The YMCA gave coaches extra resources, such as clipboard backings with concussion signs and symptoms, that were provided by the University of Montana Athletic Training Department. These extra resources were received the preseason coach's packets. The resources were to be utilized as additional referencing material in the event of suspected concussions during practice and games.

Changes to the Concussion Policy: The YMCA staff was pleased with the functionality of the concussion policy. They believed that the difficulties faced with the pilot season were due to the timing of implementation, and that the second season would be more successful in coach and parent education.

Educational Seminar for Coaches and Parents: The University of Montana Athletic Training Department offered to provide an optional educational seminar prior to the season beginning. The YMCA agreed to have a seminar after the distribution of the coaching packets.

Fall 2016

With changes to the concussion policy implemented over the summer, the YMCA transitioned into the 2016 fall soccer season.

Chapter 3

Overview

This portion of the paper includes an analysis of coach compliance, parent education, and coaches' knowledge of concussions. These categories were selected to provide feedback regarding the actual versus perceived functionality of the policy. With this information, the University of Montana will work with the YMCA of Missoula to address exposed weaknesses in the concussion policy.

Methods

Participants:

The participants of this study include all YMCA coaches, and all parents who registered their children for the spring 2016 and fall 2016 soccer seasons. Coach compliance was determined by number of coaches who completed the required concussion education training over both seasons (n=166). Coaches knowledge of concussion participants included all coaches that completed an online survey (n=37). Parent education was recorded by collecting registration forms that contained the educational material (n=1206).

Instrument:

In the *Concussion Knowledge of Youth Sports Coaches* survey, athletes were asked to identify symptoms (among distractors) associated with concussions and to identify potential consequences of a poorly managed concussion among distractors. The survey consisted of nine close ended questions and was modified from an existing valid and reliable survey related to assessment of concussion knowledge.[20] (Appendix 7).

Procedures:

This study was approved by the Institutional Review Board (IRB) for the protection of human research subject by the University of Montana. After approval, the concussion policy was developed and implemented at the YMCA of Missoula prior to the 2016 spring soccer season. After the spring soccer season the policy was reviewed by the YMCA of Missoula and Athletic Training Department of the University of Montana. The discussed adjustments were applied to the concussion policy prior to the 2016 fall soccer season. Once the 2016 fall soccer season concluded data was collected from the YMCA of Missoula and the online survey.

Data Analysis:

Data from each questionnaire was entered into Excel (version 2010; Microsoft Corporation, Redmond, WA). Descriptive statistics were used to determine the frequency of identification of each symptom and the consequence of concussion, as well as the percentage of participants who have received education from a formal source. The surveys were scored by calculating a composite score for each participant. This was done by coding the correct and incorrect answers for the symptom and consequence questions. Composite scores were generated by adding the total possible correct signs/symptoms and consequences and awarding 1 point for each correctly identified minus 1 point for each distractor selected. The final score calculated is the composite score. The total possible points on the survey is 22. Lastly, we evaluated the association between the education received and the composite score with linear regression using SPSS (Version 21.0; IBM Corporation, Armonk, NY). Cronbach's alpha was used to assess internal consistency on the symptoms and consequences scale.

Results:

Coach Knowledge of Concussion

Coach knowledge of concussion was determined from the online survey, specifically pertaining to symptom identification and long term consequence identification. Coaches' proficiency identifying symptoms of concussions was calculated to have very good reliability (0.829) using Cronbach Alpha. The most common recognized symptoms include vacant stare (94.59%), nausea/vomiting (89.18%), sensitivity to light (89.18%), and feeling in a fog (89.18%). Other results can be found in Table 1. Coaches' ability to identify long term consequences of concussions was calculated to have moderate reliability (.0618) using Cronbach Alpha. The most common recognized consequences include brain bleeds (95.59%), dizziness (91.89%), and headache (859.16). Other results can be found in Table 2.

Coach Compliance with Concussion Education Training

Coaches compliance was recorded by the YMCA staff through filing of concussion education certification. The coaches were instructed to participate in a certification course online, provided by Heads Up Concussion, at the beginning of each season. Upon completion of the course coaches provided either an electronic or hard copy of their certificate to the YMCA of Missoula. During the spring soccer season of 2016 only 44.1% (n=93) of coaches were certified through Heads Up Concussion. Coach compliance decreased to 37.0% (n=73) for the fall soccer season of 2016. When comparing both seasons, there were 35 returning coaches, of which 48.6% (n=35) were certified. The composite score calculations show an average of 12.5 (56.8%), and a median of 12 (54.5%) out of 22 possible. The association between concussion education and composite scores showed a poor relationship (0.18) using a linear regression.

Coaches compliance was much lower than expected. When considering these lower than anticipated numbers, there were four possibilities as to why coach certification requirements were not met. First and foremost, the coaches failed to complete the necessary training. Secondly, the coaches failed to turn in their certifications forms to the YMCA. Third, the YMCA failed to properly file the coach's certifications. Finally, coaches may have completed concussion education through another organization and assumed they need not complete additional concussion education training.

Parent Education

Parent education was determined by the number of registration forms collected by the YMCA. A copy of the concussion policy and parent education forms were attached to the in house soccer registration forms. However, the YMCA did not upload the concussion policy or parent education forms to their online registration process. Therefore, parents who registered their children in house were provided with concussion education materials, while parents who registered online were never exposed to these educational materials.

The 2016 spring soccer season consisted of 840 athletes, of these 574 registered in house and received concussion educational material (68.3%). The 2016 fall soccer season consisted of 726 athletes, of which 487 registered in house (67.1%). To collectively analyze the 2016 soccer seasons, both season's participants were compiled and duplicates were removed. This resulted in 1,206 athletes, of which 857 received concussion education materials (71.1%).

Discussion

The purpose of this study was to implement and analyze the concussion policy for the YMCA of Missoula. Upon analysis, it is apparent that the policy is grossly deficient in coach compliance and parent education. The completion of this study aims to remedy these deficient

areas. Analysis also showed that coach knowledge of concussions sufficient, but is still relevant to the study.

Coach Compliance: Coach compliance was related to these four shortcomings: coaches failing to complete the concussion education training, coaches not turning in their certifications, the YMCA incorrectly filing certifications, and coaches who have been concussion certified through youth sport organizations.

The YMCA staff admitted that coach concussion education was minimally enforced. When asked why staff enforcement was low, the YMCA stated that coach certification was not a priority compared to the large amount of work needed to organize the league. The organization of teams, availability of playing fields, finding coaches, and distributing materials was inefficient, and took priority over contacting individual coaches and requesting certifications. To address inefficiency, the YMCA began using new organizational software to create teams, schedule practices, and determine games. Furthermore, the YMCA and University of Montana are collaborating to create an internship position dedicated to compliance with the concussion policy. The intern would be in charge of collecting coach concussion education certificates and filing these certificates. This intern position would effectively address three of the above listed concerns with coach compliance; contacting coaches who are not certified, collecting certifications from coaches, and correctly filing certifications.

Coaches who have been educated about concussions through other organizations present an entirely different problem. While extra education can be beneficial, it is prudent that the YMCA demonstrates consistency concerning concussion education. The most prudent way to demonstrate consistency is to require current YMCA certification for all coaches, regardless of their previous training or personal educations. The concussion education provided by the YMCA

certifies coaches for one year. This means that coaches who participate in multiple seasons each year are not required to complete the training for each season, rather they must provide their certification for each season they wish to coach. For example, a coach who completed the concussion education in March of 2016 will be certified to coach for all YMCA sports until March of 2017. When registering as a coach for the 2016 fall soccer season this coach will simply provide their valid certification to the YMCA for the fall season.

Parent Education: Parent education was deficient due to their inability to access educational materials in an online form. To remedy this deficiency, the YMCA has embedded the necessary educational materials in their online registration process.

Coach Knowledge of Concussion: Previous research has shown that coaches are second only to medical professionals in concussion education.[12] The purpose of the survey analysis was to determine if coaches were capable of recognizing the symptoms and consequences of youth concussion. With positive results of good reliability recognizing symptoms and moderate reliability identifying consequences, it appears that coaches are capable of recognizing athlete health concerns. However, coaches were unable to recognize that emotional changes are often symptoms concussed athletes experience. Moreover, coaches frequently selected distractor symptoms such as pale skin and muscle spasms that typically indicate other medical issues. Coaches ability to recognize long term consequences of mistreated concussion may seem less critical than identifying acute symptoms. However, a coach that fails to recognize the long term consequences of mistreated concussions may be more willing to play an athlete who is concussed. Coaches' inability to fully comprehend an athlete's health further solidifies the need of medical professionals' presence in youth athletics.

Future Advice for Policy Development and Implementation

The success of policy development and implementation hinges on two aspects; consistency and proximity. Consistency is important to develop with coaches and other staff members so they are aware the policy is important to the organization. Proximity to the policy is also important so that policy authors and administers can ensure the functionality of the policy first hand. During this project proximity and consistency were hard to achieve. The authors of the policy were occupied by their responsibilities at the University of Montana, preventing efficient proximity to the policy. They YMCA staff had difficulty with consistency due to their prioritization of responsibilities and high work-loads. If consistency and proximity would have been a higher focus during this project the results would have been much more positive.

Conclusion

The concussion policy for the YMCA of Missoula has some major deficits that need addressed. Least of these is coach knowledge of concussion. Coaches are capable of determining general athlete health, however, decisions impacting the immediate and long-term health of the athlete should be made by a health care provider. Parent education was remedied by providing educational materials in both online and in house registration forms. Coach compliance to the YMCA's concussion policy was the most deficient within the analyzed fields, therefore this area requires drastic improvements. Coach compliance is being addressed by the YMCA through improving organizational techniques such as automating roster creation, using software to schedule games and practices, and improving filing systems. The University of Montana is also assisting in coach compliance by creating an internship position through the YMCA that is specifically dedicated to monitoring the concussion policy.

Beyond the research specific to this project, the University of Montana's efforts regarding concussion policy have created a large effect in the state of Montana. Montana legislators have revised the Dylan Steigers Protection of Youth Athletes Act to include all organized youth athletics. Not only is the YMCA of Missoula improving due to these efforts, but the entire state of Montana has become safer thanks to the efforts by healthcare professionals.

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Table 1

Symptoms Analysis

Actual Symptoms	Scores
	(n=37)
Vacant Stare	94.59% (n=35)
Drowsiness	86.49% (n=32)
Nausea/Vomiting	89.18% (n=33)
Irritability	72.97% (n=27)
Neck Pain	70.27% (n=26)
Emotions	72.97% (n=27)
Excess Sleep	75.68% (n=28)
Sensitivity to Light	89.19% (n=33)
Sensitivity to Noise	75.68% (n=28)
Feeling in a Fog	89.19% (n=33)
Balance Issues	83.78% (n=31)
Fatigue	75.68% (n=28)
Sadness	51.35% (n=19)
Ringing Ears	81.08% (n=30)
Distractor Symptoms	
Difficulty Breathing	37.84% (n=14)
Pale Skin	40.54% (n=15)
Muscle Spasms	43.24% (n=16)
Black Eye	29.72% (n=11)
Nose Bleed	35.14% (n=13)
Jaw Pain	27.03% (n=10)

Table 2

Consequences Analysis

Actual Consequences	Scores (n=37)
Dementia	81.08% (n=30)
Dizziness	91.89% (n=34)
Death	81.08% (n=30)
Headache	89.16% (n=33)
Brain Bleed	94.59% (n=35)
Alzheimer's	72.97% (n=27)
Parkinson's	45.95% (n=17)
Distractor Consequences	
Stroke	48.64% (n=18)
Neck Pain	62.16% (n=23)
Blindness	48.64% (n=18)
Jaw Pain	40.54% (n=15)

Appendix 1

Missoula YMCA

CONCUSSION INFORMATION SHEET

HEADS UP CONCUSSION

This sheet has information to help protect your children or teens from concussion or other serious brain injury. Use this information at your children's or teens' games and practices to learn how to spot a concussion and what to do if a concussion occurs.

the YMCA®

WHAT IS A CONCUSSION?

A concussion is a type of traumatic brain injury—or TBI—caused by a bump, blow, or jolt to the head or by a hit to the body that causes the head and brain to move quickly back and forth. This fast movement can cause the brain to bounce around or twist in the skull, creating chemical changes in the brain and sometimes stretching and damaging the brain cells.

HOW CAN I SPOT A POSSIBLE CONCUSSION?

Children and teens who show or report one or more of the signs and symptoms listed below—or simply say they just "don't feel right" after a bump, blow, or jolt to the head or body—may have a concussion or other serious brain injury.

SIGNS OBSERVED BY PARENTS OR COACHES

- Appears dazed or stunned.
- Forgets an instruction, is confused about an assignment or position, or is unsure of the game, score, or opponent.
- Moves clumsily.
- Answers questions slowly.
- Loses consciousness (even briefly).
- Shows mood, behavior, or personality changes.
- Can't recall events prior to or after a hit or fall.

SYMPTOMS REPORTED BY CHILDREN AND TEENS

- Headache or "pressure" in head.
- Nausea or vomiting.
- Balance problems or dizziness, or double or blurry vision.
- Bothered by light or noise.
- Feeling sluggish, hazy, foggy, or groggy.
- Confusion, or concentration or memory problems.
- Just not "feeling right," or "feeling down."

WHAT ARE SOME MORE SERIOUS DANGER SIGNS TO LOOK OUT FOR?

In rare cases, a dangerous collection of blood (hematoma) may form on the brain after a bump, blow, or jolt to the head or body and can squeeze the brain against the skull. Call 9-1-1 or take your child or teen to the emergency department right away if, after a bump, blow, or jolt to the head or body, he or she has one or more of these danger signs:

- One pupil larger than the other.
- Drowsiness or inability to wake up.
- A headache that gets worse and does not go away.
- Slurred speech, weakness, numbness, or decreased coordination.
- Repeated vomiting or nausea, convulsions or seizures (shaking or twitching).
- Unusual behavior, increased confusion, restlessness, or agitation.
- Loss of consciousness (passed out/knocked out). Even a brief loss of consciousness should be taken seriously.

WHAT SHOULD I DO IF MY CHILD OR TEEN HAS A POSSIBLE CONCUSSION?

As a parent, if you think your child or teen may have a concussion, you should:

1. Remove your child or teen from play.
2. Keep your child or teen out of play the day of the injury. Your child or teen should be seen by a health care provider and only return to play with permission from a health care provider who is experienced in evaluating for concussion.
3. Ask your child's or teen's health care provider for written instructions on helping your child or teen return to school. You can give the instructions to your child's or teen's school nurse and teacher(s) and return-to-play instructions to the coach and/or athletic trainer.

Do not try to judge the severity of the injury yourself. Only a health care provider should assess a child or teen for a possible concussion. Concussion signs and symptoms often show up soon after the injury. But you may not know how serious the concussion is at first, and some symptoms may not show up for hours or days.

The brain needs time to heal after a concussion. A child's or teen's return to school and sports should be a gradual process that is carefully managed and monitored by a health care provider.

HOW CAN I HELP KEEP MY CHILDREN OR TEENS SAFE?

Sports are a great way for children and teens to stay healthy and can help them do well in school. To help lower your children's or teens' chances of getting a concussion or other serious brain injury, you should:

- Help create a culture of safety for the team.
  - ›› Work with their coach to teach ways to lower the chances of getting a concussion.
  - ›› Talk with your children or teens about concussion and ask if they have concerns about reporting a concussion. Talk with them about their concerns; emphasize the importance of reporting concussions and taking time to recover from one.
  - ›› Ensure that they follow their coach's rules for safety and the rules of the sport.
  - ›› Tell your children or teens that you expect them to practice good sportsmanship at all times.
- When appropriate for the sport or activity, teach your children or teens that they must wear a helmet to lower the chances of the most serious types of brain or head injury. However, there is no "concussion-proof" helmet. So, even with a helmet, it is important for children and teens to avoid hits to the head.

HEADS UP CONCUSSION

the YMCA

TO LEARN MORE GO TO >> cdc.gov/HEADSUP

JOIN THE CONVERSATION AT
↳ www.facebook.com/CDCHEADSUP

Content Source: CDC's HEADS UP campaign. Customizable HEADS UP fact sheets were made possible through a grant to the CDC Foundation from the National Operating Committee on Standards for Athletic Equipment (NOCSAE).

Appendix 2

A Fact Sheet for

YOUTH SPORTS COACHES

HEADS UP CONCUSSION

One of the main jobs of a youth sports coach is keeping athletes safe. This sheet has information to help you protect athletes from concussion or other serious brain injury, learn how to spot a concussion, and know what to do if a concussion occurs.

What Is a Concussion?

A concussion is a type of traumatic brain injury—or TBI—caused by a bump, blow, or jolt to the head or by a hit to the body that causes the head and brain to move quickly back and forth. This fast movement can cause the brain to bounce around or twist in the skull, creating chemical changes in the brain and sometimes stretching and damaging the brain cells.

How Can I Help Keep Athletes Safe?

Sports are a great way for children and teens to stay healthy and can help them do well in school. As a youth sports coach, your actions create the culture for safety and can help lower an athlete's chance of getting a concussion or other serious injury. Aggressive and/or unsportsmanlike behavior among athletes can increase their chances of getting a concussion or other serious injury. Here are some ways you can help keep your athletes safe:

Talk with athletes about the importance of reporting a concussion:

- Talk with athletes about any concerns they might have about reporting their concussion symptoms. Make sure to tell them that safety comes first and you expect them to tell you and their parent(s) if they think they have a concussion.

Create a culture of safety at games and practices:

- Teach athletes ways to lower the chances of getting a concussion.
- Enforce the rules of the sport for fair play, safety, and sportsmanship.
- Ensure athletes avoid unsafe actions such as:
  - Striking another athlete in the head;
  - Using their head or helmet to contact another athlete;
  - Making illegal contacts or checking, tackling, or colliding with an unprotected opponent; and/or
  - Trying to injure or put another athlete at risk for injury.
- Tell athletes that you expect good sportsmanship at all times, both on and off the playing field.

Keep up-to-date on concussion information:

- Review your state, league, and/or organization's concussion guidelines and protocols.
- Take a training course on concussion. CDC offers concussion training at no cost at www.cdc.gov/HEADSUP.
- Download CDC's *HEADS UP* app or a list of concussion signs and symptoms that you can keep on hand.

Plan ahead. How can you help encourage concussion reporting among your athletes?

Athletes May Try to Hide Concussion Symptoms

Among a group of almost 800 high school athletes:

69% reported playing with concussion symptoms.

40% of these athletes said that their coach was not aware that they had a possible concussion.[1]

Athletes may be less likely to tell their coach or athletic trainer about a possible concussion during a championship game or other important event.[2]

To learn more, go to www.cdc.gov/HEADSUP

Centers for Disease Control and Prevention
National Center for Injury Prevention and Control

The Way You Talk and Think About Concussion Affects Athletes.

Make sure to tell athletes that safety comes first and you expect them to tell you and their parent(s) if they think they have a concussion.

HEADS UP CONCUSSION

Check out the equipment and sports facilities:

- Make sure all athletes wear a helmet that fits well and is in good condition when appropriate for the sport or activity. There is no "concussion-proof" helmet, so it is important to enforce safety rules that protect athletes from hits to the head and when a helmet falls off during a play.
- Work with the game or event administrator to remove tripping hazards and ensure that equipment, such as goalposts, have padding that is in good condition.

Keep emergency contact information handy:

- Bring emergency contact information for parents and health care providers to each game and practice in case an athlete needs to be taken to an emergency department right away for a concussion or other serious injury.
- If first responders are called to care for an injured athlete, provide them with details about how the injury happened and how the athlete was acting after the injury.

How Can I Spot a Possible Concussion?

Athletes who show or report one or more of the signs and symptoms listed below—or simply say they just "don't feel right" after a bump, blow, or jolt to the head or body—may have a concussion or other serious brain injury.

Signs Observed by Coaches or Parents

- Appears dazed or stunned.
- Forgets an instruction, is confused about an assignment or position, or is unsure of the game, score, or opponent.
- Moves clumsily.
- Answers questions slowly.
- Loses consciousness (even briefly).
- Shows mood, behavior, or personality changes.
- Can't recall events prior to or after a hit or fall.

Plan ahead. How can you help athletes lower their chance of getting a concussion?

Some athletes may not report a concussion because they don't think a concussion is serious.

They may also worry about:

- **Losing their position on the team or during the game.**
- **Jeopardizing their future sports career.**
- **Looking weak.**
- **Letting their teammates or the team down.**
- **What their coach or teammates might think of them.**[3,4,5]

Symptoms Reported by Athletes

- Headache or "pressure" in head.
- Nausea or vomiting.
- Balance problems or dizziness, or double or blurry vision.
- Bothered by light or noise.
- Feeling sluggish, hazy, foggy, or groggy.
- Confusion, or concentration or memory problems.
- Just not "feeling right," or "feeling down".

NOTE: Concussion signs and symptoms often show up soon after the injury, but it can be hard to tell how serious the concussion is at first. Some symptoms may not be noticed or may not show up for hours or days.

Enforce Safe Play. You Set the Tone for Safety.

As many as 25 percent of the concussions reported among high school athletes result from aggressive or illegal play.[6]

HEADS UP CONCUSSION

What Are Some More Serious Danger Signs to Look Out For?

In rare cases, a dangerous collection of blood (hematoma) may form on the brain after a bump, blow, or jolt to the head or body and can squeeze the brain against the skull. Call 9-1-1 or ensure an athlete is taken to the emergency department right away if, after a bump, blow, or jolt to the head or body, he or she has one or more of these danger signs:

- One pupil larger than the other.
- Drowsiness or inability to wake up.
- A headache that gets worse and does not go away.
- Slurred speech, weakness, numbness, or decreased coordination.
- Repeated vomiting or nausea, convulsions or seizures (shaking or twitching).
- Unusual behavior, increased confusion, restlessness, or agitation.
- Loss of consciousness (passed out/knocked out). Even a brief loss of consciousness should be taken seriously.

What Should I Do If I Think an Athlete Has a Possible Concussion?

As a coach, if you think an athlete may have a concussion, you should:

Remove the athlete from play.
When in doubt, sit them out!

Keep an athlete with a possible concussion out of play on the same day of the injury and until cleared by a health care provider.
Do not try to judge the severity of the injury yourself. Only a health care provider should assess an athlete for a possible concussion. After you remove an athlete with a possible concussion from practice or play, the decision about return to practice or play is a medical decision that should be made by a health care provider. As a coach, recording the following information can help a health care provider in assessing the athlete after the injury:

- Cause of the injury and force of the hit or blow to the head or body.
- Any loss of consciousness (passed out/knocked out) and if so, for how long.
- Any memory loss right after the injury.
- Any seizures right after the injury.
- Number of previous concussions (if any).

Inform the athlete's parent(s) about the possible concussion.
Let them know about the possible concussion and give them the *HEADS UP* fact sheet for parents. This fact sheet can help parents watch the athlete for concussion signs or symptoms that may show up or get worse once the athlete is at home or returns to school.

Ask for written instructions from the athlete's health care provider on return to play.
These instructions should include information about when they can return to play and what steps you should take to help them safely return to play.

Plan ahead. What should you do if you think an athlete has a concussion?

Concussions Affect Each Athlete Differently.

While most athletes with a concussion feel better within a couple of weeks, some will have symptoms for months or longer. Talk with an athlete's parents if you notice their concussion symptoms come back after they return to play.

Work with the athlete's health care provider and follow the five gradual steps for return to play.

An athlete's return to school and sports should be a gradual process that is carefully managed and monitored by a health care provider.

HEADS UP CONCUSSION

Plan ahead. How can you help an athlete safely return to play after a concussion?

Why Should I Remove an Athlete With a Possible Concussion from Play?

The brain needs time to heal after a concussion. An athlete who continues to play with concussion has a greater chance of getting another concussion. A repeat concussion that occurs while the brain is still healing from the first injury can be very serious and can affect an athlete for a lifetime. It can even be fatal.

What Steps Can I Take to Help an Athlete Return to Play?

An athlete's return to school and sports should be a gradual process that is approved and carefully managed and monitored by a health care provider. When available, be sure to also work closely with your team's certified athletic trainer.

Below are five gradual steps that you, along with a health care provider, should follow to help safely return an athlete to play. Remember, this is a gradual process. These steps should not be completed in one day, but instead over days, weeks, or months.

BASELINE: Athlete is back to their regular school activities, is no longer experiencing symptoms from the injury when doing normal activities, and has a green light from their health care provider to begin the return to play process.

An athlete should only move to the next step if they do not have any new symptoms at the current step.

STEP 1: Begin with light aerobic exercise only to increase an athlete's heart rate. This means about 5 to 10 minutes on an exercise bike, walking, or light jogging. No weightlifting at this point.

STEP 2: Continue with activities to increase an athlete's heart rate with body or head movement. This includes moderate jogging, brief running, moderate-intensity stationary biking, moderate-intensity weightlifting (less time and/or less weight than a typical routine).

STEP 3: Add heavy non-contact physical activity, such as sprinting/running, high-intensity stationary biking, regular weightlifting routine, non-contact sport-specific drills (in 3 planes of movement).

STEP 4: An athlete may return to practice and full contact (if appropriate for the sport) in controlled practice.

STEP 5: An athlete may return to competition.

REMEMBER: It is important for you and the athlete's parent(s) to watch for concussion symptoms after each day's return to play progression activity. If an athlete's concussion symptoms come back, or he or she gets new symptoms when becoming more active at any step, this is a sign that the athlete is pushing him- or herself too hard. The athlete should stop these activities, and the athlete's health care provider should be contacted. After the okay from the athlete's health care provider, the athlete can begin at the previous step.

To learn more, go to www.cdc.gov/HEADSUP

You can also download the CDC *HEADS UP* app to get concussion information at your fingertips. Just scan the QR code pictured at left with your smartphone.

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[3] Kerr ZY, Register-Mihalik JK, Marshall SW, Evenson KR, Mihalik JP, Guskiewicz KM (2014). Disclosure and non-disclosure of concussion and concussion symptoms in athletes: Review and application of the socio-ecological framework. Brain Inj. 2014;28(8):1009-21.

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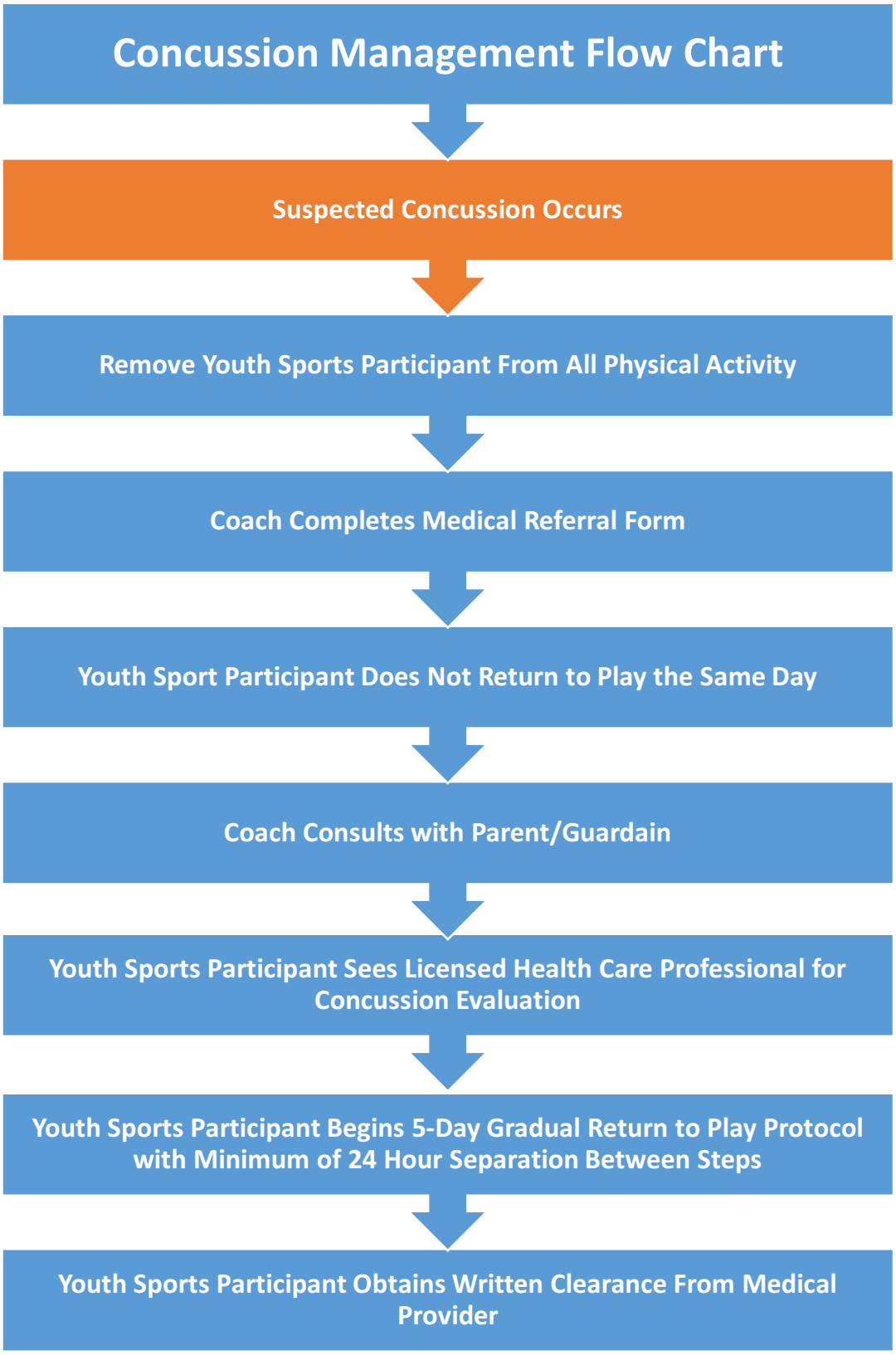
[6] Collins CL, Fields SK, Comstock RD. (2008). When the rules of the game are broken: What proportion of high school sports-related injuries are related to illegal activity? Inj Prev, 14(1):34-38.

The information provided in this fact sheet or through linkages to other sites is not a substitute for medical or professional care. Questions about diagnosis and treatment for concussion should be directed to your physician or other healthcare provider.

5/2015

Appendix 3


Concussion Management Flow Chart
Suspected Concussion Occurs
Remove Youth Sports Participant From All Physical Activity
Coach Completes Medical Referral Form
Youth Sport Participant Does Not Return to Play the Same Day
Coach Consults with Parent/Guardain
Youth Sports Participant Sees Licensed Health Care Professional for Concussion Evaluation
Youth Sports Participant Begins 5-Day Gradual Return to Play Protocol with Minimum of 24 Hour Separation Between Steps
Youth Sports Participant Obtains Written Clearance From Medical Provider

Appendix 4

Missoula YMCA
Youth Sports Participant Concussion Medical Referral

Youth Sports Participant: _____

Date of Suspected Concussion: _____

Location where Injury Occurred: _____

Activity: _____ Referred by: _____

Short Description of How Injury Occurred:

Signs/Symptoms Observed or Experienced by Youth Sports Participant After Injury Occurred:

- ☐ Appeared dazed, stunned, or disoriented
- ☐ Forgot plays or demonstrated short term memory difficulties
- ☐ Exhibited difficulties with balance or coordination
- ☐ Answered questions slowly or inaccurately
- ☐ Lost consciousness
  - How long: _____
- ☐ Demonstrated behavior or personality changes/overly emotional
- ☐ Unable to recall events prior to or after the hit
- ☐ Had a headache
- ☐ Was nauseous or vomiting
- ☐ Complained of blurry vision
- ☐ Had difficulty remembering
- ☐ Complained of being sensitive to bright lights/loud noises

In accordance with the Missoula YMCA concussion policy, if during any practice or game situation, a youth sports participant exhibiting signs, symptoms, or behaviors consistent with concussion, he/she must be immediately removed from all sport participation. The youth sports participant may only return to physical activity if/when he/she is evaluated by a licensed health care provider trained in the evaluation and management of sports concussion and receives a written clearance to return to play. By signing this form, I acknowledge that I have thoroughly evaluated _____(youth sport participant name) for concussion and have decided that the athlete is symptom free and it is safe for him/her to return to physical activity:

- ☐ Cleared to Return to Play – NO RESTRICTIONS
- ☐
- ☐ Must Return for Follow Up Visit (Date) _____/_____/_____

Signed: _____ Date: _____
(Physician, Physician Assistant, Nurse Practitioner, Certified Athletic Trainer, Sport-Certified Physical Therapist, etc)

Print Name: _____

Please note that the YMCA Youth Sports Director will review this form following completion by a licensed health care provider to approve full return to participation. This review will occur during normal business hours and the coach will be notified of receipt of this form.

Appendix 5

Missoula YMCA
Youth Sports Participant & Parent/Legal Guardian Concussion Statement

The Missoula YMCA Concussion policy requires each year that information about sports-related concussion will be provided to parents about concussion prior to the start of each sports season. Parents are required to provide written acknowledgment of receiving such information prior to their child(ren) being allowed to participate in any sport activity. The policy further states that during a practice or a game, if a youth sports participant sustains a concussion or exhibits the signs, symptoms or behaviors of concussion, the youth sport participant must be removed from all sport activity. The youth sport participant may not return to any practice or game activity until he/she is evaluated by a licensed health care professional trained in the evaluation and management of concussion (i.e., physician, physician assistant, nurse practitioner, athletic trainer, or Sport-Certified Physical Therapist). The youth sport participant must provide written clearance from that provider prior to the athlete being allowed to resume physical activity.

Youth Sport Participant Name: _____
(form should be completed for every youth sport participant, even if there are multiple youth sports participants in a household)

Parent/Legal Guardian Name(s): _____

- ☐ I/We have read the Concussion Information Sheet
- ☐ I/We understand the signs and symptoms of a concussion and will report these signs and symptoms to parents, coaches, officials and qualified medical professionals.
- ☐ I/We understand that treatment for a concussion includes immediate removal from sports participation, an evaluation from a medical professional, and activity modification/limitations.
- ☐ I/We understand that the youth sports participant must receive written clearance from a medical professional, and that the youth sports participant will complete the return to play protocol.

Youth Sports Participant signature: _____ Date: _____

Parent/Guardian/signature: _____Date: _____

Appendix 6

Missoula YMCA Concussion Management Policy

The recognition and treatment of youth sports participants who have suffered a concussion has become a national priority. As a result of an increasing number of studies that have revealed that concussions, not properly treated, can result in permanent physical and cognitive deficits, including learning disabilities. The data also suggests that concussions can lead to the development of dementia and other long-term issues earlier than expected. These risks have led the Missoula YMCA to develop policies related to sports concussion that are consistent with the current recommendations of the U.S. Centers for Disease Control and Prevention.

Recovery from a concussion may require limitation of physical activity, especially sports activity such as practice, drills, games and physical education classes. In significantly symptomatic youth sports participants, mental activity may also need to be limited cognitively to allow the brain time to heal.

To better manage instances of concussion in our sports programs, the Missoula YMCA requires the following:

1. All coaches and officials (paid and volunteer) must complete annual training in the area of current concussion management practices and provide proof to the YMCA's youth sports director prior to the start of each sports season. The training should include up-to-date information on the identification of concussion, the signs and symptoms associated with the injury, the risks involved with allowing youth sports participants to continue to play while symptomatic, methods of concussion assessment and the importance of gradual return to play practices. Training may be completed here: http://www.cdc.gov/headsup/youthsports/training/index.html

2. Information about sports-related concussion will be provided to parents about concussion prior to the start of each sports season and parents will be asked to provide written acknowledgment of receiving such information prior to their child(ren) being allowed to participate in any sport activity.

3. Prior to the start of every sport season, parents will receive educational materials about the risks of concussion prevalent in each sport, how to identify the signs and symptoms associated with concussion, along with the potential risks involved with playing while symptomatic. Parents will also be informed about the Missoula YMCA's concussion policy.

4. If, during a practice or a game, a youth sports participant sustains a concussion or exhibits the signs, symptoms or behaviors of concussion, the youth sport participant must be removed from all sport activity. The youth sport participant may not return to any practice or game activity until he/she is evaluated by a licensed health care professional trained in the evaluation and management of concussion (i.e., physician, physician assistant, nurse practitioner, athletic trainer, or Sport-Certified Physical Therapist). The youth sport participant must provide written clearance from that provider prior to the athlete being allowed to resume physical activity. The Missoula YMCA youth sports director will keep evidence of all written clearance forms on file for a period no shorter than seven (7) years.

5. Once the athlete receives medical clearance to return to physical activity, Missoula YMCA coaches should follow the graduated return to play protocol.

For more information please contact
Katie Grutsch
YMCA Youth Sports Director
kgrutsch@ymcamissoula.org

Appendix 7
Concussion Knowledge in Missoula YMCA Coaches

Beginning of Season Survey

Age: _____ Gender (Select): Male Female

1. Which of the following are symptoms of a concussion after sustaining a hit to the head? **Please select all that apply.**
    a. Vacant stare/glassy eyed
    b. Drowsiness
    c. Difficulty Breathing
    d. Nausea or Vomiting
    e. Irritability
    f. Neck Pain
    g. Inappropriate emotions (out of place feelings)
    h. Pale skin
    i. Excess Sleep (sleeping longer than usual)
    j. Sensitivity to light
2. Which of the following are symptoms of a concussion after sustaining a hit to the head? **Please select all that apply.**
    a. Muscle spasms in your neck
    b. Black eye
    c. Sensitivity to noise
    d. Feeling like "in a fog"
    e. Poor balance/coordination
    f. Epistaxis (bloody nose)
    g. Fatigue or low energy
    h. Jaw pain
    i. Sadness
    j. Ringing in ears
3. Which of the following do you think are consequences of inappropriate care of a concussion? **Please select all that apply.**
    a. Early onset dementia (impaired thinking)
    b. Increased risk of stroke
    c. Persistent dizziness
    d. Persistent neck pain
    e. Death
    f. Persistent headache
4. Which of the following do you think are consequences of inappropriate care of a concussion? **Please select all that apply.**
    a. Bleeding in the brain
    b. Early onset Alzheimer
    c. Increased risk of blindness
    d. Early onset Parkinson's

e. Persistent jaw pain

5. Have you ever had formal education about concussion? (In school, or online)
    a. Yes
    b. No

6. I understand the dangers of concussions. (**Select one**)

Disagree completely Somewhat disagree Neither Agree Or Disagree
Somewhat Agree Agree Completely

7. I know the signs and symptoms of a concussion. (**Select one**)

Disagree completely Somewhat disagree Neither Agree Or Disagree
Somewhat Agree Agree Completely

8. If a youth athlete is hit in the head and has a headache, it is OK to continue to play, as long as they did not lose consciousness (i.e., black out). (**Select one**)

Disagree completely Somewhat disagree Neither Agree Or Disagree
Somewhat Agree Agree Completely

9. If I think a youth athlete may have a concussion, it is OK for them to continue to play sports that same day. (**Select one**)

Disagree completely Somewhat disagree Neither Agree Or Disagree
Somewhat Agree Agree Completely