

**A Report Prepared
For:**

**The Interim Education and
Local Government
Committee**

Project Team:

Valerie Moody PhD, ATC, LAT
Project Director

Emily Tosoni MS, CHES, ATC
Samantha Riordan LAT
Seth Lindauer

Department of
Health and Human Performance
Athletic Training Program

The University of Montana

Missoula, MT

Assessment of Concussion Knowledge in Youth Sports Participants and Their Parents in Missoula

**PRELIMINARY REPORT
April 2016**

UM University of Montana
ATHLETIC TRAINING
Rising Above

CONCUSSION KNOWLEDGE IN YOUTH SPORTS PARTICIPANTS AND THEIR PARENTS IN MISSOULA

INTRODUCTION/PURPOSE

In 2013, the Montana Legislature passed the Dylan Steigers Protection of Youth Athletes Act (DSPYAA) promoting safety for youth athletes stating that any youth athlete who exhibits concussive symptoms must be removed from participation and must be medically cleared. Specifically, this piece of legislation protects athletes that participate in athletic activities sponsored by a school or school district. Since the enactment of this legislation, there has been significant development of school district policies to educate youth athletes, parents and coaches about the nature and risk of brain injuries, as well as appropriately manage them once they occur. However, there is a significant need to raise awareness for those youth athletes and their families who participate in athletic activity not sanctioned by schools or school districts. As written in the legislation, these athletes are excluded from protection.

The Centers for Disease Control (CDC) estimates that approximately 45 million children and adolescents aged 5-19 years of age participate in organized or recreational sports. Roughly 10% of these athletes will sustain a sport related concussion each year. Recent research indicates that youth athletes who sustain a concussion are more likely to exhibit more symptoms for longer periods of time when compared to older athletes. Even more alarming is that less than half of parents of children who sustain a head injury are able to adequately recognize signs and symptoms of a concussion (Weerdenburg, 2015). Furthermore, less than 30% of parents surveyed realized that there are specific guidelines for returning an athlete who has sustained a concussion to school or sport. Parents with lower incomes and education levels tend to have the lowest levels of knowledge about concussions (Lin, 2015).

The lack of athlete and parental knowledge regarding concussions is concerning due to the vulnerability of youth athletes. Due to several anatomical factors, such as weaker neck muscles, thinner cranial bones, and a larger head to body ratio, the youth athlete is at greater risk of concussion (Lin, 2015). There is an abundance of evidence suggesting that the inability to detect or appropriately treat a concussion may lead to catastrophic injury, permanent cognitive deficits, and impaired school performance. As a result, there is a critical need to educate youth athletes, parents and coaches in Montana who are not currently protected under the DSPYAA. In addition, because of Montana's rural nature, several communities lack direct access to a healthcare professional appropriately trained in concussion management, thereby decreasing the likelihood that these youth athletes and their parents are educated about the risks associated with concussion.

The purpose of this pilot study was to assess concussion knowledge in youth athletes and their parents participating in non-sanctioned school sports specifically focusing on Missoula Youth Hockey, Missoula Youth Football and Youth Soccer players. Subsequently with the results of this study, we intend to partner with community based organizations in the Missoula area that offer youth sports not sanctioned by school districts and currently not included in the DSPYAA to

develop an educational outreach program about concussive symptoms and management to athletes, parents and coaches and to provide athletes, parents and coaches with access to resources and referrals to effectively manage a concussion if sustained.

KEY FINDINGS

1. Our results indicate there is little correlation with self-reported completion of concussion education and the ability to recognize concussion symptoms and consequences.
2. Athletes and parents overall score on the survey was below 60%, indicating a less than average ability to recognize concussion symptoms and long term consequences of a poorly managed concussion. This is despite the fact that on average, 41% of the youth athletes reporting receiving concussion education and 27% of the parents stating they had been formally educated about concussions.
3. Over half of the parents and athletes report talking about concussions with each other. This is a critical discussion to have to facilitate open reporting of concussions, which is a well-known barrier to concussion management (i.e. failure to report symptoms for fear of losing playing time).
4. The preferred method of receiving concussion education by athletes is in the form of a Power Point presentation, whereas a majority of parents preferred educational pamphlets.

GENERAL RECOMMENDATIONS

1. Concussion education should be mandatory for both parents and athletes participating in youth sports organizations to facilitate immediate recognition of concussion symptoms and reporting.
2. Educational resources about concussions should be provided to both parents and youth athletes prior to the sports season and should be made available in a variety of formats to include electronic and paper delivery.

METHODS

The study underwent Institutional Review Board (IRB) review and was approved. Participants completed the Concussion Knowledge of Youth Sports questionnaire developed by the researchers using two existing validated and published surveys. The questions focused on recognizing concussion signs and symptoms as well as recognizing long-term consequences of concussions while also including distracting responses. The surveys were distributed in person at practices to youth athletes and their parents and took approximately 5 minutes to complete the survey. A total of 101 athletes completed the surveys and 209 parents completed the survey across three sports (soccer, hockey and football).

RESULTS

Parents and athletes scored below average on the survey indicating a poor ability to recognize concussion symptoms and long-term consequences (**See Table 1**). Further analysis reveals that there is a poor relationship between education reportedly received (**See Table 3**) and the overall ability to recognize concussion symptoms indicating that an improvement in concussion education is warranted in these groups. It is important to note that concussion education was self-reported and we did not attempt to define what formal education meant (that was determined by the respondent). Further study is warranted to determine what type of formal education these participants receive and to critically evaluate its effectiveness. It does appear that parents and athletes are discussing the consequences of concussion with each other, which can be vital to facilitating an open dialogue should a concussive injury occur (**See Table 2**).

Table 4 illustrates the ability of both parents and athletes to recognize concussive symptoms. It is clear that an improvement in athlete is necessary, as a majority of symptoms were not identified. Of note, both parents and athletes were not able to correctly identify the distractor symptoms indicating a need for more education. **Table 5** focuses on the ability of athlete's and parent's to correctly identify the long term consequences associated with poorly managed concussions. Less than half of the athletes recognized that death was a possible consequence of concussion and both parents and athletes were less likely to recognize that disorders such as Alzheimer's and Parkinson's were potential long-term consequences of concussion. Approximately half of both groups were unable to tease out the distractors related to this question.

Table 1. Composite Scores on Concussion Knowledge Survey

	Youth Soccer		Youth Football		Youth Hockey		Average All Sports	
	Athlete	Parent	Athlete	Parent	Athlete	Parent	Athlete	Parent
Average Age (years)	10.6	42.7	11.7	40.7	11	42	11.1	41.8
Composite Score on Survey*	37%	56%	37%	56%	47%	60%	40%	57%

***Composite score:** Calculated 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. Total possible points on survey = 22 points.

Table 2. Parents and Athletes Have Discussed the Consequences of Concussion with Each Other

	Youth Soccer		Youth Football		Youth Hockey		Average All Sports	
	Athlete (%)	Parent (%)	Athlete (%)	Parent (%)	Athlete (%)	Parent (%)	Athlete (%)	Parent (%)
Yes	30	45	65	87	70	69	55	67
No	70	55	35	13	30	31	45	33

Table 3. Parents and Athletes Have Had Formal Education About Concussions (Online or In Person)

	Youth Soccer		Youth Football		Youth Hockey		Average All Sports	
	Athlete (%)	Parent (%)	Athlete (%)	Parent (%)	Athlete (%)	Parent (%)	Athlete (%)	Parent (%)
Yes	36	21	44	30	42	29	41	27
No	64	79	56	70	58	71	59	73

Table 4. Frequency of Symptom Identification for Youth Sports Participants and Their Parents

Symptoms	Youth Soccer		Youth Football		Youth Hockey		Average All Sports	
	Athlete (%)	Parent (%)	Athlete (%)	Parent (%)	Athlete (%)	Parent (%)	Athlete (%)	Parent (%)
Vacant Stare/ Glassy Eyed	56.6	82.7	50	88.8	56	92	54.2	87.8
Drowsiness	76.6	75.8	67.3	91.6	72	94.6	71.9	87.3
Nausea/ Vomiting	53.3	96.5	69.5	92.5	72	98.6	64.9	95.8
Irritability	16.6	62	19.5	63.8	32	72	22.7	65.9
Neck Pain	46.3	68.9	63	69.4	56	53.3	55.1	63.8
Inappropriate Emotions	16.6	75.8	36.9	67.5	48	74.6	33.8	72.6
Excess Sleep	53.3	75.8	54.3	77.7	52	80	53.2	77.8
Sensitivity to Light	66.6	79.3	60.8	78.7	60	90.6	62.4	82.8
Sensitivity to Noise	36.3	75.8	39.1	73.1	44	69.3	39.8	72.7
Feeling Like in a Fog	46.4	82.7	41.3	92.5	56	92	47.9	89
Poor Balance	76.6	93.1	78.2	94.4	100	96	84.9	94.5
Fatigue	60	86.2	45.6	82.4	84	76	63.2	81.5
Sadness	16.6	51.7	21.7	34.2	29	44	22.4	43.3
Ringling in Ear	63.3	82.7	78.2	81.4	88	84	76.5	82.7
Distractors	Athlete (%)	Parent (%)	Athlete (%)	Parent (%)	Athlete (%)	Parent (%)	Athlete (%)	Parent (%)
Difficulty breathing	23.3	37.9	30.4	26.8	20	32	24.5	32.2
Pale Skin	30	48.2	30.4	39.8	28	37.3	29.4	41.7
Neck Spasm	23.3	51.7	43.4	38.8	44	37.3	36.9	42.6
Black Eye	30	37.9	19.5	25.9	16	21.3	21.8	28.3
Epistaxis (nosebleed)	33.3	37.9	34.9	28.7	44	28	37.4	31.5
Jaw Pain	33.3	48.2	26	37.9	20	36	26.4	40.7

Table 5. Frequency of Consequences of Inappropriate Care of Concussion for Youth Sports Participants and Their Parents

Symptoms	Youth Soccer		Youth Football		Youth Hockey		Average All Sports	
	Athlete (%)	Parent (%)	Athlete (%)	Parent (%)	Athlete (%)	Parent (%)	Athlete (%)	Parent (%)
Early Onset Dementia	53.3	65.5	45.6	72.2	60	77.3	52.9	71.6
Persistent Dizziness	73.3	93.1	82.6	85.1	80	85.3	78	87.8
Death	50	93.1	34.7	80.5	52	73.3	45.5	82.3
Persistent Headache	66.6	93.1	69.5	92.5	84	90.6	73.3	92
Bleeding in the Brain	60	100	63	85	62.5	88.8	61.8	91.2
Early Onset Alzheimer's	33.3	48.2	30.4	48.5	54.1	55.5	39.2	50.7
Early Onset Parkinson's	30	51.7	26	44.8	50	47.2	35.3	47.9
Distractors	Athlete (%)	Parent (%)	Athlete (%)	Parent (%)	Athlete (%)	Parent (%)	Athlete (%)	Parent (%)
Increased Risk of Stroke	36.3	65.5	30.4	62.2	28	69.3	31.5	65.6
Persistent Neck Pain	43.3	62	56.5	63.8	48	53.3	49.2	59.7
Increased Risk of Blindness	43.3	55.1	32.6	54.2	33.3	44.4	36.4	34.5
Persistent Jaw Pain	50	48.2	36.9	42.9	33.3	43.1	40.1	44.7