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Post-Concussion Policy Change for the Student-Athlete

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Post-Concussion Policy Change for the Student-Athlete

by

Heather Porter

A capstone project submitted to the faculty of
Gardner-Webb University Hunt School of Nursing
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Abstract

The intent of the evidence-based practice project was to implement a policy change for the development and implementation of a policy and related procedures to ensure equity and continuity in practices for successful reintegration of student-athletes who had sustained a concussion back into their classrooms. The lack of attention on cognitive effects of concussion and the “ripple effect” in the classroom needed to be addressed by the nursing profession from an education-intervention focus. A corrective action plan was developed by a doctoral student including an educational teaching session and PowerPoint Presentation and pilot policy. The end result of the project was the implementation of a policy for identification of the event, an alert system for all stakeholders in the student’s arena for learning and collaborative procedures for accommodations and reintegration back into the academic setting.

Keywords: concussion, cognitive rest, accommodations

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Post-Concussion Policy Change

Concussions, often overlooked as minor or insignificant diagnoses, are a form of traumatic brain injury. Concussions affect 1.6-3.8 million athletes each year. Youth athletes age 5-18 account for 65% of all sports related concussions (Center of Disease Control & Prevention (CDC), 2014). The insidious nature of these brain injuries is often ignored or discounted and viewed as an acceptable outcome of youth sports from football to soccer to cheerleading. Research has shown that athletes need to adhere to a prescribed “time out” of play to allow the brain to physically heal from the initial injury (Wedro & Stoppler, 2012). Symptoms of concussions including headache, dizziness, nausea, difficulty concentrating, difficulty focusing, feeling “foggy”, difficulty on reaction time, difficulty with bright lights, insomnia or excessive sleep, and irritability may lead to a decline in school performance (Wedro & Stoppler, 2012). While the thrust of assessment, management, and evaluation has traditionally focused on the physical effects of concussion, a new charge in this challenging situation has turned to the impact on cognition and learning.

Problem Statement

The lack of attention on cognitive effects of concussion and the “ripple effect” in the classroom needed to be addressed by the nursing profession from an education-intervention focus. The purpose of this project was three-fold. The first aspect was to assess the knowledge base of coaches, athletic directors, principals, and teachers regarding the cognitive effects on student-athletes who have sustained a concussion. The second aspect was to assess the same stakeholders and their understanding of present policy and procedures that assist these students to not only return to their “playing field”

but more importantly, the return to the “learning field”. This data was then used in the third aspect of the project to develop and initiate a policy to facilitate the learning and application of best practices in the “return to learning” aspect of post-concussion care of student athletes. The thrust of the project was centered on development and implementation of a policy and related procedures to ensure equity and continuity in practices for successful reintegration of student-athletes who had sustained a concussion back into their classrooms. This project sought to answer the question: What is the effectiveness of an educational policy development process on the implementation of procedures to promote academic success of student–athletes returning to the classroom after the event of concussion? The collaborative accommodations within a “learning plan of care” would then allow for a consistent recovery for the student as well as decrease the long term effects of post-concussion syndrome. The end result of the project was the implementation of a policy for identification of the event, an alert system for all stakeholders in the student’s arena for learning, and collaborative procedures for accommodations and reintegration back into the academic setting. This supported a better outcome for the student. A longitudinal study was utilized to evaluate if the policy/procedures were beneficial to the reintegration of the student back into the academic setting as perceived by the stakeholders of student success.

Literature Review

Much research and data supported many aspects of this problem inclusive of the physical, emotional, and financial effects of concussion (Brooks et al., 2013; Kostyun, Milewski & Hafeez, 2014; Majerske et al., 2008; McCrea, Leo, & Nelson, 2014; Roiger, Weidauer, & Kern, 2015; Spira, Lathan, Bleiberg, & Tsao, 2014; Toporek, 2015). A

concussion is a brain injury which results in a temporary disruption of normal brain function. A concussion occurs when the brain is violently rocked back and forth or twisted inside the skull, typically from a blow to the head or body. An athlete does not need to lose consciousness to suffer a concussion and, in fact, less than 10% of concussed athletes suffer loss of consciousness (CDC, 2014). Symptoms of a concussion consist of a wide scope of mild symptoms including both cognitive and physical effects such as difficulty thinking clearly and concentrating, amnesia, headache, nausea, dizziness, blurred vision, and sensitivity to noise or light (Lueke, 2011). The severity of a concussion often goes unrecognized because the signs of a concussion might not be immediately present and may take days to surface (Lueke, 2011). Concussions can cause symptoms which interfere with school, work, and social life. Concussion symptoms may last from a few days to several months. An athlete should not return to sports or physical activity like physical education or working-out while still having symptoms from a concussion. To do so puts them at risk for prolonging symptoms and further injury (CDC, 2014; Conder & Conder, 2015). Returning to any activity (school work, social activity, or sports activity) too soon can cause the recovery time to take longer. They also risk recurrent, cumulative or even catastrophic consequences if they suffer another concussion. Such risk and difficulties are prevented if each athlete is allowed time to recover from his or her concussion and the return-to-play decisions are carefully and individually made (National Federation of State High School Associations, 2013). The best treatment for a concussion is rest. There are no medications that can help speed the recovery. Exposure to loud noises, bright lights, computers, video games, television, and phones (including text messaging) may worsen the symptoms of a concussion. The

student needs to rest as much as possible in the days following a concussion. As the symptoms lessen, they can be allowed increased use of computers, phone, video games, etc., but the access must be lessened or eliminated if symptoms worsen (National Federation of State High School Associations, 2013).

The literature also showed there was a detrimental difference between high school athletes who sustain a concussion versus college athletes, pointing out that a high school athlete is more prone to cerebral swelling and that the cognitive effects of memory loss and cognition last seven times longer than for a college athlete (Lueke, 2011). It is imperative to protect these student athletes. The literature supports this as a vast population is affected. According to the Centers for Disease Control and Prevention (CDC) (2014), concussions affect 1.6-3.8 million athletes each year. Youth athletes ages 5-18 account for 65% of all sports related concussions. At the particular pilot school, there were 14 concussions in 2013, 19 in 2014, and 14 in 2015; this number comes from an estimated 150 athletes (Pilot School Athletic Trainer personal communication, 2015). The CDC (2014) referred to the “hidden” nature of this disorder of the brain. It further discussed that coaches and athletic directors need to be aware of early signs and symptoms and how to respond. Heyer, Weber, Rose, Perkins, and Schmittauer (2014) surveyed principals regarding practices for students returning to the classroom after concussion and found that there was a need for better assessment and collaboration between schools and health care professionals to ensure a healthy and successful return to the classroom for these students. The CDC focus on this issue has driven mandates and program development to educate student athletes, parents, coaches, athletic directors, and teachers. “All states have laws that mandate concussion education for high school

athletes. There is currently no uniform educational program to disseminate information to student athletes regarding concussions” (Williamson et al., 2014). From these findings Glang et al. (2014) implemented and evaluated a web-based educational program that specifically aimed at educating all stakeholders on the effects and return to learning for student athletes with concussions. Their research found that it was an efficient modality to facilitate the learning and application of post-concussion care plans and improved the quality of care for the students. However, in spite of the growing number of national programs, the understanding and application of post-concussion strategies to enhance student success in the classroom is not evident at the local school district level.

There are many school, county, and state policies to address the incidence of concussions but few expand beyond initially recognizing signs and symptoms of a concussion and post care of the physical event. This post care only supports the aspects of physical rest through limitation of physical activity and contact sports. The literature presented best practices in the provision of post-concussion strategies for the student athlete but implementation and outcomes at the local level have not been sufficiently addressed. The literature points out that the key to recovery from a concussion includes not only physical rest but mental rest followed by a gradual progression back to normal activities (Duff, 2009). This data, along with information from The Nationwide Children’s Hospital of Sports Medicine (2012) points out that most concussions, if properly managed with physical and mental rest, resolve within five days to a few weeks. However, if improperly managed or not recognized quickly and measures put in place, the symptoms may linger and potentially cause long-term academic and social difficulties for students. This could significantly impact the student’s academic career as a whole

(McGrath, 2010). McGrath (2010) further points out that proper management and accommodations by educators would allow students to continue academically progressing but with accommodations implemented to prevent further sequelae of the concussion as well as permanent damage to the student's academic record. Thus, educator involvement is vital. Supporting a student recovering from a concussion requires a collaborative approach among school professionals, health care providers, and parents, as she/he may need accommodations during recovery (CDC, 2014). Conder and Conder (2015) indicated that conservative management is imperative to aid in speedier recovery and prevent prolonged cognitive damage for student-athletes. Their number one medical recommendation for all students suffering any degree of a concussion is reduced cognitive and academic demands with careful monitoring by parents, teachers, and coaches. All students being diagnosed with a concussion should have the following accommodations made for them: take rest breaks as needed, spend fewer hours at school, be given more time to take tests or complete assignments, receive help with schoolwork, reduce time spent on the computer, reading, or writing (Conder & Conder, 2015). If these accommodations are made upon first day entry back into the class, recovery for the student should be much quicker (Conder & Conder, 2015). Based on specific health care provider's recommendations, additional accommodations may need to be made but those could be made on a case by case basis. The above are general recommendations for all students to aid in a speedier recovery. While it has been well documented that concussions are serious injuries, the literature points out that not giving the brain enough time to heal after a concussion can be dangerous. A repeat concussion that occurs before the brain heals from the first, usually within a short amount of time (hours, days, weeks),

can slow recovery or increase the chances for long-term health problems. These may include changes in how the child or teen thinks, feels, and acts, as well as their ability to learn and remember. While rare, a repeat concussion can result in brain swelling or permanent brain damage. It can even be fatal (McCrorry & Berkovic, 1998).

The National Center for Injury Prevention and Control (2014) has said that while all states have state concussion laws in place, more needs to be done. It is recommended that local policies and action plans be implemented. The recommendation is a plan that includes special support or help for students during the school day to help with their recovery. There is a need for a concussion management team to check on students with concussion for any changes in behavior or increased problems with school work. Attending to this need to educate all stakeholders at the local level on the “learning recovery” was the impetus for the project as well as developing a policy that would ensure a coordinated effort by all stakeholders to allow the student to have the cognitive rest they are required. As delineated in *The Doctor of Nursing Practice (DNP) Essentials*, (Zaccagnini & White 2014), the DNP professional has the responsibility to implement clinical prevention and population health activities that address health disparities in identified populations. This charge was the foundational concept underlying this project. The aspect of post-concussion care needed to be addressed and a change was needed that would allow for the acknowledgement of the cognitive effects of concussion and the impact on the athlete as a student. It would add to the literature support for the best practice of policy change that would enhance the understanding and support for all those involved; the student, the teacher, the coach, the principal, parents, and the athletic director. What was apparent from the review of literature is that while the physical

aspects of recovery and the impact on sport participation on the “playing field” is well established, especially at the national level, there was a literature gap addressing “learning recovery” and the “playing field” of learning and classroom participation at the grass roots of the educational system. A gap also existed between state plans in place for accommodations and the implementation of those plans, thus the need for a policy.

Needs Assessment

The current gap existed in many levels. First, there was a gap in knowledge related to the importance of allowing “cognitive rest” for the student as well as athletic rest. Second, a current plan, by the name of 504 existed at the state level for accommodations of student medical needs but due to miscommunication, this plan was not currently being implemented. Third, there was a gap in a policy to insure communication of policy and procedures. These gaps drove the focus of the project to develop and implement appropriate policies and procedures. The development and implementation of such policy was vital and important to ensure the student would be given the appropriate accommodations in the classroom that would facilitate recovery and prevent further damage from the concussion. The stakeholders in this setting were the athletic director, the athletic trainer, the principal, teachers, school nurses, parents and student. In an informal conversation with the athletic director, principal, athletic trainer and teachers in the desired setting, all expressed a breach and gap in knowledge and procedures when they have dealt with student athletes who have sustained a concussion. The culture seemed to be one inviting the possibility of a policy that would alleviate a great deal of miscommunication that ultimately impacts the student’s learning milieu. Finally, the setting for this policy was of particular need due to the fact it is a rural high

school that had athletes that have statistically been shown to be affected by concussions. Also, the policy was needed due to the fact that in the setting there was neither a dedicated school nurse nor athletic trainer, thus all other stakeholders needed to have the knowledge as well as a policy to implement should an event arise in the absence of both key people.

PICOT Plan

The population was a local, rural high school with athletes at the statistically highest occurrence rate. The desired intervention was the implementation of a policy reflective of an understanding of the cognitive effects of concussion and best practices for return of that student to the learning field reflecting implementation of a 504 plan. A comparison occurred through a logarithm study that tracked the students who suffered from a concussion in Fall 2015 and how many of those students were reintegrated back into the classroom through the use of the developed policy and procedures for this population. The outcome desired was equitable and consistent utilization of the policy/procedures for the reintegration of the student back into the academic setting as perceived by the stakeholders of student success.

The timeframe best suited for the project was the development of the policy during the summer of 2015 and the educational training session of the pilot policy in the early fall of 2015. This timeframe was especially important due to the fact that through informal conversation with the athletic trainer, more concussions are suffered by athletes during the fall football season. This drove the need to implement it in the early Fall so that student data could be tracked during the fall as concussions occurred.

SWOT Analysis

Through a SWOT analysis, the strengths, weaknesses, opportunities and threats were identified through early planning. A strength of the project was the implementation of a new policy that benefited all stakeholders. Another strength was an increase in knowledge and understanding of the cognitive effects of concussions. There was a misconception that concussions are only important in regards to the playing field; however, the effects of concussions are much more in-depth in regard to the cognitive realm than the playing field. Potential weaknesses could have been gathering enough data in regard to students with concussions in that timeframe, which could be followed on the logarithm. The opportunities for the project were multifold. The opportunity existed to increase knowledge to all stakeholders. Also, there was a need for a policy to be developed and implemented to insure that all student athletes have the same treatment and accommodations available to them. As it stood many parents, students and athletic trainers received push back from teachers to make accommodations inclusive of special testing accommodations, assignments and overall learning time. However, the opportunity existed that if all stakeholders had the knowledge of cognitive effects they would more readily buy in to making these accommodations. The potential threats existed regarding the initial buy in of the stakeholders. Ultimately, once the stakeholders understood that their commitment would facilitate a quicker return to normal classroom settings, decreased need for accommodations and a return to the playing field, it would benefit the overall health and recovery of the students.

Desired Outcomes

The outcome of the project was a policy that would be followed for all students once a concussion had been diagnosed. The measurability of data occurred through a logarithm. The logarithm tracked how many students in a given timeframe had a concussion, how many of those students had the pilot policy implemented, and the perceptions of its viability from the stakeholders. Ultimately, this process should benefit the student athlete in their recovery and academics. The project was achievable and in the identified timeframe, with Fall having the highest occurring rate of concussions thus providing the most trackable data. Another reason the project was achievable was based upon the need of such knowledge and the implementation of a policy. The stakeholders had all informally expressed a miscommunication or lack of communication of information, thus they were willing to utilize such a policy to their benefit. The project was reasonable from a cost standpoint for the DNP student as well as for the school system as there was no cost involved. The educational framework and policy was written by the DNP student and the measurement tool did not require any upfront cost. As in most public school state systems, budget unfortunately impacts and impedes many projects, regardless of the intended outcome. For this project budget issues did not come in to play. The timeframe occurred by developing the educational framework and developing the policy and procedure during the summer of 2015, with implementation set for a teacher workday prior to school beginning in the fall of 2015. This timeframe was set so that the higher incidence of concussions could be tracked. Establishment of met outcomes could be tracked through the logarithm and evaluating the outcome and the duration of the concussion for each student in the set timeframe.

Theoretical Underpinning

The theoretical framework for the project was Imogene King's Theory of Goal Attainment. In King's theory, the focus is on the care of the human being. In the Goal Attainment Theory the premise is the nurse and client communicate information, set goals mutually and then act to attain those goals (Butts & Rich, 2011). The major goal for this project was for the student to be allowed the cognitive "time out" as much as the athletic "time out". The second part was that all stakeholders would implement and follow the policy implementation. King's theory also stated that persons must be motivated to understand the necessity of using new or consistent behaviors to facilitate goal attainment (Butts & Rich, 2011). Application for this project occurred through learning a new educational framework and policy implementation that facilitated the student-athlete. The basic concept of the theory was that the nurse and patient communicate information, set goals together, and then take actions to achieve those goals. It described an interpersonal relationship that allows a person to grow and develop in order to attain certain life goals (Butts & Rich, 2011). The factors that affect the attainment of goals are roles, stress, space, and time. According to King, the patient is a social being who has three basic needs: the need for health information, the need for care that seeks to prevent illness, and the need for care when the patient is unable to help him or herself (Frey & Sieloff, 1995). In this situation the patient would have been all the stakeholders. King's theory consists of three interacting systems. The first is the personal system which consists of areas involving perception, self, growth and development, body image, space, and time. The second system is the interpersonal system with the concepts of interaction, communication, transaction, role, and stress. The third system is the social

system with the concepts of organization, authority, power, status, and decision making. According to King's theory, the goal of the nurse is to help patients maintain health so they can function in their individual roles (Frey & Sieloff, 1995). This theory functions for this project as the goal of the project was to implement a policy for identification of the event, an alert system for all stakeholders in the student's arena for learning and collaborative procedures for accommodations and reintegration back into the academic setting. This would support a better outcome for the student. The nurse's function in King's theory is to interpret information in the nursing process, to plan, implement, and evaluate nursing care (Butts & Rich, 2011). For the project, the nursing process was utilized to identify a problem and need that existed in regards to a concussion policy for stakeholders. A plan was then formulated to develop and implement an educational framework for stakeholders and a policy to be followed for all identified students. Upon completion of the pilot, evaluation of the educational framework and policy change was completed to measure if the changes have helped all stakeholders.

Working Plan

The project proposal occurred in a multi-tiered fashion. The purpose of this study was to explore the perceptions of teachers and coaches of the impact of concussions on student learning outcomes and success. The results of this exploration then guided the provisions of an educational framework session at a mandated teaching workday in August 2015. This in-service program had already been approved by the principal at the school. The goal was to implement a strategy to protect the athlete cognitively, post-concussion. The third aspect of the project was to develop and initiate a policy to facilitate the learning and application of best practices in the "return to learning" aspect

of post-concussion care of student athletes. The overall thrust of the project was centered on development and implementation of a policy and related procedures to ensure equity and continuity in practices for successful reintegration of student-athletes, who have sustained a concussion, back into their classrooms. After completing the training session and explanation of the pilot policy, students who sustained a concussion during the fall semester were followed using a logarithm. Evaluation consisted of information utilized from the logarithm as well as stakeholders' feedback to see if the policy change was beneficial and if it facilitated a more timely transition for the student-athlete. It had already been a recommendation by the project practicum partner that after completion of the project and evaluation method, that he be allowed to present it to the county athletic director and Board of Education for consideration of implementation into county policy. The principal, who was a project committee member, also felt the project had merit and would like to see it elevated to the county level as well for policy implementation and change.

Timeline

The timeline for the project is presented in Figure 1.

	January- May 2015	June- July 2015	August 2015	Sept 2015	Oct. 2015	Nov. 2015	Dec. 2015	Jan. 2016	Feb. 2016
Post-Concussion Policy Change									
Planning									
Research									
Design									
Implementation									
Follow-up Evaluation									

Figure 1. Gantt Chart Timeline

The timeline for the project stood as implementing the educational framework and explanation of the policy at one of the mandated teacher workdays in mid-August. The principal at the pilot school devised the workday calendar in mid-July and then emailed the exact date and time of the session. Once the educational session had been completed, the doctoral student worked side by side with the project practicum partner in identifying any student athletes throughout the fall semester which ran through December. This

timeframe was also chosen as the rate of incidence for concussions is highest during the fall semester with football season. All student-athletes who had been identified as having a concussion were tracked on a logarithm. The data consisted of the following data points: (1) did the student have the policy implemented for them, (2) was the policy followed by all stakeholders, and (3) did the policy facilitate a quicker and safer transition into the classroom and return to the playing field. Data was also collected from stakeholders on their perception regarding benefits of the policy and if it facilitated a lessening of stress and confusion when dealing with the student-athlete who had sustained a concussion. This process allowed for identification of needed revisions or additions to the policy and final evaluation by the project practicum partner. It is anticipated to present the policy and procedure to the county athletic director and Board of Education in the spring of 2016.

Budget

As budgetary constraints are always a challenge to implementation of any new project, the project presented no need for budgetary considerations. The work was conducted by the DNP student as well as the project practicum partner so no funding was needed to facilitate the project's implementation. The educational framework and policy change were written by the DNP student thus incurring no time constraints on current employees of the school system. Expanding the project to a county wide-focus would still not require any budgetary monies or time commitment from the stakeholders. The educational framework was one that could be easily taught at the beginning of the next fall by each school nurse or faculty could access it through educational resources and complete the training online and the policy change thus would not incur any additional

cost. There are no measurement tools or extra supplies that would need to be purchased now or in the future that would be a reoccurring charge for the state. Should the policy change have merit, it would ultimately save time for stakeholders and not be an extra source of paperwork or stress.

Evaluation Plan

The first benefit to the evaluation plan was equitable accountability for all stakeholders. As it previously stood there was no set policy, thus all students and each case were treated differently. Also, per informal conversations with the athletic director and the athletic trainer, they received resistance from teachers when an athlete was diagnosed with a concussion. The mindset was that a concussion should only affect an athlete on the field and had no translation into the classroom for the student-athlete. Through the educational framework and training session, this mind set was changed. The evaluation plan aimed to demonstrate quality improvement as well for the student-athlete in their transition back into the classroom and on to the playing field. The evaluation plan also strived to demonstrate effectiveness to the targeted population. The evaluation was one of quantitative and qualitative methods. The quantitative data consisted of how many teachers attended the educational training session. Since the principal is a major supporter and had scheduled it for a mandatory workday and training session, this helped with attaining full attendance. Other quantitative data collected was the number of students diagnosed with a concussion, and of those, the number that had the policy implemented and followed. The tool that measured the quantitative data was a logarithm. Qualitative data was collected in regard to the usability of the educational framework and its value in aiding teachers to fully understand post-concussion and how it translated to

the student in the classroom. In addition, data was solicited in regard to the perception of helpfulness of the policy or if it was not implemented the rationale for not doing so. The overall focus of the qualitative component of the project was to ascertain what the change in policy and procedures meant for all stakeholders, most importantly, the student athlete. Qualitative data collection tools were observation, written questionnaires, and structured interviews with stakeholders. A key person for the evaluation plan was the project practicum partner. The practicum partner assisted in implementation of the policy and aided in tracking the data of students diagnosed with a concussion. The practicum partner, the athletic director, had a key role and through the new policy was the first person to be alerted to a concussion of an athlete in the school. The practicum partner had a vested interest in seeing the project be successful since once the idea was proposed it was easy to identify a flaw in the system. A Logic Model illustrating project linkages is shown in Figure 2.

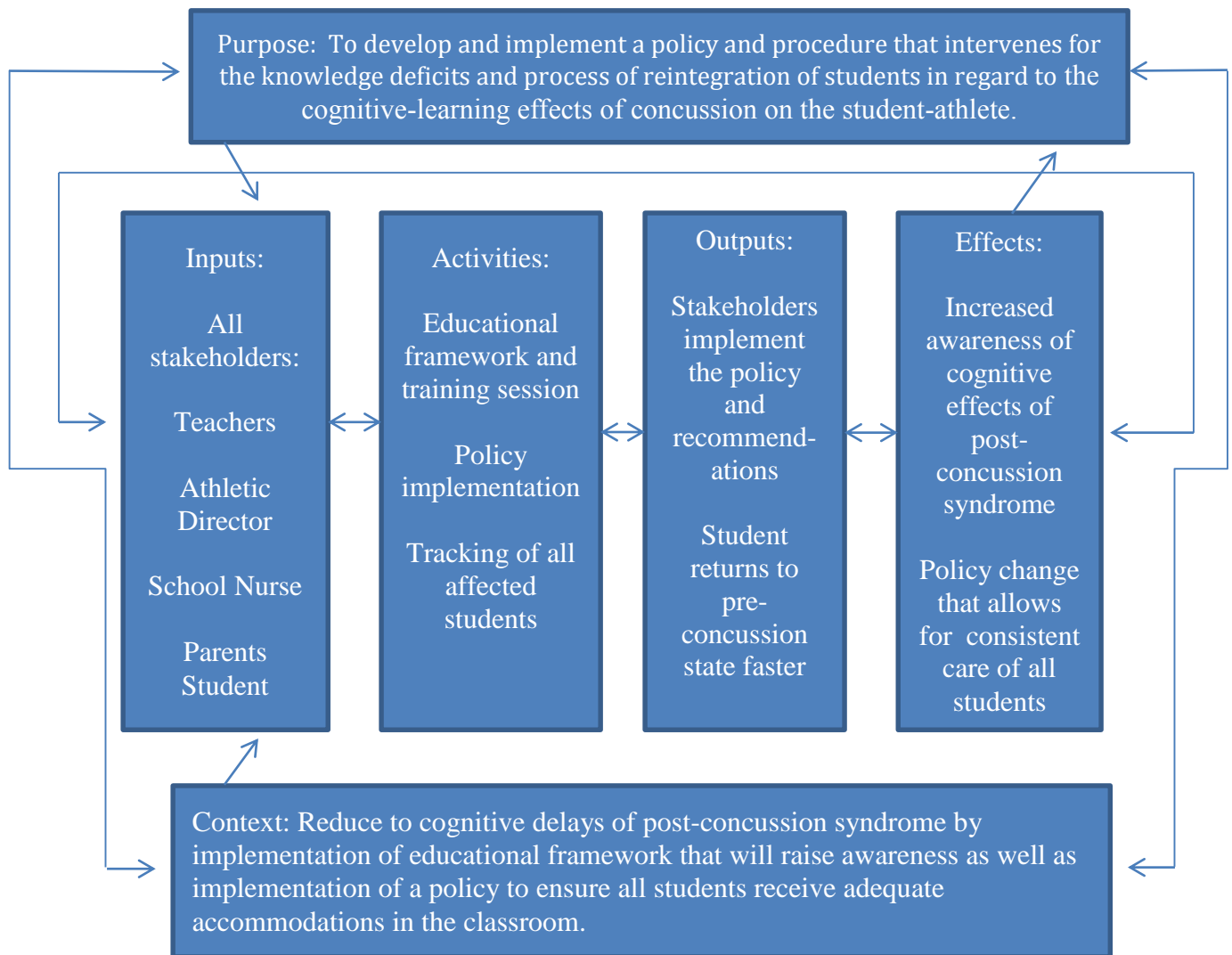


Figure 2. Logic Model Development

Quality Improvement Methods

One of the major underpinnings of nursing is accurate record keeping. With the implementation of this project, accurate records would be available for proper identification and recognition of those student-athletes who suffered a concussion during each calendar year. Prior to project implementation, there was no set document or record keeping of these findings. There was also no set standard as to what factors should be set in place for students once they had been diagnosed with a concussion. Accommodations ranged from no accommodations being made to parents and physicians fighting to have accommodations put in place and then still not having full support from all teachers as there was no set protocol for communicating the information to each teacher. Instituting a policy will insure quality improvement in care of the student-athlete in this situation. The project also aligns with several of the DNP Essentials. DNP Essential III addresses designing, directing, and evaluating quality improvement methodologies to promote safe, effective, efficient, equitable, and patient-centered care (Zaccagnini & White, 2014).

Project Implementation Process

Institutional Review Board (IRB) approval was obtained through the University's School of Nursing but was not required from the local school system. The facility contract and practice immersion contract were completed at the pilot school. On August 18, 2015 all faculty and staff employed by the local school system completed an education class and review of the pilot policy. This was completed prior to school starting in the 2015-2016 school year. The education class took place on one of the mandatory teacher workdays which was coordinated and arranged by the principal. This was done to ensure maximum attendance and to ensure the policy was followed and all faculty were

well informed. Faculty had an opportunity to ask questions or seek clarity. Each participant was given a copy of the PowerPoint Presentation (Appendix A) as well as a copy of the policy and procedure (Appendix B) for future reference. The information was also then uploaded to their system that houses educational information and resources. All participants stayed actively engaged and asked questions as well as voiced excitement and willingness to participate in the pilot policy and felt such information and policy were necessary.

Project Evaluation

Outcome

The evaluation for this project was completed in two parts. At the completion of the pilot policy, teachers who had utilized the policy and had students under the policy from August 2015-December 2015 completed a questionnaire. The questionnaire was a means of data collection on information in regards to the policy, the effectiveness of the educational session, as well as the benefit of the policy in regards to successful reintegration and progression of the students who had sustained a concussion. The results of the questionnaire revealed that 100% of respondents agreed that the educational session was beneficial as well as the pilot policy made it much easier to make accommodations for the students and they felt more comfortable and well informed having the policy in place. One hundred percent also felt like the policy protected them better since they knew from the first day what accommodations to put into place. All respondents felt having the policy in place made reintegration of the student back into the classroom easier. Having participated in the pilot of the policy, they would like to see this policy put into place. A recommendation by the respondents in the comments section

was that the pilot policy should become a set policy as it was so beneficial and they recognized how much faster students under the policy improved and returned to full class participation versus students who did not have the policy initiated on first day.

The second part of the evaluation process consisted of analysis of the longitudinal study data which was collected and measured through a logarithm. The logarithm tracked how many students in the designated timeframe had a concussion, how many students had the pilot policy followed, if the athletic director and teachers were notified, if the student's academic standing was tracked, if the accommodations were put into place for the student initially and the number of days the student had to have accommodations made (Appendix C). Based on the Fall 2015 data, there were eight concussions sustained at the pilot school from August 2015- December 2015. In all eight cases the athletic director was notified, the policy was followed, each teacher was notified and signed off on the policy being implemented from the first day of the event and accommodations were implemented, and the student's academic standing was tracked during this period. Data revealed that five of the eight cases had accommodations made for under four days, two of the eight had accommodations that extended to 12 days, and only one of the eight had accommodations that lasted 20 days. This data showed that the policy attained desired outcomes of ensuring a coordinated effort by all stakeholders to allow the student to have the cognitive rest they required. It further supported what the literature presented as best practice for provisions in post-concussion which was allowing for the "learning recovery" time. This was demonstrated by more than half of the students having accommodations in place for less than four days. This data demonstrated that when a coordinated effort and plan was followed from the first day and a learning plan of

care was implemented, that recovery and reintegration back into the academic setting was attained sooner and the student athlete was also able to maintain academic standing during this time. This further supported the literature findings that the key to recovery from a concussion includes not only physical rest but mental rest followed by a gradual progression back to normal activities (Duff, 2009). Data from The Nationwide Children's Hospital for Sports Medicine (2012) points out that most concussions, if properly managed with physical and mental rest, resolve within five days to a few weeks. Data from the pilot demonstrated that to be true as on average students had accommodations for less than four days. This further demonstrated that when accommodations are put in place from day one, it will drastically shorten their signs and symptoms since they have been allowed the cognitive rest required. Further data to solidify the validity of the policy and its merit was obtained from the school nurse at the pilot school. While there was no logarithm of data previously kept on past students who sustained a concussion, the nurse was able to go back and identify that for previous students at the pilot school who had accommodations in place, on average their symptoms did persist longer and had accommodations in place at a minimum of two weeks but roughly three to four weeks (School Nurse at pilot school personal communication, 2016). She also pointed out that since there was no prior set policy, that accommodations were not put into place until after they were seen and evaluated by a physician as far as classroom modifications and that could be anywhere from several days to one to two weeks post event occurring. Data from the school nurse also revealed that during the time frame of the pilot that several other students who were non-athletes sustained concussions. Due to the policy pilot plan, those students did not fall under the implementation of the policy immediately, and data

on those students revealed their recovery time was significantly longer by as much as three weeks. This data also reveals that early implementation of the policy significantly reduces their cognitive recovery time.

Sustainability of Project

Subsequent to the educational session and pilot policy implementation, the doctoral student met with team members to develop a policy that flowed and looked similar to other policies in place county-wide. This was done so that it would be user friendly and look similar to other policies for stakeholders and would aid in ease of use of the policy. In addition to developing the policy, a PowerPoint Presentation and handout of the educational material was provided in the educational sessions as well as uploaded to the school web site for resources and information. With that in place, the sustainability of the policy should it become adopted county or state wide would be one of ease. There would be no cost that would need to be incurred since the policy has been written and now piloted, with data to support its merit. No cost would need to be incurred for the training sessions as the educational sessions could occur online as many other educational sessions are web-based. No additional cost would be incurred by means of additional faculty needing to be hired as all school systems have the key stakeholders and personnel in place at every local high school. This also would help better utilize resources such as school nurses who presently are at the high schools typically one day per week, which means they may not be notified and accommodations be put in place until many days later. This would be a more seamless process and be a better utilization of the school nurse's time as well because the policy would help alleviate the process of notification by means of detailed emails to teachers for each student case by case accommodations.

Sustainability of this policy is imperative to also address and answer the needs of the students as well as the recommendation of governing bodies. The National Center for Injury Prevention and Control has said that while all states have state concussion laws in place more needs to be done (National Center for Injury Prevention and Control, 2014). They recommend that local policies and action plans be implemented. The recommendation as it stands now is that of a plan that includes special support or help for students during the school day to help with their recovery and a concussion management team to check on students with concussion for any changes in behavior or increased problems with school work. The utilization and implementation of this policy would address all of those recommendations.

Conclusion

The purpose of this project was to develop and implement a policy and procedure that intervenes for the knowledge deficits and process of reintegration of student-athlete in regard to the cognitive-learning effects of concussion. The project was multi-tiered. The first aspect was to assess the knowledge base of the coaches, athletic directors, principals, and teachers regarding the cognitive effects on student-athletes who have sustained a concussion. The second aspect was to assess the same stakeholders and their understanding of present policy and procedures that assisted these students to not only return to their “playing field” but more importantly, the return to the “learning field”. This data was then used in the third aspect of the project to develop and initiate a policy to facilitate the learning and application of best practices in the “return to learning” aspect of post-concussion care of student athletes. The thrust of the project was centered on development and implementation of a policy and related procedures to ensure equity and

continuity in practices for successful reintegration of student-athletes who had sustained a concussion back into their classrooms. Fourth, an evaluation was conducted to see if the policy/procedures were beneficial to the reintegration of the student back into the academic setting as perceived by the stakeholders of student success.

Medically it has been shown that symptoms of concussion are headache, dizziness, nausea, difficulty concentrating, difficulty with focusing, feeling “foggy”, difficulty in reaction time, difficulty with bright lights, insomnia or excessive sleep, and irritability. Due to these symptoms students may see a decline in their school performance or their grades (Wedro, & Stoppler, 2012). It is imperative that teachers, coaches, school nurses, and athletic directors recognize that student-athletes need not just time off the field or “no play time” but also accommodations made in the classroom where they are making decisions that affect their high school transcripts and overall GPA. It was the goal of this project to expand the knowledge of the cognitive-learning effects of concussion on the student-athlete, and implement a policy and procedures in the hope that the student part of the equation would receive as much focus as the athlete part of the equation while ensuring an optimal learning environment for students.

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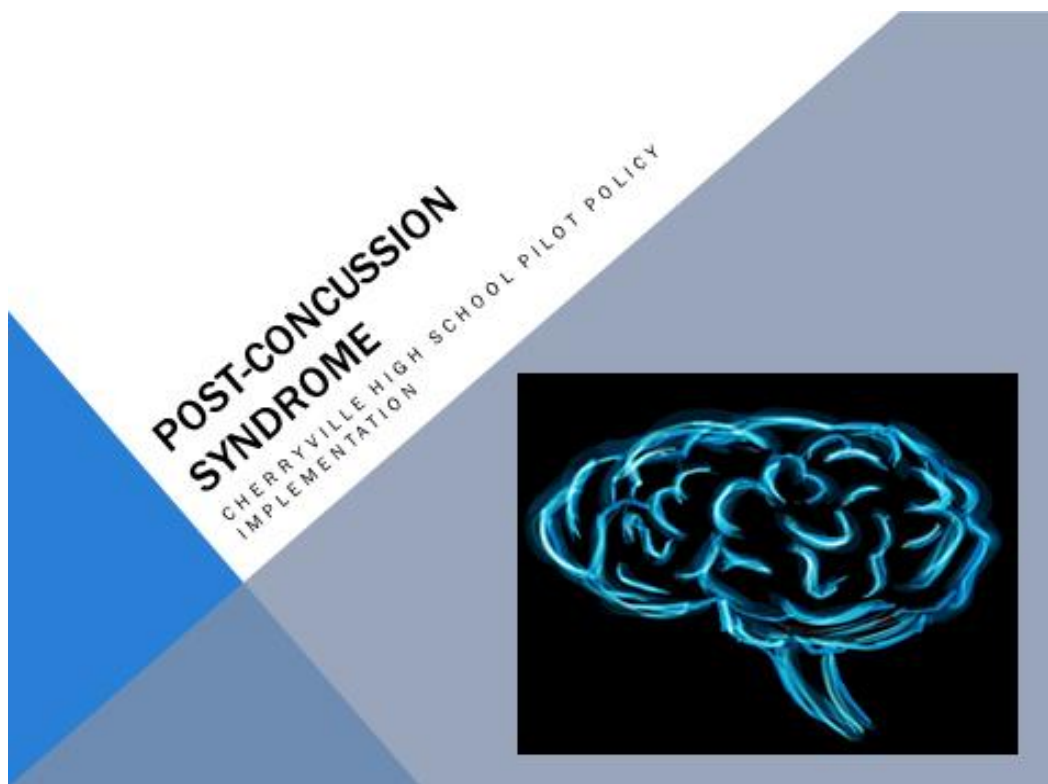
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Appendix A

Educational Material for Post-Concussion Policy Change



WHAT IS A CONCUSSION



A concussion is a brain injury which results in a temporary disruption of normal brain function. A concussion occurs when the brain is violently rocked back and forth or twisted inside the skull, typically from a blow to the head or body. An athlete does not need to lose consciousness (be “knocked-out”) to suffer a concussion, and in fact, less than ten percent of concussed athletes suffer loss of consciousness (CDC, 2014).

The focus on the physical recovery of this event often undercuts a needed focus on strategies to facilitate students’ “learning recovery” secondary to the event.

<http://www.youtube.com/watch?v=NhSvc98ZBik>

<https://www.youtube.com/watch?v=Bh6W4yEX7TQ>



LITERATURE BEHIND THE NEED FOR A POLICY

Youth athletes ages 5-18 account for 65% of all sports related concussions.

High school athletes are more prone to cerebral swelling and the cognitive effects of memory loss and cognition problems last 7 times longer than a college athlete (Lueke, 2011).

At CHS, there were 14 concussions in 2013, 19 in 2014 and thus far in 2015, 14, this number comes from an estimated 150 athletes (Cherryville High School Athletic Trainer, 2015).

Concussions can cause symptoms which interfere with school, work, and social life.

Concussion symptoms may last from a few days to several months.

An athlete should not return to sports or physical activity like physical education or working-out while still having symptoms from a concussion. To do so puts them at risk for prolonging symptoms and further injury (CDC, 2014) (North Carolina Medical Journal, 2015).



LITERATURE CONT.



Student-athletes that return to any activity too soon (school work, social activity or sports activity), can cause the recovery time to take longer. They also risk recurrent, cumulative or even catastrophic consequences, if they suffer another concussion. Such risk and difficulties are prevented if each athlete is allowed time to recover from his or her concussion and the return-to-play decisions are carefully and individually made. (National Federation of State High School Association, 2013).

The best treatment for a concussion is rest. There are no medications that can help speed the recovery. Exposure to loud noises, bright lights, computers, video games, television and phones (including text messaging) may worsen the symptoms of a concussion. The student needs to rest as much as possible in the days following a concussion. As the symptoms lessen, they can be allowed increased use of computers, phone, video games, etc., but the access must be lessened or eliminated, if symptoms worsen (National Federation of State High School Association, 2013).



BASIC LIST SIGNS AND SYMPTOMS

SIGNS OBSERVED BY PARENTS, FRIENDS, TEACHERS OR COACHES

Appears dazed or stunned
 Is confused about what to do
 Is unsure of game, score, or opponent
 Moves clumsily
 Answers questions slowly
 May lose consciousness
 Shows behavior or personality changes
 Can't recall events prior to hit
 Can't recall events after hit
 Repeats questions
 Forgets class schedule and assignments

SYMPTOMS REPORTED BY Student-ATHLETE

Headache
 Nausea
 Balance problems or dizziness
 Double or fuzzy vision
 Sensitivity to light or noise
 Feeling sluggish
 Feeling foggy or groggy
 Concentration or memory problems
 Confusion



MORE ADVANCED LIST REPORTED BY STUDENTS

EMOTIONAL:

- Irritable
- Sad
- More emotional than usual
- Nervous

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”

WHAT TEACHERS NEED TO KNOW FOR THE STUDENT ENTERING THE CLASSROOM

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, and prolong their recovery stage (North Carolina Medical Journal, 2015).

Supporting a student recovering from a concussion requires a collaborative approach among school professionals, health care providers, and parents, as she/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. This would only be in extreme case but if recommendations are followed recovery is typically quick. (CDC, 2014).



TEACHER RECOMMENDATIONS

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 able to cope with stress or is more emotional

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 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.



WHAT SHOULD BE DONE FOR ALL STUDENTS DIAGNOSED WITH A CONCUSSION

The North Carolina Medical Journals recent article *Sports Related Concussions* indicates that conservative management is imperative to aid in speedier recovery and prevent prolonged cognitive damage for student-athletes.

Their number one medical recommendation for all students suffering any degree of a concussion is reduced cognitive and academic demands with careful monitoring by parents, teachers and coaches (Conder & Conder, 2015, pg. 91).

All students being diagnosed with a concussion should have the following accommodations made for them:

- Take rest breaks as needed,
- Spend fewer hours at school,
- Be given more time to take tests or complete assignments,
- Receive help with schoolwork,
- Reduce time spent on the computer, reading, or writing (Conder & Conder, 2015, pg. 91).

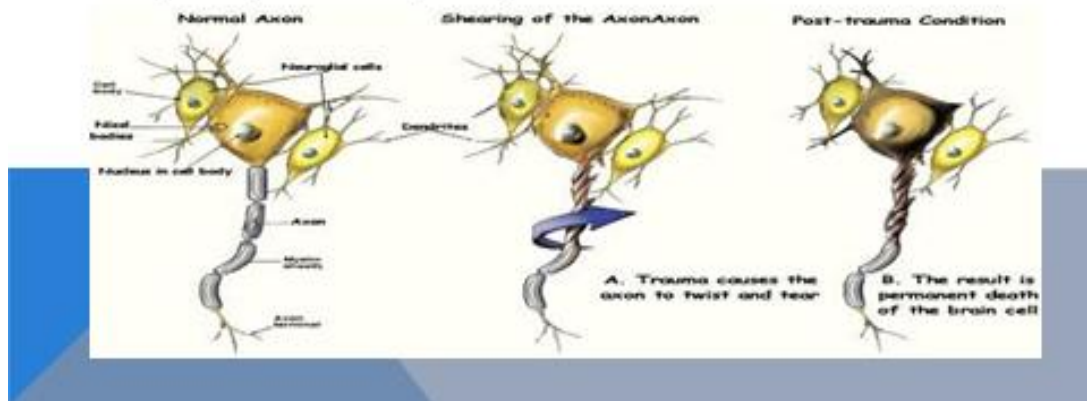
If these accommodations are made upon first day entry back into the class recovery for the student should be much quicker.

Based on specific doctor recommendations additional accommodations may need to be made but those could be made on a case by case basis. The above are general recommendations for all students to aid in a speedier recovery.



WHY THIS MATTERS

Not giving the brain enough time to heal after a concussion can be dangerous. A repeat concussion that occurs before the brain heals from the first, usually within a short amount of time (hours, days, weeks), can slow recovery or increase the chances for long-term health problems. These may include changes in how the child or teen thinks, feels, and acts, as well as their ability to learn and remember. While rare, a repeat concussion can result in brain swelling or permanent brain damage. It can even be fatal (McCroy & Berkovic, 1998).



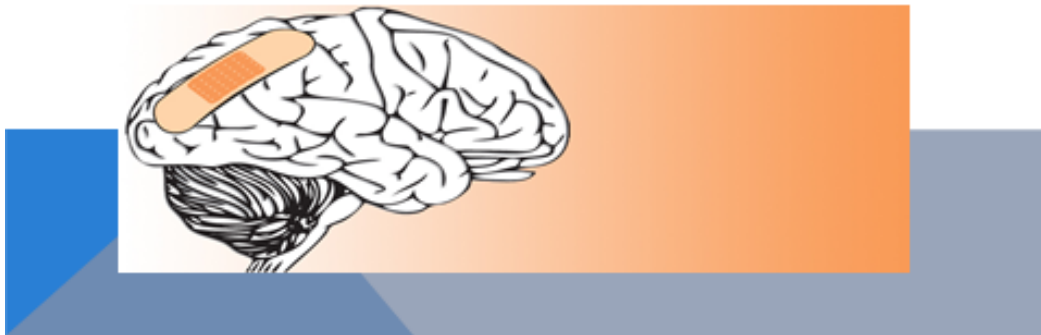
WHY NOT MAKE IT HAPPEN AT CHS!

The National Center for Injury Prevention and Control has said that while all states have state concussion laws in place more needs to be done (National Center for Injury Prevention and Control, 2014).

They recommend that local policies and action plans be implemented.

The recommendation is:

- A plan that includes special support or help for students during the school day to help with their recovery.
- A concussion management team to check on students with concussion for any changes in behavior or increased problems with school work.



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Appendix B

Pilot Policy

Post-Concussion Pilot Policy

Student Name _____

Birthdate _____

Address _____ Home Phone _____

Grade _____

Teachers _____

Parent/Guardian _____ Day Phone _____

Emergency Contact _____ Day Phone _____

Physician's Name _____ Phone _____

Concussion Facts:

- A concussion is a type of brain injury
- It is a serious condition that does have cognitive implications
- A concussion can be caused from various sources such as a blow to the head, jolt to the head or collision of the head

Symptoms of a Concussion: These can occur immediately or days or even weeks later.

These are the things that may be observed by school staff.

Physical: headache, nausea, vomiting, difficulty with balance, feeling of dizzy or spinning sensation, difficulty with vision or light sensitivity, sensitivity to noise, feeling of being dazed or world moving in slow motion or around them.

Cognitive: Feeling foggy, dazed, slowed down, difficulty with concentration, difficulty with attention span, difficulty with numbers or recall, difficulty remembering events or

conversations, may repeat conversations or have no recall of conversations, difficulty following directions or instructions, difficulty staying on tasks

Emotional: Feeling of confusion, sadness, irritability, nervousness, agitation, feelings of things being out of their control

Steps to be taken for the Student

1. The school athletic director (AD) should be notified
2. The AD will look at the student's schedule and alert each teacher of the student's condition as well as the school counselor and the school nurse.
3. Each teacher will make the following accommodations based upon Centers for Disease Control and Prevention (CDC) and National Federation of State High School Associations recommendations:
 - Limited screen time; this is to include computer, smartboards and AV equipment
 - Delay of test taking or extended test time
 - Reduce class assignments and homework to key tasks
 - Provide written instructions and help for homework and classwork
 - Allow the student to show they understand a concept orally instead of written
 - Allow student to wear sunglasses if they are bothered by light or sit in an area that is less bright such as closing blinds in an area or away from window
 - If bothered by noise, allow them to test, study or do individual work in a quiet place or do during break or lunch if possible
 - Slowly progress the student back into normal routine once symptoms have resolved, if symptoms return decrease progression or integration into normal activities.
4. These recommendations should be in effect until physician specific recommendations are set in place or until student is symptom free- whichever should arise first. These accommodations should not exceed three days without physician recommendations to follow.
5. School counselor role will be to track academic standing during this period of cognitive rest so that the student does not academically decline as a result of the concussion or post-concussion symptoms.
6. School nurse will monitor the student's signs and symptoms and complete the appropriate medical concussion health plan.
7. Athletic director and DNP student will track the overall progression of the student-athlete. Data will be collected on the data flowsheet.

- 8. Student upon being symptom free in the classroom will progress to the gradual return to play progression plan.

Student specific recommendations beyond those stated above:

Athletic Director Signature: _____

School Nurse Signature: _____

Each Teacher's Signature:

Appendix C

Flowchart for Concussion Policy

