



Concussion Management in the Schools

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Agenda

- Types of Brain Injury
- Common Causes, Symptoms & Statistics
- Educational Impact of Concussion
- Hierarchy of Neurocognitive Functioning
- Legislation
- Concussion Management in Lincoln Public Schools



Types of Brain Injury



Congenital (OHI)

- Before birth/pre-natal; hereditary, congenital, degenerative

Acquired Brain Injury (OHI)

- Acquired after birth
- anoxia, aneurysm, stroke, infection

Traumatic Brain Injury (TBI)

- Due to bump or blow to the head

All have similar impacts and require similar interventions and/or supports

A Concussion is a Mild TBI

- A concussion is a type of **traumatic brain injury** (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 rapidly back and forth. This sudden movement can cause the brain to bounce around in the skull, stretching and damaging the brain cells and creating chemical changes in the brain. (Center for Disease Control and Prevention 2017)



Common Causes of TBI



- **Infants:** Physical abuse
- **Toddlers:** Falls and abuse
- **Young Children:** Passengers in vehicles; falls
- **School-aged Children:** bicycle and pedestrian collisions with vehicles; youth sports; falls
- **Adolescents:** Drivers and passengers in motor vehicle accidents; sports; falls; assaults

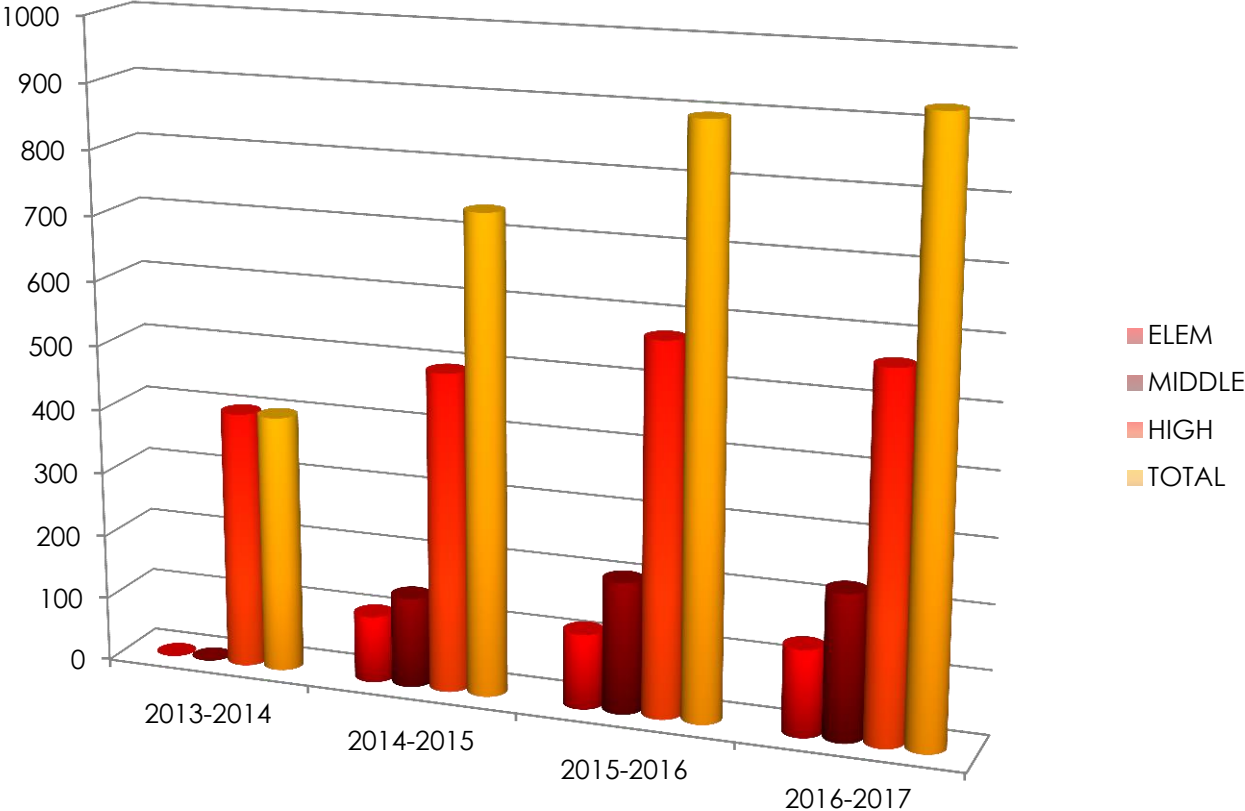
Symptoms of TBI/Concussion

4 Categories:

1. Thinking/Cognitive
2. Sleep/Fatigue
3. Physical
4. Social/Emotional



LPS Statistics



Why are Concussions Such a Big Deal?



A CONCUSSION IS A BRAIN INJURY!

- Health care professionals may describe a concussion as a “mild” brain injury because concussions are usually not life threatening.
- Even so, their effects can be serious and can change the way the brain normally works. (Centers for Disease Control & Prevention 2017)

Why are Concussions Such a Big Deal?



- These changes can lead to a set **of symptoms affecting cognitive, physical, emotional and sleep functions** that can adversely affect children and adolescents in various aspects of their lives, including home, school, social relationships, and sports/recreation activities. (Ransom et al 2015)
- After a concussion, the child or adolescent may not appear to be ill or physically injured. In fact, they may “look” just fine. **A concussion is an invisible injury.** Even though there is no physical appearance of illness, a concussion can affect a student’s learning capabilities.

Why are Concussions Such a Big Deal?



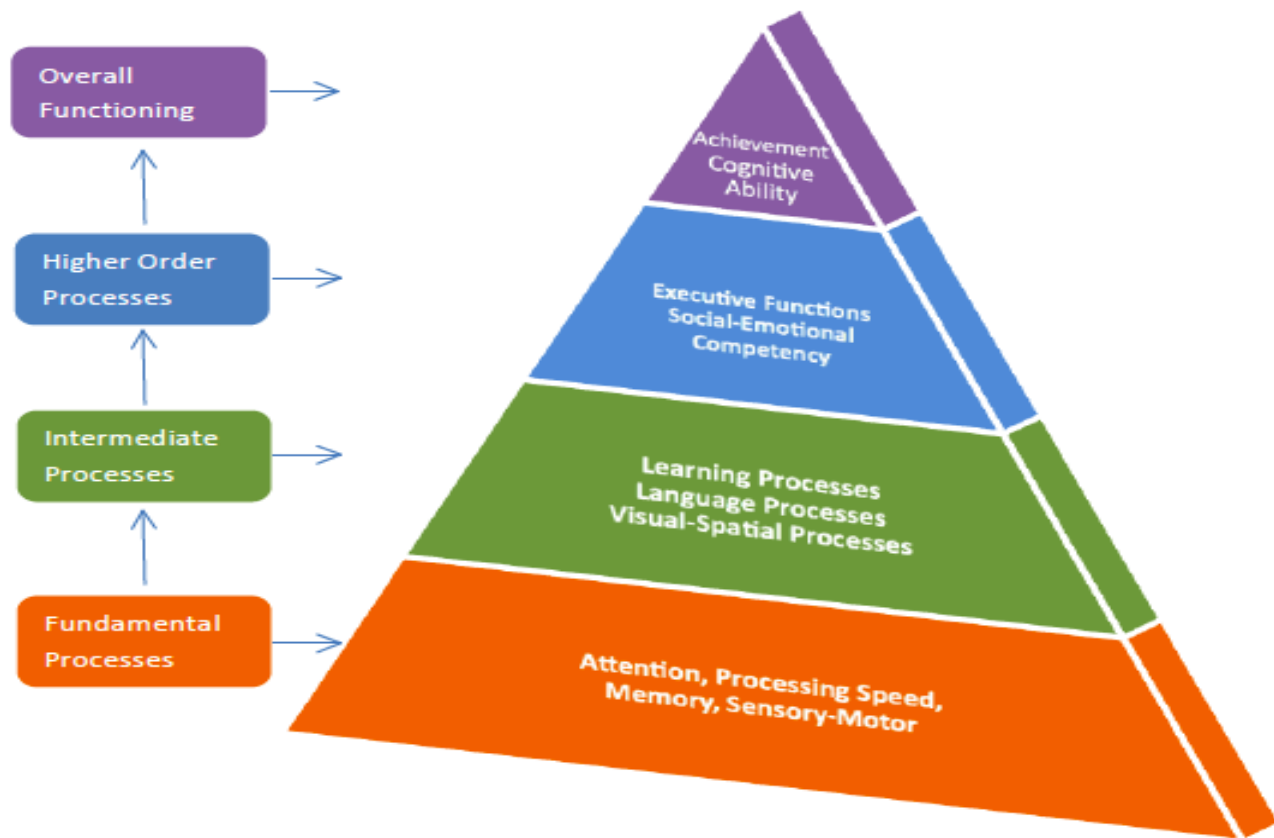
- While a student is symptomatic, returning to full-time academics or play before symptoms have cleared can result in prolonged recovery time or risk of further injury. Ignoring the symptoms and trying to “tough it out” often makes symptoms worse! A **gradual return to activity** (academic and sports) is recommended.

Impact on Classroom Performance

- Appears to be dazed or lazy
- Is confused and disorganized
- Appears to be inattentive
- Processes information slowly and inefficiently
- Is sensitive to lights and noise
- Can't recall events prior to or after the hit, bump, or fall
- May show behavior or personality changes
- Forgets class schedule or assignments



Hierarchy of Neurocognitive Functioning



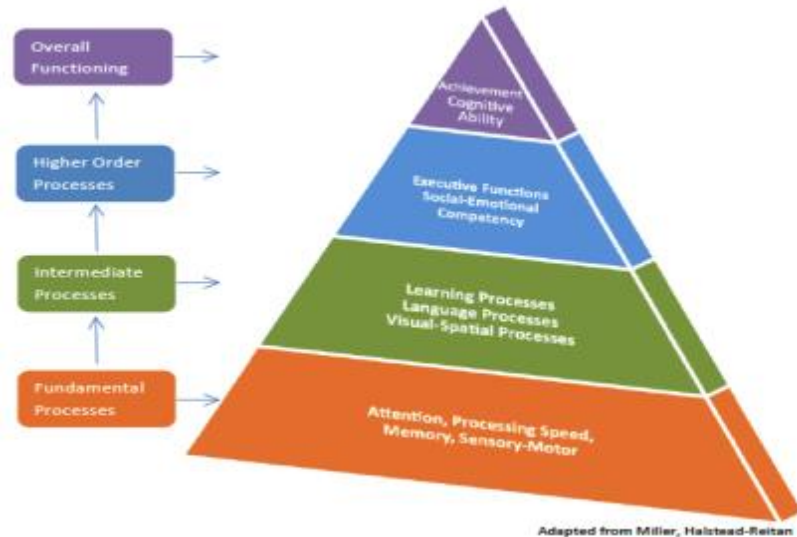
Adapted from Miller, Halstead-Reitan

Domain Areas Sensitive to a TBI

Fundamental Processes

- Attention
- Processing Speed
- Memory
- Sensory-Motor
 - Fine Motor
 - Gross Motor

Hierarchy of Neurocognitive Functioning

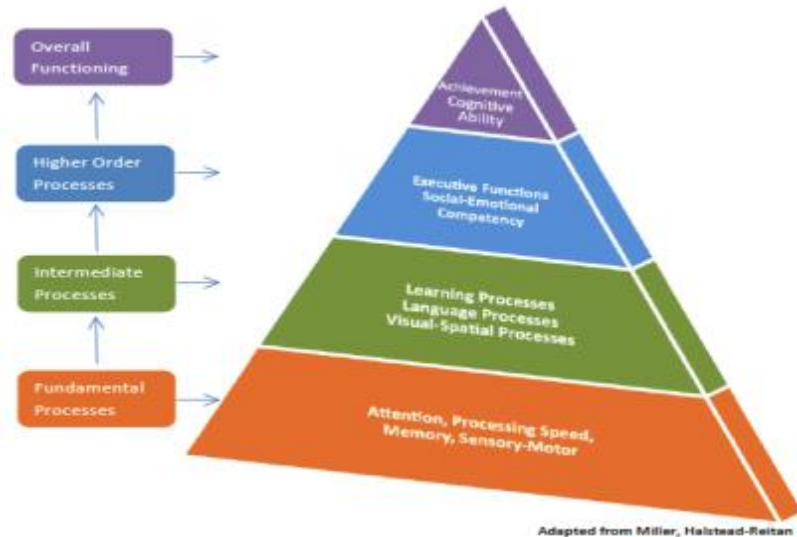


Domain Areas Sensitive to a TBI

Intermediate Processes

- New Learning
- Language
 - Receptive
 - Expressive
 - Pragmatics
- Visual-Spatial

Hierarchy of Neurocognitive Functioning

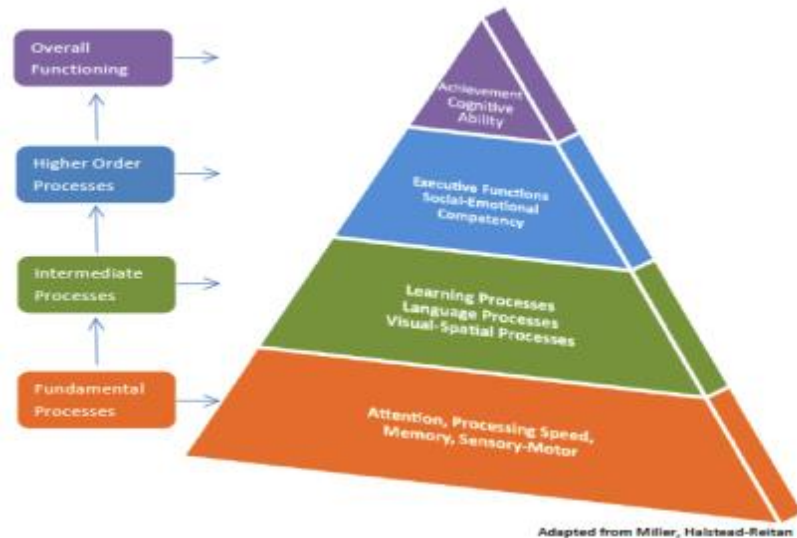


Domain Areas Sensitive to a TBI

Higher Order Processes

- Social/Emotional/Behavioral
- Executive Functioning
 - Initiation
 - Reasoning
 - Planning
 - Mental Flexibility

Hierarchy of Neurocognitive Functioning



Learning Processes: Unevenness

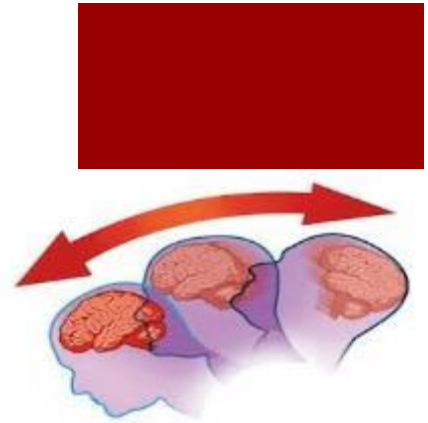


A hallmark of brain injury is an unevenness in abilities across different settings, over time, and across different contexts.

■ **Examples:**

- Across Domains- a 10 year old may have typical abilities in fine and gross motor areas but have the social-emotional regulation of a 5 year old.
- Within domains- Average abilities in expressive language but difficulties with receptive language
- Across time- a student knows material on Tuesday but cannot retrieve the same information later that same week
- **Try 'differently' rather than harder to reach students.**

Changing the Culture of Concussions



Nebraska's Concussion Awareness Act

- Effective date July 1, 2012 – Return to Play

Nebraska Concussion Awareness Act – Amendment

- Effective date July 18, 2014 – Return to Learn

Nebraska Statutes - 79-9104 - Establish a return to learn protocol for students that have sustained a concussion. The return to learn protocol shall recognize that students who have sustained a concussion and returned to school may need informal or formal accommodations, modifications of curriculum, and monitoring by medical or academic staff until the student is fully recovered.

LPS Concussion Management



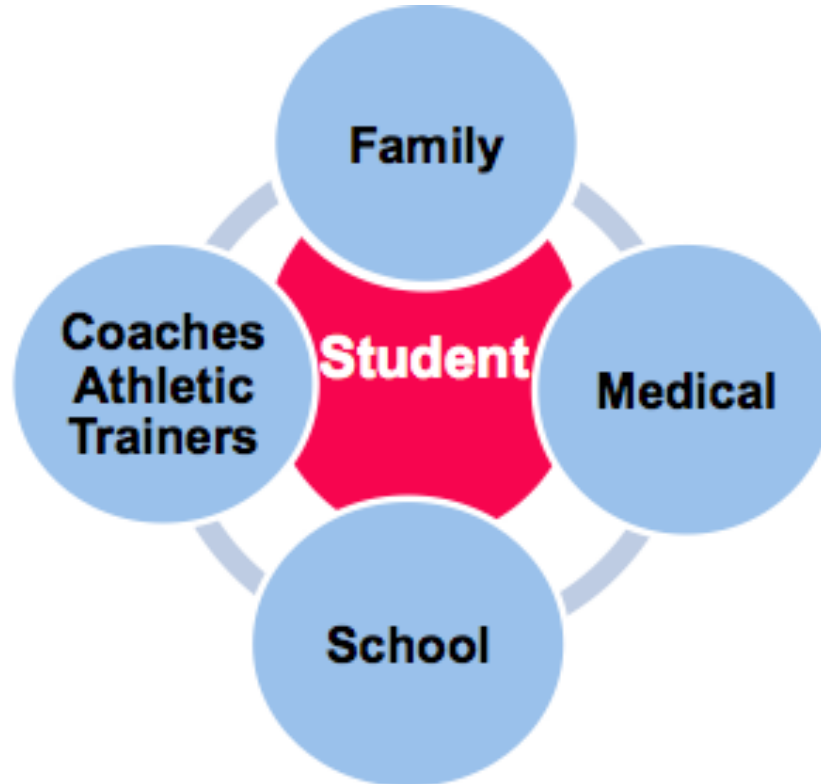
- Established Concussion Management Teams (CMTs) in all high schools in 2013-2014
- Established Concussion Management Teams (CMTs) in all elementary and middle schools in 2014-2015

Keys to Management

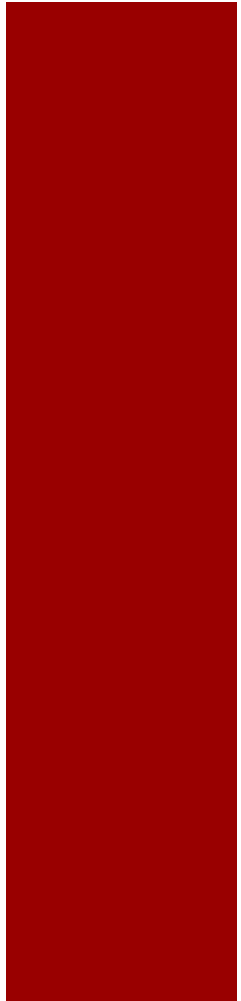


- Identify Early
- Manage Properly
 - Prevent Second Impact Syndrome
 - Manage post concussive symptoms
 - Provide academic accommodations during recovery
- When managed well, recovery is quicker, & second injury is prevented.

Collaborative Approach to Concussion Management



The Concussion Management Team



Concussion Management Team Membership



Suggested Members:

- Administrator(s), SAT Coordinator(s)
- Athletic Trainer
- School Nurse
- Speech-Language Pathologist
- School Psychologist
- Counselor
- Classroom Teacher
- Occupational Therapist
- Physical Therapist

Concussion Management Team Responsibilities



Upon receiving notification of a student's concussion, the team will:

1. **Assess** the student's needs.
2. **Create and implement a concussion management plan** with sound procedures that support the concussed student.
3. **Monitor** the effectiveness of the plan.
4. **Adjust** and readjust until the student no longer has special needs resulting from the condition.

(NDE, 2017)

LPS CMT Process



As soon as the school is made aware of the injury:

- 1. Assign a CMT point person** to contact the family.
- 2. TBI Screening Tool:** Ask the parent to complete the screening form that corresponds with the student's age.
- 3. Post Concussion Symptom Checklist:** Ask the parent and student to rate the student's symptoms post injury.
- 4. Schedule a meeting** with the student and parent as soon as possible to develop a Return to Learn plan if the student is still symptomatic.

Tools

- NDE developed and approved—Research based
- TBI Screeners- by grade levels: birth to 21
 - Symptom survey is most important
 - Checks for history of previous concussions
 - Make a routine part of the SAT process
- Post Concussion Symptom Checklist
- Return to Learn Progression 2017
- Return to Play Progression 2017
- CMT Return to Learn Progression Guide
- Bridging the Gap Booklet (with appendices)
- TBI Manual- Colorado Department of Education



TBI Screeners by grade levels birth to 21

- Documents information re: the injury
- Documents baseline symptoms

SAFE Child Screening Tool: Grades 1 to 5

ID# _____

Children referred to educators or school nurses for assistance because of academic, behavioral, or physical challenges sometimes have histories of possible brain injuries. The SAFE Child Screening tool provides information to help educators develop and implement appropriate accommodations and services.

Completing this form will not diagnose your child with a brain injury!

If you have concerns about your child, contact your physician or an educator.

Today's date: _____		Child's date of birth: _____	
Your relationship to child: _____		Child's gender: <input type="checkbox"/> Male <input type="checkbox"/> Female	
		Child's grade: 1 2 3 4 5	
Child's race: <input type="checkbox"/> African American <input type="checkbox"/> Caucasian <input type="checkbox"/> Asian <input type="checkbox"/> Hispanic <input type="checkbox"/> Native American <input type="checkbox"/> Other			
Is your child currently receiving special educational services? <input type="checkbox"/> Yes <input type="checkbox"/> No			
If yes, what is your child's disability? _____			
Sickness	Has your child ever had a seizure, high fever (greater than 104 degrees), infection of the brain or spinal cord (e.g., meningitis or encephalitis), or other serious illness affecting the brain?	<input type="checkbox"/> Yes <input type="checkbox"/> No If yes, how many times? _____	
Accidents	Has your child ever: been in a car accident? <input type="checkbox"/> Yes <input type="checkbox"/> No experienced a near drowning or suffocation? <input type="checkbox"/> Yes <input type="checkbox"/> No stopped breathing for one minute or longer? <input type="checkbox"/> Yes <input type="checkbox"/> No been exposed to toxins (e.g., lead, carbon monoxide)? <input type="checkbox"/> Yes <input type="checkbox"/> No or sustained a blow to the head? <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No If yes, how many times? _____	
Falls	Has your child ever had a substantial fall, resulting in a blow to the head (e.g., down stairs, from playground equipment, or while riding a bicycle, scooter, skateboard)?	<input type="checkbox"/> Yes <input type="checkbox"/> No If yes, how many times? _____	
Emergency Room	Has your child ever needed emergency medical attention because of drowsiness, a loss of consciousness, or a blow to the head?	<input type="checkbox"/> Yes <input type="checkbox"/> No If yes, how many times? _____	
Child Behaviors	If you answered YES to any of the above questions, have you noticed any of the following behaviors in your child since the accident? Check all that apply.		
	<input type="checkbox"/> Sensitivity to light or sound	<input type="checkbox"/> Sadness, anxiety, or irritability	
	<input type="checkbox"/> Frequent headaches, nausea, or ringing ears	<input type="checkbox"/> Difficulty with school work or loss of previously-learned academic skills	
	<input type="checkbox"/> Coordination problems, clumsiness, or dizziness	<input type="checkbox"/> Limited social interactions with friends or a change in personality	
	<input type="checkbox"/> Impulsive behaviors or outbursts of anger	<input type="checkbox"/> Loss of interest in previously-enjoyed activities	
	<input type="checkbox"/> Changes in mood	<input type="checkbox"/> Problems with attention, concentration, organization, memory, multi-tasking, or starting or finishing tasks	
	<input type="checkbox"/> Changes in sleeping habits		
	<input type="checkbox"/> Lack of energy or tiring easily		
	<input type="checkbox"/> Other _____		

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Post-Concussion Symptom Checklist

- Completed by parent and student or point person every morning
- Drives decisions re: accommodations & modifications for the day

Post-Concussion Symptom Checklist

Name: _____

Date: _____

Please indicate how much each symptom has bothered you over the past 2 days.

	Symptoms	None	Mild	Moderate	Severe			
PHYSICAL	Headache	0	1	2	3	4	5	6
	Nausea	0	1	2	3	4	5	6
	Vomiting	0	1	2	3	4	5	6
	Balance Problem	0	1	2	3	4	5	6
	Dizziness	0	1	2	3	4	5	6
	Blurry or double vision	0	1	2	3	4	5	6
	Sensitivity to Light	0	1	2	3	4	5	6
	Sensitivity to Noise	0	1	2	3	4	5	6
	Balance Problems	0	1	2	3	4	5	6
	Pain other than headache	0	1	2	3	4	5	6
THINKING/ COGNITIVE	Feeling "in a fog"	0	1	2	3	4	5	6
	Feeling Slowed Down	0	1	2	3	4	5	6
	Difficulty concentrating	0	1	2	3	4	5	6
SLEEP ISSUES	Difficulty Remembering	0	1	2	3	4	5	6
	Trouble Falling Asleep	0	1	2	3	4	5	6
	Fatigue or low energy	0	1	2	3	4	5	6
EMOTIONAL	Drowsiness	0	1	2	3	4	5	6
	Feeling more Emotional	0	1	2	3	4	5	6
	Irritability	0	1	2	3	4	5	6
	Sadness	0	1	2	3	4	5	6
	Nervousness	0	1	2	3	4	5	6

Do symptoms worsen with physical activity? Yes _____ No _____ Not Applicable _____
 Do symptoms worsen with thinking/cognitive activity? Yes _____ No _____ Not Applicable _____

Activity Level: Over the past two days, compared to what I would typically do, my level of activity has been _____% of what it would normally be.
 Adapted from Oregon Concussion Awareness and Management Program (OCAMP)
http://media.cbirt.org/uploads/files/sports_concussion_management_guide.pdf

Return to Learn Progression

- **Every student and every concussion is different! No two concussions are the same!**
- The amount of time needed between the injury and the commencement and completion of Return to Learn activities will vary between students and should be guided by symptom status.
- Student is excused from PE, sports, “contact” activities at recess during recovery.
- The Return to School progression should be allowed to progress over time and as symptoms subside. A **minimum** of 24 hours should elapse between each step of the Return to School progression.

Gradual Return to Learn Progression

(Consensus Statement on Concussion in Sport – the 5th International Conference on Concussion in Sport held in Berlin, October 2016)

<u>Objective</u>	<u>Activity</u>	<u>Goal of each Step</u>
1. After Concussion Diagnosis: rest at home for 24-48 hours may be <u>necessary</u> ...	Typical activities during the day if symptoms are not increased, e.g., reading, texting, screen time – Start with 5 minutes and gradually increase	Gradual return to typical activities
2. School Related Activities	Homework, reading or other cognitive activities outside of the classroom – increase to 30 minutes before symptoms worsen	Increased tolerance to cognitive work
3. Return to School	Gradual introduction of schoolwork. May need to begin with partial day or with several rest breaks during day	Increase academic activities
4. Return to School Full Day	Gradually progress to full day of school activities; Moderate supports provided in response to symptom status (presence, absence or increase in symptoms) during day; Use progress monitoring to assess intervention effectiveness; adjust types and intensity of supports as symptoms subside	Increase academic activities and expectations for productivity; few rest breaks
5. Return to School Full Day Without Supports	Full day of school activities can be tolerated with no rest breaks or recurrence of symptoms	Return to full-time academic activities; no supports needed

Return to Play Progression

Graduated Return to Sport Strategy

(Consensus Statement on Concussion in Sport – the 5th International Conference on Concussion in Sport held in Berlin, October 2016)

- An initial period of 24–48 hours of both relative physical rest and cognitive rest is recommended before beginning the Return to Sport progression.
- There should be at least 24 hours (or longer) for each step of the progression.
- If any symptoms worsen during exercise, the athlete should go back to the previous step. Resistance training should be added only in the later stages (stage 3 or 4 at the earliest).
- If symptoms are persistent (e.g., more than 10–14 days in adults or more than 1 month in children), the athlete should be referred to a healthcare professional who is an expert in the management of concussion.

Stage	Aim	Activity	Goal of each step
1	Symptom-limited Activity	Daily activities that do not provoke symptoms	Gradual reintroduction of work/school activities
2	Light Aerobic Exercise	Walking or stationary cycling at slow to medium pace; No resistance training	Increase heart rate
3	Sport-specific Exercise	Running or skating drills; No head impact activities	Add movement
4	Non-contact Training Drills	Harder training drills, e.g., passing drills; May start progressive resistance training	Exercise, coordination and increased thinking
5	Full Contact Practice	Following medical clearance, participate in normal training activities (NE Concussion Awareness Act 2012)	Restore confidence and assess functional skills by coaching staff
6	Return to Sport	Normal game play	Normal game play

Return to Activity



- Following a concussion, there needs to be a period of both **cognitive and physical rest**.
- **The brain does not heal. It needs time to reorganize.**
- Every concussion is different. The amount of time needed between the injury and the commencement of return to activities will vary not only between students, but also between concussions (should a student suffer more than one).

However...



Students **do not need to be symptom free** to return to school and do not need medical clearance to return to school following a concussion. Best practice indicates that it is important for a student to return to school as soon as symptoms are “tolerable, intermittent and amenable to rest.”

(Halstead et al, 2013)



Empty Tank of Gas Analogy



- Due to the inefficiency of the cells, the brain **“runs on empty”** and **flares symptoms** -- like a car with a very small gas tank.
- The small-tanked car can leave the garage, it just has to drive a little, fill up, drive a little, fill up.
- A student with a concussion, **CAN** get out of the garage (go to school) and do many things (academically), they just can't go as fast and cover as much territory.
- Students have to **learn a little, rest a little, read a little, rest a little, work on the computer a little, rest a little.**



Energy Crisis

- A concussion is an **energy crisis** that is more impactful closer to the time of the injury and tends to get better over 1 to 4 weeks.
- **Energy Crisis:** Small bucket of cells (energy).
How will you spend them?
School 1st! Extracurricular activities last
- Typically, symptoms decrease over weeks and the ability to add back in academic and home activities increases daily/weekly.



Rest & Exercise for the Concussed Student



- Rest has been widely recommended during recovery from concussion. The basis for recommending physical and cognitive rest for managing a concussion is that rest may ease discomfort during the acute recovery period by alleviating post-concussion symptoms and/or that rest may promote recovery by minimizing energy demands on the brain following concussions.
- **Currently**, there is insufficient evidence that prescribing complete rest achieves these objectives.

Rest & Exercise for the Concussed Student



- **Recent research** found no benefit to “strict rest” beyond two days. Students randomly assigned to 5 days of strict rest vs. 1 – 2 days of rest followed by a gradual return to activities (school and social activities) had a poorer outcome (higher symptoms over a longer period). (Thomas, et al 2015)
- Thus, after a brief period of rest (24 - 48 hours), students are encouraged to become gradually and progressively more active if physical and cognitive activity does not bring on or cause symptoms to worsen. (Consensus Statement on Concussion in Sport – Berlin, October 2016)

Rest & Exercise for the Concussed Student



- The American Academy of Pediatrics Clinical Report on Returning to Learning recommends that a student **return to school when symptoms are “tolerable, intermittent and amenable to rest.”** (Halstead 2013)
- Students do not need to be “symptom-free” to return to school/learn.
- School is the student’s rehab.

Rest & Exercise for the Concussed Student



- Early research on monitored exercise programs suggests that best outcomes occur with a gradual reintroduction of physical, cognitive, and social activity **of moderate intensity** throughout recovery, **but with no contact activities**.
- Riding a stationary bicycle or walking on the track may be a starting point and the level of exertion is increased as tolerated with no increase of symptoms. The amount of rest and exercise is individualized for each student based on the symptoms displayed.

Return to Learn Before Return to Play

- If a student athlete continues to receive academic adjustments due to a presence of any symptoms, they should be considered symptomatic and not be allowed to return to normal training activities or normal game play.



Prolonged Symptoms



- Zemek, et al, 2016 indicate that 70% (+/-) of students recover from concussions within 4 weeks.
- At the same time, symptoms typically persist for up to 4 weeks.
- If symptoms have not resolved in 4 weeks, discuss with parent; student may need to return to the health care provider for further evaluation and recommendations.
- **School and medical personnel are encouraged to maintain communications and work collaboratively during a student's recovery period.**

Prolonged Symptoms



- A **Health Care Plan** may be developed for the student and monitored by the school nurse or athletic trainer regarding the return to PE and playground activities.
- When symptoms continue beyond 4 weeks, prolonged in-school support is required.
- Student supports may be coordinated and provided through an MTSS/RtI Plan, a Health Plan or a 504 Plan. A small percentage of students may require a referral for special education.
- **Contact the regional BIRSST members** for consultation on strategies, adjustments and accommodations for concussed students in the classroom.

Brain Injury Regional Support Teams (BIRSST)



- Nebraska has five regional BIRSST teams located throughout the state.
- BIRSST teams can assist school districts by:
 - Providing information about concussions and brain injury to parents, students, and school staff.
 - Providing training and consultation for Concussion Management Teams.
 - Identifying strategies to support student success.
 - Consulting about assessment and programming for students with moderate to severe brain injury.



Tips for Teachers

- Reduce non-essential course workload
- Decrease or excuse non-essential homework
- Allow breaks during the day, i.e., rest in quiet area
- Allow additional time to complete assignments
- Provide instructor's notes, outline, study guide for student or peer notes
- Avoid over-stimulation (noise and light)
- Allow extra time on projects and tests
- Focus on quality not quantity
- Frontload interventions upon student's return to school
- Increase expectations as symptoms begin to fade
- Testing or completion of major projects during recovery is individualized for each student based on symptom status
- For Nebraska state tests, consider a medical waiver for the concussed student
- Keep in mind that some students may have pre-existing conditions such as ADHD or learning disabilities that may affect reporting on a symptom checklist and academic progress.



Tips for Parents



- Parents play a key role in maximizing the child's recovery from a concussion.
- Parents take the student to the ER or contact the child's healthcare provider immediately after the concussion.
- After the diagnosis of a concussion by the healthcare professional, parents monitor symptoms and activities at home. Rest and restriction of activities is individualized for each student based on the symptoms displayed.

Tips for Parents



- Parents enforce rest, both physical and cognitive, and ensure that the child receives sufficient sleep and engages in activities that do not cause jerking of the head immediately after a concussion.
- The student may have symptoms that interfere with concentration and may need to stay home from school to rest for a day or two.
- Parents are urged to work with school personnel and health care providers in modifying the amount of time spent participating in watching TV, playing video games, working/playing on the computer, texting, using a cell phone, blowing on a musical instrument or piano lessons.

Tips for Parents



- Light mental activities can resume if symptoms do not worsen. When the student can tolerate 30-45 minutes of light mental activity, a gradual return to school/academics can commence.
- Parents monitor and track symptoms at home and communicate regularly with the school Concussion Management Team (CMT).
- Parents sign permission for two-way Release of Information between the medical provider and the school district so information about the child's symptoms and academic progress can be shared.

Tips for Parents



- Parents may request information about concussions from the school CMT.
- Parents are aware of academic adjustments in the school setting.
- When the CMT and family agree that the student is symptom free and attending school full-time with no academic adjustments or accommodations, the parent delivers medical clearance from the healthcare provider to the CMT and the parent provides written permission for the Return to Play Progression to begin. (Nebraska Concussion Awareness Act 2012)

Recovery



Symptoms, balance, and cognition back to baseline

- Return to Learn before Return to Play
- **KEY: Pay Attention—Monitor—Manage**
- Identify earlier so we can treat earlier

Wear Your Helmet



Questions?

Thank you!