

Concussion in the Classroom

Jason M Matuszak, MD, FAAFP

Chief of Sports Medicine

Excelsior Orthopaedics

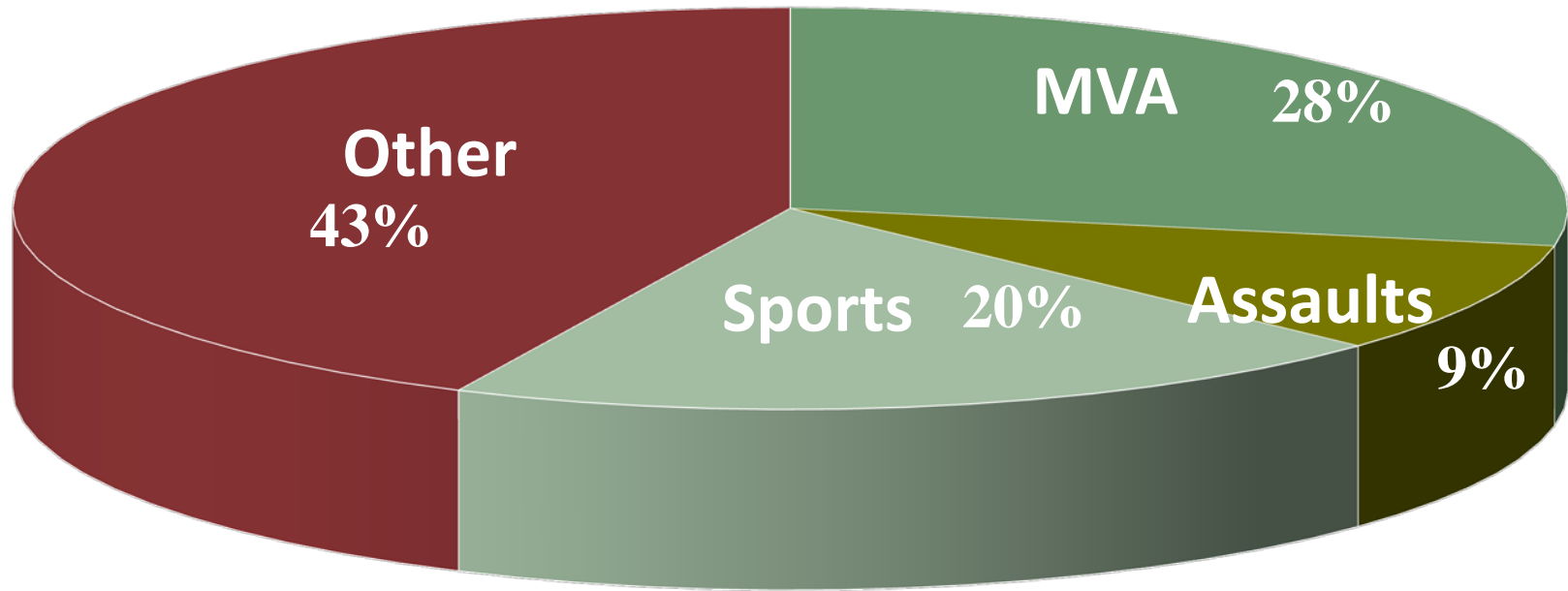
**"In theory there's no difference
between theory and practice. In
practice there is."**

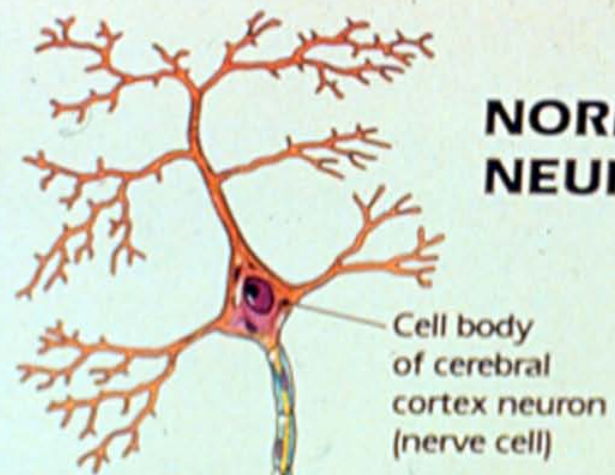
-Yogi Berra

Concussion

- 1.6-3.8 million concussions annually in young people
- Average of 7-10 days to resolve
 - Adolescents and children can normally take up to 28 days
 - Some have problems for months....
- Impairs ability to function in everyday life and activities, including school based activities
- May look physically normal

Causes of TBI





Axon of first cell

Dendrite of next cell

Presynaptic terminal

Synapse

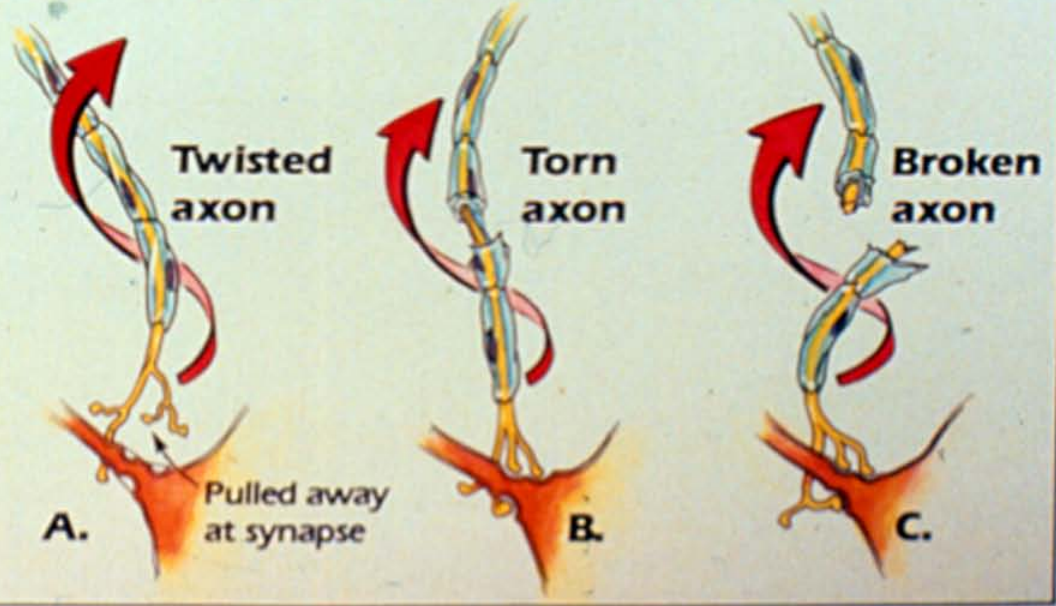
Postsynaptic membrane

Axon to next cell

Dendrite of next cell

Terminal endings of axon

DIFFUSE AXONAL INJURY

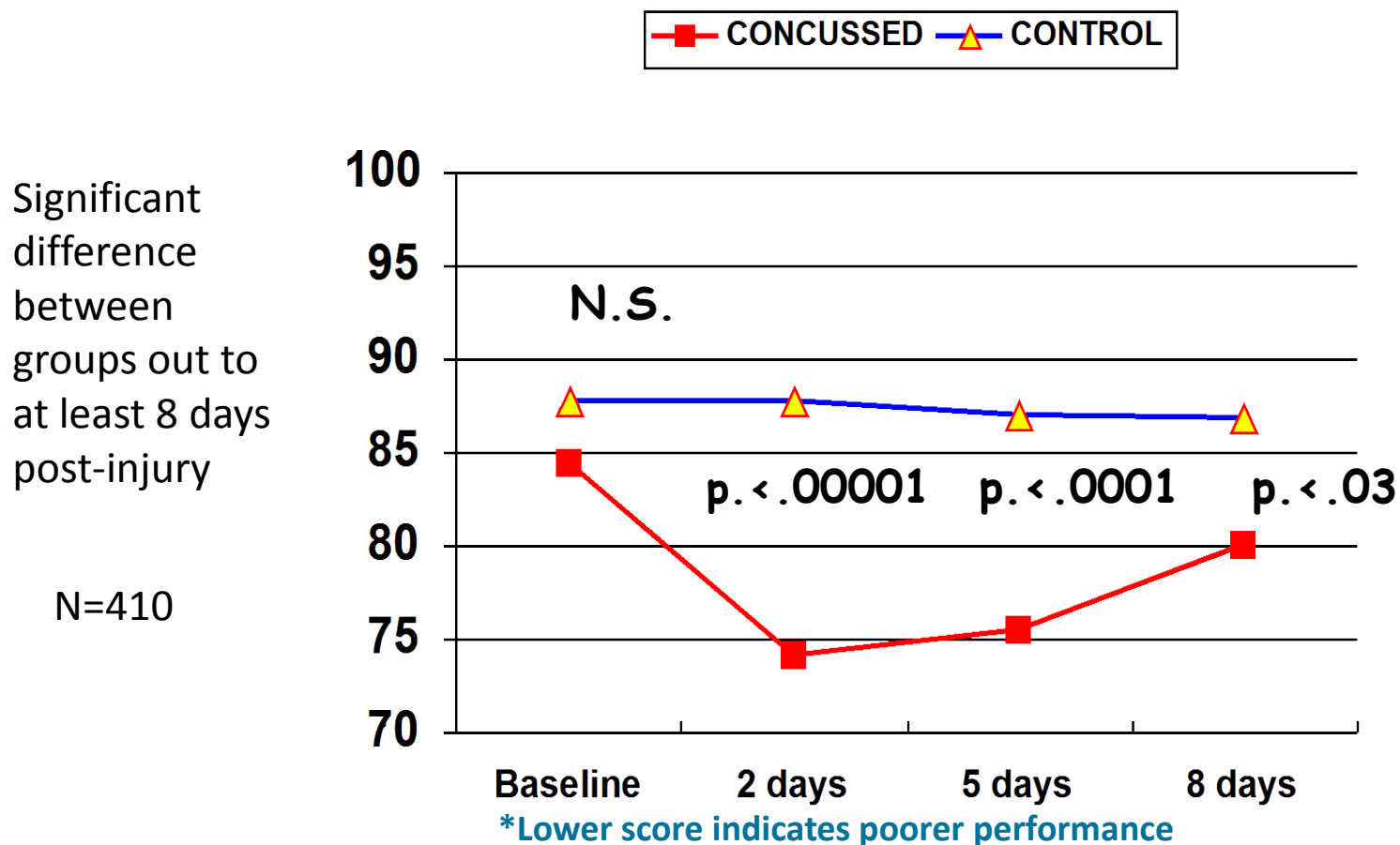


Why is concussion a big problem for those affected?

- Memory and learning difficulties
- Decreases in attention, processing speed, and problem solving abilities
- Weaker planning ability and impaired future memory
- Sleep disturbance, fatigue, headaches, fogginess, and somatic complaints
- Decreased ability to cope with stress, increased irritability

MEMORY COMPOSITE

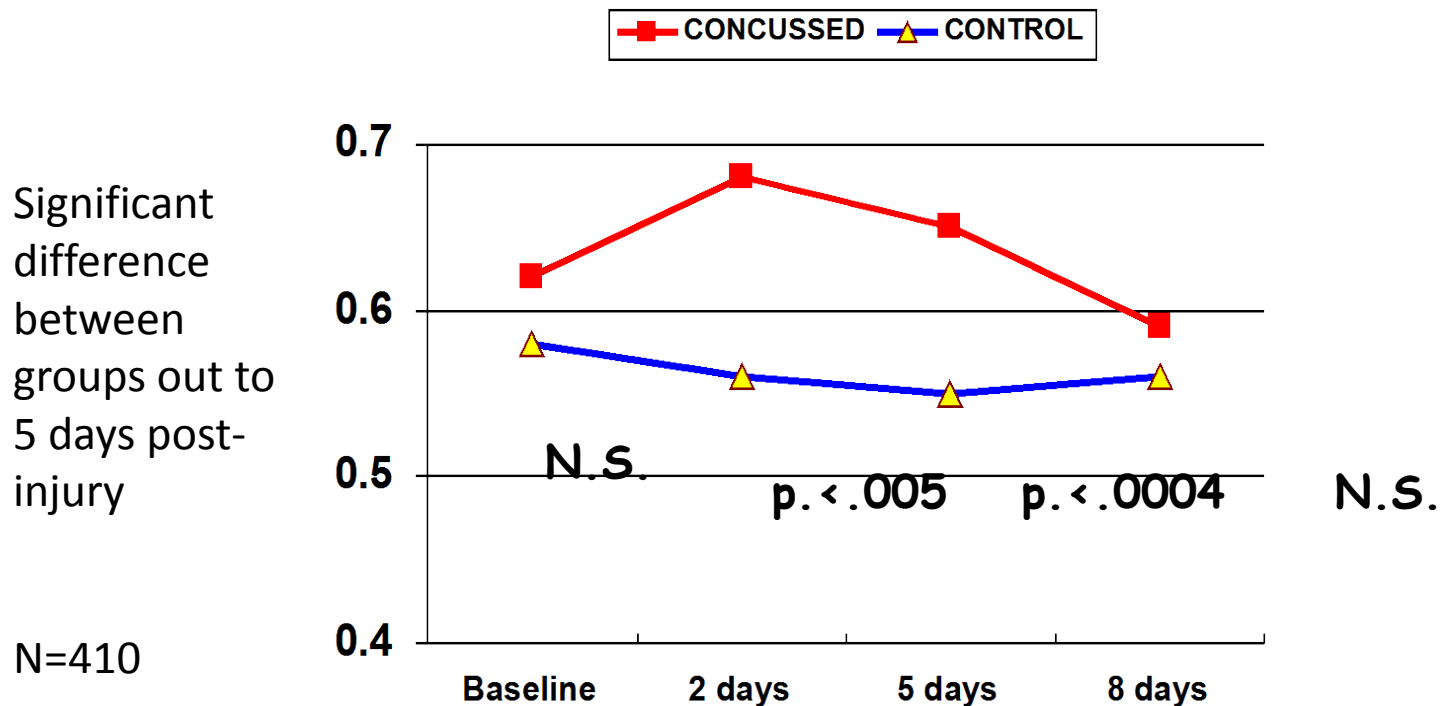
Control vs. Concussed Athletes



Collins MW, Lovell MR, Maroon et al. Medicine and Science in Sports Exercise, 34:5;2002

REACTION TIME COMPOSITE

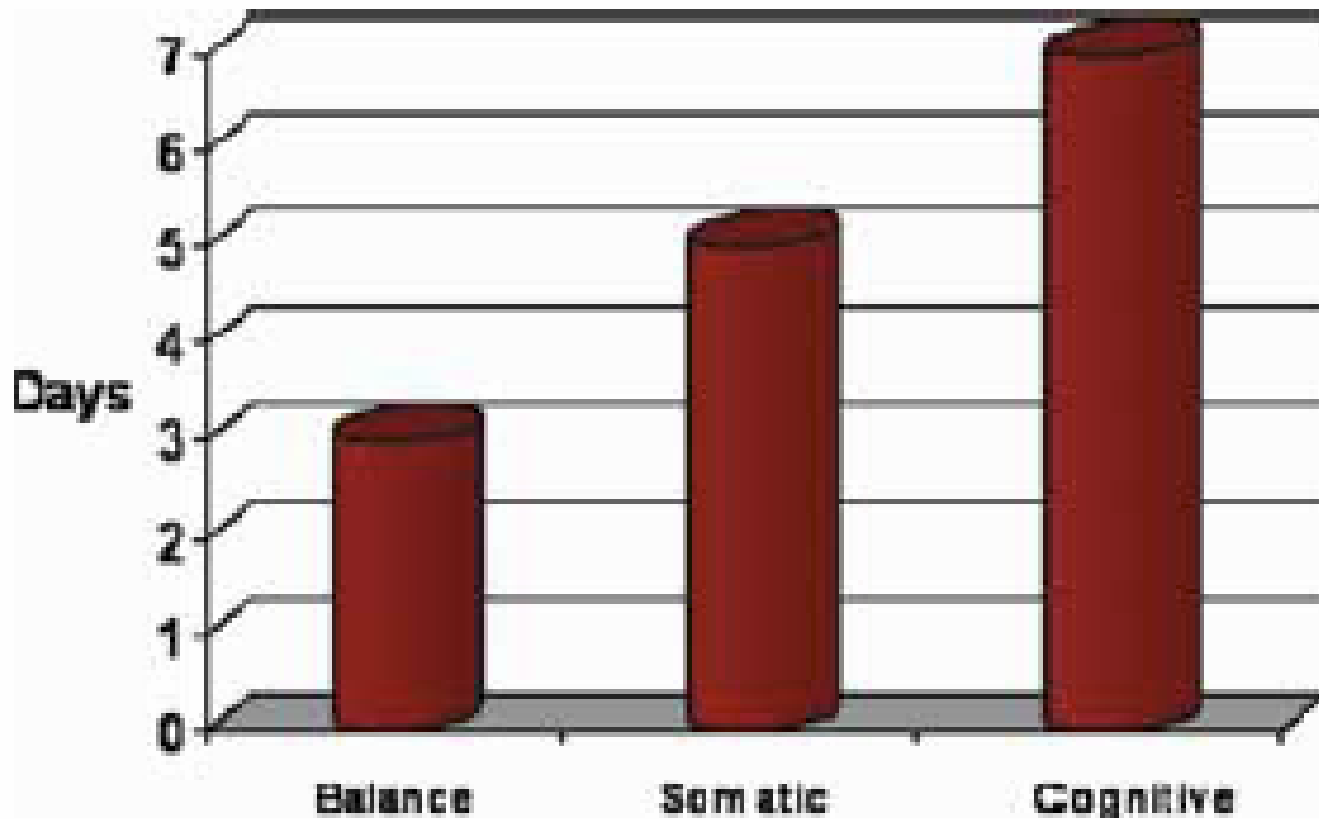
Control vs. Concussed Athletes



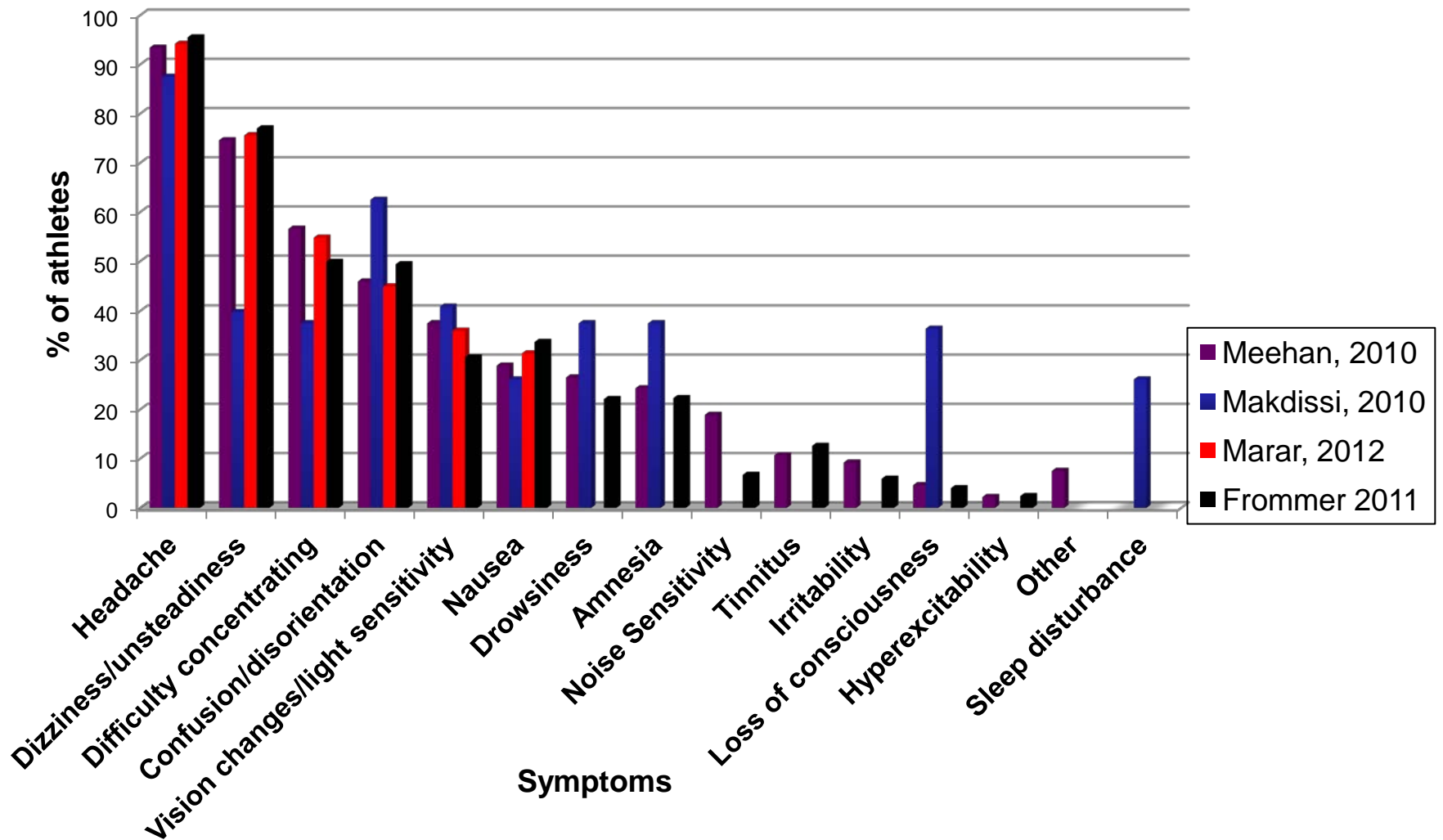
*Higher score indicates poorer performance

Lovell MR, Collins MW, Maroon et al. Medicine and Science in Sports Exercise, 34:5;2002

Recovery



Assess the Concussed Athlete: Immediate and Delayed Symptoms



Headache

Implications

- Most common symptom
- Distracting
- Variable throughout day
- Trigger
 - Noise
 - Light
 - Concentration

Adjustments

- Frequent breaks
- Identify triggers and reduce exposure
- Rests/Naps in Nurse's office/quiet area

Dizziness

Implications

- Indication of vestibular system injury
- Typically last longer
- Positional changes
- Provoked by
 - visual stimulus, especially videos
 - moving targets

Adjustments

- Allow to put head down
- Leave class early for classroom changes

Visual Symptoms

(Light sensitivity, double or blurry vision)

Implications

- Difficult to manage with high visual demands in classroom
- Artificial lighting
- Difficulty reading and copying
- Computers
- Smart Boards
- iPads
- Slide presentations

Adjustments

- Reduce screen brightness
- Allow hat or sunglasses
- Consider use of audiotapes
- Turn off fluorescent lights
- Seat student closer to center/front

Noise Sensitivity

Implications

- Lunchroom
- Some classes
 - Music, Shop, Phys Ed
- Crowded hallways
- Organized sports activities
- Social school activities
 - Pep rallies, school dances, loud sporting events

Adjustments

- Allow lunch in quiet area with classmate
- Limit or avoid loud class time
- Consider ear plugs
- Early class dismissal to avoid crowded hallways

Difficulty Concentrating or Remembering

Implications

- Learning new tasks
- Comprehending new material
- Recalling and applying previously learned material
- Lack of focus
- Trouble with test taking
- Troubles with standardized tests
- Difficulty reading
- Trouble with distractions (driving)

Adjustments

- Avoid testing or major projects when possible
- Provide extra time for nonstandardized tests
- Postpone standardized tests (may require 504)
- Consider 1 exam per day
- Consider pre-printed notes or scribe
- Consider oral reader for test-taking

Sleep Disturbances

Implications

- Excessive fatigue
- Hamper memory and focus
- Excessive napping may lead to further disruptions of sleep-wake cycle

Adjustments

- Consider shorter school days
- Allow rest breaks
 - Quiet meditation vs naps

Reentry to School

- Identification – consider using liaison (nurse, psychologist, teacher) to coordinate
- Accommodate gradual increase in cognitive and physical activity
- Allow rest periods as needed
- Increase time allowed for tests/assignments
- Manageable pieces

Return to Learn

- Very symptomatic students will often be held out of school
 - Unable to perform work of even up to 30 minutes
- Half days
 - Usually when student can tolerate 30-45 minutes of work at a time
 - Consider alternating first and second halves
 - Consider full days, but attending alternating classes

Academic Accommodations

- Academic “adjustments”
 - Typically 1-3 weeks during recovery phase
 - Do not jeopardize the curriculum
 - Do not require alterations in standardized testing
- Academic Accommodations
 - Typically longer than 3-4 weeks
 - Consider team evaluation
 - Evaluation process for 504 plan or IEP
 - Involvement of TBI specialist

Individualized education plan (IEP)

- Formalized educational plan protected under the Individuals with Disabilities Education Act (special education), that provides for classification or coding of a student under 1 of 13 federally designated categories and allowances for modification of regular education without penalty to the student.

504 Plan

- Section 504 of the Rehabilitation Act and the Americans with Disabilities Act provides for a student who is not eligible for special education under an IEP but who requires accommodations in regular education on the basis of bona fide medical need, as documented by a physician and validation by the educational home.

Why are some kids more adversely affected?

- Neural Reserve
- High achievers
- Learning disabilities
- ADD/ADHD
- Migraine sufferers
- Mood disorders, new or pre-existing
- Pre-injury alcohol consumption or marijuana/drug use