Community Education Series

The Recovery Village and Advanced Recovery Systems

ADVANCED RECOVERY SYSTEMS

an advanced approach to patient care

Presentation Topic:

The Psychiatric Aspects of Sports Related Concussion and Mild Traumatic Brain Injury

Speaker:

Alexander S. Strauss, MD

About the Speaker:

Alexander S. Strauss

MD

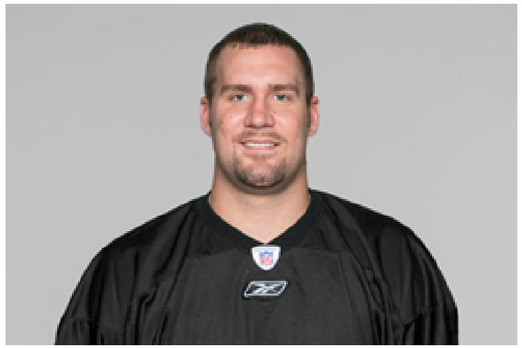
- Alex Strauss, M.D. is Board Certified by the American Board of Psychiatry and Neurology (ABPN) in both Psychiatry and Child & Adolescent Psychiatry. He received his Doctor of Medicine (M.D.) from Northwestern University School of Medicine in Chicago, Illinois. He completed his Adult, Child and Adolescent residency and fellowship at Western Psychiatric Institute and Clinic (WPIC), (#12 Top Psychiatry Hospital U.S. News and World Report 2017) a part of the University of Pittsburgh School of Medicine. At WPIC, he served as the chief resident for education and the chair of the academic, administrative, clinical educator track. During his time at WPIC, he received comprehensive training in the assessment and treatment of all varieties of psychiatric illness. He is a partner at Centra, Clinical Assistant Professor in the Department of Psychiatry at Rutgers Robert Wood Johnson Medical School and Consulting Sport Psychiatrist for Temple University Athletics. He has expertise in the use of psychiatric medication and psychotherapeutic techniques for the treatment of all age groups. He also has a special interest in the treatment of concussion and psychiatric illness in athletes.

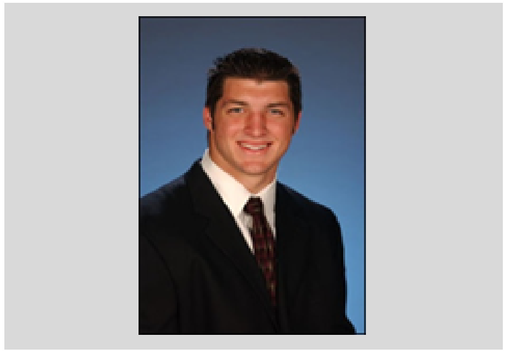
Topics

- Defining concussion
- Post concussive syndrome with a psychiatric focus
- Treatment for post concussive syndrome

Longitudinal Trajectories of Postconcussive Symptoms in Children with Mild Traumatic Brain Injuries and Their Relationship to Acute Clinical Status. Pediatrics, 2009

What do all these people have in common?





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http://throughmyeye.files.wordpress.com/2009/03/_u7i0044.jpg

Max’s Law

The Brain Injury Association of Oregon (BIAOR) brought a bill to the state legislature

Senate Bill 348
Requires coaches of school athletic teams to receive annual training on how to recognize symptoms of concussion and how to seek proper medical treatment for persons suspected of having concussion.

http://www.disabilityrightsoregon.org/the-dro-blog/maxs-law-moves-forward
http://gov.oregonlive.com/bill/SB348/

NJSIAA Policy April 2010

(New Jersey State Interscholastic Athletic Association)

- Parents/guardians - annual concussion information sheet
- Annual training for student-athletes, coaches, athletic trainers and physicians employed by the school

What’s The Big Deal?

“I had a concussion and I was fine…”

What Is a Concussion?

There is no clear consensus

Concussion

There is no uniform definition

Multiple terms have been used

Treatment is affected!

Importance of a Definition

- Published online January 18, 2010 PEDIATRICS
- "My Child Doesn't Have a Brain Injury, He Only Has a Concussion"
- “The concussion (v. mTBI) label was strongly predictive of earlier hospital discharge… and earlier return to school…

Concussion: CDC Definition

- A concussion is a type of traumatic brain injury- or TBI- caused by a bump, blow or jolt to the head or by a hit to the body that causes the head and brain to move rapidly back and forth.
- A TBI disrupts the normal function of the brain.
- Medical providers may describe a concussion as a “mild” brain injury because concussions are usually not life-threatening.

Centers for Disease Control, 2020

A Simple Definition

Any trauma induced alteration in mental status that may or may not include a loss of consciousness.

American Academy of Neurology, 1997

Who Do They Happen To?

- 1-3 million people each year
- Highest risk age groups are:
  - 0-4 years
  - 15-19 years (highest rate of motor vehicle)

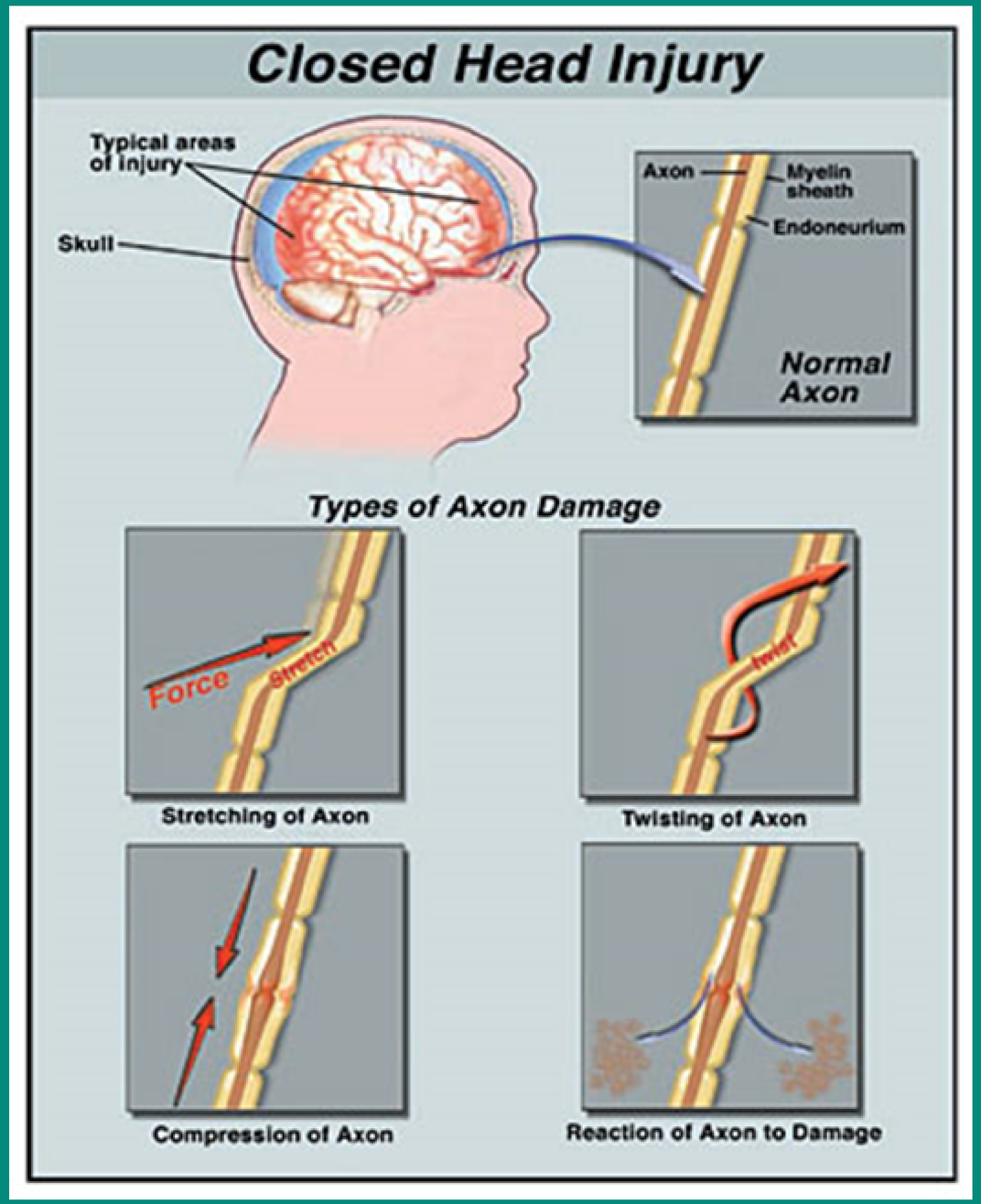
A News Story

youtube.com

What Happens to Your Brain?

- There are several theories
- It is likely due to rotational acceleration forces straining the brain

1st Cells break apart and release potassium
2nd Glutamate is then released
3rd More potassium suppresses the brain
4th Energy is expended increasing glycolysis
5th Lactic acid accumulates



http://images.conquestchronicles.com/images/admin/closedheadinjury.jpg

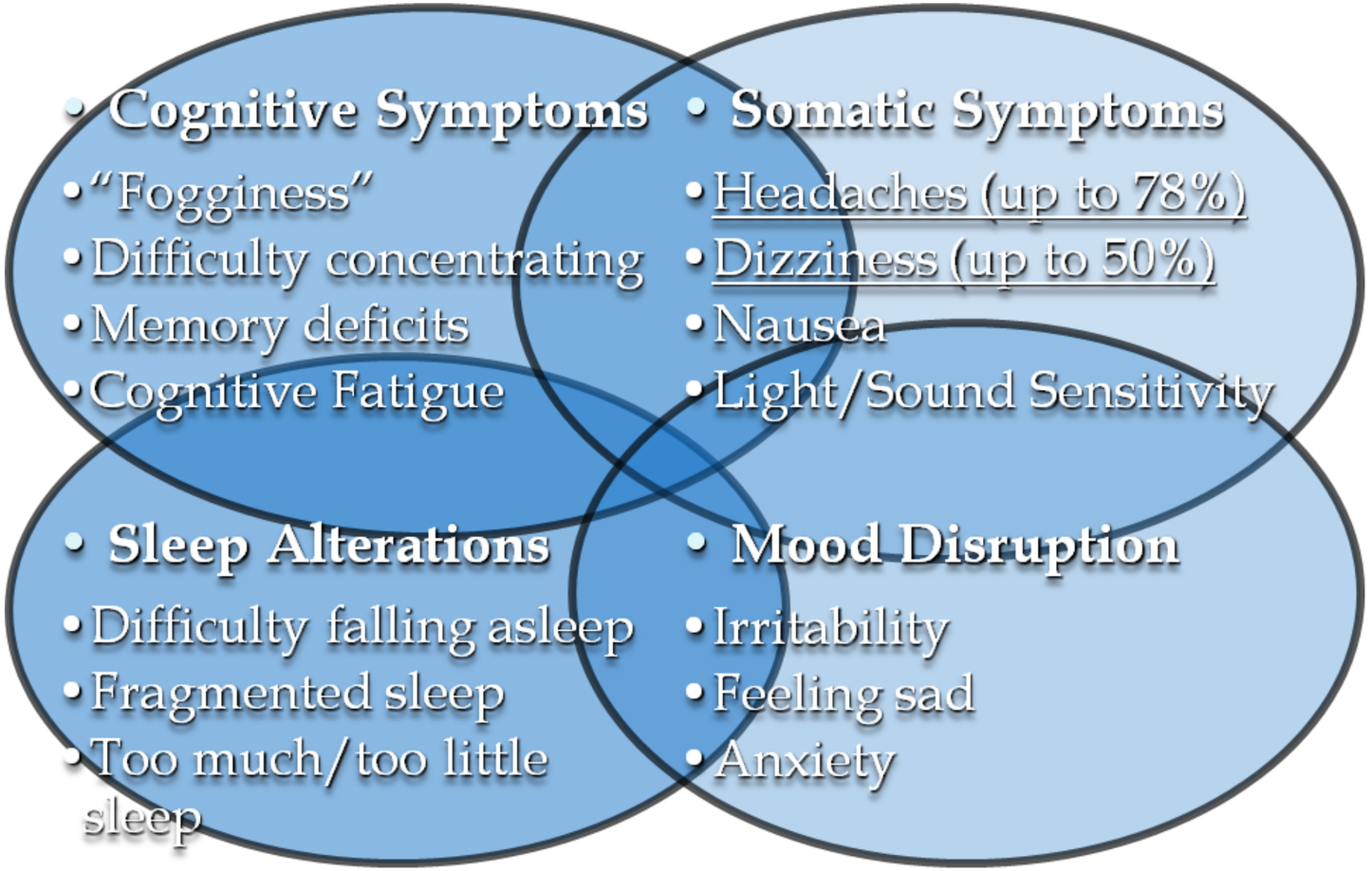
Tim Tebow

videos.espn.com

Signs

- Memory loss before or after trauma
- Appear to be dazed, stunned or confused
- Move clumsily
- Answer questions slowly
- Behavior or personality change
- Abnormal CT Scan
    - (only ~10%)
- Loss of consciousness
    - (only 4-10% of concussions)
- Seizure (immediately transport to ER)
    - (less than 5% of concussions)

Symptoms



When Can I Play Again?

International Conference on Concussion in Sport, Vienna 2001 and Vienna 2004

“When in doubt, sit them out”

- Not in the current game or practice
- Return only after monitoring & medical evaluation
- Using a stepwise process
  - Symptom free at rest
  - Symptom free with physical/cognitive exertion
  - Intact neurocognitive functioning

NJSIAA Return to Play 2010

- Immediate removal
- Medical Evaluation
- Recommended a symptom free week before initiating a graduated return-to-play exercise protocol
- Monitored during protocol
- If return of symptoms return after playing they will return to primary care physician
- If symptoms return during protocol return to prior level and advance as tolerated
- Utilization of tools are suggested

New Concussion Law in New Jersey

- New Jersey Governor Chris Christie signed the law Tuesday December 10, 2010

- “A student-athlete who is removed from competition or practice shall not participate in further sports activity until he is evaluated by a physician or other licensed healthcare provider trained in the evaluation and management of concussions, and receives written clearance from a physician trained in the evaluation and management of concussions to return to competition or practice.“
- http://www.sportsconcussion.com/ & http://www.bianj.org/

What Does This Mean For You?

1. Your child/the patient should stop playing
2. S/he should seek medical evaluation
3. S/he needs to be symptom free at rest
4. Then symptom free with school and exercise
5. Finally, have intact neurocognition
6. Then return to play

Graduated Return to Learn

1. Cognitive rest
2. Gradual intro to cognitive activities (~15 min)
3. Homework (~30 min)
4. School re-entry with part-time school and accommodations
5. Increase time at school and decrease accommodations
6. Full cognitive workload and full school

Consensus statement 2016 and Ped Annals 2012;41(9):3

What Is Neurocognition?

- Attention
- Concentration
- Memory
- Processing speed
- Performance at tasks
- Reaction time

How Is Neurocognition Tested?

- Neuropsychological testing
- Computerized neuropsychological tests
  - E.g. ImPACT, HeadMinder, ANAM, CogState
- Mandatory in the NHL and NFL
- Recovery = baseline scores

How Long Does Recovery Take?

- Typical recovery occurs in 7-10 days
- 80% athletes recover spontaneously within three weeks of trauma
- Who does worse? People with:

- Pre-existing learning disability
- Younger age
- Prior concussive injury
- Amnesia
- Migrainous symptoms
- Over-exerters

Collins et al, 2006; Yang et al, 2007; Collins et al, 1999; Iverson et al, 2004.

Repeat Concussion

- Athletes are at increased risk
- 6X more likely if you have LOC
- Greatest risk first 7-10 days
- Longer recovery after repeat concussion

Second Impact Syndrome

- A 2nd head injury before recovery from a concussion
- The second injury may be minor
- The injury can lead to death due to increased pressure in the brain
- Children may be at increased risk

Eric Lindros

Retirement

- Consider referral to a specialist to make the decision

- Proposed Criteria
  - 3 concussions in an individual season
  - 3 months of symptoms

Long Term Effects

- May lead to neurocognitive deficits
- May lead to psychiatric problems
- May lead to chronic traumatic encephalopathy (CTE)

Chronic Traumatic Encephalopathy (CTE)

- Originally termed dementia pugilistica
- Memory disturbances
- Behavioral and personality changes
- Parkinsonism, speech and gait abnormalities
- Distinct from other neurodegenerative conditions
- At least 17% of people w/ repetitive mTBI

McKee, AC et al., 2009

Postconcussive Syndrome

- One definition:
  - 3 or more symptoms
  - Must last 3 months or more
  - Must cause significant functional impairment
  - Must cause significant decline from previous functioning

Diagnosistic and Statistical Manual of Mental Disorders. 4th ed. 1994.

Neuropsychiatric Complications

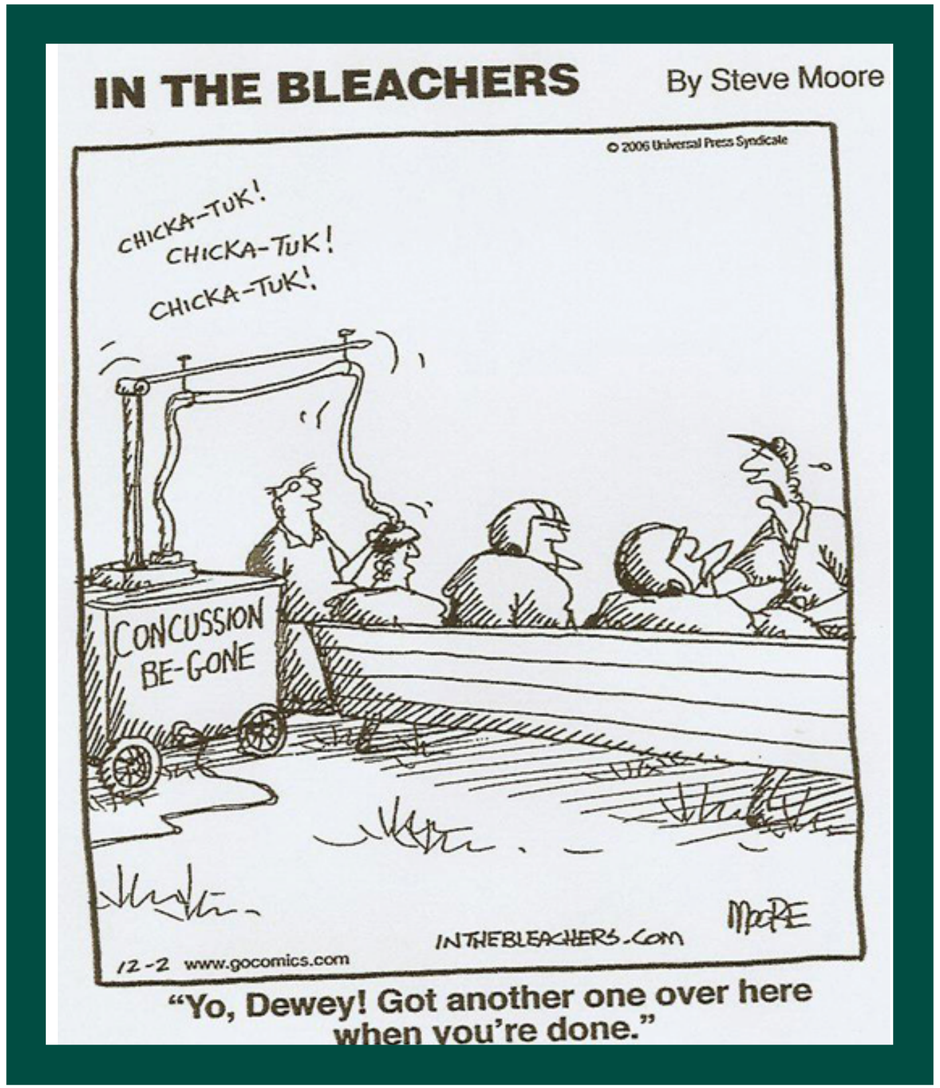
- Mild TBI at 12 months follow up 22% developed a psychiatric disorder that they had never experienced before
- With no past psychiatric history the adjusted relative risk is increased compared to no TBI
    - Mild TBI ARR = 2.8
- Past psychiatric history is a significant predictor of psychiatric illness

Brant, RA et al., 2010, Vaishnavi et al., 2009 and Jorge, RE. 2005

Neuropsychiatric Complications

- Cognitive Deficits (25-70%)
- Depression (25-50%)
- Anxiety disorders (10-77%)
- Agitation & Aggression (~30%)
- Sleep problems (30-70%)
- Suicide (3x Incidence)
- Substance use disorders
- Psychosis
- Obsessive compulsive disorder
- Personality changes
- Dementia
- Mania (1-10%)
- Stress Disorders
- Apathy (10%)

Treatment



http://www.thehiddenepidemic.com/images/ConcussionbGoneCartoon.jpg

Treatment

- Collaborative Care
- Education, Support and Guidance
- Rest (brain and body)
- Accommodations
- Sleep hygiene
- Relaxation

- Vestibular therapy
- Physical therapy
- Cognitive Rehabilitation
  - Occupational therapy
  - Speech therapy
- Psychotherapy
- Medications

Collaborative Care

- Pediatrics October 2016
  - Patients 11 to 17 years old with persistent symptoms ≥ 1 month following sports related concussion
  - Randomly assigned to collaborative care (CBT, care management and psychopharmacology consultation (n=25) vs. usual care (n=24)
  - Statistically significant improvement in collaborative care group at 6 months. 13% of intervention patient and 41.7% of controls had high levels of PCS.

Education, Support & Guidance

- Over 10 studies have been completed
- Mixed results with regard to improvement in symptoms and functioning
- Overall support and education appear to benefit patients
- Reassurance and education may be helpful shortly after injury
- Group education and support intervention and group CBT decreased postconcussive symptoms compared to wait list

Recovery with Rest (brain and body)

- Rest no more than 48 hours or so
- 80-90% will not have prolonged symptoms
- No TV, texting, video games, reading, homework, tests
- Average time to baseline neuro-cognition
  - High school athletes 10-14 days
  - College athletes 5-7 days
  - Profession athletes 3-5 days

Collins et al, 2006; Yang et al, 2007; Collins et al, 1999; Iverson et al, 2004. Treatment of Pediatric Concussion. Seminars in Pediatric Neurology 2019. Sports-Related Concussion. Pediatrics, 2010

Sleep Hygiene and Other Techniques

Sleep problems in up to 1/3 of youth

- Track sleep patterns
- Only go to bed when tired
- Don’t lie in bed more than 20 minutes
- Relax each night before bed
- Wake up at the same time every morning
- Avoid taking naps
- Melatonin is commonly used
- Exercise
- Consider CBT-I

Treatment of Pediatric Concussion. Seminars in Pediatric Neurology 2019

Relaxation

- Deep breathing
- Progressive muscle relaxation
- Calming visualization
- Meditation
- Etc…

Vestibular Therapy

Abnormal vestibular test in up to 90% of youth.

- Moderately strong evidence based on Cochrane review (2016)
- Comprehensive evaluation of the vestibular and balance systems
- Tx – Canalith repositioning, habituation, gaze stability, etc.
- Exercises to address:
    - Balance problems, Dizziness, Nausea, Blurred vision, Headaches

Treatment of Pediatric Concussion. Seminars in Pediatric Neurology 2019

Physical Therapy

- Evaluation
- Active Rehabilitation
  - Non-risk, positive feedback, aerobic activity, cooping skills and reassurance
- Associated with improved mood, somatic complaints, energy and cognition
- Return to play
  - Rest, Aerobic exercise (low), Sports specific (moderate), Noncontact (heavy), Full contact, Game play

Treatment of Pediatric Concussion. Seminars in Pediatric Neurology 2019

Cognitive Rehabilitation

- Comprehensive interdisciplinary programs
- Studies have shown improvement in neuropsychological testing, cognitive functioning, post-concussive symptoms and attention
- It is unclear if effects are due to practicing, if the results are due to lack of control groups and if the treatment really leads to improved functioning
- Inconclusive evidence

Comper DP. et al., 2005 and Snell DL et al., 2009

Occupational Therapy

- Perform assessments for health risks
- Evaluate for gross and fine motor deficits, sensory processing or adaptive behavior differences
- Teach strategies for activities of daily living
- Identify solutions to barriers

Speech Therapy

- Assessment and treatment speech and/or language disorders
- Assess for learning style
- Teach strategies to:
  - Increase attention
  - Increase concentration
  - Increase retention
  - Adapt study skills
  - Improve organization and planning

Psychotherapy

- Cognitive behavioral therapy may be effective

- Al Sayegh, A., et al., 2010 -Psychological approaches to treatment of post-concussion syndrome: a systematic review
- 17 Randomized controlled trials all different participants
- Education and reassurance alone may not be as beneficial as previously thought

Treatment of Pediatric Concussion. Seminars in Pediatric Neurology 2019. Sports-Related Concussion Child Adolesc Psychiatric Clin N Am 27 (2018) 93-108

Therapy

Cognitive Behavioral Therapy for Headaches

- Powers S., et al.,2013
  - 135 children and adolescents with chronic migraines
  - CBT w/ Amitriptyline vs Education w/Amitriptyline
  - CBT group greater reduction in headache days

- Trautmann, E and Kroner-Herwig, B., 2010
  - 65 children and adolescents with recurrent headaches
  - Internet based cognitive behavioral therapy and applied relaxation led to improvement led to improvement in headache frequency, duration and pain catastrophizing
  - NNT 2.0 compared to educational intervention

Family Therapy

- “Group differences in somatic symptoms as reported by parents were more pronounced among children from families that were higher functioning and had more environmental resources.” (Yeates, K. et al., 2012)

- “Mild TBI are associated with family burden and distress more than mild injuries not involving the head, although PCS may influence post injury family burden and distress more than the injury per se.” (Ganesalingam, K. et al., 2008)

Medications

- No medication has FDA approval for the treatment of neuropsychiatric consequences of TBI
- Limited quality research mostly on adults
- Many different medications have been used

Arciniegas DB, et al., 2008

Medications

- 1st wait for symptoms to go away on their own
- Start at low doses of meds and increase slowly
- Watch out for drugs worsening agitation and confusion
- Discontinue meds that don’t work
- Watch out for lowing seizure threshold
- Watch out for extrapyramidal and anticholinergic side effects
- Watch out for drug-drug interactions

Fleminger, S. 2008

Summary

- Over 1,000,000 concussions each year in the United States
- Many go undiagnosed
- Most youth recover within 2-4 weeks
- 10-20 % go on to have chronic problems
- Treatment requires a multidisciplinary team approach

Contact Information

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Questions?

THANK YOU