

# Concussions and Mental Health

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# Presenter Conflict

## No Conflict

- The views expressed in these slides and the today's discussion are mine
- My views may not be the same as the views of my company's clients or my colleagues
- Participants must use discretion when using the information contained in this presentation



# Learning Objectives

- At the conclusion of the presentation participants should be able to:
  - Identify the most common mental health concerns which present in athletes with concussions.
  - Be able to recognize the symptomatology associated with mental health concerns related to concussions.
  - Feel comfortable referring athletes with mental health concerns to a mental health professional.



Multiple brain injuries can result in lasting  
cognitive impairments, substance abuse,  
mental health and physical health concerns  
(Ilie et al, 2014)



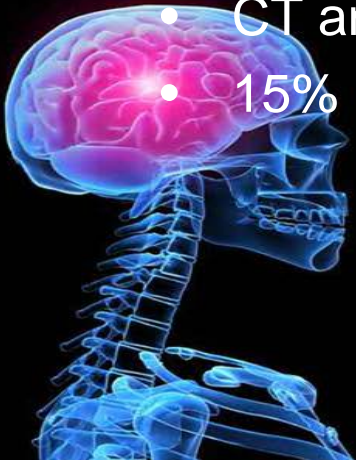
“A mental disorder is a syndrome characterized by clinically significant disturbance in an individual’s cognitive, emotion regulation, or behaviors that reflects a dysfunction in the psychological, biological, or developmental processes underlying mental functioning.”

(DSM-5)



# So, What is a Concussion?

- Definition: “Complex pathophysiological process affecting the brain, induced by traumatic biomechanical forces”
- Usually defined as ANY change in neurologic function
- Often referred to as mild traumatic brain injury
- Only about 10% of concussions involve loss of consciousness
- CT and MRI are often normal
- 15% may have symptoms lasting >1 year



McCrory P et al. Consensus statement on Concussion in Sport-the 3<sup>rd</sup> International Conference on Concussion in Sport held in Zurich, November 2008. *J Sci Med Sport* 2009

# Why the increased focus recently on sports-related concussions?

- Evolving definition of concussion
- Common in sports and increasing
- Potential for catastrophic outcomes



# Why the increased focus recently on sports-related concussions?

- Media attention
  - NFL concussion laws, recent attention on long term effects of concussions in professional athletes
  - “Snitch Rules”
  - Lystedt Laws





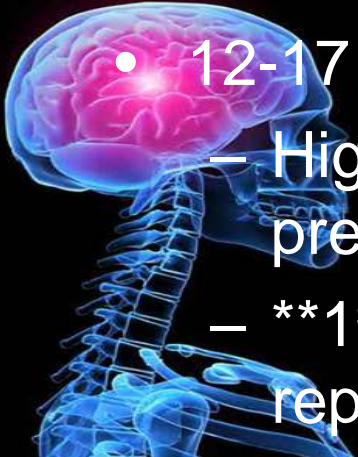
# What's Missing?

- Despite increased awareness regarding concussions, mental health concerns are NOT being addressed
- Focus on prevention is great, but what about focusing on mental health concerns
- Guidelines for treatment regarding concussion related mental health
- Recognition



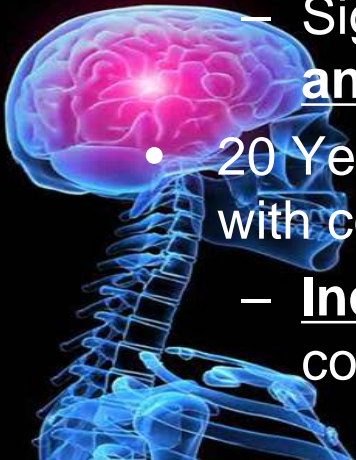
# Research Relating Concussion to Mental Health Disorders

- 1979-1993 Danish Population Study, 2001
  - Increased risk of suicide possibly associated with increased physical, psychological, and social consequences of TBI (Teasdale et al, 2001)
- 12-17 year olds
  - Higher prevalence of diagnosed depression if previous diagnosed concussion national sample
  - \*\*1<sup>st</sup> study to find this correlation in a nationally representative sample\*\* (Chrisman et al, 2014)



# Research Relating Concussion to Mental Health Disorders

- 41 Year Swedish Population Study, 2014
  - TBI carries elevated risk of **premature mortality from suicide** (Fazel et al, 2014)
- Canadian Population-Based Study (Adolescents Grades 7-12)
  - Significant association between TBI and **suicide, depression, anxiety, substance abuse** (Ilie et al, 2014)
- 20 Year Longitudinal cohort analysis of adults in Ontario diagnosed with concussion
  - **Increase in long-term risk of suicide** especially after concussions on weekends (Fralick et al, 2016)



# Anxiety

- Baseline depression and anxiety scores (CESD-Center for Epidemiological Studies Depression Scale and State-Trait Anxiety Inventory) = strongest predictors of post-concussion depression and anxiety (Yang et al, 2015)
- Physical symptoms are similar to concussion symptoms



# Major Depressive Disorder

- **Accepted** that a relationship exists between depression (5 or more symptoms with at least one being “depressed mood” or “loss of interest or pleasure”) and prolonged symptoms of SRC (Solomon et al, 2016)



# Major Depressive Disorder

- Commonality of symptoms between SRC and depression
  - Sleep disturbances, mood changes, cognitive symptoms (Solomon et al, 2016)
- Similarities between brain scans in patients with concussion-related depression and non-injured patients diagnosed with major depressive disorder (Alhilali, Barrow Neurological Institute)



# Major Depressive Disorder

- Post-concussive depression associated with increased morbidity, school failure, substance abuse and suicide (Chrisman et al, 2014)
- **11% increase** in depression in youth 6 months following TBI (abnormal brain imaging) (Chrisman et al, 2014)
- Prevalence of minor depression increased in patients experiencing a head injury in early adulthood.
  - Rates of depression: 11.2% in head injury group and 8.5% in control group (Holsinger et al, 2002)



# Suicide

- Long-term risk increases threefold in adults having experienced at least 1 concussion (Cepelewicz, 2016 & Fazel 2014)
- 31 deaths per 100,000 patients with TBI annually vs. 12.6 deaths per 100,000 patients not suffering from a TBI
  - Average completed suicide 6 years after injury
  - Independent of demographics or previous psychiatric conditions
  - Increased risk with increased # of concussions
- Canadian Medical Association Journal (Cepelewicz, 02/08/16)





# Suicide

- Odds of contemplating or attempting suicide **2.89 times higher** in students with TBI (Ilie et al, 2014)
  - Adolescents (up to age 24) shortest time between thoughts of suicide and suicide attempt
- Good News: Students with TBI had 2X higher rates of seeking counseling or crisis help as well as being prescribed anxiety/depression medications (Ilie et al, 2014)
- Bad News: About ½ of patients visited a physician in the last week of life (Fralick et al, 2016)



# Case Study 1- 15 y/o female

- 1<sup>st</sup> concussion: 05/2008 (PE class)
- 2<sup>nd</sup> concussion: 08/2009 (Volleyball)
- 3<sup>rd</sup> concussion: 11/2009 (Basketball)
- 4<sup>th</sup> concussion: 01/2010 (Basketball)
- Cleared for RTP after each concussion



# Case Study 1

- February 2010 wanted to discuss competing in track
- Decision made that competing was NOT safe, but would rehab with the team
- Progressed to sprinting, but no long jump, triple jump, high jump
  - Due to potential impact to head



# Case Study 1

- No official diagnosis of depression
  - However, several discussions with student regarding how she was feeling.
    - Feeling “down,” tired, as if she would never get better
    - Lost a part of her identity when she was unable to play basketball
      - “depression” symptoms improved once she was able to return to practice/competing and her daily routine



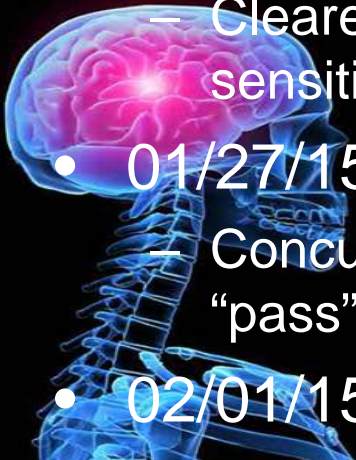
# Case Study 2

- 16 y/o H.S. sophomore Basketball & Softball Athlete
- 11/26/14: Elbow to Jaw (no mouth guard)
  - Sx: neck pain, headache, dizziness, blurred vision, nausea, sensitivity to light & noise
  - 11/27-28/14: neck pain, headache, dizziness, blurred vision, nausea, sensitivity to light & noise
  - 11/29/14: neck pain, headache, blurred vision, sensitivity to light & noise
  - 12/01/14: Concussion Specialist Visit
    - SCAT 3: symptom score 67, 18/22 symptoms
  - 12/02-07/14: neck pain, headache, blurred vision, sensitivity to light & noise
  - 12/08/14: Concussion Specialist Visit
    - SCAT 3: Symptom score 34, 12/22 symptoms
  - 12/09-12/14: neck pain, headaches, sensitivity to light & noise
  - 12/19/14: Concussion Specialist Visit cleared to RTP



# Case Study 2

- 01/02/15: Return to full contact practice
- 01/23/15: Head contacted floor during basketball game
  - SCAT 3: “passed”
  - Neck pain, headache, sensitivity to light & noise
- 01/26/15:
  - Cleared by ATC at high school to RTP with symptoms of headache, sensitivity to light & noise
- 01/27/15: woke up with worsened symptoms
  - Concussion Specialist: ends basketball season due to inability to “pass” impact test
- 02/01/15: tinnitus begins, other symptoms continue



# Case Study 2

- 03/09/15: collided with center fielder in softball game
  - All symptoms returned, light & noise sensitivity worse
  - Continued to play, but “took it easy”
  - Did not see doctor after this incident



What would you do?

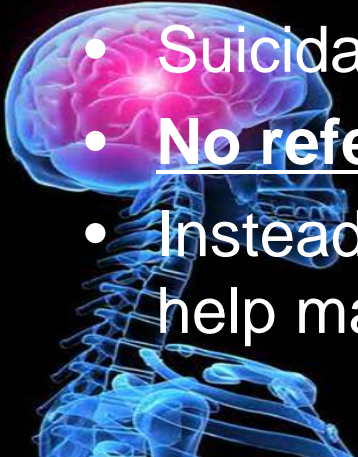
Treatment Options?





# Case Study 2

- Symptoms consistent with:
  - Depression
  - Anger
  - Anxiety/Panic
  - PTSD?
- Suicidal Thoughts
- **No referral** for counseling
- Instead prescribed “sleeping meds,” antihistamine to help manage symptoms (tinnitus)



# Solutions According to Research

- Detecting and managing psychiatric conditions becomes an integral component of treatment to reduce premature mortality (Fazel, 2014)
- Primary care physicians need to screen for potential mental health concerns (Ilie et al, 2014)
- Education
  - mental health and behaviour problems among adolescents are a “blind spot” in our culture (Ilie et al, 2014)



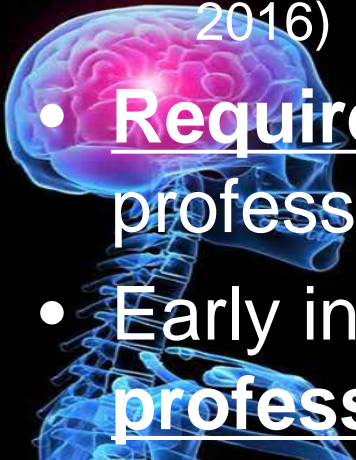
# Solutions According to Research

- Greater attention to long-term care after concussions (Fralick et al, 2016)
  - Including Screening for psychiatric illness and suicide risk often neglected
- “belief that neurological symptoms have an obvious cause, will resolve quickly, leave nothing visible on medical imaging and do not require follow-up” (Friger 2016)



# My Solutions

- Recognition by ATC's, Chiropractors, Coaches, Teammates
  - mental health symptoms?
  - “snitch rule”
  - @ least ½ of all collegiate concussions go undiagnosed (Armstrong, 2016)
- Requirement for consultation with mental health professional
- Early intervention and referral to mental health professional



# Take Home Points

- Care of individuals with concussion needs to be a collaborative effort which addressed the physical, emotional and psychological symptoms of the injury.
- Don't confuse signs/symptoms of a mental health concern with concussion symptomatology...if NOT sure REFER!!



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