Concussions	
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Disclosure I have no disclosures or financial relationships	
Learning Objectives Diagnosis of Concussions Evaluation of the athlete Concussion Symptoms Return to Play Injury Prevention	



Definition

- Caused by a direct blow to the head, face, neck or a blow elsewhere on the body with an impulsive force transmitted to the head
- Results in the rapid onset of short-lived impairment of neurological function that resolves spontaneously. In some cases, symptoms may evolve over minutes to hours.
- May result in neuro-pathologic changes

- Acute clinical symptoms reflect a functional disturbance not a structural injury
- Results in a graded set of clinical syndromes which may or may not include LOC
- Typically associated with normal structural neuroimaging studies
- Resolution of clinical and cognitive symptoms typically follow a sequential course
- In some cases, symptoms may be prolonged

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Diagnosis

- Clinical symptoms
- Physical signs
- Cognitive impairment
- Neurobehavioral changes
- Sleep disturbance
- Detailed concussion history

Suspected diagnosis includes 1 or more

- Symptoms
 - Somatic headache
 - Cognitive feeling foggy
 - Emotional lability
- Physical Signs
 - Loss of Consciousness
 - Amnesia
 - Neurological deficit

- Balance Impairment
 - Gait unsteadiness
- Behavioral Changes
- Irritability
- Cognitive Impairment
 - Slowed reaction times
 - Concentration disturbances
- Sleep/Wake Disturbance
 - Insomnia
 - Somnolence
 - Drowsiness

Acute Evaluation Sideline or On-field

- Evaluation by a physician or other licensed health care provider
- Use standard emergency management protocols and excluding cervical spine injury
- If no health care provider is available, player should be removed from practice or play and have an urgent referral to a physician

•	Concussion assessment with SCAT 5, IMPACT,
	HEAD'S UP or other sideline assessment tools

- Do not leave to player alone after the injury
- Monitor with serial exams for deterioration in over the initial few hours
- ANY PLAYER WITH SUSPECTED CONCUSSION SHOULD NOT RETURN TO PLAY ON THE DAY OF INJURY

Evaluation in ED or Office

- May be the first contact with the athlete after the injury
- Comprehensive history
- Detailed neurological exam including mental status, cognitive functioning, sleep/wake disturbance, ocular function, vestibular function, gait and balance
- Clinical status whether improved or worse since the time of the injury
- If worse, may need to rule out severe brain injury or structural abnormality with brain imaging

Clinical Assessment

- Neuro-cognitive –verbal memory, visual memory, reaction time, processing speed summary scores
- Physical Exertion
- Symptoms headache, dizziness, nausea, concentration, sleep problems
- Vestibular dizziness, fogginess, fatigue, motion discomfort, anxiety, irritability, impaired balance, environmental sensitivity

Recov	ery
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- Symptoms: 5-14 daysCognitive: 7-21 days
- Males recover quicker than females
- Adults recover quicker than kids
- Average recovery: 1-4 weeks
- Back to baseline
 - 40% in 1 week
 - 60% in 2 weeks
 - 80% in 3 weeks
 - 90% in 4 weeks

Post-concussion Symptoms

- 20% take > 3 weeks to recover
- Symptoms
 - Cognitive
 - Emotional
 - Sleep Disturbance
 - Physical-Migraine
- If all 4, it will take longer to recover
- Treatment based on symptoms

 Cognitive Attention Problems Memory dysfunction "Fogginess" Fatigue Cognitive slowing Emotional 	
 More emotional Sadness Nervousness Irritability 	
 Sleep Disturbance Difficulty falling asleep Sleeping less than usual Physical-Migraine Headaches Visual problems Dizziness 	
Noise/Light sensitivityNausea	
Poturn To Play	
Return To Play • Athletes should not return to play on same	
day of injury • No return to practice or games until all	
 symptoms have resolved – old Children and adolescents should not return to sport until they have successfully returned to school. 	
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Return to School

- Daily activities at home do not give the athlete symptoms
 - Reading, texting, screen time
 - Start with 5-15 minutes
 - Gradually increase
- School activities
 - Homework, reading or other cognitive activities

- Return to school part time
 - Gradual introduction of school work
 - May do partial school days
 - Or increased breaks during the day
- Return to school full time
 - Gradual progression of school activities until a full day is tolerated

Return to Play

- After a brief rest during the acute phase (24-48 hours) after injury, patients can start to become gradually and progressively more active.
- They need to stay below their cognitive and physical symptom-exacerbation threshold
- Their activity should not bring on or worsen their symptoms
- They should avoid rigorous exercise while recovering
- The exact amount and duration of rest is not yet well defined

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- Symptoms need to be gone for 24 hours before gradual return to play ???
- Should be at baseline, asymptomatic at rest
- Off acute medications
- Watch for pre-exiting conditions
- Screen time help or hinder?
- Watch for anxiety, depression
- Try to keep on routines

Graduated Return to Play Protocol

- Step-wise progression
- May proceed to next level if no recurrence of symptoms at the current level
- Each step should take 24 hours
- Takes approximately 1 week through full protocol once no symptoms at rest
- If any symptoms return, patient should return to previous asymptomatic level
- May try next level again after 24 hours
- Return must be individualized to each athlete

- No activity x24-48 hours: physical and cognitive
- Light aerobic exercise: increase heart rate
 - Walking, swimming, running
 - Keep intensity <70% of maximum heart rate</p>
 - No resistance training
- Sport specific exercise: add movement
 - Skating drills for hockey
 - Running drills in soccer
 - No head impact activities

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- Non-contact training drills: exercise, coordination, and cognitive load

 More complex training drills
 - May start progressive resistance training
- Full contact practice: restore confidence and assessment of functional skills by coaches
 - After medical clearance, participation in normal training activities
- RETURN TO PLAY: normal game play

Injury Prevention

- Protective Equipment
 - Reduce impact forces to the brain, but these have not shown to decrease the incidence of concussions
 - Mouth guards: prevent dental and oro-facial trauma
 - Helmets: prevent skull fractures
 - Soccer head bands: doesn't decrease ball impact force for routine heading but may decreased risk of concussion with head to head contact
 - Set equipment standards
 - Improve equipment development: 5 star helmets
 - Risk Compensation: adoption of more dangerous techniques

- · Rule changes
 - Long history in NCAA and CIF to decrease brain injury
 - Set play and practice standards
 - Limiting high school football contact practices to 2x's/week
 - Ideally 30 minutes/day and 60-90 minutes/week
 - No contact on consecutive days
 - Decreases head impact exposure by 42% over the season but varies by position
 - Majority of concussions occur during practice
 - Decrease checking in pee wee hockey

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- Defining contact: air, bags, wrap style, take down, live action
- What age do you allow contact
- Who teaches contact
- Teaching and enforce rules of proper tackling, checking
- Heads up football: decrease head impacts by about 40%
- Zero tolerance for illegal, head first hits

Reporting of Injuries

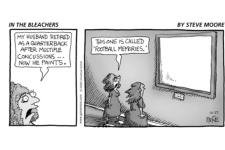
- Because of state laws, media, awareness, education (parents, athletes, coaches), there has been improved reporting
- Could do better 30% not reporting
- · Change culture of reporting
- Athletes don't want to disappoint coaches, peers, parents

- Have trainers or side line medical professionals present to do the reporting
- Establish a national surveillance system that includes high school, club teams and college levels
- Establish evidence based guidelines
- Set up longitudinal studies

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Conclusions

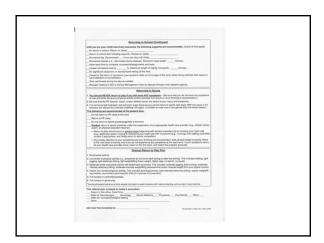
- Promote education and awareness of concussions
- Remove athletes from play immediately for suspected concussion
- No return to play on the same day as the concussion
- No return to play for brief period (24-48 hours) after acute injury
- No return without medical clearance



Appendix

- Head's Up: CDC
- SCAT 5
- Child SCAT 5

Acute Concussion Evaluation Physician/Curricum Office Visit Secret Stein, Prof. & Mony Collina, Prof.		MOE VERSION Collina, PROF	Patie 008 Date					
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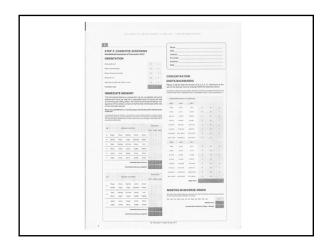


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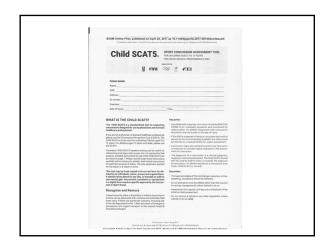


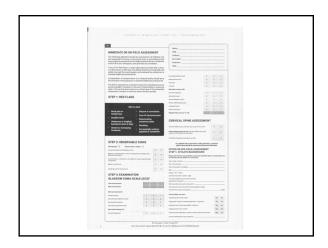


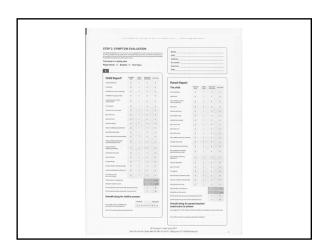


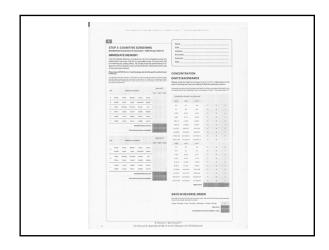
















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