Concussion management
On-screen demonstration

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UCSF sports concussion care

- UCSF Playsafe
  - Athletic trainer at high school
  - M.D. on sideline and in clinic
- Preparticipation exam
  - Concussion hx
  - Baseline testing
- Sideline: early recognition
  - If in doubt sit out
- Clinic: M.D. evaluation

Who are you?

1. Primary care provider and involved in sports coverage.
2. Primary care provider, not involved in sports coverage.
3. Physical therapist
4. Chiropractor
5. Athletic trainer

Who was in the concussion talk this morning?

1. I was there and remember the main points.
2. I was there and would like a review of the main points.
3. I wasn’t there.
How many sports concussion cases do you see in your practice?

1. A few patients/week
2. A few patients/month
3. A few patients/year
4. None

Concussion definition

- Blow to head, neck, body \(\rightarrow\) force to head
- Rapid onset of neurologic impairment
- Symptoms usually short-lived and resolve spontaneously but in some cases can be prolonged
- Symptoms represent functional or metabolic change in CNS, not structural injury
- Graded set of clinical syndromes that may or may not include loss of consciousness
- Symptom resolution is sequential
- Standard neuroimaging is normal

Concussion symptoms

Concussion pathophysiology

- Force to brain
- Ion fluxes; vasoconstriction
- Need glucose but less blood flow
- Energy crisis


Concussion evaluation

On-Field Evaluation
- Call 911
- Stable
- Emergency

Sideline Evaluation

Sideline concussion evaluation

- Remove from play
- Mechanism of injury
- Maddocks questions
  - If unreliable, very disoriented consider ED
- Neck and Neuro exam
  - Rule out CS injury
  - Rule out head bleed

SCAT2: locker room or clinic

http://laist.com/2006/12/03/troy_in_bruins.php
Monitor symptoms

- 24-48 hours for complete evolution of symptoms
- On sideline
  - Send athlete home with supervision OR...
  - Repeated exams, check athlete every 10 minutes or so for worsening symptoms and decreased alertness
- Overnight: wake patient up to make sure oriented, check symptoms

Concussion treatment

- Cognitive rest
- Physical rest
- Medication
  - Avoid aspirin and ibuprofen
  - Tylenol OK
- Avoid alcohol
- Avoid driving

Concussion cases

Refer to syllabus for the following:
1. SCAT2
2. UCSF Playsafe acute concussion info sheet
3. UCSF Playsafe post concussion symptom scale
4. UCSF Playsafe return to participation sheet

Worsening headache
Seizure
Increasing drowsiness
Focal neuro deficit
Repeated vomiting
Slurred speech

Does not recognize people/places
Increasing confusion/irritability
Weakness/numbness arms or legs
Neck pain
Loss of consciousness >30 seconds


Case 1:
20 y/o with headache and dizziness

20 y/o with headache and dizziness

- SCAT2 symptom scale before entering the room
- History keys
  - Mechanism of injury
  - Symptoms initially and currently
  - Did they play through the symptoms? Did they have a second hit (might make sx longer)
  - Loss of consciousness (if many minutes then would expect transport and head CT)
- PMH
  - ADHD, learning d/o
  - Depression, anxiety
  - Concussion

20 y/o with headache and dizziness

- Physical exam
  - Neurologic
  - SCAT2
SCAT2 summary results

- Orientation score ___/5
- Immediate memory score ___/15
- Concentration score ___/5
- Balance score ___/30
- Coordination score ___/1
- Delayed recall score ___/5

What would you recommend for Jason?

1. Rest from school and sports. Tylenol or NSAIDs as needed for headache. F/u 1 week.
2. Rest from sports. Tylenol or NSAIDs as needed for headache. F/u 1 week.
3. No sports x 2 weeks then can return. F/u as needed.
4. Return to school and sports once headache resolves. F/u as needed.

UCSF PlaySafe school and sports note

1-week f/u with Jason

- Asymptomatic
- Symptoms = 0
- SCAT2 stable to improved.
1-week f/u: what do you recommend for Jason?

1. Return to school without limitation. Hold out from sports for another week. F/u in 1 week.
2. Return to school without limitation. Begin noncontact sports progression. F/u in 4 days.
3. Return to school and sports without limitation. F/u as needed.
4. Hold out from school and sports for another week. F/u in 1 week.

Describe a return to play progression for Jason.

1. **Stage 1:** REST UNTIL ASYMPTOMATIC (physical and mental rest)
2. **Stage 2:** LIGHT AEROBIC EXERCISE --- INDIVIDUAL (15 min. walking, stationary bike, <50% exertion)
3. **Stage 3:** SPORT SPECIFIC EXERCISE --- INDIVIDUAL (non-team, non-contact, <75% exertion)
4. **Stage 4:** NON-CONTACT TRAINING DRILLS --- TEAM (with team, 75%-100% exertion) and resistance training
5. **Stage 5:** MEDICAL CLEARANCE by Team Physician or PCP
6. **Stage 6:** FULL CONTACT TRAINING --- TEAM
7. **Stage 7:** FULL RETURN TO SPORT ACTIVITIES --- COMPETITION

Step-wise activity progression

- Asymptomatic
- Clinician clearance
- Light aerobic activity
- Clinician clearance
- Sport specific activity
- Non-contact training
- Full contact practice
- Game play

Questions?

Case 2:
18 y/o with possible concussion

What do you tell Chris about this week’s game?

1. If he’s asymptomatic by Wednesday he can play in Thursday’s game.
2. If he’s asymptomatic by Tuesday he should be able to get back for the game.
3. He has a concussion and thankfully his symptoms are mild, but he won’t be ready for this week’s game.
4. He has a concussion and will need to avoid football for the next 2 weeks.

Symptom resolution after sport concussion

- 50% recovered and returned to play in 1 week; 90% in 3 weeks (Collins et al. Neurosurgery, 2006.)
- High schoolers take longer to recover based on neuropsychological testing compared to college athletes (Field et al, J Pediatr, 2003.)
Step-wise activity progression

- Asymptomatic
- Clinician clearance
- Light aerobic activity
- Sport specific activity
- Non-contact training
- Full contact practice
- Game play

Risks of premature return to play

- College football players with h/o concussion more likely to sustain concussion
- 1/15 of players with concussion had repeat concussion in same season
  - 75% within 7 days of first injury
  - 92% within 11 days of first injury
- History of concussion associated with prolonged recovery from later concussions

Questions?

Case 3:
21 y/o with headache, fatigue, and irritability
What’s in your ddx for this patient’s symptoms?
- Migraine headache
- Sleep disorder
- Depression
- Concussion → postconcussion syndrome

Long term effects of concussion
- Postconcussion syndrome
  - Frequency unclear (0-15%?)
  - Concussion sxs persist x months, usually <1 year

How would you manage this case?
- Further work-up
- Team approach
- Medications
- Rehabilitation

How would you approach return to play in this case?

1. Ice hockey is low-risk for concussion. He can play without any concerns.
2. Ice hockey is a higher-risk sport for concussion. I have concerns about him playing.
3. There is no literature on risk of repeated concussions so I can’t give him any advice.
4. The literature on repeat concussion pertains to football players so I can’t give him any advice.

Effects of concussion

- Increased risk of repeat concussion

Effects of concussion

- History of concussion associated with prolonged recovery from later concussions

Cumulative effects of concussion

- Unclear
  - Conflicting data in literature on whether or not concussion causes long term cognitive problems
  - Rising concern re: chronic traumatic encephalopathy in former NFL players
  - Need for prospective longitudinal studies
How many concussions is too many?

- Individualized to athlete
- Concussion hx
  - Number
  - Less force
  - More frequent
  - Increased severity of sx
  - Increased duration of sx
  - Age: possibly more consequences if younger at time of concussion

Concussion management pearls

- SCAT2 for evaluation
- Treatment = cognitive and physical rest
- Step-wise return to play
- Team approach to post concussive syndrome
- Individualized approach to the athlete with severe symptoms or repeat injuries

Thank you!

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