

Sport Concussion, Office Management

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- Fellowship: Sports Medicine
- Mt. Tam Orthopedics
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- Head Team MD:
 - US Olympic Freestyle Ski Team
 - US Freestyle Ski Team
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Concussion

- Athletes
- Patients
- Common in my practice

Diagnosis

- History
- Mechanism
- Physical exam
- Clinical course over time

Common Symptoms

- Headache
- Foggy
- Irritable
- Nausea
- Trouble concentrating
- Light sensitive
- Sleep disturbance
- Memory disturbance

— Guskiewicz et al.: AJSM vol. 28, 5. p 643-650, May 2000

POST-CONCUSSION SYMPTOM CHECKLIST

Name: _____

Date: ____/____/____

Instructions: For each item please indicate how much the symptom has bothered you over the **past 2 days**

Symptoms		none	mild		moderate		severe	
Physical	Headache	0	1	2	3	4	5	6
	Nausea	0	1	2	3	4	5	6
	Vomiting	0	1	2	3	4	5	6
	Balance Problem	0	1	2	3	4	5	6
	Dizziness	0	1	2	3	4	5	6
	Visual Problems	0	1	2	3	4	5	6
	Fatigue	0	1	2	3	4	5	6
	Sensitivity to Light	0	1	2	3	4	5	6
	Sensitivity to Noise	0	1	2	3	4	5	6
	Numbness/Tingling	0	1	2	3	4	5	6
	Pain other than Headache	0	1	2	3	4	5	6
Thinking	Feeling Mentally Foggy	0	1	2	3	4	5	6
	Feeling Slowed Down	0	1	2	3	4	5	6
	Difficulty Concentrating	0	1	2	3	4	5	6
	Difficulty Remembering	0	1	2	3	4	5	6
Sleep	Drowsiness	0	1	2	3	4	5	6
	Sleeping Less than Usual	0	1	2	3	4	5	6
	Sleeping More than Usual	0	1	2	3	4	5	6
	Trouble Falling Asleep	0	1	2	3	4	5	6
Emotional	Irritability	0	1	2	3	4	5	6
	Sadness	0	1	2	3	4	5	6
	Nervousness	0	1	2	3	4	5	6
	Feeling More Emotional	0	1	2	3	4	5	6

Exertion: Do these symptoms worsen with:

Physical Activity ☐ Yes ☐ No ☐ Not applicable

Thinking/Cognitive Activity ☐ Yes ☐ No ☐ Not applicable

Overall Rating: How different is the person acting compared to his/her usual self?

Same as Usual 0 1 2 3 4 5 6 Very Different

Activity Level: Over the past two days, compared to what I would typically do, my level of activity has been ____% of what it would be normally.

OCAMP

Oregon Concussion Awareness and Management Program

Modifiers

- Schoolwork
- Exercise
- Time
 - Symptom index

Physical Exam

- Associated injuries
- Focused Neurologic Exam

Cranial Nerves

- Facial symmetry
- Sensation
- Hearing
- Tongue symmetry
- Shoulder shrug

Eyes

- PERRL
- Visual fields (finger counting)

Eye Movement (VOMS)

- Smooth pursuit (H pattern)
- Saccades (horizontal and vertical)
- Convergence
- Vestibular Ocular Reflex
- Visual Motion Sensitivity

– Collins et al, AJSM vol 42, 10: 2479-2486, 2014

Smooth Pursuit

Convergence < 6 cm



Saccades



Vestibular Ocular Reflex



Visual Motor Sensitivity



Motor, coordination

- Finger nose
- Proximal/Distal strength 4 extremities
 - Deltoid, interossei
 - Quad, dorsiflexion

Proprioception

- Romberg (no step or sway)
- Fakuda (less than 30 degree turn, no misstep)

Romberg



Fakuda



Balance

- Single leg stance, eyes closed
- Tandem Walk

Single leg stance



Diagnosis

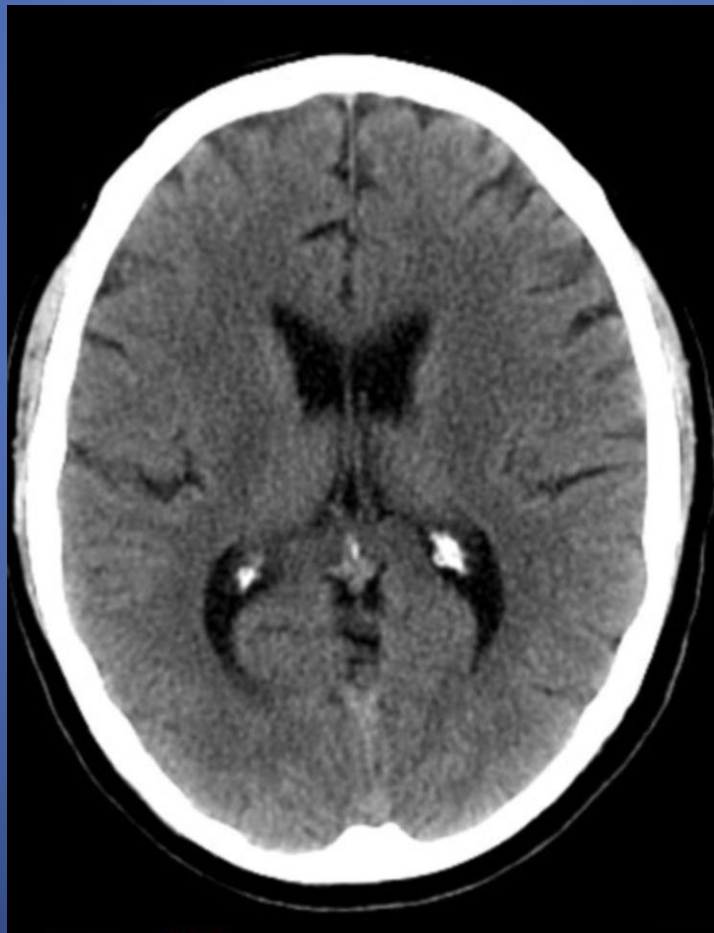
- Past: Grade I, II, III
- Current:
 - Concussion
 - Probable Concussion
 - Possible Concussion
 - No Concussion
 - Aubry et al: Summary and Agreement statement, 1st International Conference on Concussion in Sport BJSM 36(1): 6-10, 2002
 - Lovell et al: AJSM 32(1): 47-54, 2004



Consequences

Wojtys et al, AJSM Vol. 27, 5 p. 676-679, May 1999

- Second Impact Syndrome



CTE

Concannon et al, Sports Health vol. 6, 5: p 396-401, April 2014

- No diagnostic test
- Post Mortem diagnosis
- “Tauopathy”
- Specific recommendations for prevention are not yet validated

Management

- Mental and Physical Rest
- Graduated Return to Cognitive Stimuli
- Graduated Return to Sports
 - 2012 Zurich Consensus Statement, 4th International Conference on Sport Concussion
- Team Approach
 - ATC
 - Strength Coach
 - PT
 - ImPACT testing
 - Pellman et al.: Neurosurgery, 58(2): 263-274
- Monitor Progress
 - Kutcher et al., Journal of Child Neurology, vol. 30, 12: p 1686-1694, May 2015
 - Meehan et al., AJSM vol. 39, 11: p 2304-2310, October 2011

Clinician Role

- Establish Diagnosis
- Educate Athlete
- Monitor Recovery
- Authorize return to contact

Safe for Contact Sports?

- Symptoms Resolved
- Normal Exam
- Academics and Athletics progressed without return of symptoms
 - Aubry et al: Summary and Agreement statement, 1st International Conference on Concussion in Sport BJSM 36(1): 6-10, 2002
- If available: ImPACT within range baseline
- California law (AB 25)

Thank You!

