

# Concussion Assessment and Management Update

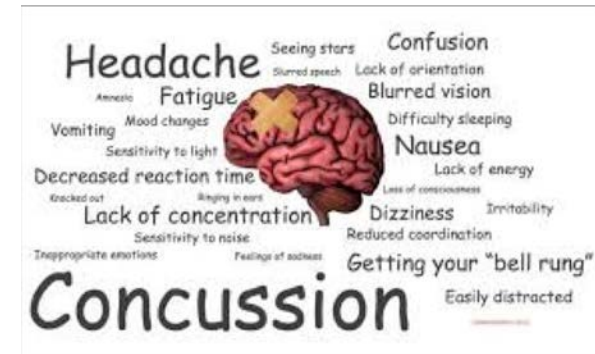
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1/12/19



# OBJECTIVES

- When to refer to a physician?
- When to sent to the ER?
- When to image?
- Update on sports related concussion
- When to return to play?



# CASE 1

- 1/18 : 18 y/o high school athlete sustained a fall with symptoms including headaches presented to the office one week after injury. Mostly vestibular and cognitive deficits on exam
- 1/25: Follow up, HA, difficulty with return to class, difficulty with sleeping, started of vestiblar-ocular rehab
- 2/8: HA persists, No therapy yet,
- 3/5: HA persists, started therapy
- 4/2: MRI of the brain ordered, continue Nortriptyline
- 4/16: MRI of the brain normal
- 5/17: Symptoms persists, ocular symptoms, recommend neurology, tried Neurontin
- 9/25: Email from athlete



# SIDELINE EVALUATION

- Consider neck immobilization when appropriate
- No single diagnostic gold standard
- SCAT 3
- Vestibular Oculomotor Screening (VOMS)
- BESS test
- King-Devick Test





# CLINICAL DECISION RULES IN IMAGING IN CONCUSSION

- New Orleans Criteria
  - Headache
  - Vomiting
  - Older than 60 years
  - Drug or alcohol intoxication
  - Persistent deficit in short term memory
  - Visible trauma above clavicle
  - Seizure



# CLINICAL DECISION RULES IN IMAGING IN CONCUSSION

- Canadian CT Head Rule
  - Patients with minor head injuries with GCS score of 13-15 after LOC, amnesia or confusion

Glasgow Coma Scale		
Response	Scale	Score
Eye Opening Response	Eyes open spontaneously	4 Points
	Eyes open to verbal command, speech, or shout	3 Points
	Eyes open to pain (not applied to face)	2 Points
	No eye opening	1 Point
Verbal Response	Oriented	5 Points
	Confused conversation, but able to answer questions	4 Points
	Inappropriate responses, words discernible	3 Points
	Incomprehensible sounds or speech	2 Points
	No verbal response	1 Point
Motor Response	Obeys commands for movement	6 Points
	Purposeful movement to painful stimulus	5 Points
	Withdraws from pain	4 Points
	Abnormal (spastic) flexion, decorticate posture	3 Points
	Extensor (rigid) response, decerebrate posture	2 Points
No motor response	1 Point	

Minor Brain Injury = 13-15 points; Moderate Brain Injury = 9-12 points; Severe Brain Injury = 3-8 points.



# RECOVERY TRAJECTORIES

- Cervical
- Oculomotor
- Vestibular
- Cognitive/Fatigue
- Anxiety/Mood
- Post-Traumatic headaches/migraine
- Sleep
- Pre-Injury and comorbid medical factors



# ROLE OF PHYSICIANS

- Lystedt Law
  - Requires clearance by a licensed healthcare provider
- Medications

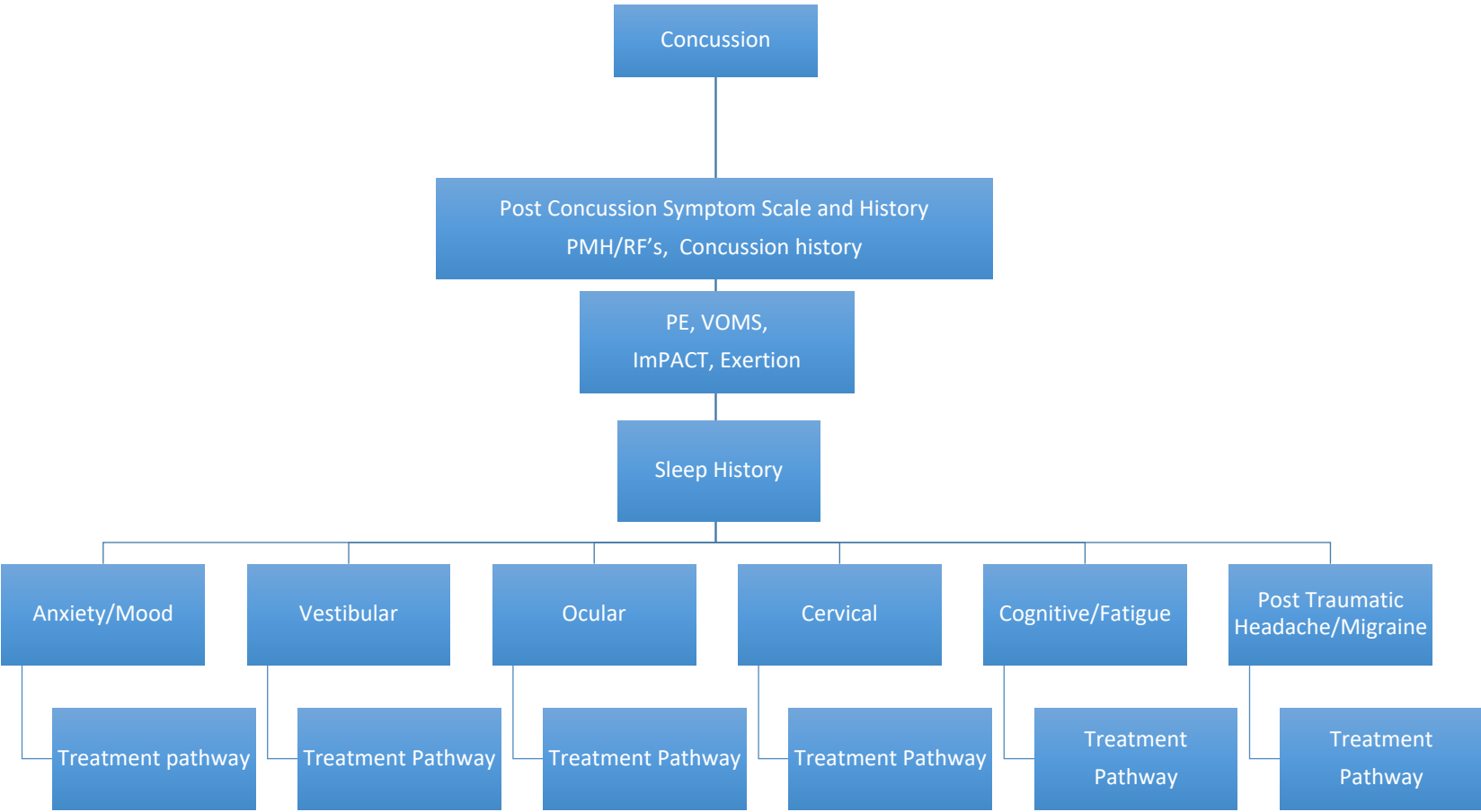




# MEDICAL CLEARANCE

- Number of concussions
- Duration of symptoms
- Frequency
- Time interval and recovery time





# UPDATE ON CONCUSSION IN SOCCER

- Concussion = 1/5 of all high school soccer-related injuries
- Females 1.6X more likely than males to sustain soccer-related concussion
  - AND miss more time away from soccer (Mean 10.9 v 12.2days)
- Peak neck velocity higher in females during heading
- Increased neck sway after heading practice



Kerr 9/2018



Bretzin 6/2018



Caccese 12/2018



Caccese 12/2018





## Storelli Exoshield

Cost: \$59.99

Style: headband



Coverage: 56%

Score: 0.16



"Not a lot of players wear them right now, despite the tremendous protection they can provide,"







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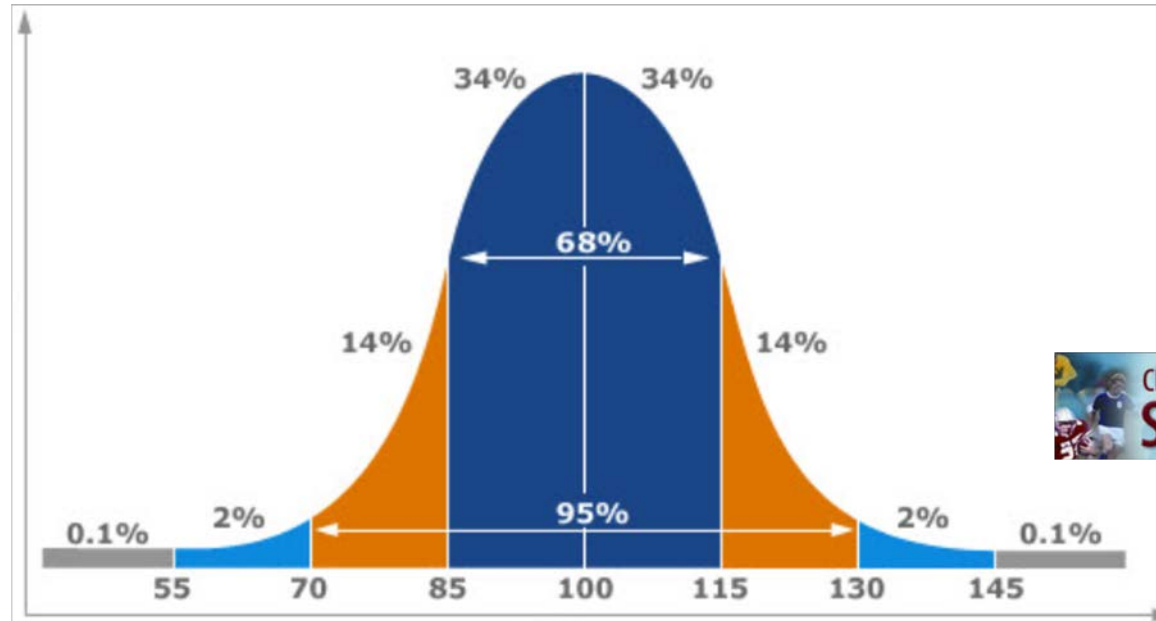
"Not a lot of players wear them right now, despite the tremendous protection they can provide,"

**MAYBE?!**



# RETURN TO PLAY

- Average 9.8 days until symptom-free
  - Standard deviation +/- **11 days**



Putukian 2018



# RETURN TO PLAY

- Importance of **GRADUAL** increase in physical activity
  - Think individual components of sport
  - Away from stress of practice environment
  - Cleared for sport after school





# CASE 2

- 16yo soccer athlete catches errant ball to the side of the head during warmups. As practice begins he complains of a headache and it is clear he is having trouble focusing during drills.



-Next steps?





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- Next steps?
- Prevention strategies?



# CASE 3



- A 9 year-old female sustained a concussion one week ago. She has not returned to school in the meantime and continues to have daily headaches that have only improved mildly. She is having difficulty getting to sleep at night and has not felt like eating. She has not left the house since the day of the concussion.



# CASE 3



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- You have a good relationship with the athlete's parents. They are understandably concerned and have read that an MRI might be warranted.





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- You have a good relationship with the athlete's parents. They are understandably concerned and have read that an MRI might be warranted. How do you respond?





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- You have a good relationship with the athlete's parents. They are understandably concerned and have read that an MRI might be warranted. Anything they could have done to prevent this outcome?



# CASE 4

- A 13 year-old male midfielder complains of dizziness after a particularly stressful but uneventful practice session that included several 50/50 headers. He reports instability and mild vertigo after practice especially when standing up after changing out of his boots. He reports a mild diffuse headache, especially focused over the temples and upper face.
- Anything else you want to know? How do you proceed?



# REFERENCES

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Henry L, Elbin RJ et al. Examining Recovery Trajectories After Sports-Related Concussion With a Multimodal Clinical Assessment Approach. Neurosurgery 78: 232-241, 2016

