



Texas Children's Professional Education Series
Orthopedics and Sports Medicine



What is New with Sports Concussions?

Jonathan Santana, DO, FAAP, CAQSM
Adolescent & Sports Medicine
Texas Children's Hospital



Topic #1



VS



Live Life

- No need to "cocoon" patients
- Rest in the first 48-72 hours
- Phones, tablets, computers are part of daily life
- Minimize video games initially
- Try to resume a regular routine
- Get out of the house



Association Between Early Participation in Physical Activity Following Acute Concussion and Persistent Post-concussive Symptoms in Children and Adolescents

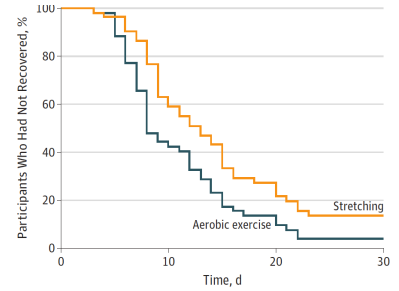
Grool AM et al JAMA 2017

- Prospective study of 3063 children and adolescents (5 to 18 years) with acute concussion (9 Canadian EDs).
- Follow up survey of association between early participation in Physical Activity within 7 days of injury and symptoms at one month.
- Physical activity within 7 days of injury compared with no physical activity was significantly associated with reduced risk of symptoms at 28 days (24.6% vs. 43.5%)



Exercise in the Acute Phase

Early **subthreshold aerobic** exercise has been shown to improved recovery time and decrease persistent post concussive symptoms



No. at risk	0	10	20	30
Aerobic exercise	52	23	7	2
Stretching	51	32	14	7

Survival analysis comparing groups; the aerobic exercise group recovered significantly faster than the stretching group after adjusting for age, sex, time from injury to first clinical visit, and concussion history ($z = 2.82; P = .005$).

Leddy J., et al., 2019



Topic #2



Clinical Evaluation

- Concussion is still a **clinical diagnosis**
- Symptom Checklist
- SCAT 5
- VOMS Testing
 - Vestibular symptoms ~67%–77%
 - Occular impairment ~45%

Valovich M., 2015



Vestibular/Ocular-Motor Screening (VOMS) for Concussion

Vestibular/Ocular Motor Test:	Not Tested	Headache 0-10	Dizziness 0-10	Nausea 0-10	Fogginess 0-10	Comments
BASELINE SYMPTOMS:	N/A					
Smooth Pursuits						
Saccades – Horizontal						
Saccades – Vertical						
Convergence (Near Point)						(Near Point in cm): Measure 1: _____ Measure 2: _____ Measure 3: _____
VOR – Horizontal						
VOR – Vertical						
Visual Motion Sensitivity Test						

Mucha 2014



Smooth Pursuit



Saccades



Vertical Saccades



Vestibulo-Ocular Reflex (VOR)



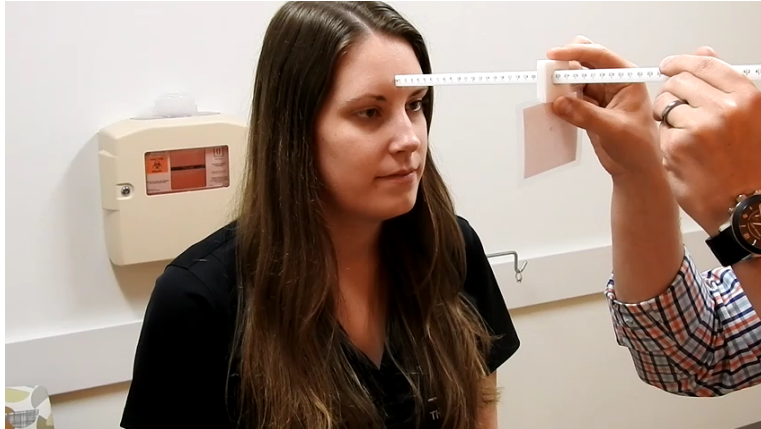
Vertical VOR



Visual Motor Sensitivity



Convergence



Topic #3



Driving After a Concussion

- Motor vehicle accident are the leading cause of death in adolescence
- Less than 50% of providers discussed driving recommendations with concussion patient's

Lucas JA, 2018



Percentage of Driving Smart Phrase Implemented



Driving Recommendations

- Temporary physical and mental impairments including:
 - Slower reaction time
 - Trouble paying attention
 - Poor physical coordination
 - Poor judgment
- Should not drive:
 - Within 24 hrs of a concussion
 - Light and noise sensitivity
 - Vestibular/Ocular symptoms
- Gradual return to driving:
 - Short rides
 - Avoid high speeds
 - No driving at night



Topic #4



Sleep and Concussion

- May lead to poorer outcomes
- Trouble falling asleep
 - Missed more days of school Howell,D., et al. 2018
 - More severe symptom Howell,D., et al. 2018
 - Prolonged recovery Bramley H, et al. 2017
- Need to discuss proper sleep hygiene



Sleep Recommendations

1. Keep a consistent sleep schedule
2. Get enough sleep at night
 - School-aged children (6-12 years) need between 10 and 11 hours of sleep per night
 - Adolescents (13-18 years) require between 9 and 9 ½ hours of sleep per night
3. Have a consistent bedtime routine to help you relax each night before bed
4. Don't go to bed unless you are sleepy
5. Avoid taking naps if you can
 - If you must take a nap, try to keep it short (less than one hour)
 - Try not to take a nap after 3 p.m. so that you can fall asleep at bedtime
6. Avoid caffeine
7. Make your bedroom a sleep haven
8. Keep all electronics out of the bedroom
9. May use melatonin if difficulty falling asleep

Topic #5



Mental Health

- Psychosocial factors have one of the strongest impacts on overall health Cassel A., 2016
- History of mental health problems is a risk factor for prolonged recovery Zemek R., 2016
- Post concussive symptoms may not be solely due to the concussion

Conclusion

- Encourage sub-threshold aerobic activity
- Discuss driving restrictions
- Incorporate VOMS into clinical exam
- Evaluate sleep and psychosocial issues