A Practical Approach to Concussions in the Workplace

Ryan Foreman, MD

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Objectives

- Discuss Pathology
- Diagnosis/Physical Exam
- Typical Treatment Course
- Role of Physical Therapy
- Return to Work
- Ongoing Symptoms vs. Malingering

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What is a Concussion?

- It is at the mild end of the spectrum of traumatic brain injury
- Impact shakes the brain inside the skull
- A wave through brain tissue causes discharge of damaging chemicals
  - Nerve cells can shear
  - Microscopic damage can affect the anatomy and function of brain cells

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What is a Concussion?

- https://www.youtube.com/watch?v=RfhJdATqDLY

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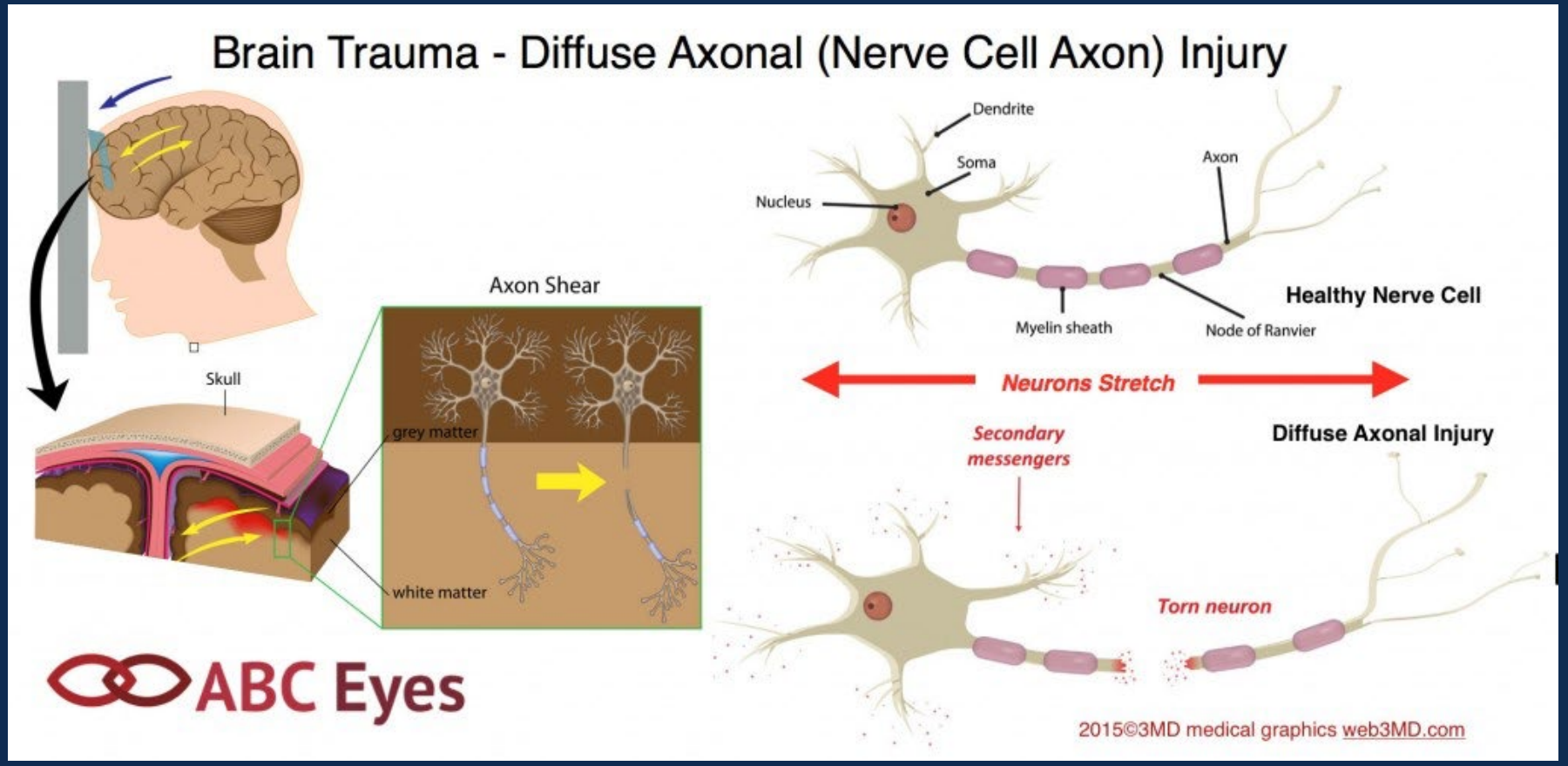
What is a Concussion?



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What is a Concussion?

- You know it when you see it….. Usually
- https://www.youtube.com/watch?v=d5c_zR85ca4
- https://www.youtube.com/watch?v=EPbg_KIyUko

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What is a Concussion?

- Does not require a direct hit
- Do not have to lose consciousness in order to sustain a concussion
- May be confused or have a lapse in memory
  - Reflecting brain dysfunction
- Patient may think they were unconscious because they can't account for some span of time (memory gap)

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What is a Concussion?

- Microscopic axonal injury
  - Increased energy demand
- Mitochondrial dysfunction
  - Decreased energy supply
- Decreased cerebral blood flow

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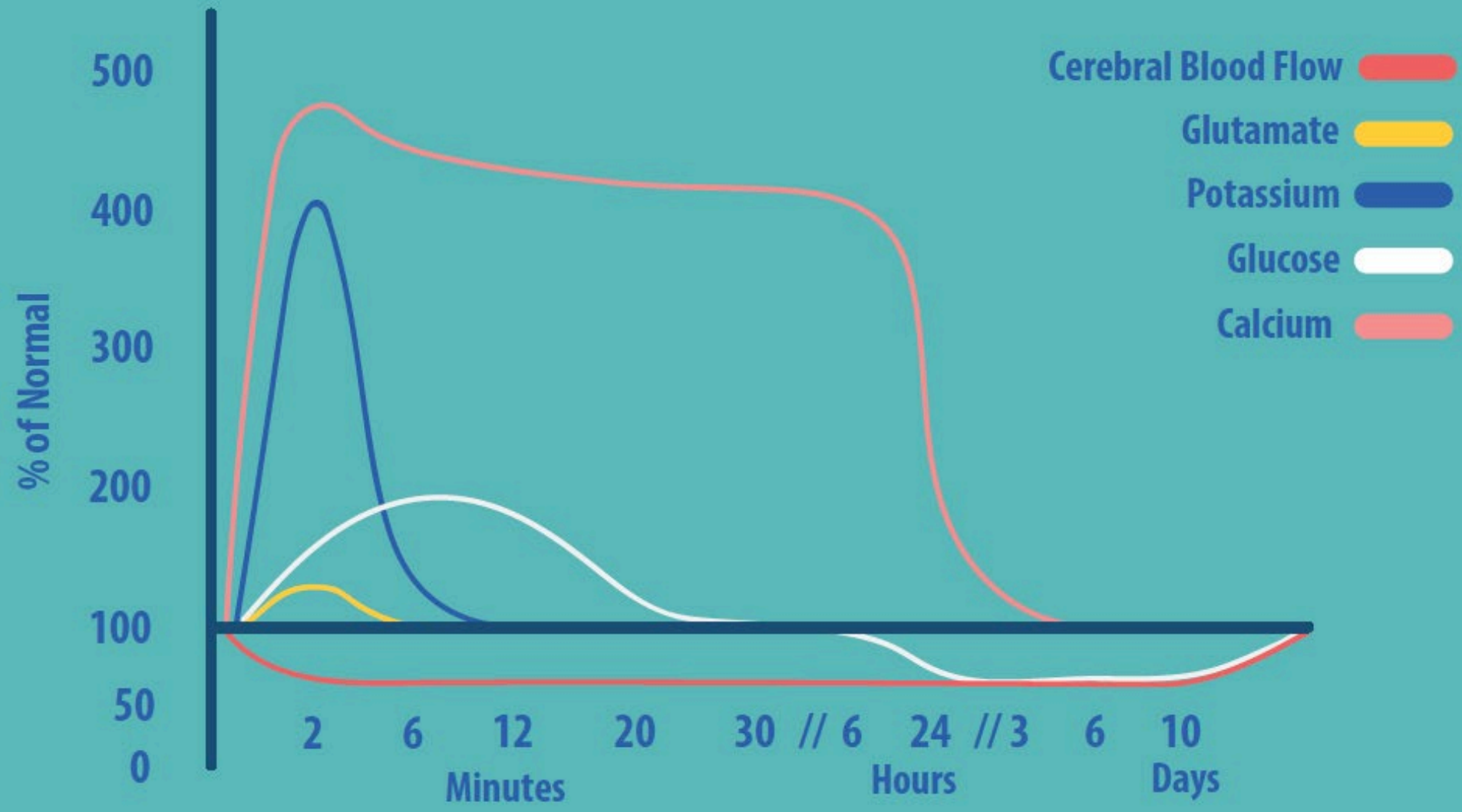
The Neurometabolic Cascade Following Cerebral Concussion



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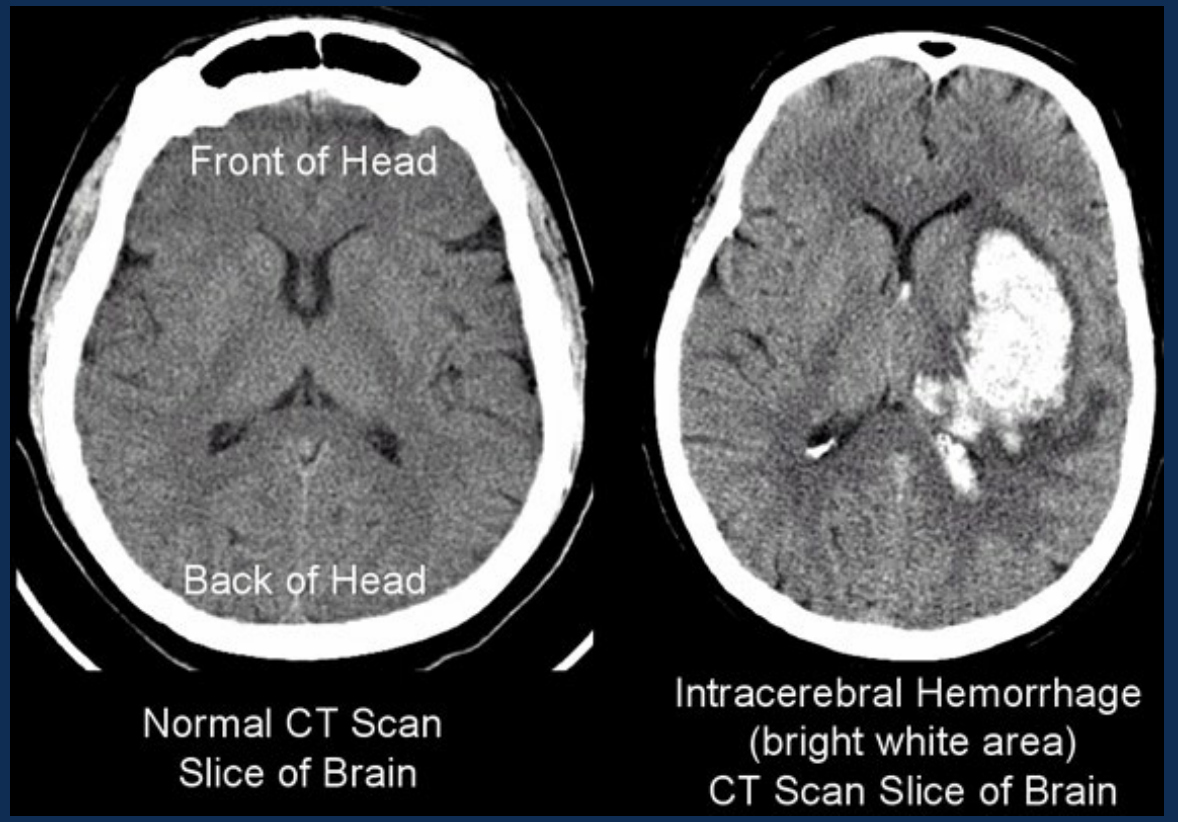

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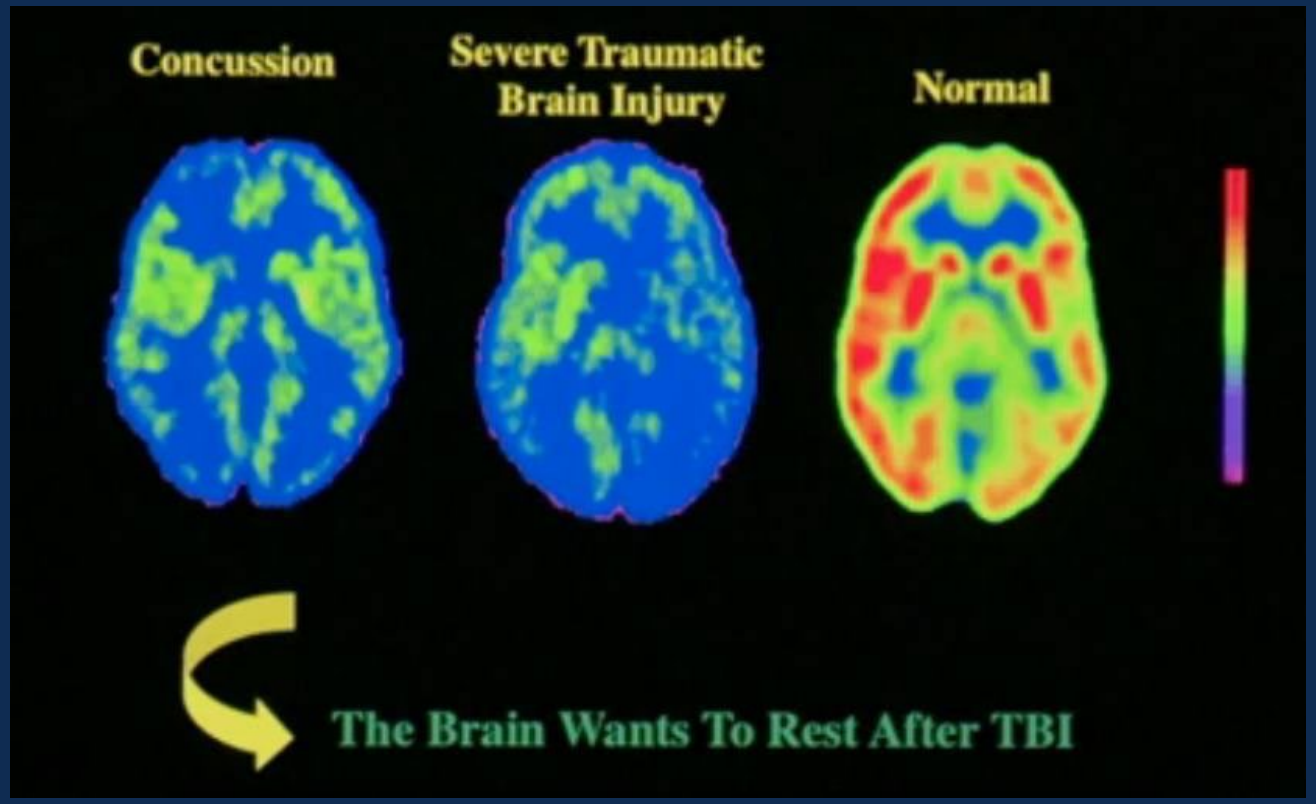

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Imaging

- CT scan and MRI by definition are normal in concussion
- Not needed vast majority of the time
  - Especially after the first few hours
- CT scan should be done on emergent basis for:
  - Acute decompensation
  - Prolonged loss of consciousness
  - Focal neurological deficit
- MRI should be considered for persistent clinical or cognitive symptoms

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Clinical Evaluation

- Starts before going in the room
- Review of records
- Mechanism of injury
- How long ago?
- Prior treatment
- Current work status
- Prior imaging
- Current symptom score
- Did they drive?
- Gait pattern walking into the room
- Speech
- How long to fill out paperwork
- Are the lights on?
- Vomiting?
- Histrionic

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Clinical Evaluation

SCAT symptom Score
- Standardized Concussion Assessment Tool
- 22 Symptoms rated 1-6

Assessed at every visit
- Total Score greatest predictor of recovery
- Individual scores most helpful for accommodations

	none	mild		moderate		severe
Headache	0	1	2	3	4	5	6
"Pressure in head"	0	1	2	3	4	5	6
Neck Pain	0	1	2	3	4	5	6
Nausea or vomiting	0	1	2	3	4	5	6
Dizziness	0	1	2	3	4	5	6
Blurred vision	0	1	2	3	4	5	6
Balance problems	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
Feeling slowed down	0	1	2	3	4	5	6
Feeling like "in a fog"	0	1	2	3	4	5	6
"Don't feel right"	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
Fatigue or low energy	0	1	2	3	4	5	6
Confusion	0	1	2	3	4	5	6
Drowsiness	0	1	2	3	4	5	6
Trouble falling asleep (if applicable)	0	1	2	3	4	5	6
More emotional	0	1	2	3	4	5	6
Irritability	0	1	2	3	4	5	6
Sadness	0	1	2	3	4	5	6
Nervous or Anxious	0	1	2	3	4	5	6

Total number of symptoms (Maximum possible 22)

Symptom severity score
(Add all scores in table, maximum possible: 22 x 6 = 132)

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Physical Exam

- Neurological physical examination
  - Rule out focal defect
  - If abnormal – Imaging usually required
- Vestibular exam
- Psychological exam

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Vestibular Exam

- Smooth Pursuit
  - The patient is instructed to maintain focus on the target as the examiner moves the target
- Saccades
  - Patient to follow a target between two points as quickly as possible
- Near Point of Convergence
  - Measure the ability to view a near target without double vision

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Vestibular Exam

- Vestibulo-Ocular Reflex
  - Assess the ability to stabilize vision as the head moves.
  - The patient and the examiner is seated. The examiner holds a target of approximately 14 point font size in front of the patient in midline at a distance of 3 ft.
  - Use a metronome to help with speed at about 180 beats/min

- Visual Motion Sensitivity
  - Test visual motion sensitivity and the ability to inhibit vestibular –induced eye movements using vision.
  - Patient holds arm outstretched and focuses on their thumb. Maintaining focus on their thumb, the patient rotates together as a unit, their head, eyes and trunk at an amplitude of 80 degrees to the left and 80 degrees to the right.

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Psychological Exam

- Appearance
- Mood/Affect
- Speech
- Cognitive Function
- Attention
- Memory
- Insight

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Treatment

- Early Mental and Physical Rest
  - Brain needs to spend energy on recovery not on processing information
  - Too much mental or physical stimulation will worsen symptoms
- Individualized Treatment Based on Individual Symptoms
- Allow For as Much Activity as Symptoms Allow
- Gradual Progression of Activity as Symptoms Allow

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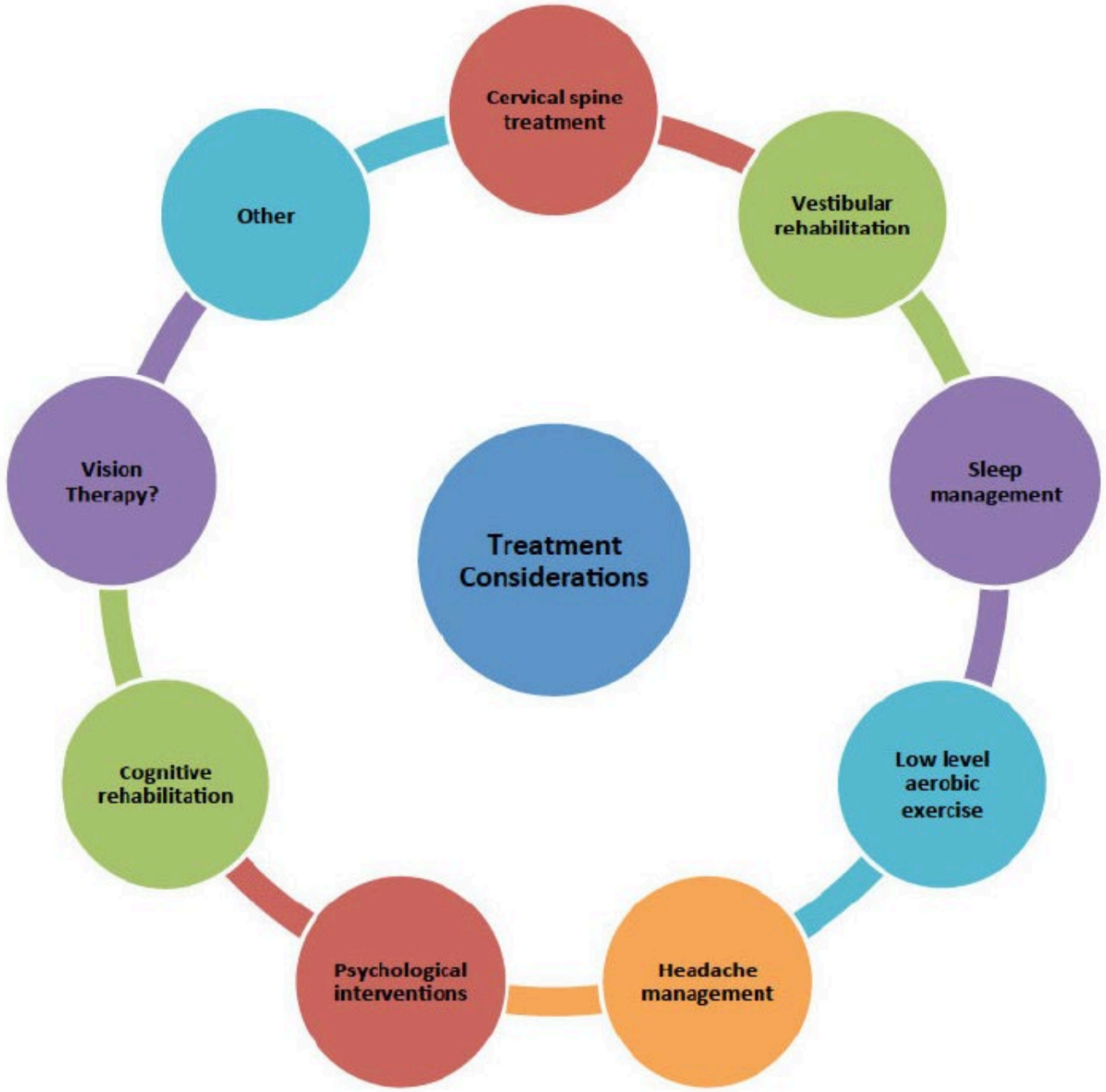

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Medication

- Early Tylenol and Ibuprofen
- Avoid most other meds if possible
  - Particularly Narcotics
  - Consideration of sleep aid for short term use
- May need adjustment of depression/anxiety meds

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Try to Maintain Normal Schedule

- Avoid isolation
- Maintain sleep/wake cycle
- Get back to work as quickly as possible
  - Neuroplasticity

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Physical Therapy

- Treat cervical pain
- Vestibular rehab
- Guide Return to Work duties
- Side benefits
  - Power of touch
  - Track progress
  - Track compliance

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Other Therapies

- Speech Therapy
  - Concentration
  - Word finding

- Vision Therapy
  - Blurry Vision
  - Double Vision
  - Convergence

- Occupational Therapy
  - Work Specific Accommodations

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Return to Work

- Safety sensitive duties
  - Avoid a second hit
- Avoid common triggers
  - Loud environment
  - Bright lights
- Good sleep hygiene
- Less physical exertion
  - Reduced hours
  - Seated work
  - Lifting restriction
  - Slower pace
- No exercise

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What Happens When Patients Don't Get Better?

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What Happens When Patients Don't Get Better?

- Physical
- Sleep
- Mood
- Cognitive

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Physical

- Headache
- Neck pain
- Light-headedness
- Sensitivity to Light
- Sensitivity to Sound
- Ringing in the Ears
- Balance problems, dizziness
- Fatigue
- Fuzzy, double, or blurry vision, trouble with reading
- Rarely, decreases in taste and smell
- Reduced tolerance to stress, emotional excitement, or alcohol.

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Sleep

- Sleeping more than usual
  - Early symptom
- Sleeping less than usual, or trouble falling asleep
  - Later symptom
- Sleep disturbance (sleep cycle is interrupted)
  - After prolonged time off

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Mood

- Irritability
- Sadness or depression
- Anxiety
- More emotional
- Apathy that didn't exist before the concussion
- **these symptoms often pre-existing and made worse/altered by the concussion

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Cognitive

- Difficulty with memory, or remembering new information
- Difficulty with attention
- Difficulty with thinking clearly
- Difficulty with focus or concentrating
- Confusion
- Feeling slowed down mentally

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Often Trying to Differentiate Between a Zebra and a Horse

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Reality

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Those Who Take Longer

- Bad Injury
- Prior Brain Injury
- Older Age
- Multiple Trauma

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Competing Diagnoses

- Depression
- Anxiety
- Bipolar
- Adjustment Disorder

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Malingering

- Differentiate from Conversion Disorder
- Risk Factors:
  - evaluation is perceived as adversarial
  - the personal stakes are very high
  - no alternatives appear viable.
- Add:
  - Toxic work environment

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Malingering

- Inconsistent symptoms
- Fluctuating symptom score
- Symptoms vs. Mechanism of Injury
- Symptoms vs. Exam

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Treatment Process

- Treat known symptoms
  - Rest
  - Therapy
  - Time
- Identify Red Flags
  - Secondary Gain
  - Inconsistencies
- Consider True Zebras
  - MRI
- Neuropsychological Assessment

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Neuropsychological Testing

Objective test of function of the brain

Evaluate for:

- Processing speed
- Executive function
- Test taking effort (malingering)
- Working memory
- Neurocognitive battery
- Psychological assessment

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Putting it all Together

- Early mental and physical rest
- OTC meds for early pain/headaches
- Safety sensitive duties
- Physical therapy for neck pain, vestibular dysfunction
- Gradual return to work duties
- Ongoing physical symptoms – Consider MRI
- Ongoing functional/mental symptoms – Consider Neuropsych eval

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Common Pitfalls

- Too aggressive to return to work duties
- Not aggressive enough to return to work duties
- Not validating or reassuring the anxious patient
- Not looking for co-existing diagnoses
- Too much therapy – long visits
- Therapy with someone not familiar with concussions
- Medication side-effects
- Malingering

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Thank you!

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