MANAGEMENT STRATEGIES FOR THE CONCUSED ATHLETE

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**SEMINAR OBJECTIVES**

- Understand and implement at least 2 balance assessments
  - Capable of being done in any environment
  - Require minimal equipment
- Implement at least 2 new balance strategies
  - Increase the challenge of the activity
  - Help determine return to activity for the injured person
- Understand options for assessing exercise level and physiologic recovery
- Recognize symptom overlap of mTBI and depression
WHAT IS A BRAIN INJURY?

A disruption to the normal function of the brain from a bump, blow or jolt to the head or the body
A BRAIN INJURY,

can happen to anyone, whether it happens while playing sports, at work, or just slipping on an icy sidewalk. Injuries can range from “mild” to “severe”, with a majority of cases being concussions or mild TBI.
mTBI is an alteration or a loss of consciousness of 30 minutes or less.
NEUROMETABOLIC CASCADE

- With the impact or forces on the brain in the skull, chemicals are released in the brain. Often greater than normal and this energy crisis is known at the neurometabolic cascade.
- Deficits may be greater 3-5 days post injury than immediately noted at the sideline.
- Reason why serial testing and monitoring are important.
<table>
<thead>
<tr>
<th>Symptom</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headache or Pressure in the Head</td>
<td>Sensitivity to Noise</td>
</tr>
<tr>
<td>Nausea or Vomiting</td>
<td>Feeling foggy, groggy, sluggish</td>
</tr>
<tr>
<td>Balance Problems or Dizziness</td>
<td>Difficulty concentrating or remembering</td>
</tr>
<tr>
<td>Double or Blurry Vision</td>
<td>Confusion</td>
</tr>
<tr>
<td>Sensitivity to Light</td>
<td>Does not Feel right</td>
</tr>
</tbody>
</table>
## Signs Observed by Coach, Parent, Team Manager

<table>
<thead>
<tr>
<th>Condition</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appears dazed or stunned</td>
<td>Answers questions slowly</td>
</tr>
<tr>
<td>Is confused</td>
<td>Loses consciousness—even briefly</td>
</tr>
<tr>
<td>Forgets play or plays</td>
<td>Shows behavior or personality changes</td>
</tr>
<tr>
<td>Unsure of score, location, opponent</td>
<td>Can’t recall items before injury</td>
</tr>
<tr>
<td>Moving clumsily</td>
<td>Can’t recall items after injury</td>
</tr>
</tbody>
</table>
RED FLAG SYMPTOMS

- Loss of Consciousness
- Seizures
- Worsening of Signs and Symptoms
- Severe Headache - Worst headache of their Life. Migraine complications
- Persistent vomiting
- Difficulty walking
- Vision changes
- Unequal pupil size
- Weakness in arms or legs
Girls are at greater risk than boys in some sports
- Soccer, Ice Hockey, Basketball
- In similar high school sports, girls may have 2x concussions risk of boys (Lincoln, 2011, Marar, 2012)

Football, Boys Lacrosse, Girls Soccer, and Ice-Hockey have some of the highest rates of concussion

Concussions can happen in any sport and outside of Sport
SCAT 3

- Sport Concussion Assessment Tool Rev. 3
  - Assess cognitive function
  - Uses postural control to assess motor function.

- Pro: Great for sideline and serial testing
- Con: Static test. Scores will improve regardless of intervention
- Suggestion: add dynamic testing to guide treatment progression
DO I HAVE TO REST?

- Guiding return to sport and limiting depression side effects of concussion

<table>
<thead>
<tr>
<th>Stage of Rehab</th>
<th>Functional Exercise to be attempted</th>
<th>Objectives to meet</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. No Activity</td>
<td>Complete physical and cognitive rest</td>
<td>Recovery – remain at stage 1 until symptom free</td>
</tr>
<tr>
<td>2. Light aerobic exercise*</td>
<td>Walking, swimming, stationary cycling (Intensity &lt;70% of max heart (HR) rate) – no resistance training</td>
<td>Increase HR</td>
</tr>
<tr>
<td>3. Sport-specific exercise</td>
<td>Skating, running, jumping (No head impact activities)</td>
<td>Add sport-specific movement</td>
</tr>
<tr>
<td>4. Non-contact training drills</td>
<td>Progress to more complex training drills (passing, catching, dribbling, stick-handling etc.); May begin progressive resistance training</td>
<td>Exercise, coordination, and cognitive load – challenging multiple systems</td>
</tr>
<tr>
<td>5. Full contact practice**</td>
<td>Following medical clearance, participate in normal training activities</td>
<td>Restore confidence and assess functional skills</td>
</tr>
<tr>
<td>6. Return to play</td>
<td>Normal Game Play</td>
<td></td>
</tr>
</tbody>
</table>

Table 4 (Article 8)
Exercise testing can determine safe HR for exercise without exacerbating symptoms.

“Prolonged rest, especially in athletes can lead to physical deconditioning, metabolic disturbances and secondary symptoms such as fatigue and reactive depression.”

Loss of occupational or family roles may lead to depressive symptomology.

Depressed mood and fatigue are commonly observed in individuals deprived of usual exercise activities.
<table>
<thead>
<tr>
<th>Symptom</th>
<th>mTBI</th>
<th>PTSD</th>
<th>Depression</th>
<th>Pain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive slowing</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Memory difficulties</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Concentration</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Sleep problems</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Noise sensitivity</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Appetite changes</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Irritable</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Fatigue</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Headaches</td>
<td>*</td>
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</tr>
</tbody>
</table>
## Loss of Identity and Activity

<table>
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<tr>
<th>Negative Symptoms or Side Effects of Injury</th>
<th>Positives of Maintaining Role as Teammate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irritable</td>
<td>Maintains interactions with peers, gives family a “break”</td>
</tr>
<tr>
<td>Too Much Screen Time</td>
<td>Schedule, time to check in and complete exercises</td>
</tr>
<tr>
<td>Poor Nutritional Habits</td>
<td>Team Training Table or out to eat with peers</td>
</tr>
<tr>
<td>Altered Sleep / Wake Cycle</td>
<td>Regular activity and check ins with the teams</td>
</tr>
</tbody>
</table>
ASSESSMENT OPTIONS: GUIDING RETURN TO PLAY

- Balke Exercise Treadmill Test
- Cycle Ergometry
- ARMY PFT or NHL Team specific pre season requirements
“The most commonly reported symptoms indicating that the concussion is not resolved are worsening headache and/or a sensation that the head feels full. A comparison of the HR at the point of symptom exacerbation to the athletes theoretical maximum HR gives you a good indication of how close the athlete is to full recovery.”
FREQUENCY OF EXERCISE

- Post Concussion rehab program 3-5 x/ day
- Why do concussion rehab at the training room?
  - Guide and progress difficulty of program
  - Rule out other symptoms like BPPV
  - Facilitate nutrition, sleep patterns
  - Maintain the Athlete’s role on team
Most patients who experience a concussion recover fully within weeks, but some may continue to have symptoms for a longer period of time. Patients with chronic symptoms of concussion should get evaluated for other medical problems.

The cause of prolonged symptoms following concussion is not well understood.
Possible causes include: psychological health conditions, physiological changes to the brain, ability to manage stress, pre-existing health conditions or co-occurring conditions such as cervico-genic dizziness and visual perceptual problems.
MAINTAINING LIFE ROLES

- Cardiovascular exercise facilitates rest and normal wake / sleep patterns
- Coping mechanism for stress and pain
- The training room allows them to remain hockey players
- Gives purpose to their teammate who assists with transportation, moral support or exercise
WHAT TO EXPECT WHEN YOU REFER OUT

- Written Reports
- Multidisciplinary Treatment Strategies
- Recommendations for a comprehensive care plan including rest and work and leisure
- Open Dialog
- Goal setting short and long term
- Re testing at regular intervals
- Medical management
Balance Rehabilitation should occur at home and in the training room.

Balance rehabilitation includes sports specific training and prepares the athlete for returning to the game.

Cardiovascular exercise is an important part of concussion management following a short period of rest.

It is vital to maintain a player’s role as athlete, teammate and provider to limit other symptoms.
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REFERENCES


2. KM Guskiewicz, SE Ross, and SW Marshall, “Why the Clinical Test for Sensory Integration of Balance (CTSIB) for concussion baseline balance testing?” in J Athl Train (2001)

3. NeuroCom, “Sensory Organization Test (SOT),” 1

REFERENCES


REFERENCES


RESOURCES

- www.CDC.gov
- Pocket Scat 2 Concussion App
- Concussion Coach App
- www.kingdevick.com
- www.concussioneducators.com
- http://mail.momsteam.com/concussion
- DCOE.mil