

# What Comes Next After a Concussion?

STEPHANIE HAYS, PT, DPT  
ADAM EWALD, MOT OTR/L CSRS  
GRACE KNOX, MS, CCC-SLP

# What is a Concussion?

- ▶ According to the AANS:
  - ▶ A concussion is an injury to the brain that results in temporary loss of normal brain function. It usually is caused by a blow to the head. In many cases, there are no external signs of head trauma. Many people assume that concussions involve a loss of consciousness, but that is not true. In many cases, a person with a concussion never loses consciousness.

# Types of Concussions/Mechanisms of Injury

- ▶ A direct impact to the head is by far the most common mechanism of encountering a concussion.
- ▶ It can be caused by a stable object like the floor or from an object in motion, like a baseball or hockey stick.
- ▶ Sporting activities, such as football and hockey, or car that involve greater levels of contact and collision will present with increased risk of concussion injuries.

# Common Symptoms After Concussion

- ▶ Headache
- ▶ Dizziness
- ▶ Mental fogginess
- ▶ Amnesia
- ▶ Emotional lability
- ▶ Depression
- ▶ Nausea/vomiting
- ▶ Unsteadiness
- ▶ Irritability
- ▶ Fatigue
- ▶ Slowed reaction time
- ▶ Sensitivity to light/noise
- ▶ Sleep disturbances
- ▶ Vision deficits
- ▶ Neck pain

**THE TRUTH ABOUT CONCUSSION**

A concussion is a mild traumatic brain injury (mTBI). Most concussions occur without losing consciousness.

**EFFECTS OF TRAUMA**  
Trauma can cause vestibular dysfunction.

- DIZZINESS
- VERTIGO
- BLURRED VISION
- IMBALANCE
- FATIGUE
- FALLS

**SYMPTOMS**

- THINKING**  
Difficulty concentrating, memory
- EMOTIONAL**  
Irritability, sadness
- PHYSICAL**  
Headache, dizziness
- SLEEP**  
More/less than usual

**COMMON CAUSES**

FALLS: 41%	STRUCK BY/AGAINST: 15%	ASSAULT: 11%
TRAFFIC ACCIDENT: 14%	OTHER: 19%	

**NEXT STEPS**

**STOP** 1. Stop sport/activity. When in doubt, sit it out. 2. Seek medical evaluation.

What should I do?  
For more information, visit: [vestibular.org](http://vestibular.org)

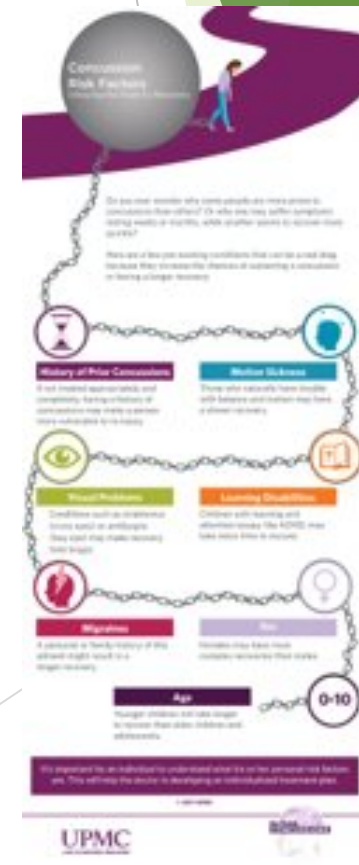
**VEDA**

# Signs/Symptoms following a Concussion

- ▶ Headache/ Migraine
- ▶ Cervical
- ▶ Oculomotor
- ▶ Vestibular
- ▶ Cognition/ Fatigue
- ▶ Anxiety

# Predictors of Longer Recovery

- ▶ Number and severity of symptoms in the first day (or first few days)
  - ▶ Dizziness
- ▶ History of previous concussion
- ▶ History of migraines
- ▶ History of depression/mental health diagnosis
- ▶ Age
- ▶ Female sex



# When to Refer to Therapy

- Refer to PT: for headaches, dizziness, balance/gait impairments, neck pain, vestibular deficits, vertigo/BPPV
- Refer to OT: for headaches, visual deficits, concentration issues, coordination difficulties, memory issues, multisensory processing difficulties and trouble with ADL/IADL tasks
- Refer to ST: for memory deficits, academic concerns, problem solving issues, concerns about return to work/learn, word-finding deficits, issues with reading/writing

# Standardized Physical Therapy Assessments

- ▶ VOMS
- ▶ Dynamic Balance
  - ▶ FGA/DGI
- ▶ Static Balance
  - ▶ BESS
- ▶ NeuroCom
  - ▶ SOT
  - ▶ VOR/ Gaze Stabilization
  - ▶ Dynamic Visual Acuity
- ▶ Cervical Spine Assessment
- ▶ ImPACT
- ▶ Vertigo/ BPPV
- ▶ Buffalo Treadmill Test
- ▶ Concussion Grading Scale



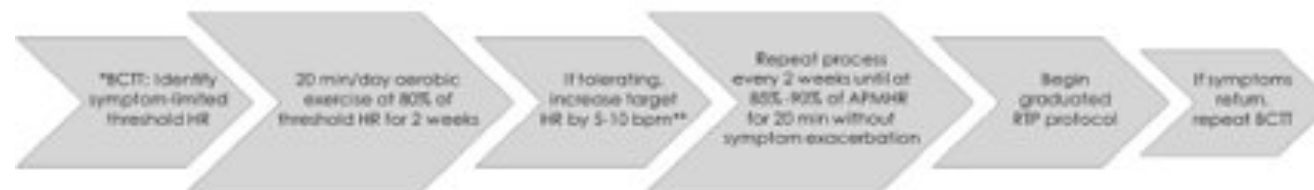
# VOMS

## 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						

# Buffalo Treadmill Test

- ▶ Used to establish a safe aerobic exercise program
- ▶ HR and BP are recorded at symptom exacerbation to determine exercise prescription threshold



# Headache/ Migraine

- ▶ Light/ noise sensitivity
- ▶ Progresses as day goes on?
- ▶ Wake up with a Headache
- ▶ Post Traumatic Migraine

# Cervical

- ▶ Neck pain
- ▶ Limited neck ROM
- ▶ Postural dysfunction

# Oculomotor

- ▶ Difficulty reading
- ▶ Blurry vision
- ▶ Double vision
- ▶ Headache with visual tasks

# Vestibular

- ▶ Dizziness
- ▶ Balance problems
- ▶ Blurry vision

# Cognition/ Fatigue

- ▶ Tiredness
- ▶ Fogginess
- ▶ Memory deficits

# Anxiety

- ▶ Dizziness
- ▶ Nervousness
- ▶ Difficulty sleeping
- ▶ Emotional issues



# Equipment used for testing

- ▶ Neuro Com
- ▶ IMPACT
- ▶ Interactive metronome
- ▶ BITS bioness

# The Role of the Physical Therapist (PT)

- ▶ PT evaluation is indicated if pt reports difficulty with
- ▶ Cervical spine limitations
- ▶ Vestibular deficits
- ▶ Headaches
- ▶ Balance/gait impairments
- ▶ Vertigo/BPPV/ Dizziness
- ▶ Increased nausea

# How can a Physical Therapist help me?

- ▶ Rest and recovery
- ▶ Restoring strength and endurance
- ▶ Stopping dizziness and improving balance
- ▶ Reducing headaches
- ▶ Returning to normal activity or sport.

# Cognitive Disorders and Blast Injuries: Fast Facts

- ▶ Most common cause of injury in Operation Iraqi Freedom and Operation Enduring Freedom
  - ▶ Mild Traumatic Brain Injury (mTBI)
- ▶ The effects of a blast are different from other sources of TBI (car accident, etc)
- ▶ 10-20% of service members returned from OIF/OEF met criteria for mTBI during a detailed screening

# Cognitive Disorders and Psychological Challenges

- ▶ Psychological challenges common after mTBI
  - ▶ Depression
  - ▶ Irritability
  - ▶ Anxiety
  - ▶ Decreased initiative/self-esteem
- ▶ Psychological challenges affect cognitive function!

# Support for Cognitive Therapy after mTBI

- ▶ There is a great need for specific research for servicemembers and therapy following concussion!
  - ▶ Current research is based on the civilian population.
  - ▶ Memory retraining is helpful, especially use of compensatory devices/strategies.
  - ▶ Organization of school/work materials is important as well and requires support from therapist to personalize strategies.

# The Role of the Speech Pathologist (SLP)

- ▶ SLP evaluation is indicated if pt reports difficulty with:
  - ▶ Focus/attention to task
  - ▶ Short-term memory recall
  - ▶ Word finding in writing or conversation
  - ▶ Organizing/maintaining schedule
  - ▶ Processing speed
- ▶ SLP will focus on cognitive-linguistic tasks

# Standardized Speech Therapy Assessments

- Scales of Cognitive Ability for Traumatic Brain Injury (SCATBI)
  - Perception/Discrimination, Orientation, Organization, Recall, and Reasoning
- Functional Assessment of Verbal Reasoning and Executive Strategies (FAVRES)
  - Verbal reasoning, complex comprehension, discourse, and executive functioning
- Montreal Cognitive Assessment (MoCA)
  - Attention and concentration, executive functions, memory, language, visuoconstructional skills, conceptual thinking, calculations, and orientation
- Individual Tasks
  - Card sort
    - Attention to task, processing speed
  - Number/letter trail
    - Executive function, working memory
  - Patients may bring their own tasks (homework, study prep, planner, etc.)



# Standardized Speech Therapy Assessments



Clinicians asked for a standardized test of subtle cognitive-communication deficits ... Announcing ...

## FAVRES

### Functional Assessment of Verbal Reasoning and Executive Strategies

By Sheila MacDonald M.C.I.Sc. SLP/CI

**Sufficiently Challenging to Detect Subtle Cognitive-Communication Deficits**

- Assesses verbal reasoning, complex comprehension, discourse, and executive functioning during performance on a set of challenging functional tasks.
- Requires processing of "real life" amounts of information, analysis of several factors, integration of a variety of types of stimuli, and formulation of written and oral responses.

**Standardized on the ABI population**

- Standardized on adults with acquired brain injury as well as a sample of non-injured controls (30-70 yrs).
- Individual performance can be compared to norms for time, accuracy, rationale, and a set of reasoning subtests.
- Sound reliability and validity with clinical trials demonstrating statistically significant differences between adults with ABI and non-injured controls.

**Reflective of Functioning in the Real World**

- Designed with ecological validity in mind (FAVRES tests simulate real world communications and incorporate content using natural settings, roles, and conversations).
- Qualitative and Quantitative aspects of performance are incorporated into the scoring.
- Tasks require the examinee to:
  - Plan an Event
  - Schedule a Work day
  - Decide on a Gift
  - Build a Case to Solve a Common Problem

**Valid Clinically Relevant Information about Verbal Reasoning Performance**

FAVRES results form the basis for treatment planning by answering the following questions:

- Getting the Facts** - Can the person identify the most important facts?
- Eliminating Irrelevant Information** - Can the person identify and ignore less relevant information in order to focus on more important information?
- Weighing the Facts** - Can the person compare or weigh competing options or criteria?
- Flexibility** - Can the person make a decision or plan of action when presented with new information?
- Generating Alternatives** - Can the person efficiently generate a variety of solutions, options or alternatives?
- Predicting Consequences** - Can the person predict potential outcomes, pros and cons, or consequences of a choice?
- Providing a Rationale** - Can the person provide a rationale or a set of reasons for making a choice?

To order see order form. For further information contact us at:

Eaton Publishing, 2000 Carleton Place, Suite 200, North York, Ontario, Canada M2H 4P7  
Phone: 416-754-8700 Fax: 416-754-8886 www.eatonpublishing.com

# How can a speech therapist help me?

- ▶ SLPs can help patients by providing therapeutic strategies:
  - ▶ Use of memory recall strategies (association, repetition, writing things down)
  - ▶ Spaced retrieval training (increasing time increments of recall)
  - ▶ Use of organization strategies (planner, phone calendar)
  - ▶ Simulation of cognitive tasks (sort cards with music playing)
  - ▶ Use of reading comprehension strategies (highlighting important information in reading passages, pre-reading skills)
  - ▶ Test-taking strategies (for tests in school or for college admission tests like ACT/SAT)

# The Role of the OT (OT)

- ▶ OT evaluation is indicated if pt reports difficulty with:
- ▶ Interference with ADL/IADL's
- ▶ Difficulty with cognition
- ▶ Vision difficulties both acuity and visual processing
- ▶ Sensitivity to light/ noise
- ▶ Sleeping disturbances
- ▶ Difficulties with being at school/ work
- ▶ Reducing headaches

# Standardized Occupational Therapy Assessments

- ▶ Brain Injury Visual Assessment Battery (BADS)
- ▶ Dynamic Visual Acuity
- ▶ MVPT4
- ▶ CLQT
- ▶ Rivermead
- ▶ ImPACT

# How can Occupational Therapist help me?

- ▶ Work on re-organization in the sensory system
- ▶ Physical exercise
- ▶ Cognitive exercise
- ▶ Adaptive Approach for symptoms
- ▶ Remedial Approach for symptoms
- ▶ Advocating for accommodations at school/ work

Questions?



# Reference

- ▶ Centers for Disease Control and Prevention (CDC), National Center for Injury Prevention and Control. Report to Congress on mild traumatic brain injury in the United States: steps to prevent a serious public health problem. Atlanta (GA): Centers for Disease Control and Prevention; 2003
- ▶ Fisher, A. G., Bray Jones, K. (2011) *Assessment of Motor and Process Skills. Volume I: Development, Standardization, and Administration Manual. Seventh Edition Revised*. Fort Collins, CO. Three Star Press
- ▶ Finn, C, Waskiewicz, M. The Role of Occupational Therapy in managing post-concussion syndrome. 2015; 38
- ▶ DeRiesthal, M. (2009). Treatment of Cognitive-Communicative Disorders Following Blast Injury. American Speech-Language-Hearing Association, Perspectives on Neurology and Neurogenic Speech and Language Disorders.
- ▶ Unsworth, C. (1999). *Cognitive and Perceptual Dysfunction: A Clinical Reasoning Approach to Evaluation and Intervention*. Philadelphia, PA. F. A. Davis Company.
- ▶ Zoltan, B. (2007) *Vision, Perception, and Cognition: A Manual for the Evaluation and Treatment of the Adult With Acquired Brain Injury Fourth Edition*. Thorofare, NJ. Slack Incorporated.