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THE SPEECH-LANGUAGE PATHOLOGIST'S ROLE IN CONCUSSION MANAGEMENT



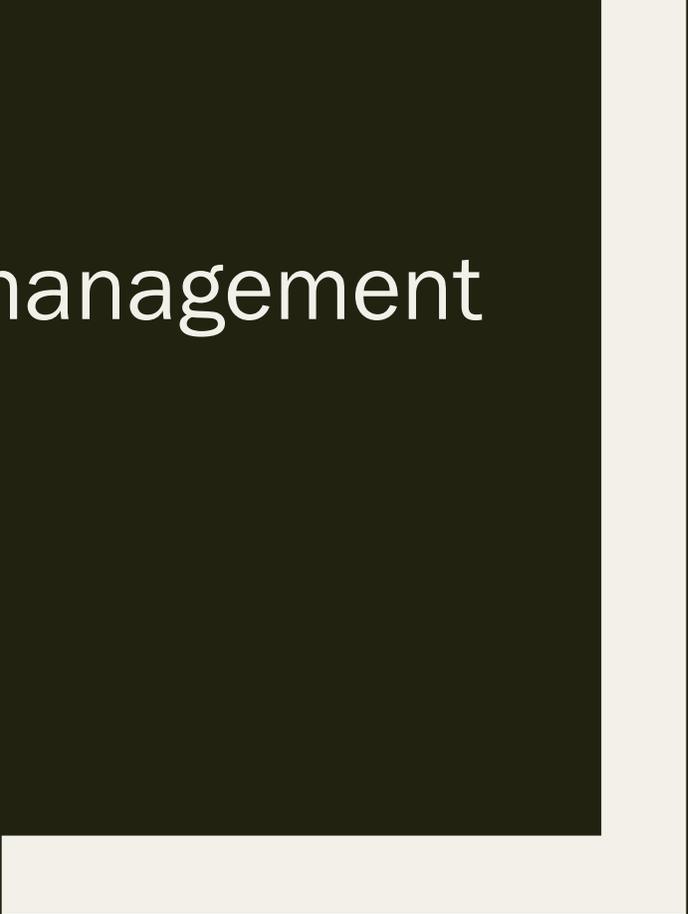
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Learner Outcomes

By the end of this session, the participant will be able to:

- Describe the neurological sequelae involved in concussive injury.
- Identify three techniques for assessment of cognitive-linguistic changes after concussion
- Discuss the role of SLPs as members of an interdisciplinary concussion management team.

AGENDA

- Defining concussion
 - The role of the SLP in concussion management
 - Assessment and intervention
 - What's next
- 



New York Times

The Mechanism of Concussion: What happens to the brain?

Concussion, defined:

- Complex multi-system event caused by a direct blow or jarring motion to the head or body
- Neurochemical and neurometabolic changes
- May or may not involve loss of consciousness
- Remarkable for rapid onset and spontaneous recovery, typically over a period of 7-14 days.
- In the initial stages, no structural damage may be evident on imaging studies

Concussion, defined:

- “Any trauma induced alteration in mental status that may or may not include a loss of consciousness” (American Academy of Neurology, 1997)
- ***Neurometabolic Cascade:*** ionic fluxes that occur at the neuronal level after a cerebral concussion
- Immediately following injury, depolarization occurs due to the release of neurotransmitters and changes in neuronal chemistry.

Concussion, defined:

- Clinical symptoms and functional signs may involve changes in executive functions and academic abilities, e.g.,
 - *Impaired attention*
 - *Delayed responses*
 - *Deficits in visual and verbal memory function*
 - *Auditory comprehension deficiencies*

Post Concussion Syndrome

- About 25% of patients continue to experience physical and/or cognitive symptoms 6 months post-injury (Bazarian, et al., 1999)
- Early intervention post-injury can improve longer term outcomes (cf., Allen, 2007; Ponsford, et al., 2002)

Second Impact Syndrome

- The circumstance of sustaining a second concussion prior to adequate resolution of injury symptoms experienced from the first concussion.
- Exponentially worse in terms of potential damage
- Typically seen in athletes <20 years old
- Statistically rare, but remarkably serious

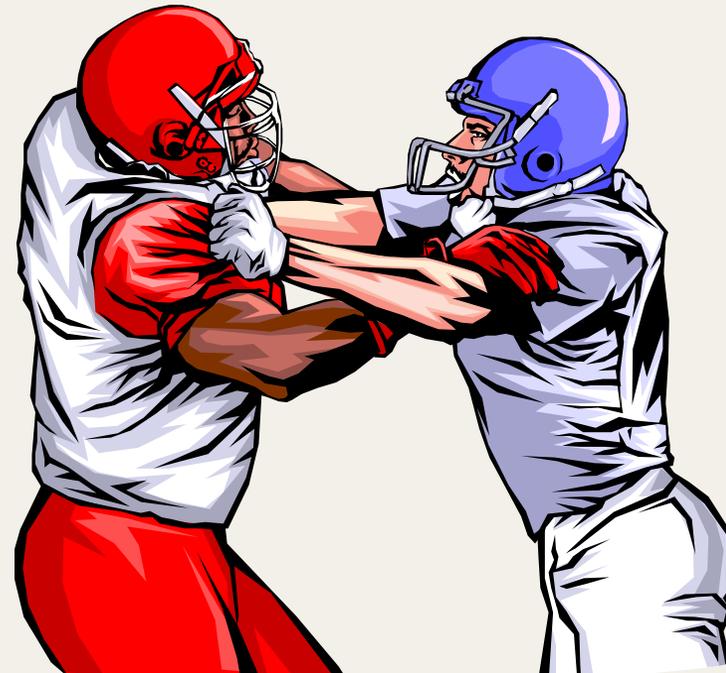
(Cantu, 2007; Salvatore & Sirmon-Fjordbak, 2011)

Is a concussion the same thing as a mild TBI?

- Depends on who you ask...
- Sequelae of symptoms
- Time to recovery
 - *Concussions typically resolve in 7-14 days*
 - *Sustained cognitive deficits after that time may be more indicative of TBI*

Prevalence

- *1.6 to 3.8 million sports/recreation-related head injuries occur in US each year; probably under-reported. (CDC, 2012)*
- Estimated to involve an average of 10% of all athletes across sports
- Contact sports:
 - *Football*
 - *Soccer*
 - *Hockey*



Concussion in School-Aged Population

Increased risk for brain injury:

- *5 – 10% of all students involved in sports*
- *Inexperience with contact sports*
- *Diverse presentation in strength, physical stature, aerobic conditioning, coordination*
- *Ongoing development of frontal lobes of the brain*

Concussion in School-Aged Population

Concussion occurs among school-aged children primarily in the context of sports-related activities, but also from *any* activity which involves a jarring motion of head or body.



*What do SLPs
need to know
about
concussion?*

Our role

- Speech-language pathologists (SLPs) have an emerging role in the management of sports-related concussion in school-aged populations.
- Although the physical aspects of a concussive injury are more readily apparent, subtle deficits related to language function can have a significant impact on academic performance.
- Scope of Practice and Code of Ethics
- Interdisciplinary Treatment Teams

Cognitive and communicative deficits frequently seen after concussion:

- Word retrieval deficits and other aphasic-like symptoms
- Difficulty with processing speed and efficiency
- Distractibility
- Visual comprehension deficits
- Auditory comprehension dysfunction
- Problems with Executive Functions

Impact of concussion on academic function

- Student-athletes with concussions present with symptoms consistent with traumatic brain injury.

Salvatore & Sirmon Fjordbak, 2011

- Decreased attention to task
- Limited encoding, storage, and retrieval
- Impaired problem solving
- Poor impulse control

Impact of concussion on academic function

- Breakdown in logical sequencing
- Sensitivity to light or sound
- Increased fatigue
- Decreased tolerance for frustration
- Word retrieval issues
- **Impaired auditory comprehension for verbally-presented information**

SLPs and Concussion Management

SLPs are well-prepared to work with this population, because of the educational and clinical requirements for licensure and certification.

Managing Concussion

Acknowledging that approximately 90% of injuries will improve without intervention, the recommendation is to err on the side of caution, especially since the intervention can be innocuous and inexpensive, but the benefit is *significant*.

- Federal regulations guarantee the provision of a free and appropriate education for all children in the least restrictive environment, including those who are demonstrating the need for special accommodations or services.
- Eligibility for services

Assessment and Intervention

■ Baseline (pre-season) Assessment

- *Cognitive-communicative function*
- *Word retrieval*
- *Auditory comprehension*

■ Post-injury

- *Serial re-assessment*
- *Graduated and stepwise return to activity*
- *Modifications in the classroom*

Concussion Management

- Environment of decreased stimulation
- Limited physical exertion
- Reduction in visual input
- Diminished cognitive load
- *Moderated level of stimulation → improved context for recovery*
- *Premature return → exacerbation of symptoms*

- Lee, 2009

Concussion Management

Stepwise return to play:

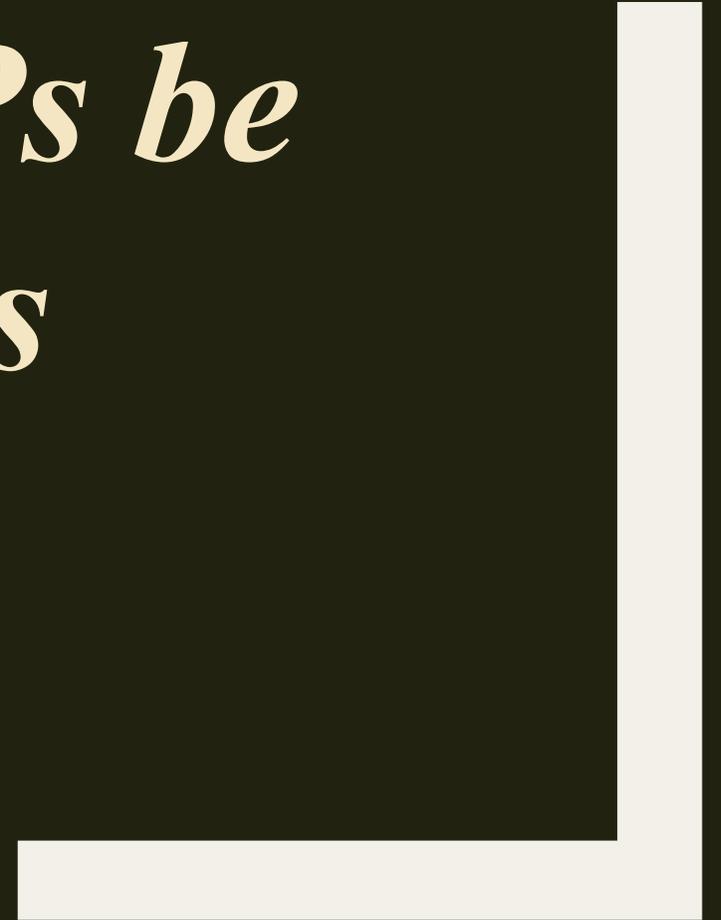
- No activity
 - *Light return*
 - Sport-specific return
 - *Non-contact drills*
 - Full contact drills
 - *Game play*

Concussion Management

Stepwise return to *academic* function:

- No academic activity
 - Shortened school days
 - Decreased homework
 - Extra time on exams
 - Multiple rest breaks
 - Return to full academic load

*How else can SLPs be
involved in this
process?*



Prevention of concussion

- Education of parents, school personnel, policy-makers on concussion issues such as:
 - *Concussion mechanism and the post-concussion neurophysiological and cognitive-communicative sequelae.*
 - *Importance of utilization of appropriate sports equipment and awareness of safe habits in practice and play.*

Traditional Models of Prevention

Prevention is a recognized and integral part of the scope of practice for SLPs (ASHA, 2007).

Approaches to prevention of concussion have addressed isolated issues (e.g., helmet laws).

*There are few
comprehensive approaches
to this public health question.*

■ Typical models of prevention

- *Primary, secondary and tertiary*
- *involving a chronological sequence*

■ **Inadequate** for describing the multidimensional complexity of concussion prevention

■ The traditional linear and sequential models of prevention fall short in describing the **inter-connected involvement** of prevention of concussion.

(Lo & Sirmon-Taylor, 2014).

SLP as Advocate

- Understanding and use of evidence-based practice
- Psychometric assessment knowledge and skills
- Clinical expertise in neurological dysfunction
- Experience in diagnosis and intervention
- Competence in provision of services in schools
- Understanding of regulatory policies.

Advocacy

- ✓ Scope of Practice issue
- ✓ Individual level
- ✓ Organizational level
- ✓ Legislation and policy level

What is happening at the governmental level regarding concussion management?

- National trends in state laws
 - *Pre-concussion policy*
 - *Post-concussion policy*
 - *Patterns of diffusion*
- In your state
- At the federal level

What happens next?

- Improved sports equipment/rule changes
- Cultural influences
- Concussion in the military population
- Epidemiology of concussion in the elderly
- Ongoing research

Some concluding thoughts...

- Speech-language pathologists have a clear role as members of concussion management teams.
- SLPs have expertise and experience in diagnosis and treatment with this population.
- SLPs can contribute to the efforts targeting prevention, advocacy, and policy.

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