

Sports-Related Concussion: Diagnosis- Treatment-Prevention

Anthony P. Salvatore, Ph.D., CCC-SLP

Board Certified-ANCD

Chair, Dept. Rehabilitation Sciences

University of Texas at El Paso, &

Texas Tech Medical School



Historical Context

- Concussion was described by a Persian physician named Rhazes (980-1057). He described concussion as a transient impairment of mental states following a jolt to the head.

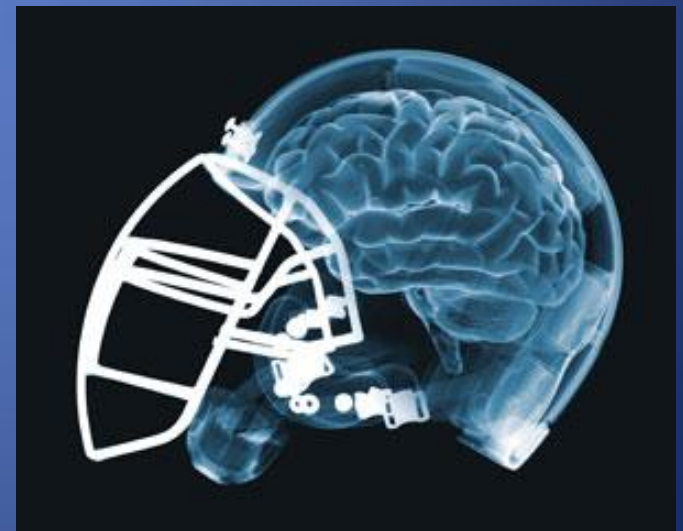
Jolt?? Shaking?? Vibration of the brain???

Prevalence

- 1.6 to 3.8 sport-related/recreation generated TBIs per year. (CDC)
- Our data suggest that H.S. concussions are under reported.

Motivation for Establishing the Concussion Management Clinic

- Interest in the diagnosis, treatment, prevention of blast injuries of soldiers in Iraq and Afghanistan.
- Interest in investigating sports-related concussion as a model for pursuing the interest in blast injuries.



Sports as a Laboratory Assessment Model (SLAM).

Barth, et al. (1989, 1996, 2001)

1. Use a pre and post-trauma assessment approach.
2. Use a young, healthy, and motivated population with a high probability of sustaining mild acceleration-deceleration head injury.
3. College football, soccer, basketball and volleyball players meet the above criteria.
4. Requires cooperation of head athletic trainer and team physician, as well as the head coach.

Prevention/Treatment

- Prevention:
 - Second Impact Syndrome
 - Pre-Participation Baseline Testing
 - Education of student-athlete & parents
 - “Love your children watch sports”
- Post-Concussion Treatment:
 - Total Rest; no physical/cognitive stimulation.

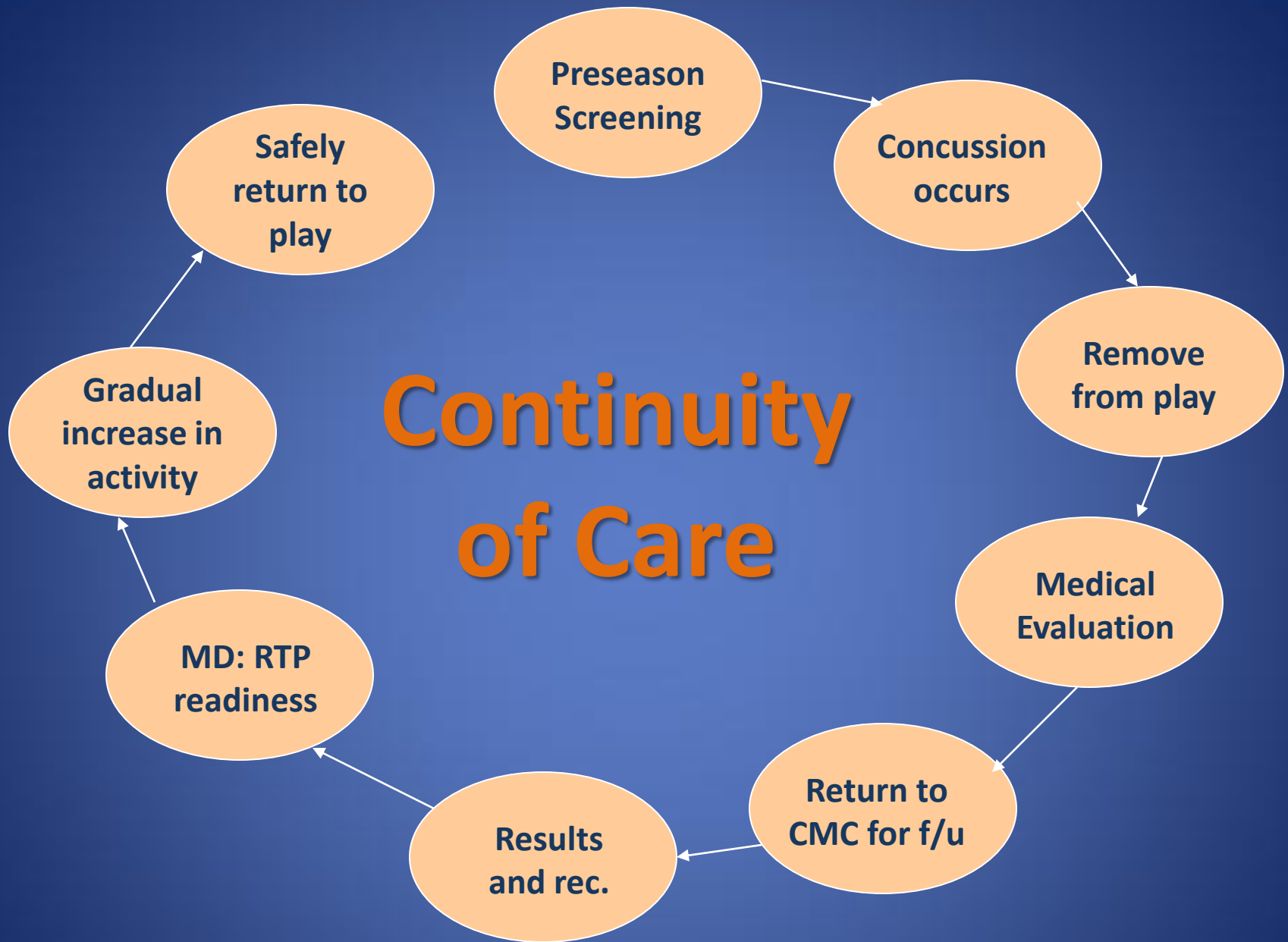
What is mTBI/concussion?

- Risks:
 - Repeated concussion before recovery can cause **Second Impact Syndrome** involving brain swelling, permanent brain damage, even death.
- Behavioral Changes:
 - Cognitive, Emotional, Neurological
- Post-Concussion Syndrome

Common Signs & Symptoms

- Appears to be dazed or stunned
- Is confused about assignment
- Forgets plays
- Is unsure of game, score, or opponent
- Moves clumsily
- Answers questions slowly
- Shows behavior or personality change
- Forgets events prior to or after being injured
- Loses consciousness, even temporarily





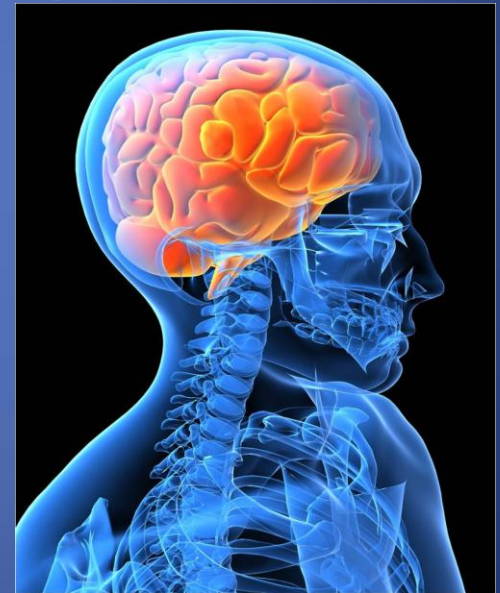
Assessment of Concussion/mTBI

Behavioral Assessment of Concussion/mTBI

-Pre-season/participation Testing

—Follow-up testing

- Post-concussion
- Serial re-evaluations



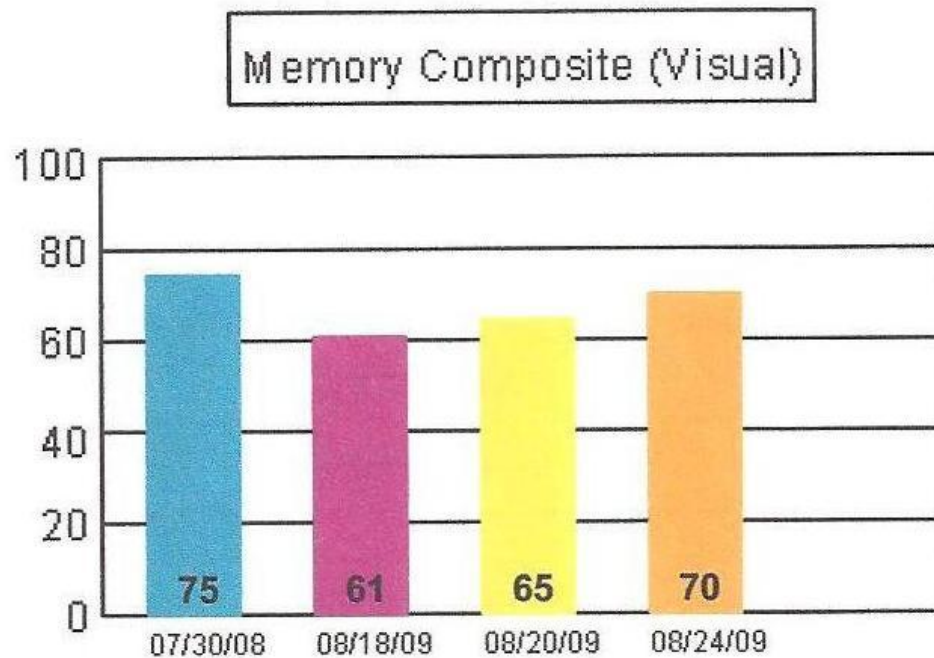
Protocols

- **ImPACT Test Battery (Immediate Post Concussion Assessment & Cognitive Test)**
- **Word Fluency**
- **Computerized Revised Token Test**
- **Wii Balance System**
- **3-dimensional copying task**
- **PTSD Questionnaire**

Immediate Post-Concussion Assessment and Cognitive Testing *(ImPACT)*

- Computer-based program, objective administration
- Strong psychometric basis
- Three components:
 - Demographics
 - Symptoms
 - Neurocognitive assessment
- Available in 13 languages
- NFL, NHL, Major League Soccer, US Lacrosse

- Can be administered in about 40 minutes
- Provides graphed data on a time line



*High School Athlete #1 ~ ImPACT Test
History of ADD/Hyperactivity /Class I Concussion*

Percentile Ranks based on Learning Disability Norms

| | BL | PC1 | PC2 | PC3 | PC4 |
|-----------|-----------|------------|------------|------------|------------|
| | | 2days | 8days | 28days | 23ms |
| Verb Mem. | - | 46 | 50 | 74 | 88 |
| Vis Mem. | - | 31 | 5 | 24 | 44 |
| RT | - | 9 | 45 | 25 | 49 |
| Errors | - | 10 | 20 | 10 | 5 |
| Tot Sympt | - | 21 | 11 | 0 | 32 |

Goal of Management:

*Permit
the brain injury
to heal.*

Criteria for Return-to-Play and Return-to-School

- Testing performance returns to pre-participation test performance.
- If no test available use normative data.
- Symptom free
- Progressive Step-Wise return to play & school
- Systematic increase in exertion.

Goals of the Concussion Management Clinic:

- Promote baseline testing to improve outcomes
- Provide follow-up serial assessments to contribute to return-to-play decisions in case of injury.
- Present public education and training regarding the mechanism of concussion/mTBI in athletes.
- Conduct research to contribute to the understanding the sequelae of concussion/mTBI.

Future

- Change the culture of contact sports.
No piece of equipment will eliminate concussions.

The proper management of a concussion will require a dramatic change in the culture.

“Love your children. Watch sports.”

The UTEP Concussion Management Clinic would also like to acknowledge the work of the following Speech-Language Pathology students:

- ***Master's students:***

- Tomas Mendez*
- Princess Puga*
- DeShea Gornowicz*
- Valerie Villegas*
- Marcus Neal *
- Catherine Herrera *
- Veronica Aguilera *
- Tory Carson *
- Lorena Olivares *

- Paula Sanchez
- Attea Guidi
- Jacqueline Picone
- Vanessa Fernandez
- Nadia Flores

Doctoral Students

Edina Bene, Ph.D.*

Mrudula Raparla

Thank You for Your Attention

Questions?

- asalvatore@utep.edu

