



Traumatic Brain Injury in Domestic Violence Victims

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Disclosure

- NFL Unaffiliated Neurotrauma Consultant, 2013-2016
- NFL Head Neck & Spine Committee
- Chair, Arizona Interscholastic Association Sports Medical Advisory Committee
- Member, National Federation of High School Associations Sport Medical Advisory Committee
- Scientific Advisory Committee, ImPACT



Social Determinants of Domestic Violence

- National Youth Survey Family Study
- Covey, et al. 2013
- Effects of Adolescent Physical Abuse, Exposure to Neighborhood Violence, and Witnessing Parental Violence on Adult Socioeconomic Status
- Findings:
 - Physical Abuse - reduced educational attainment, employment, income, less likely to marry.
 - Neighborhood Violence - decreased employment.
 - Witnessing Parental Violence - decreased income, decreased net worth.

Social Determinants of Domestic Violence

- School Climate Survey
- Milam et al. 2010
- Perceived School and Neighborhood Safety, Neighborhood Violence and Academic Achievement in Urban School Children.
- Assessment of student's perception of community and school safety.
- Increasing neighborhood violence was associated with statistically significant decreases from 4.2%-8.7% in math and reading achievement.
- Increasing perceived safety was associated with significant increases in achievement from 16%-22%.

Social Determinants of Domestic Violence

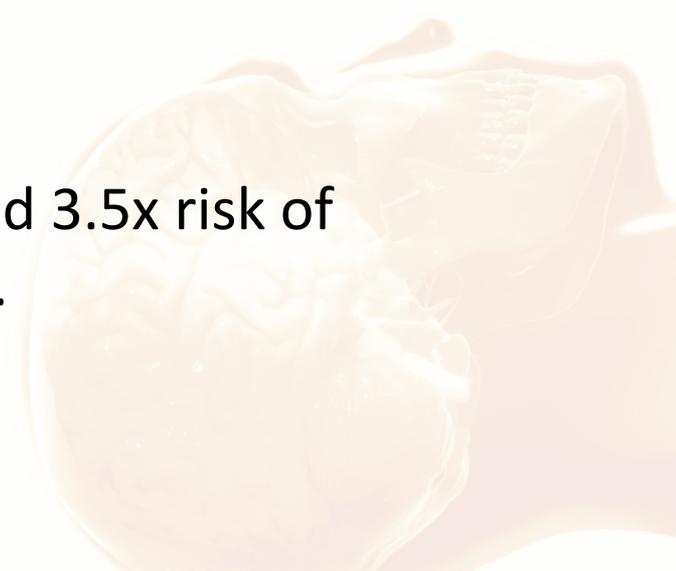
- CDC Adverse Childhood Events (ACE) Study
- Whitfield, et al. 2003

Violent Childhood Experiences and the Risk of Intimate Partner Violence in Adults: Assessment in a Large Health Maintenance Organization

- Childhood - physical abuse
 - - sexual abuse
 - - battered mother

Women exposed to all 3 in childhood had 3.5x risk of victimization/perpetration in adulthood.

Men 3.8x risk



Social Determinants of Domestic Violence

- Study of Asian American and Pacific Islanders in Hawaii
- Crowne, et al. 2010
- Concurrent and Long-Term Impact of Intimate Partner Violence on Employment Stability
- Women with a history of IPV had lower rates of employment 6 years later
- Reported depression as primary reason



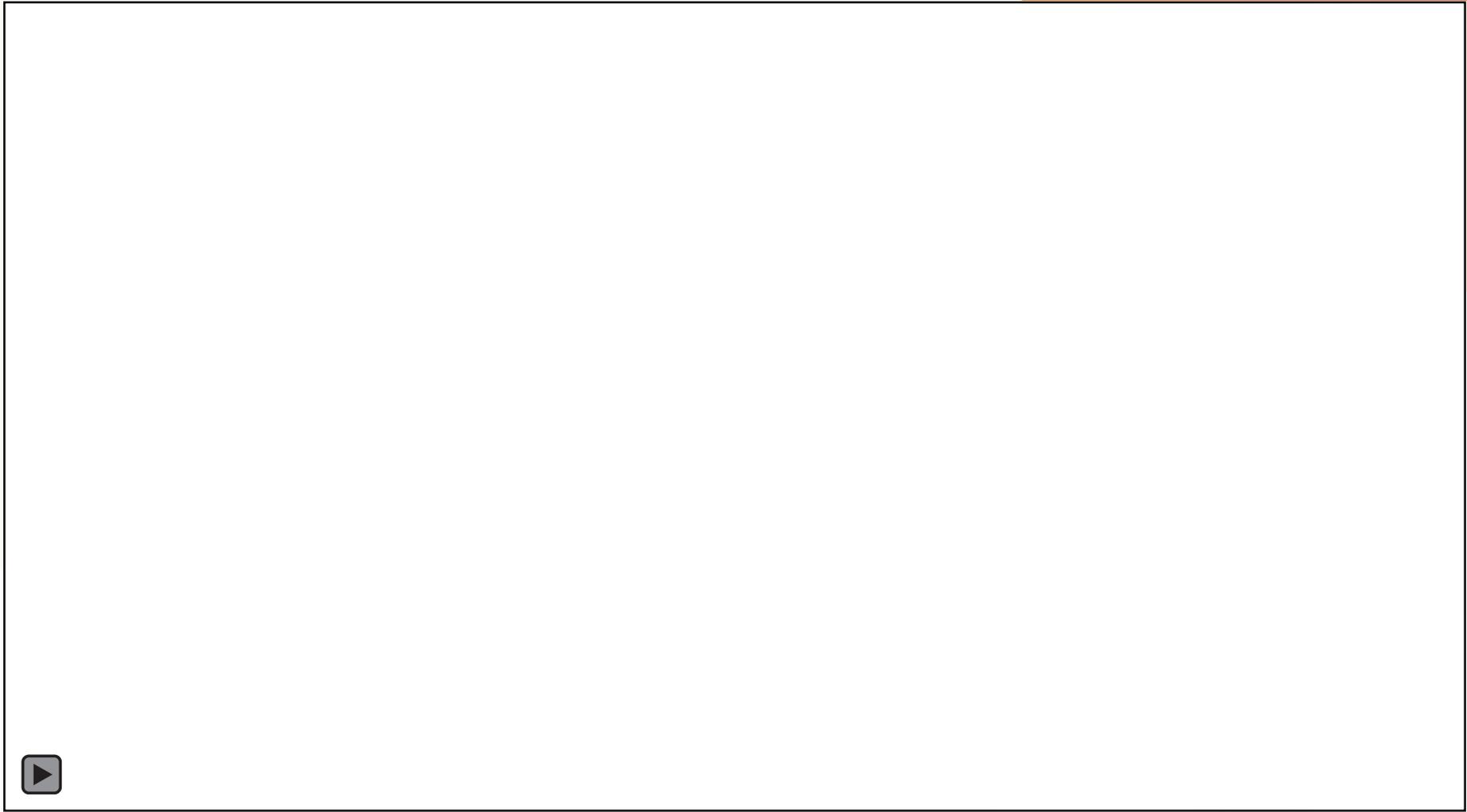
Social Determinants of Domestic Violence

- Between 27%-66% of homeless women across the country report being the victim of domestic violence.
- 17% of cities report that domestic violence is the primary cause of homelessness
- 9.5% off elderly have suffered abuse









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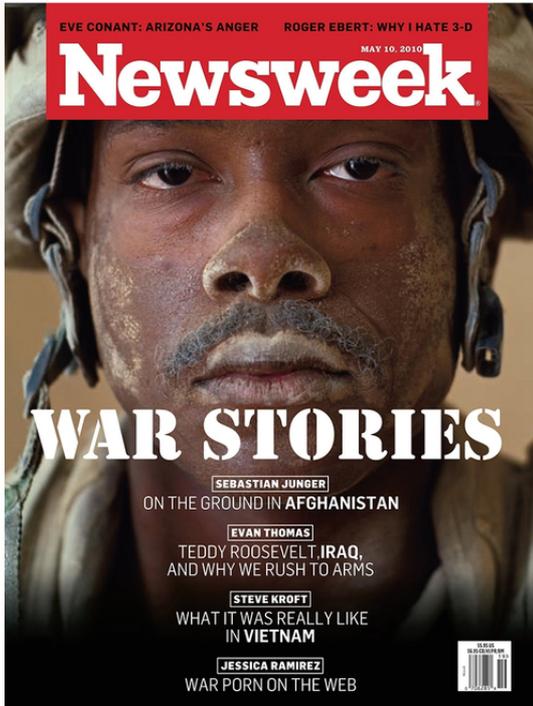
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AND WHY WE RUSH TO ARMS

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Was this a new problem or just an often misdiagnosed or unrecognized one? Was the premature retirement of these men a statistical anomaly or the beginning of an epidemic?

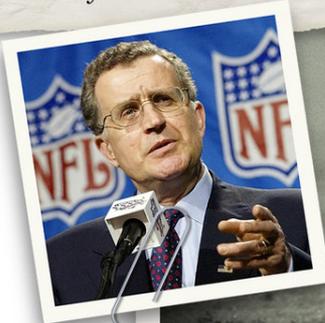
Elliot J. Pellman
Chairman, Mild Traumatic
Brain Injury Committee,
National Football League



Lorillard

CLINICAL STUDIES

All players who reported any symptoms of MTBI to the team athletic trainers or physicians were included in this study.



Paul J. Tagliabue, Esq.
Commissioner, National Football League
410 Park Avenue
New York, NY 10022
Gentlemen:

The attached decision of the Third Circuit Court of Appeals in Haines v. Liggett et al., dated September 4, 1992, is furnished at the request of Mr. P.R. Tisch. The petition and

Very truly yours,

Arthur J. Stevens
Arthur J. Stevens



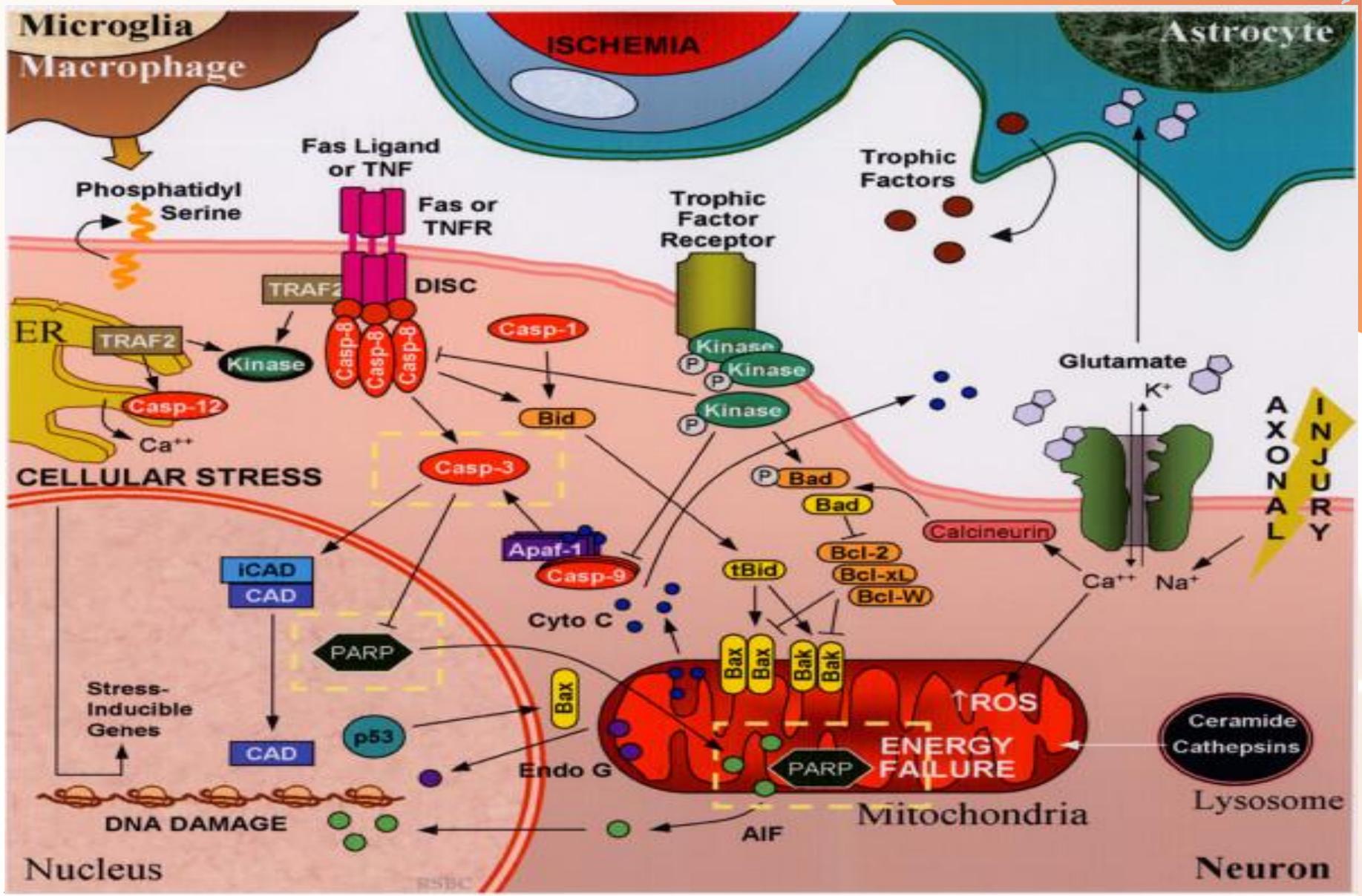
Concussions Force Steve Young Into Retirement

San Francisco 49ers quarterback Steve Young lays motionless after suffering a concussion in the second quarter of the 49ers' game against the Arizona Cardinals.

Pathophysiology

- Concussion
 - Abrupt neuronal depolarization
 - Release of excitatory neurotransmitters
 - Impaired axonal transmission
 - Altered cerebral blood flow





Metabolic needs after concussion

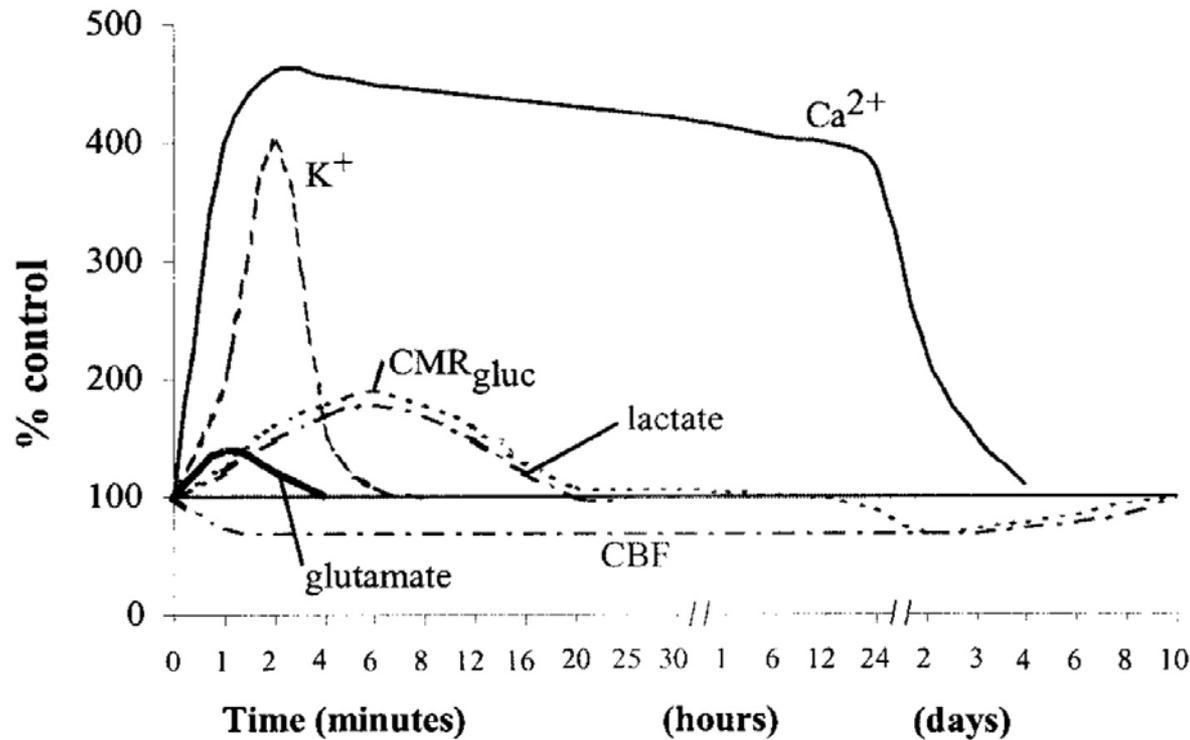
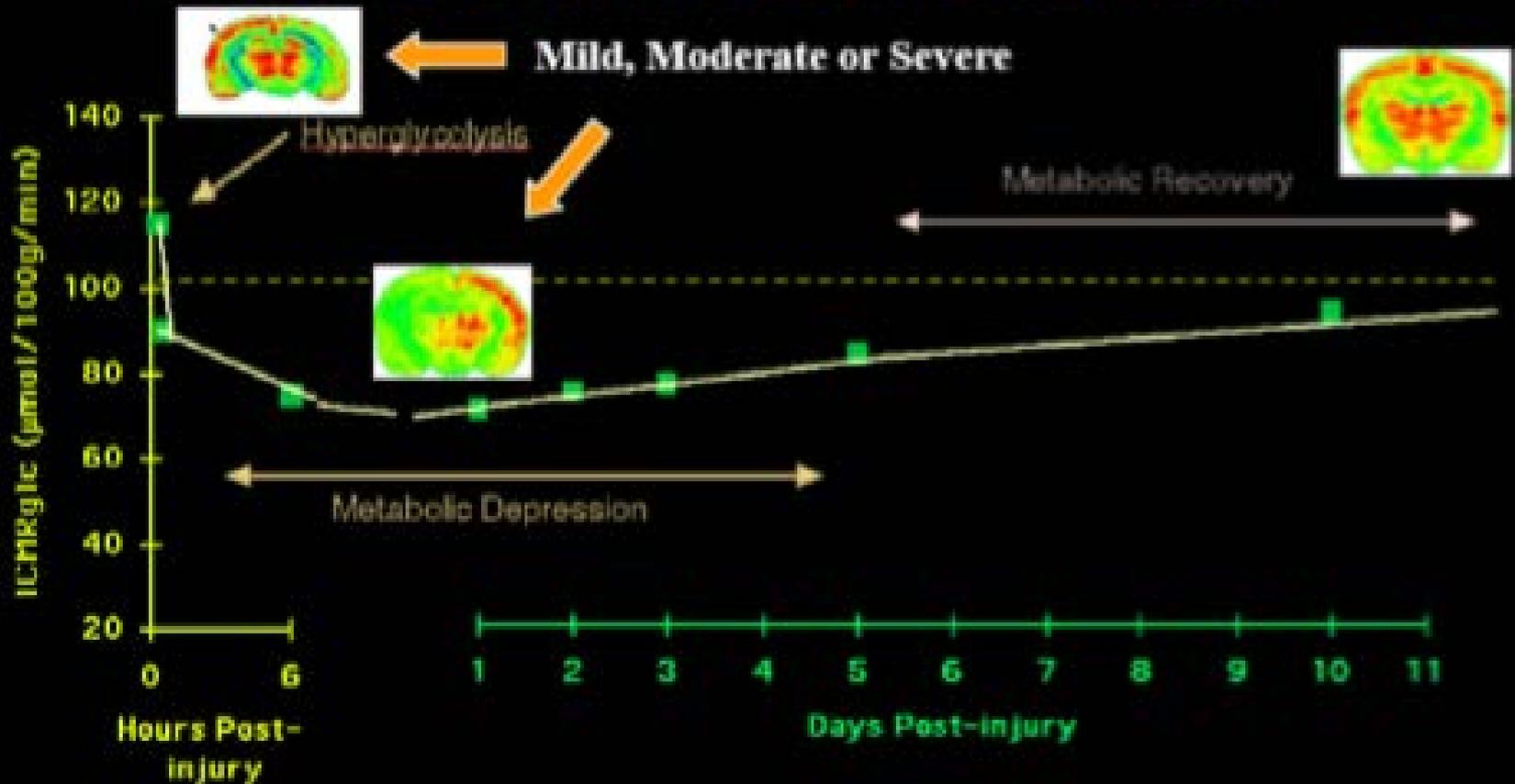
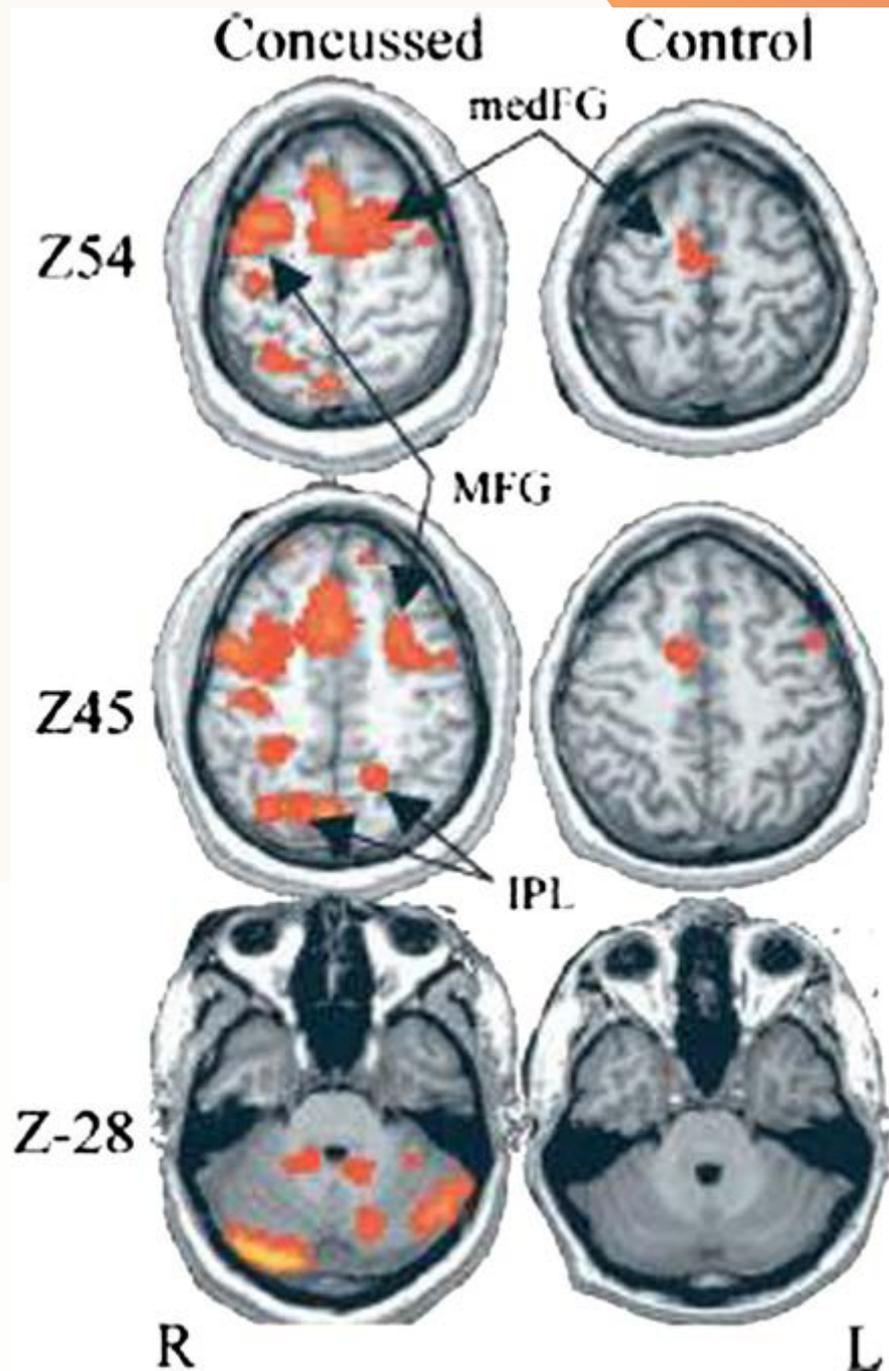


Figure 1. Neurometabolic cascade following experimental concussion. K^+ , potassium; Ca^{2+} , calcium; CMR_{gluc} , oxidative glucose metabolism; CBF, cerebral blood flow. (Reprinted with permission. Giza CC, Hovda DA. Ionic and metabolic consequences of concussion. In: Cantu RC, Cantu RI. *Neurologic Athletic and Spine Injuries*. St Louis, MO: WB Saunders Co; 2000:80–100.).

Hyperglycolysis is Followed by a Prolonged Period of Reduced Glucose Utilization



Yoshino et al: Brain Research 561:106-119, 1991



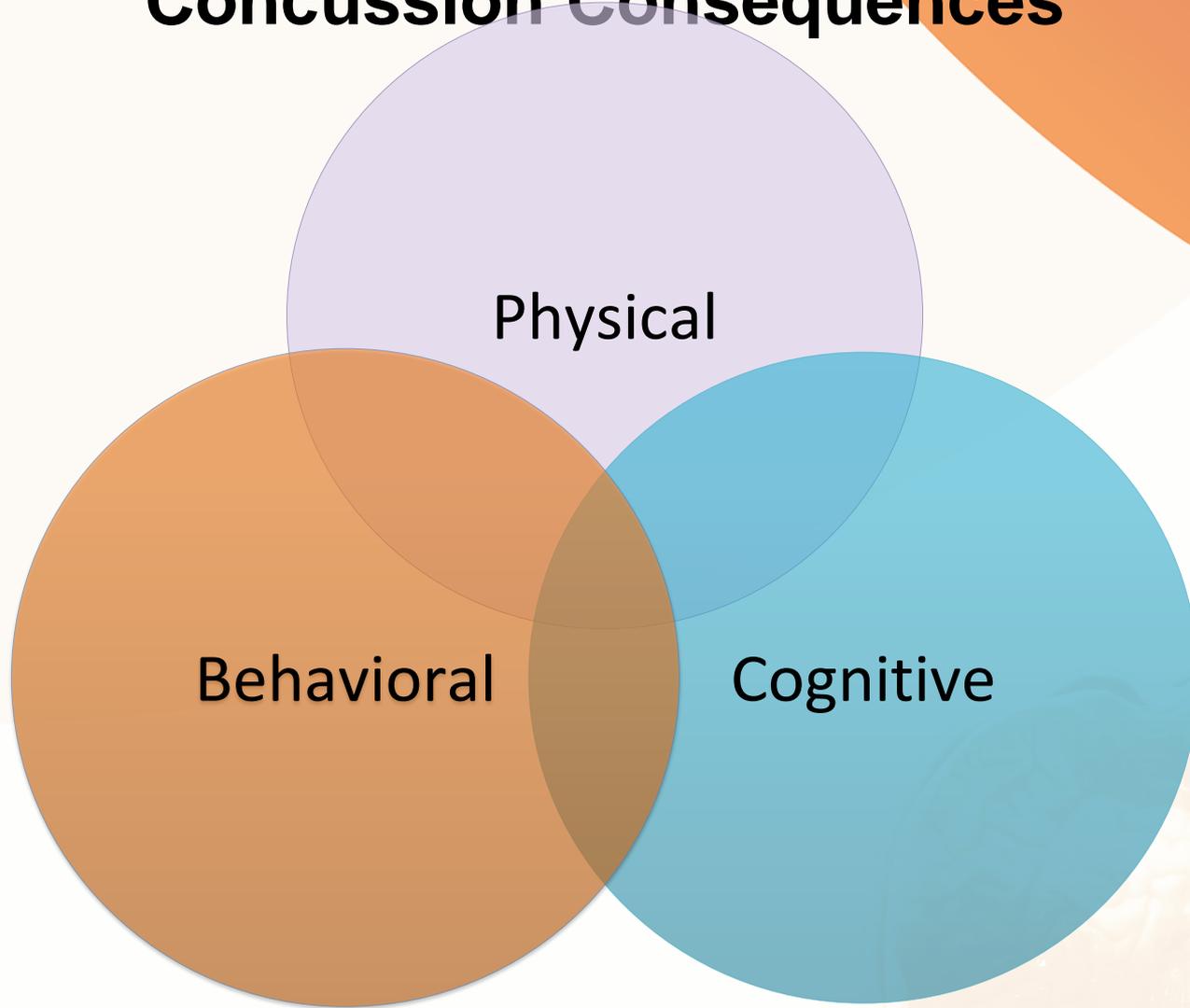
Concussion Consequences

Physical

Behavioral

Cognitive

Concussion Consequences





Post-traumatic headache

- Concussion
 - 90% have headache
 - Patients with mild TBI were more likely to have headache than patients with moderate or severe TBI.
- Duration
 - Days to weeks
- Problems
 - Prolonged PCS
 - Sleep
 - Mood
 - concentration
 - Missed work/ school



Postconcussive Syndrome

The current status of postconcussion syndrome

George P. Prigatano and Shawn D. Gale

- Emotional/ behavioral
 - Irritable, frustrate
 - Cognitive
 - Slowed thinking, distractibility, poor learning and memory
- Current Opinion in Psychiatry** 2011, 24:243–250
- Lasting up to 3 months
 - Most recover within weeks
 - Up to 15% can have long lasting or permanent symptoms

Neuropsychological testing is often indicated

Accommodations in the classroom are needed for those whose symptoms persist
Children perform better overall when their teacher is aware that they have suffered a TBI

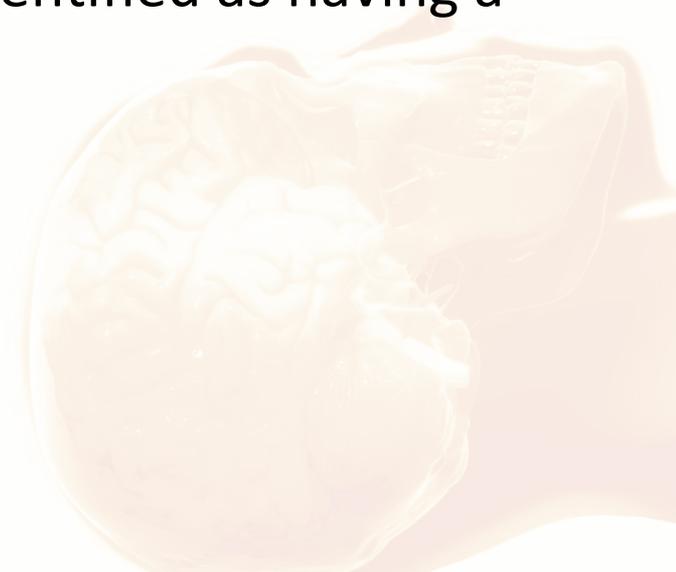
Social Determinants and Brain Injury

- Domestic violence is the leading cause of injury to women
- One in three women around the world are abused
- Every 9 seconds a US woman is beaten
- Traumatic brain injuries occur in 35-92% of domestic violence victims



Domestic Violence and TBI

- Brain Injury Association of America Reports:
- 51 Women were surveyed out of 169 women who came to three ED's over a 7-9 month period with injuries related to assault or abuse
- Overall 35% of the participants were identified as having a mTBI



Women Reporting to ER's for Injuries Associated with DV

- 30% of battered women reported a loss of consciousness at least once
- 67% reported residual problems that were potentially head injury related
- How many did not go to the ER?



Leading Causes in Domestic Violence or any kind of Abuse

- Greater than 90% of all injuries secondary to DV occur to the head, neck or face region-Forcefully hitting partner on the head with an object
 - Smashing her head against a wall
 - Pushing her downstairs
 - Shaking her
 - Strangling her

New York State Office for the prevention of DV

(Monahan & O'Leary, 1999)

Seldom Assault only once

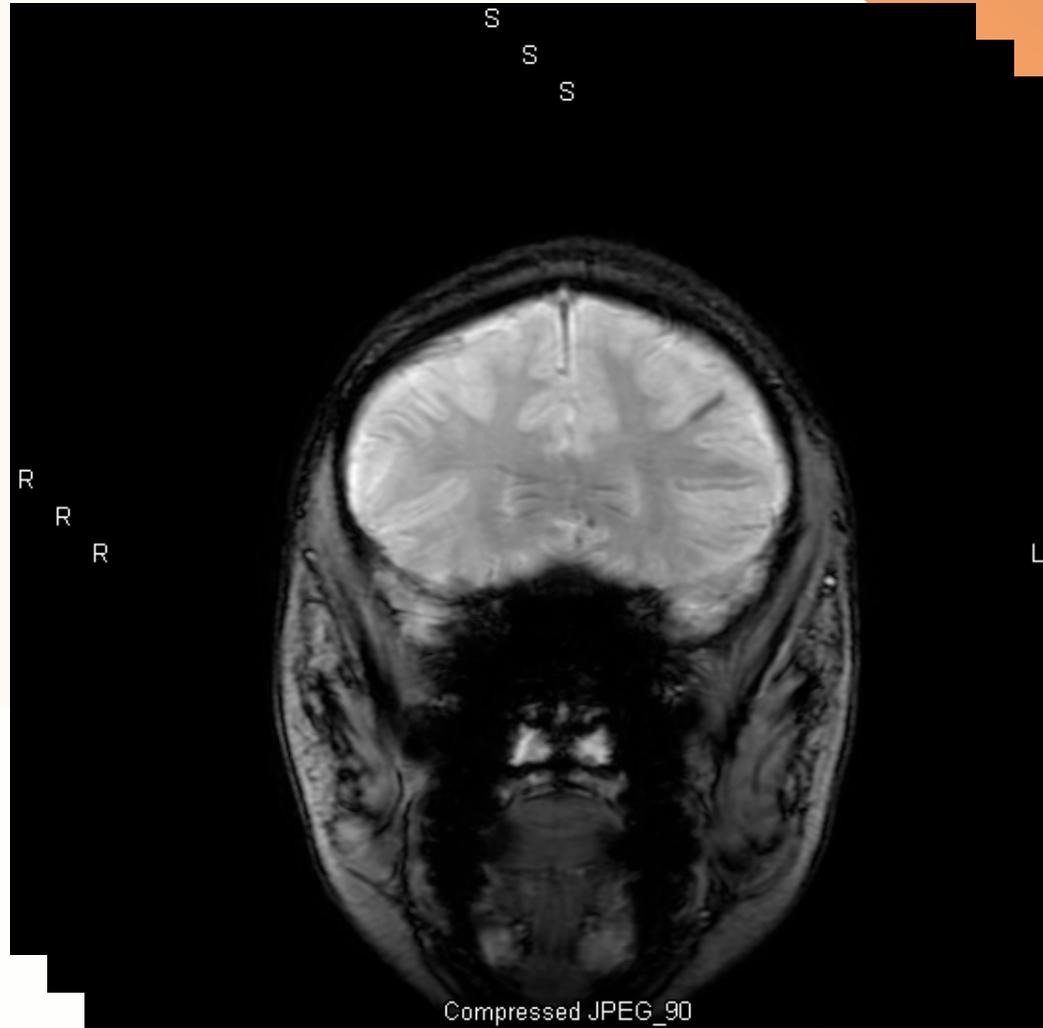
- A study in DV shelters in NY showed:
 - 92% had been hit by their partners more than once
 - 83% had been both hit in the head and severely shaken
 - 8% had been hit in the head over 20 times in the past year



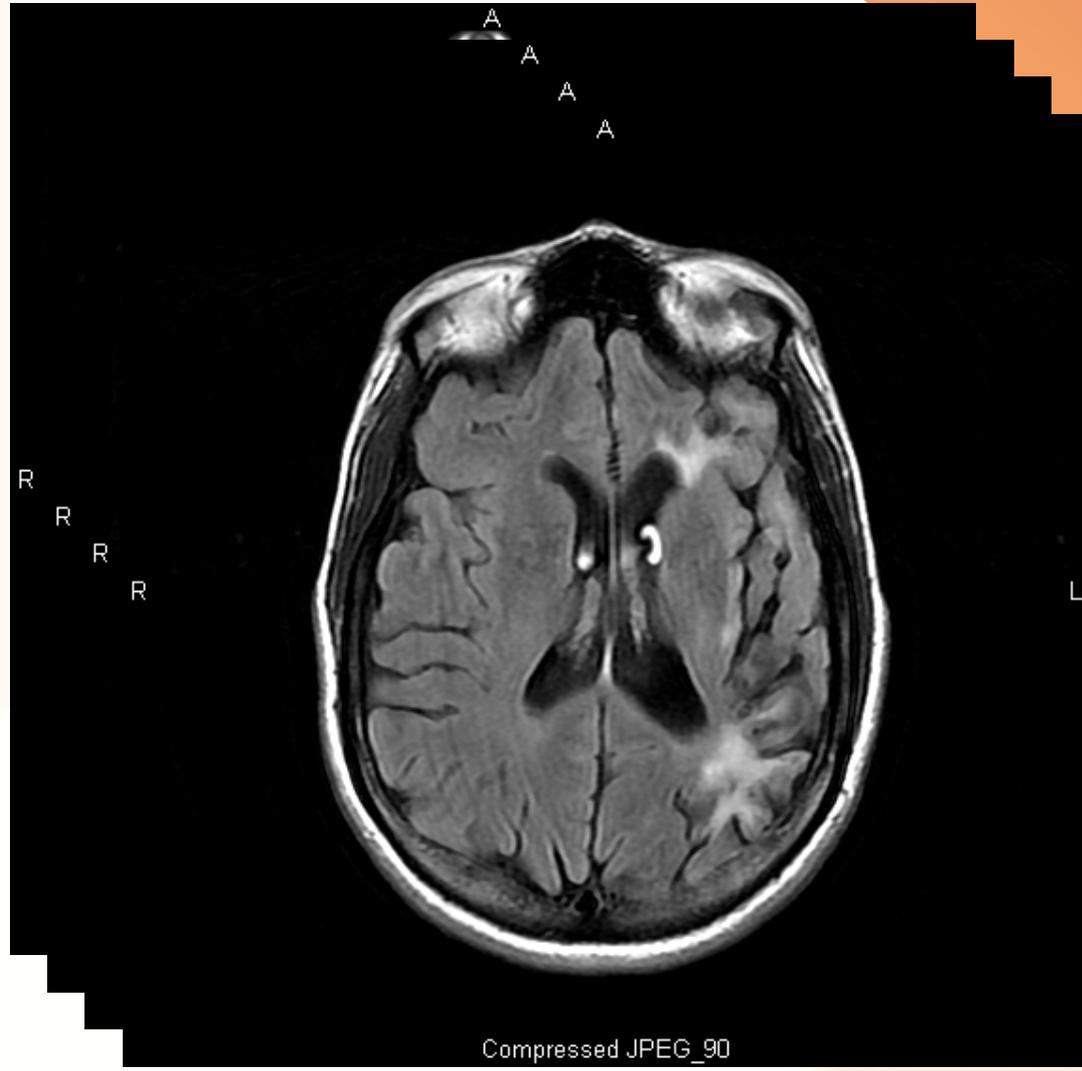
JB



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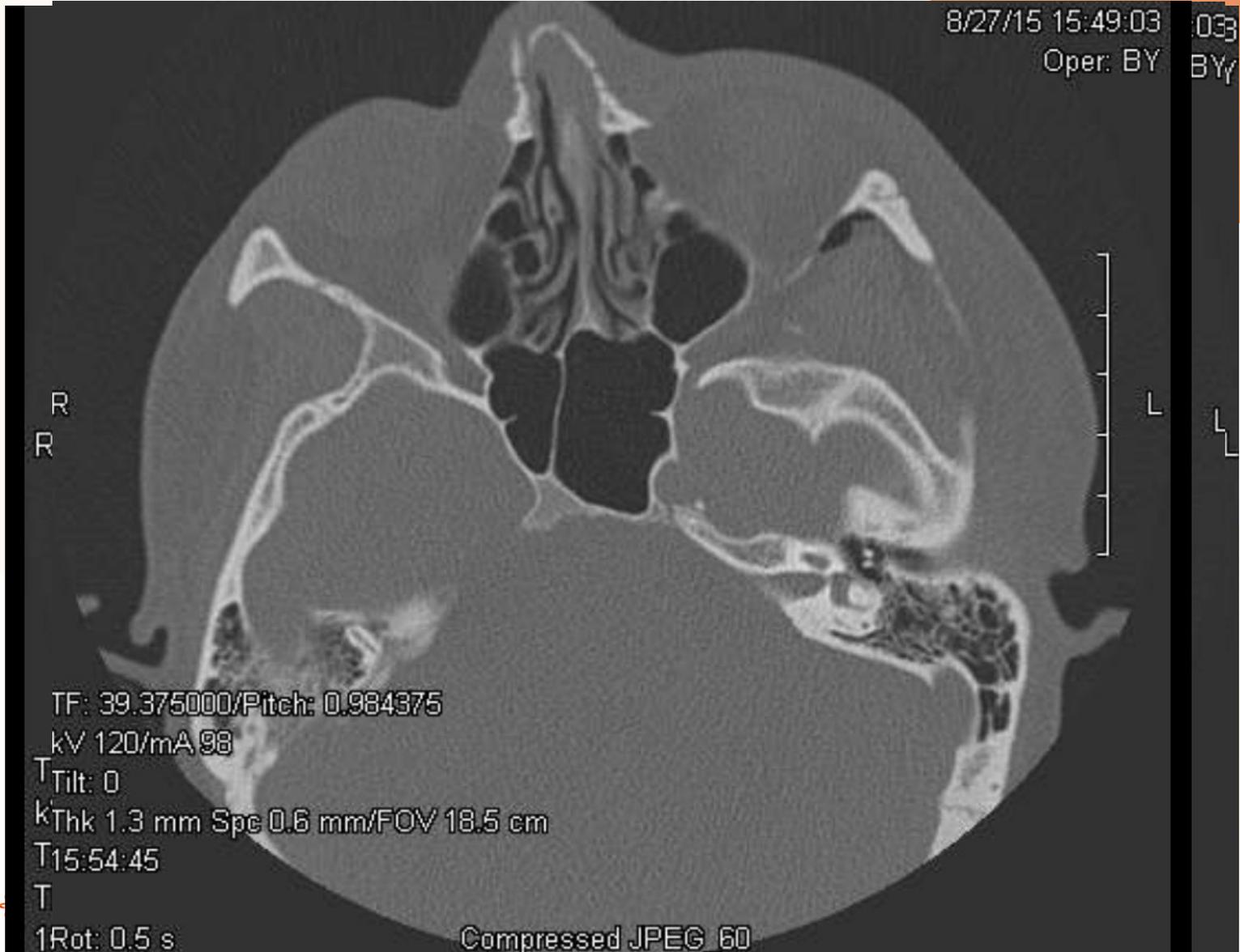


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LB



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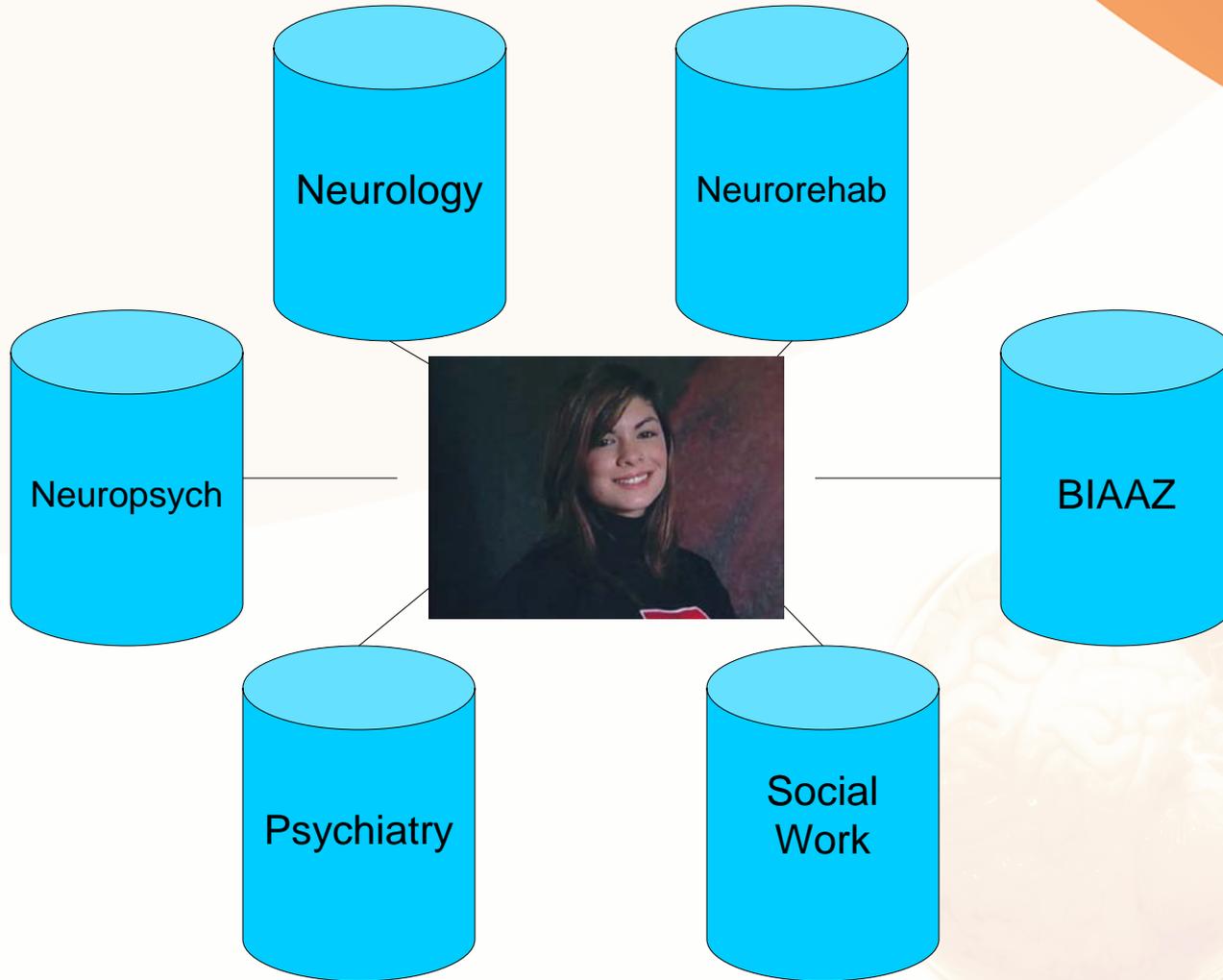


Mission

- To improve outcomes of those who suffer from neurological injury through;
 - comprehensive, patient centered care
 - collaboration
 - research



Barrow Concussion and Brain Injury Center



Team



Neurology



Neurorehabilitation



Social Work



BIAAZ



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Team



Neurology



Neurorehabilitation



Neuropsychology



BIAAZ



Psychiatry

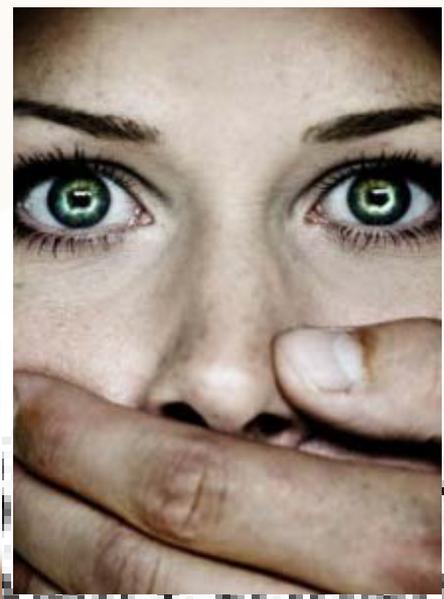


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Social Work



A New Chapter in Brain Injury



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Thank you



References available upon request.