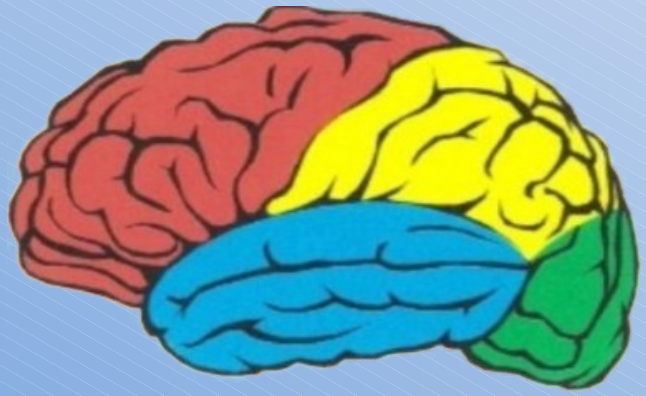
Brain STEPS



Child & Adolescent Brain Injury School Re-Entry Program

Brenda Eagan Brown, M.S.Ed., CBIS
Program Coordinator
eaganbrown@biapa.org
Phone: 724-944-6542

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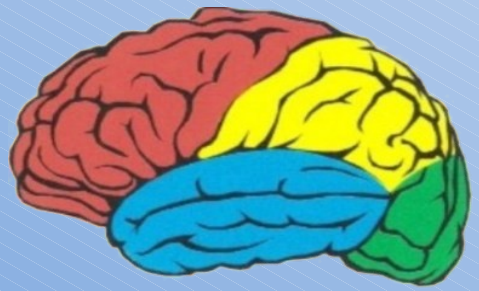
Brain STEPS



- **S**trategies
- **T**eaching
- **E**ducators
- **P**arents
- **S**tudents

Brain Injury Association of Pennsylvania, Inc.

pennsylvania DEPARTMENT OF EDUCATION

DEPARTMENT OF HEALTH

Traumatic Brain Injury

Brain Injury Association of Pennsylvania, Inc.

Brain injury is the leading cause of death and disability in children & young adults.

Good News:

Dramatic reduction in brain injury mortality rates over the past 20 years.

We are saving roughly 70% of those who used to die in serious motor vehicle accidents.

Which Means:

Increasing number of young, otherwise healthy individuals with chronic neuropsychiatric disabilities.

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Traumatic Brain Injury in the United States: A Report to Congress. Division of Acute Care, Rehabilitation Research, and Disability Prevention, CDC, US Dept HHS. December, 1999

CDC Statistics

Average **ANNUAL** number of Traumatic Brain Injury Emergency Department Visits and Hospitalizations in the United States

474,000

Children with Traumatic Brain Injury 0-14 years of age

- Most children who sustained a TBI (91.5%) were treated and released from the emergency department.

Brain Injury Association of Pennsylvania, Inc.

United States. Centers for Disease Control. Traumatic Brain Injury in the United States. 2005. http://www.cdc.gov/ncipc/pub-res/TBI_in_US_04/TBI%20in%20the%20US_Jan_2006.pdf>.

- 1 in 90 children under 5 and
- 1 in 125 from 0 to 14 have had a traumatic brain injury
- 1 in 150 children are diagnosed with an autism spectrum disorder.

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- United States. Centers for Disease Control. Traumatic Brain Injury in the United States. 2005. http://www.cdc.gov/ncipc/pub-res/TBI_in_US_04/TBI%20in%20the%20US_Jan_2006.pdf>.
- The Autism Society of America. 2007. 28 August 2007 http://www.autism-society.org/.reh

How Common is TBI in Children in Pennsylvania?

Each year, approximately

25,975

children in Pennsylvania sustain a traumatic brain injury

(mild, moderate, or severe)

Source: The Brain Injury Association of Pennsylvania, 2008

Brain Injury Association of Pennsylvania, Inc.

In 2006

3,938

Children & Adolescents in Pennsylvania were **HOSPITALIZED** with **TBI**

Source: The Pennsylvania Department of Health, 2006
DOES NOT INCLUDE EMERGENCY ROOM VISITS.

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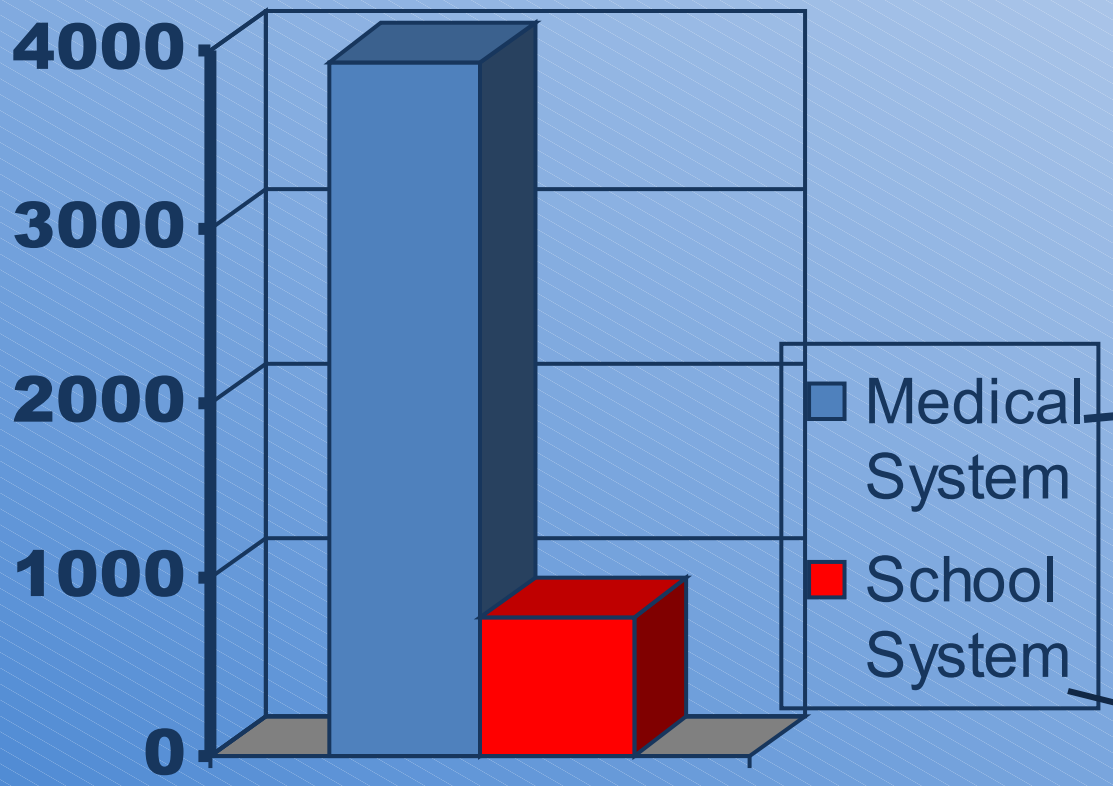
Statistics in Pennsylvania

In one year (2006) the PA Department of Health recorded 3938 children ages 0-21, who were hospitalized with TBI.



Children Discharged from Hospitals in PA with TBI Diagnosis:

3938

Number of students classified as TBI receiving Special Education as of the 2007-2008 PDE Report:

788

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Where Have All the Children with TBI Gone?

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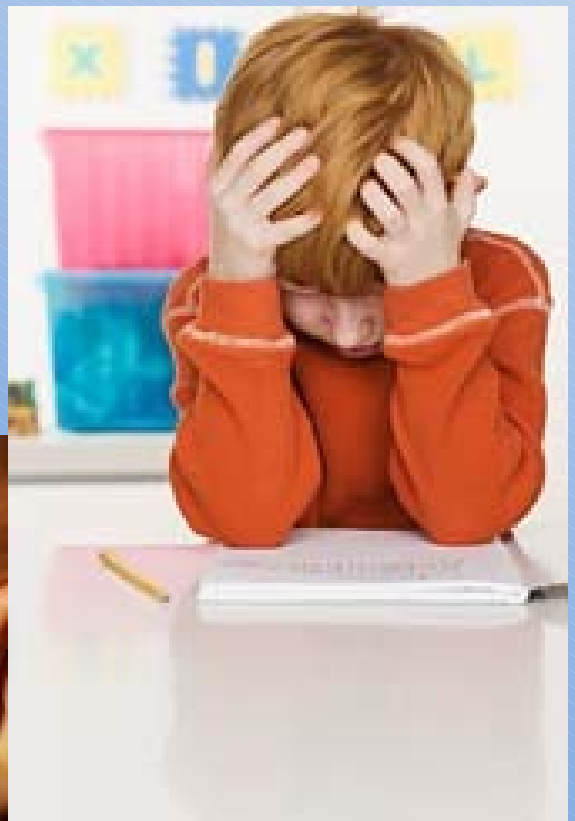
Why the Discrepancy?

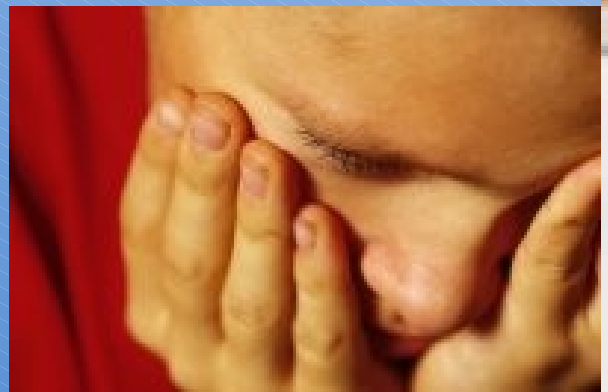
- Not all children who sustain a brain injury experience lasting effects
- Not all parents want to have their child classified – they want their child back to "normal"
- The effects of a brain injury can be latent.

Why the Discrepancy?

- Effects of TBI may mimic other disabilities leading to misdiagnosis and inappropriate placement

- Under-identification & misidentification within the educational system.





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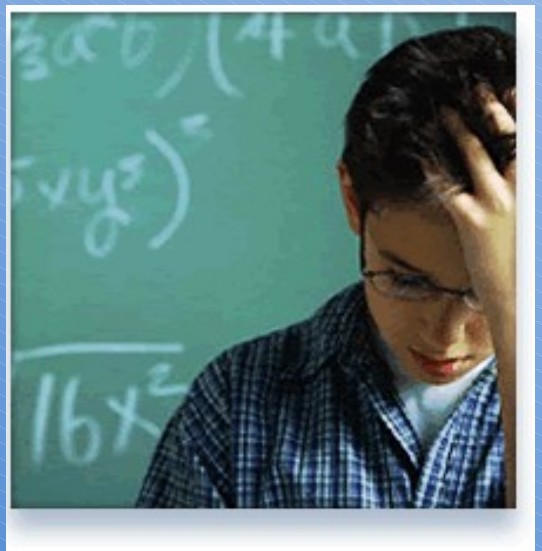
Educator's Knowledge of Brain Injury

- Lack of Pre-service Training on brain injury
- Less than 8% of graduate level special education training programs cover brain injury
- Limited knowledge of the impact of TBI



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A Child's Brain

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A Child's Brain

- Under-developed
- Unlike other organs, the brain needs time & experience to mature.
- Not well organized & undifferentiated

A Child's Brain

- Easily injured
- New abilities build on ESTABLISHED skills over time
- Does not "bounce back" after injury

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A child's brain is not fully developed until around the age of 25 . . .

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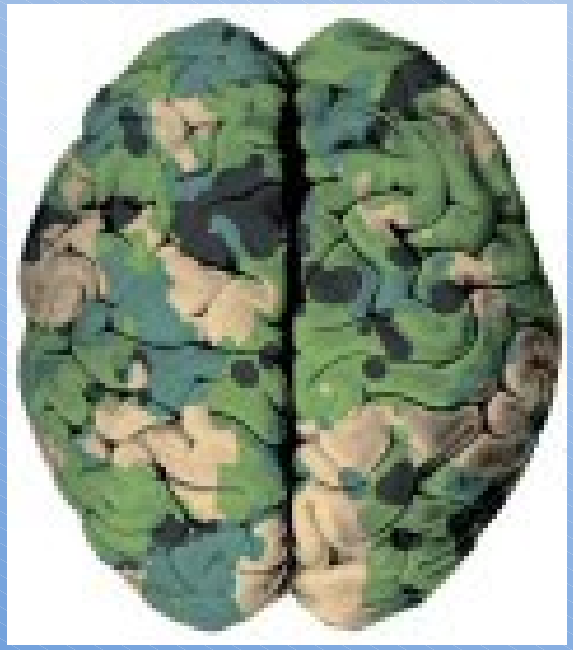
…which means that many of our returning soldiers are receiving TBI's on brains that are still in the process of developing.



2 Important Developmental Stages

- Child's stage of development **when injury happened**
- Child's stage of development **NOW**

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It is the CAPACITY to LEARN & RECAPTURE the developmental momentum set forth prior to injury that is the most vulnerable to interruption and not the loss of what has already been MASTERED.

Thus, very young children will be at greater risk for interference of their ability to resume a normal rate and pattern of learning and development. (Lehr, 1990).

Pre-Existing Conditions & TBI

- Children with pre-existing behavioral weaknesses are much more likely to have a TBI.
- Effects of TBI will compound and add to pre-existing learning, behavioral or psychological problems, such as:
  - Dyslexia
  - ADHD
  - Paranoia
  - Depression

Brain Injury & Developmental Stages

- Capacities in process of development, and those not yet developed are those **most vulnerable** to brain injury.

- The younger a child is when a brain injury occurs, the more pervasive the impact on thinking, emotion regulation & behavior.

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Acquired Brain Injuries

Traumatic

&

Non-Traumatic

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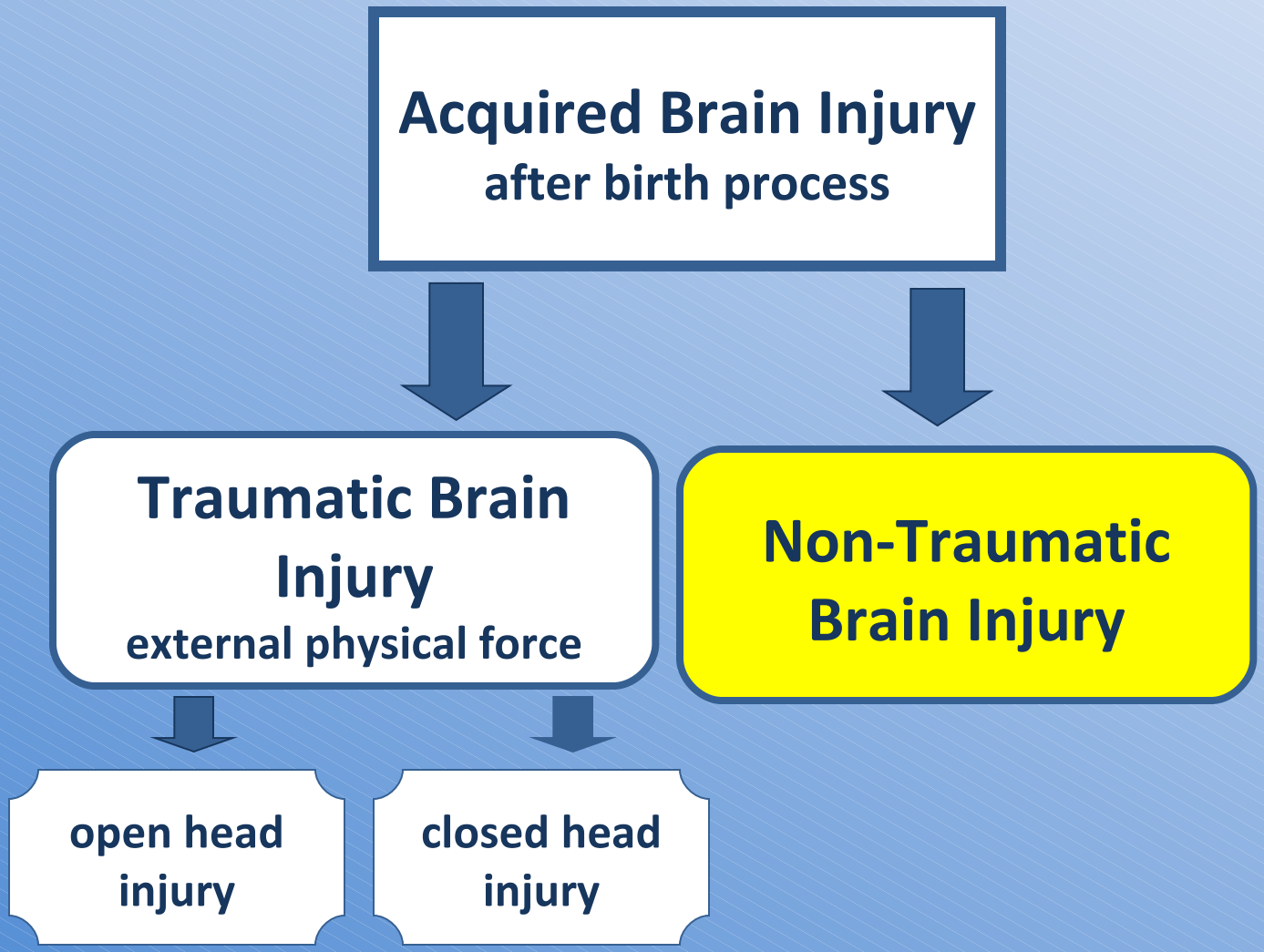
Types of Brain Injury



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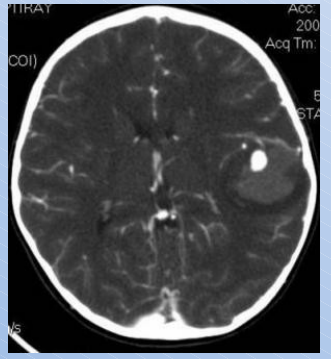
Non-Traumatic Brain Injury Causes

Cerebral Vascular Accidents

- Vascular Occlusions
- Hemorrhaging
- Aneurysms



Ingestion of Toxic Substances

- Inhalation of Organic Solvents
- Ingestion of Heavy Metal
- Alcohol and Drug Abuse

Non-Traumatic Brain Injury Causes

- **Brain Tumors**
- **Hypoxia**
- **Infections of the Brain**
  - Brain Abscesses
  - Meningitis
  - Encephalitis

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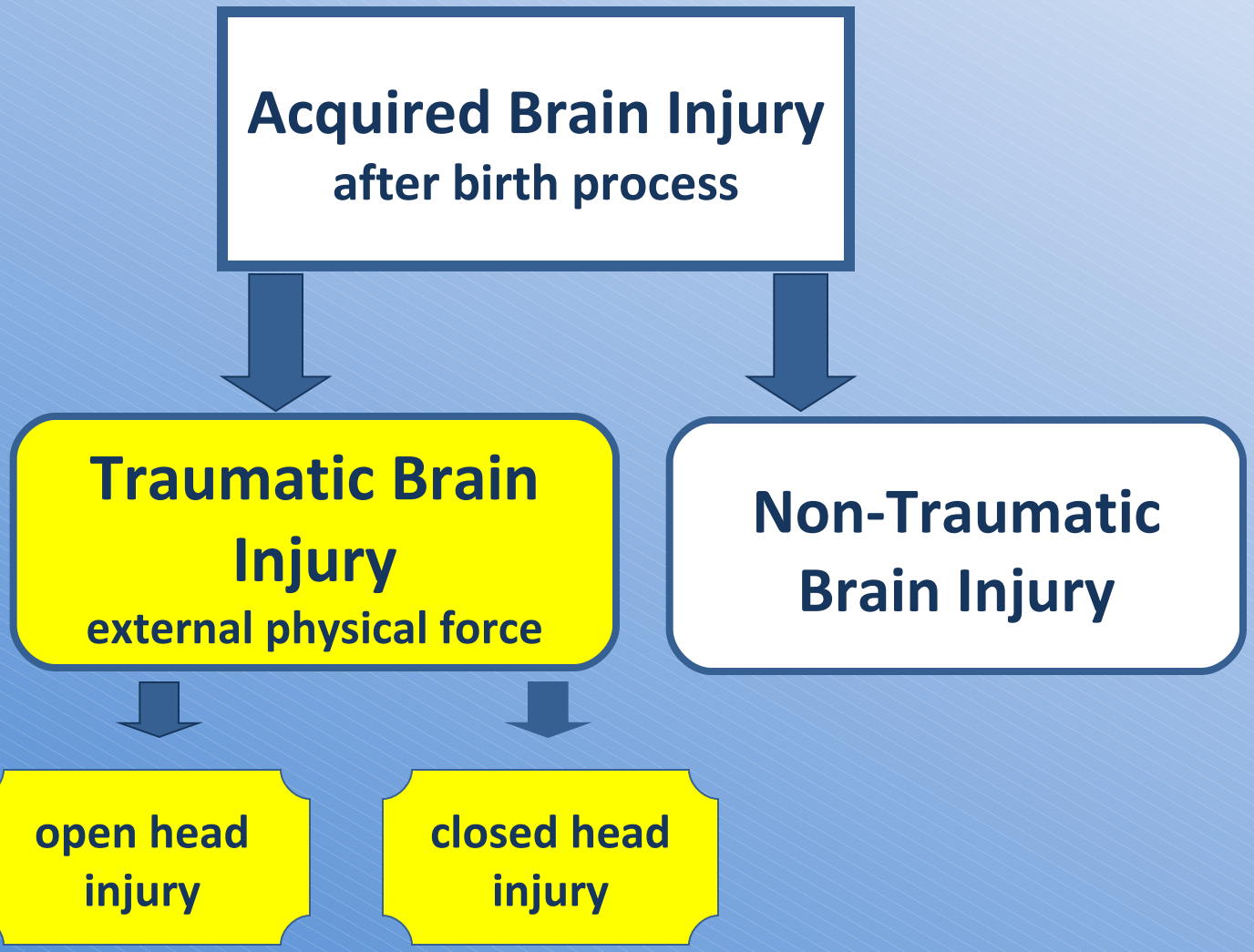
NEAR DROWNING

Types of Brain Injury



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Traumatic Brain Injuries

External Causes

- Closed Head Injuries
- Open Head Injuries

Gunshot

SHAKEN BABY SYNDROME

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Car Accidents

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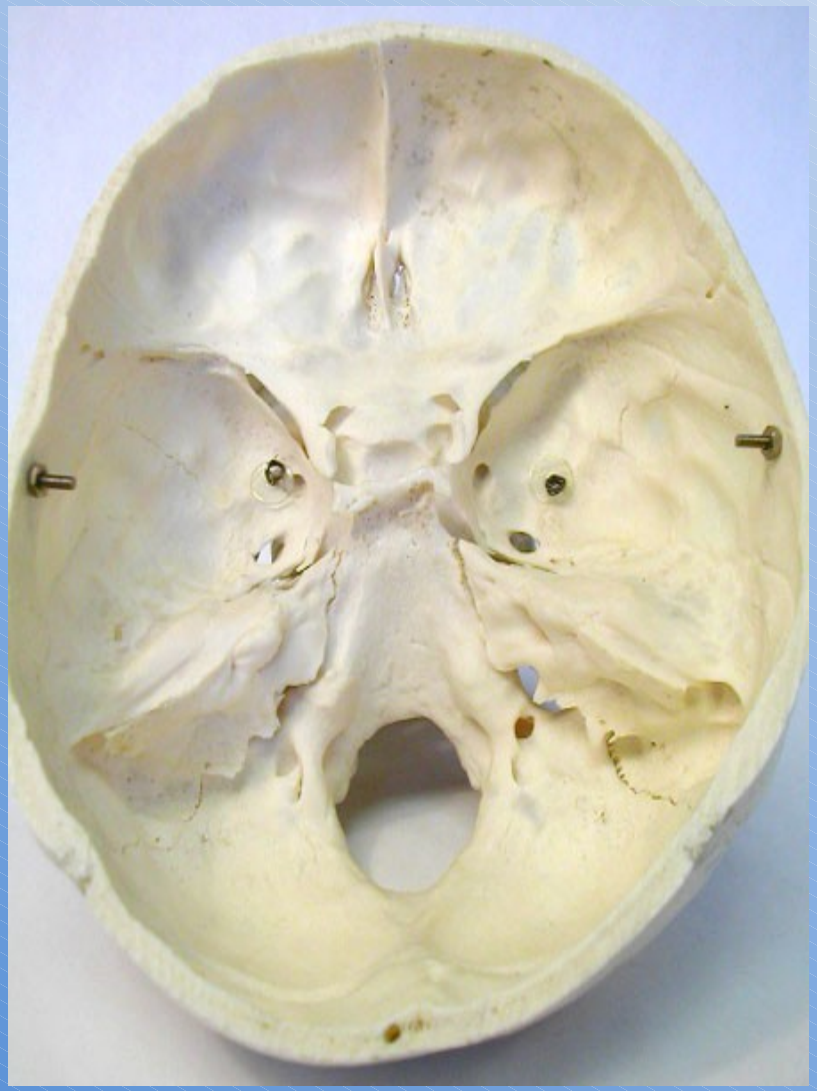
What Happens During a Closed Head Injury?

Skull Protrusions



Brain Tissue that is damaged does not regain lost function.

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Levels of Severity of TBI

Mild:

- Brief or no loss of consciousness
- Shows signs of concussion
  - vomiting
  - lethargy
  - dizziness
  - lack of recall of injury

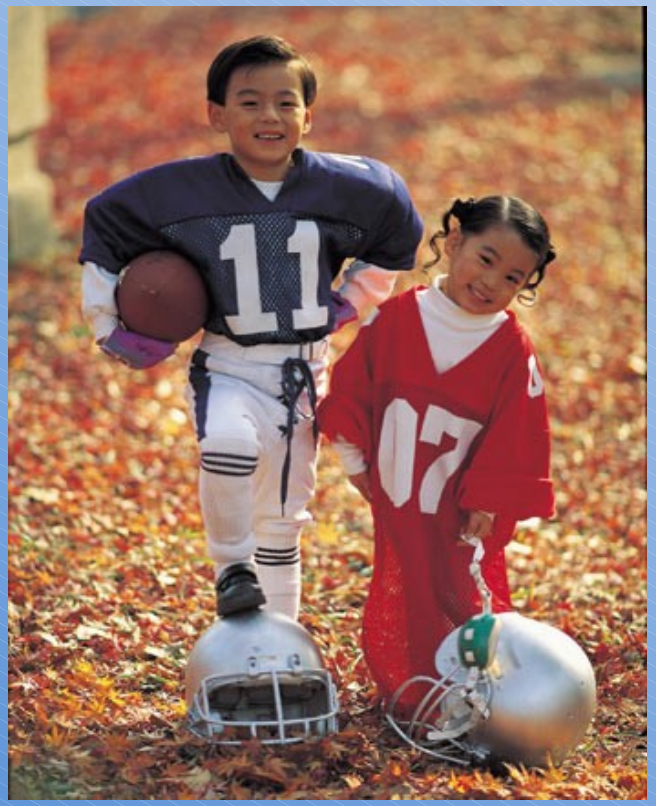
Moderate:

- Coma < 24 hours duration
- Neurological signs of brain trauma
  - Skull fractures with contusion (tissue damage)
  - Hemorrhage (bleeding)
- Focal Findings on EEG/CT scan

Severe:

- Coma > 24 hours duration

Effects of Brain Injury on Children



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Why Students with Brain Injury are Different

- Sudden onset of disability
- TBI results in disruption of PRIOR normal brain development
- Reconciliation of "old" self with "new" self
- Problems may be more exaggerated & severe

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Why Students with Brain Injury are Different

- Requires hospital to school transition planning
- Ongoing medical needs
- Loss of peer relationships & change in family
- Having to learn HOW to learn again
- Exacerbation of prior difficulties

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Why Students with Brain Injury are Different

- Problems are not developmental
- Reliance on previous learning strategies – might not be effective now
- Relearning of old material – may appear to learn "faster" at first
- More extreme discrepancies among abilities and very uneven and unpredictable progress

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“The Swiss Cheese Effect”

- Physical
- Cognitive
- Social
- Emotional
- Behavioral
- Sensory
- Language
- Academic

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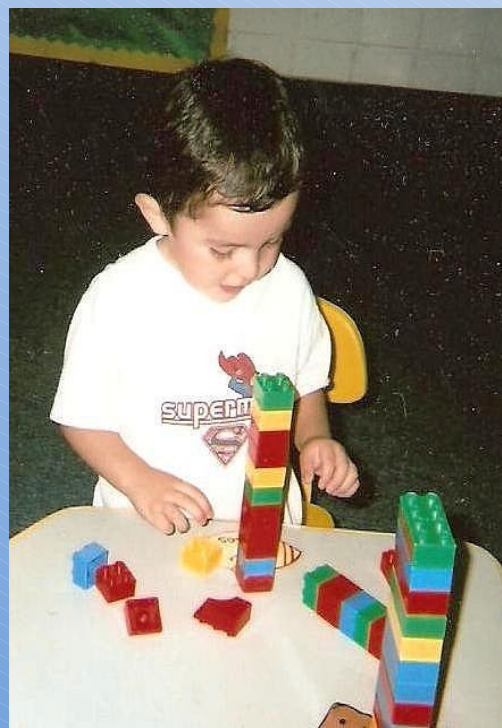
Executive Functioning Deficits

- Focusing & Sustaining Attention
- Delayed Response Time
- Organization
- Simultaneous Processing
- Generalizing
- Flexible Problem Solving
- Concept Formation
- Perceptual/Spatial Functions
- Judgment
- Memory



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Physical Changes

- Changes in sleep patterns
- Seizures
- Headaches
- Hearing and vision impairments
- Changes in ability to control body temperature, blood pressure, or breathing
- One or both side body weakness

Motor Coordination
It's Harder than you Think!

1. Slightly lift your right foot off the floor

2. Begin circling that foot clockwise

3. Write your whole name in cursive

Behavioral Changes

- Disinhibition
- Temper outburst
- Low frustration tolerance
- Inappropriate sexual language or behavior

Discuss what would happen if you said or did anything that crossed your mind.

Behavior Changes

- Lack of interest (apathy)
- Lack of motivation
- Difficulty initiating tasks
- Mood swings/Emotional lability
- Irritability
- Depression

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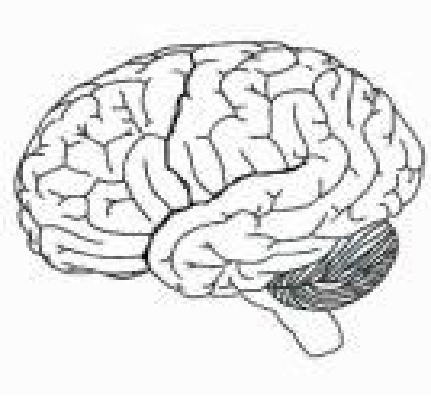
Special Education Classification

Traumatic Brain Injury

(TBI)



Traumatic Brain Injury was added into the Special Education Law (IDEA) in 1990 as a *specific category* requiring specialized understanding.

Public Law 101-476
[34 Code of Federal Regulations §300.7(c)(12)]

IDEA Regulations

Our nation's special education law, the Individuals with Disabilities Education Act (IDEA) defines **Traumatic Brain Injury** as...

"...an acquired injury to the brain caused by an external physical force, resulting in total or partial functional disability or psychosocial impairment, or both, that adversely affects a child's educational performance."

Public Law 101-476

[34 Code of Federal Regulations §300.7(c)(12)]

TBI Definition (IDEA)

The term applies to <u>open or closed head injuries</u> resulting in <u>impairments in one or more areas</u>:

- cognition
- language
- memory
- attention
- reasoning
- abstract thinking
- problem-solving
- psychosocial behavior
- physical functioning
- information processing
- speech
- judgment
- sensory, perceptual, and motor abilities

Public Law 101-476
[34 Code of Federal Regulations§300.7(c)(12)]

TBI Definition (IDEA)

The term does NOT apply to brain injuries that are congenital, degenerative, or induced by birth trauma.

Public Law 101-476
[34 Code of Federal Regulations §300.7(c)(12)]

This federal definition does NOT include brain injuries caused by internal conditions, such as stroke, brain infection, tumor, anoxia, or exposure to toxic substances.

SPECIAL EDUCATION SERVICES

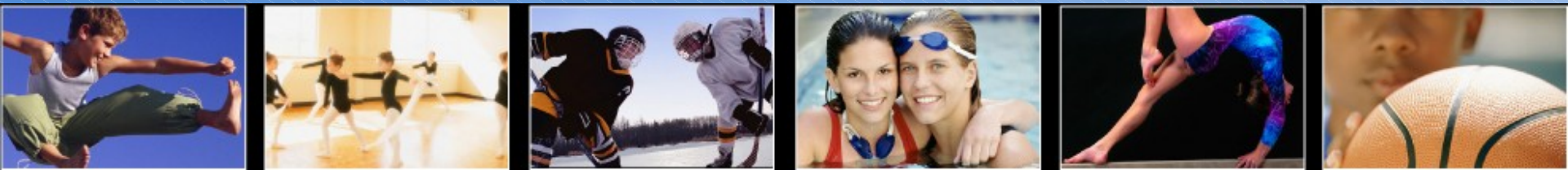
Classification

Traumatic Brain Injury (TBI)

Open Head Injury, Closed Head Injury, or Near Drowning

Other Health Impaired (OHI)

Non-Traumatic Acquired Brain Injury (e.g., brain tumor, stroke, brain infection)



Near Drowning = TBI for Special Education Classification

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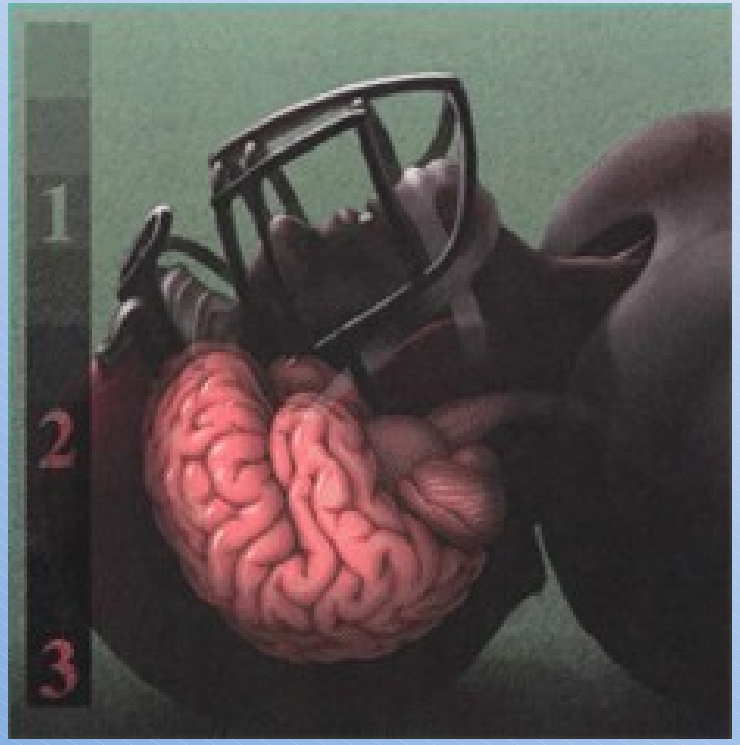
A CONCUSSION is a MILD TRAUMATIC BRAIN INJURY



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- Got your Bell Rung!
- A Dinger!
- A Head Banger!
- Knocking the Cobwebs Loose!
- Seeing Stars!
- Punch Drunk!
- A Little Fuzzy!
- Just Shake it Off!

- Why do we sometimes see STARS when we hit our heads?

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Brain injury can occur even if there is **NO** loss of consciousness

Initial CT/ MRI likely to be normal

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"More than 90% of concussions do not involve loss of consciousness."

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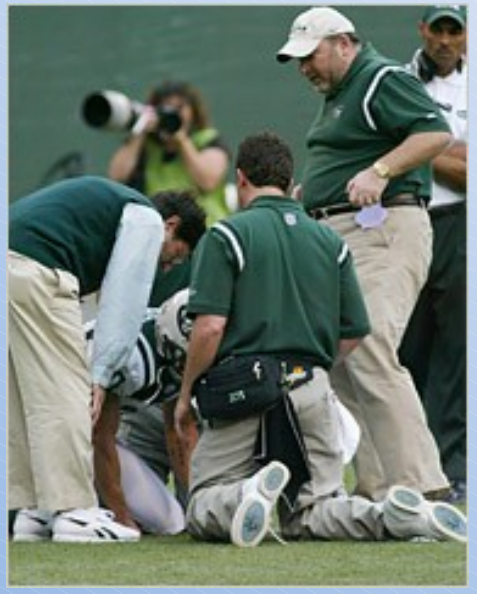
EACH YEAR – Thousands of student athletes in Pennsylvania sustain Concussions



- Defined as a trauma-induced alteration in mental status (dazed, disoriented, confused)
- May or **may not** involve loss of consciousness
- Can result in loss of memory for events immediately **before or after** trauma
- Can result in local neurological deficits that may or may not be transient

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Following CONCUSSION there are actual

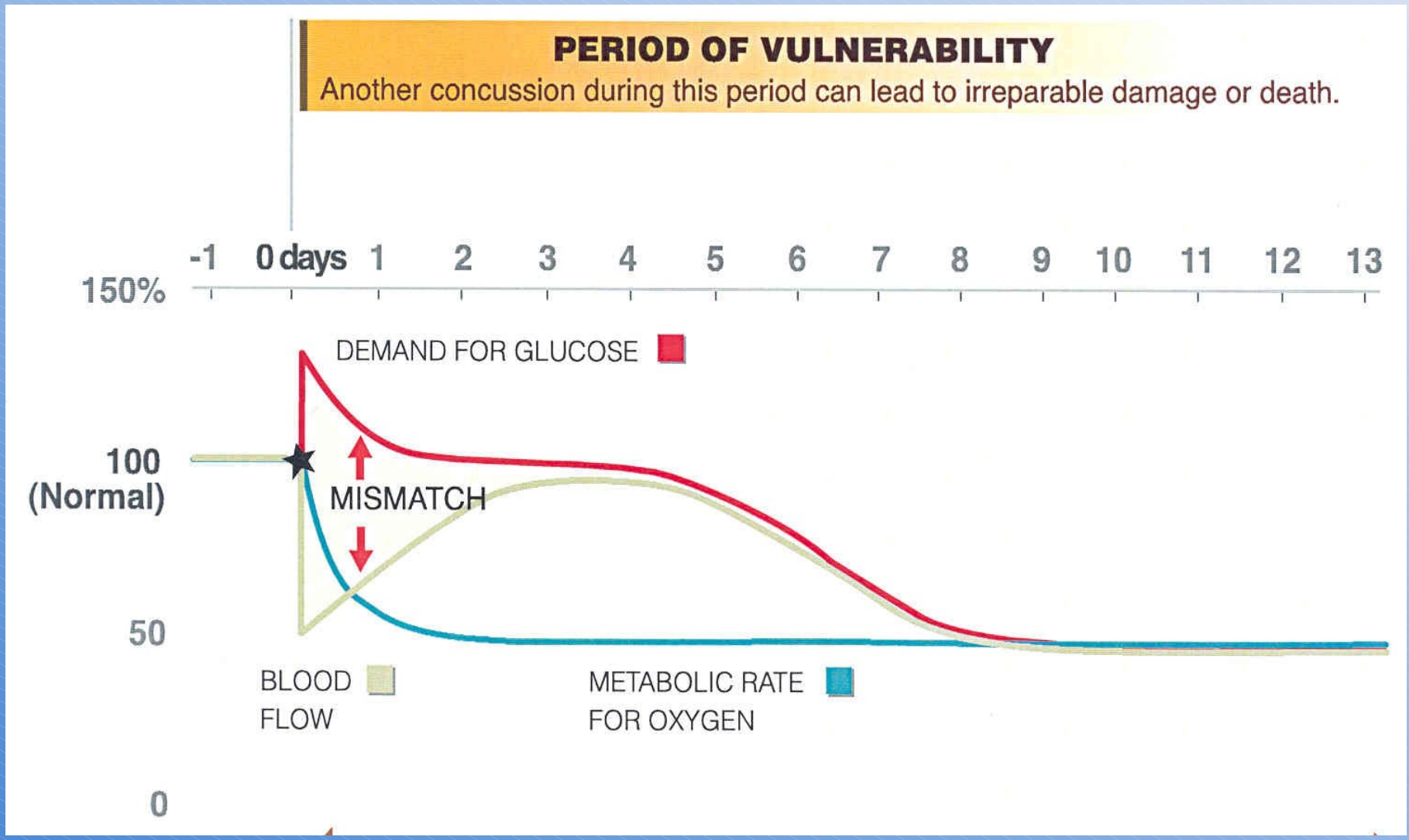
PHYSICAL,

METABOLIC, &

CHEMICAL CHANGES

that may take place in the brain

Neurometabolic Changes and Concussion



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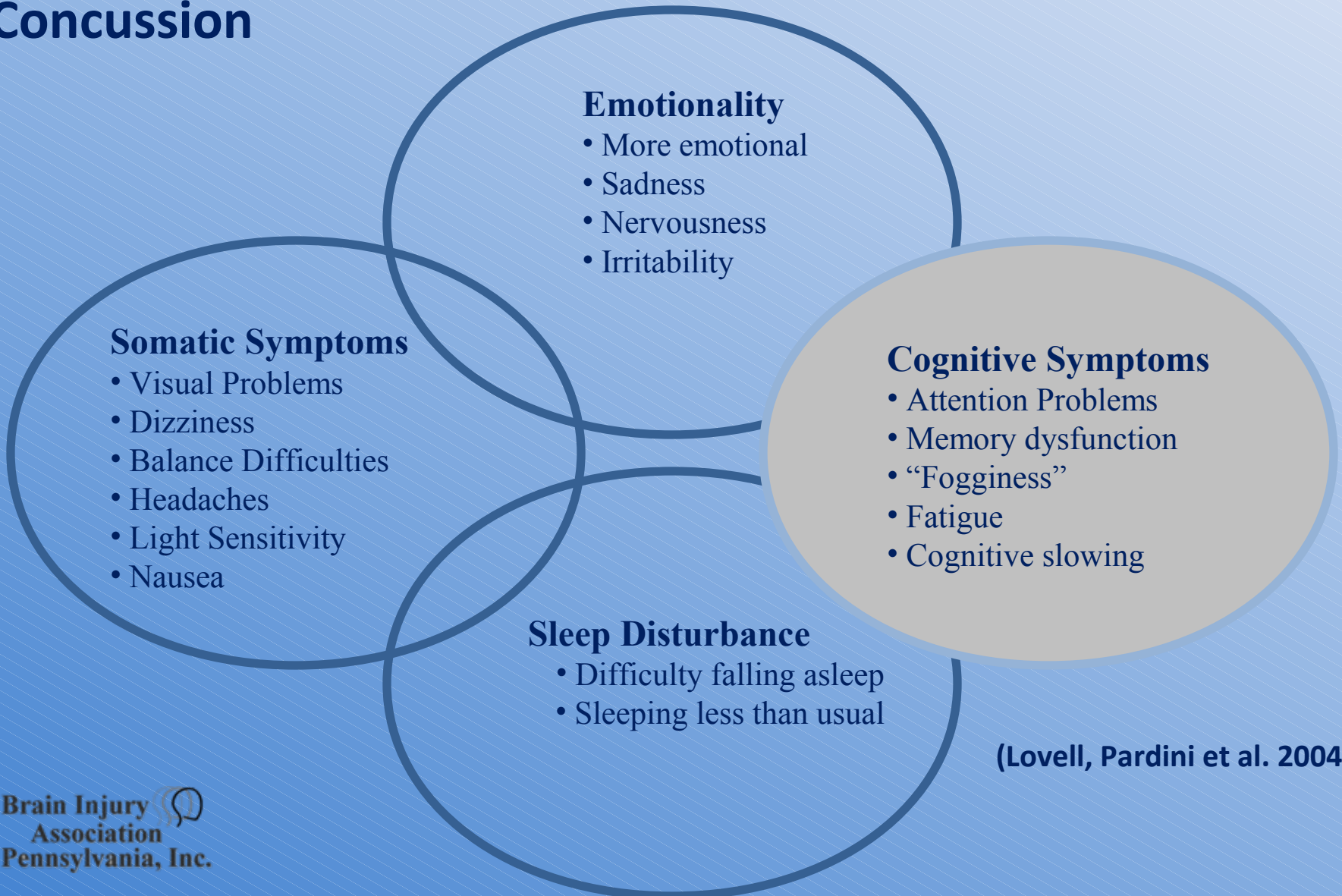
The Neurometabolic Cascade of Concussion, Christopher C. Giza & David A. Hovda, J Athl Train. 2001 Jul–Sep; 36(3): 228–235

Factor Analysis, Post-Concussion Symptom Scale High School and University Athletes 7 Days after Concussion



(Lovell, Pardini et al. 2004)

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3 Things to Remember:

1. Children, unlike adults take LONGER TO RECOVER from concussions

2. **Post Concussion Syndrome** can occur

3. **Second Impact Syndrome** can occur

Later Signs of Concussion
Post-Concussion Syndrome

- Decreased processing speed
- Short-term memory impairment
- Concentration/attention deficit
- Irritability/anxiety/depression
- Fatigue/sleep disturbance
- General feeling of "fogginess"
- Academic difficulties
- Persistent headache
- Intolerance of bright lights and noise

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M. Lovell, Ph.D.- UPMC Sports Concussion Medicine Program

Second Impact Syndrome (SIS)

- Athlete sustains an initial head injury and then sustains a second head injury before symptoms from the first have fully resolved.

McCrory PR. ***Neurology,*** 50(3) Mar 1998

New Concussion Management Guidelines
CIS Group, Vienna (2001), Prague (2004)

"Cornerstones of Concussion Management"

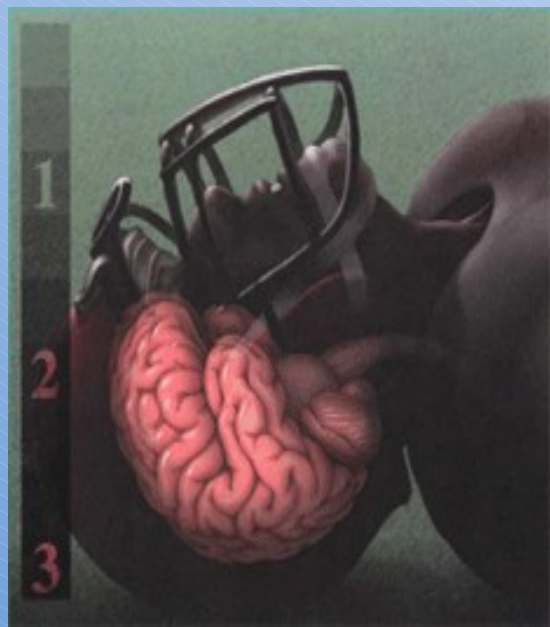
- Removal of symptomatic athletes from play
- Restriction from play while symptomatic
- Graduated return to play (following exertion)
- Recognition of differences in children
- Neuro-cognitive testing recommended

Aubry, Cantu, Dvorak, Graf-Baumann, Johnston, Kelly, Lovell, McCrory, Meeuwisse, Schasmasch, 2001. *Clinical J. Sports Med*.

Concussions Can Impact SCHOOL

- The RETURN to PLAY Guidelines can be adapted for RETURN to SCHOOL

- Educators need to watch for concussion effects!



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When Should Students "Return to School?

- Should be Symptom Free at REST & during PHYSICAL EXERTION! (exertion added gradually)

- AT LEAST 7-10 days during which time they experience No Symptoms

Getting A-Head of Concussion
P. Hossler and R. Savage (2006)

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A CONCUSSION IS A BRAIN INJURY TAKE IT SERIOUSLY!

- Effects from concussions can last 6 months to 1yr or more-there is no set time-line.
- Some students will have **lifelong** effects from their concussion.
- Many students can fully recover from a concussion, but it is **essential** that their brain be given time to rest and that they be protected from further injury during this time.

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Don't Trivialize CONCUSSIONS!!!

Many Times:

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Commonly Recommended After Concussion

1. Restricted Gym Class Activity

2. Full academic accommodations as specified below:

- Untimed, open book, take home, and/or shortened tests
- Reduce class work and homework by 50%; shorten tests & projects (reduce 50 problems to 25 problems; 4 pages to 2 pages)
- Frequent breaks from class when experiencing symptoms (e.g., go to nurse, put head down on desk)
- Extended time on homework, projects
- Full days of school as tolerated
- Half days of school as tolerated

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(Pardini, Fazio, Taylor. 2008)

Brain Injury & School

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- She doesn’t look brain injured!
- He’s using his brain injury as an excuse to get out of doing school work!
- The brain injury should be healed by now!
- But there was no loss of consciousness!

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Educational Programming for Students with Traumatic Brain Injury

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Remember:

If you've seen one student with TBI, you've ONLY SEEN ONE.

Important! Outcome for Children is Based On:

1. Location of Brain Injury
2. Severity of TBI
3. Medical/Rehabilitation Care
4. Post Injury Family Support

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Postinjury:

VERBAL IQ is a good estimate of premorbid status

~ Scores tend to recover within 6-12 months of injury

PERFORMANCE IQ is the better measure of loss and meter of recovery.

~ Scores have been shown to take at least three times as long as Verbal IQ scores to recover.

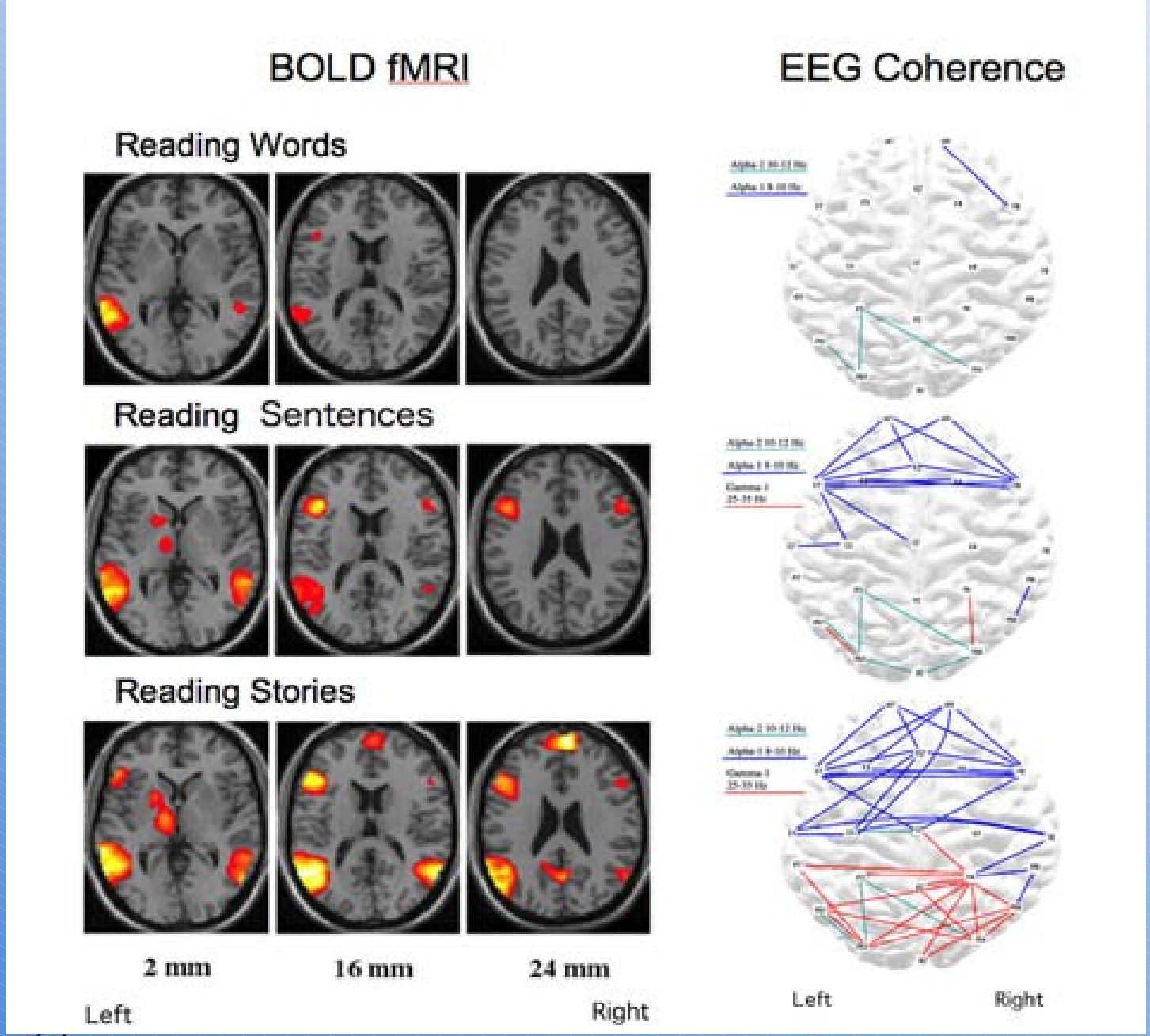
(V. Begali, neuropsychologist)

TBI children are a UNIQUE POPULATION

No other category of exceptional learners can claim potential for a “gain” of as many as 30 IQ points within one year.

Children with RIGHT hemisphere damage tend to do better with verbal memory tasks.

Children with LEFT hemisphere damage tend to do better with visual memory tasks


BOLD fMRI
EEG Coherence
Reading Words
Reading Sentences
Reading Stories
2 mm
16 mm
24 mm
Left
Right
Left
Right

TBI Curriculum?
TBI Classroom?

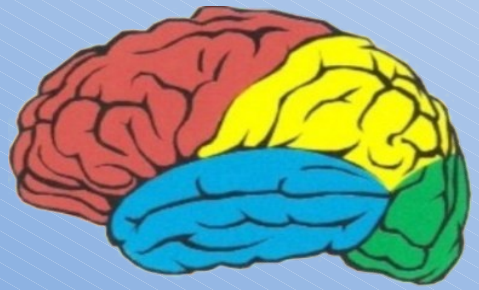
Only a few studies available that validate specific educational interventions for students with TBI

There is NO “BEST” Program or teaching method!!

However ….

If students are identified by
Functional Need
educators can connect needs with
Proven Teaching Strategies the
educators already are familiar with!

Brain STEPS



Brain Injury School Re-Entry Model Program

Brain Injury Association of Pennsylvania, Inc.

The Brain STEPS Program

- Funded by a Title V, federal Maternal Child Health Block Grant, from the PA Department of Health.

- Partnered with the PA Department of Education, Bureau of Special Education

- Implemented by the Brain Injury Association of Pennsylvania - September 2007

Brain Injury Association of Pennsylvania, Inc.

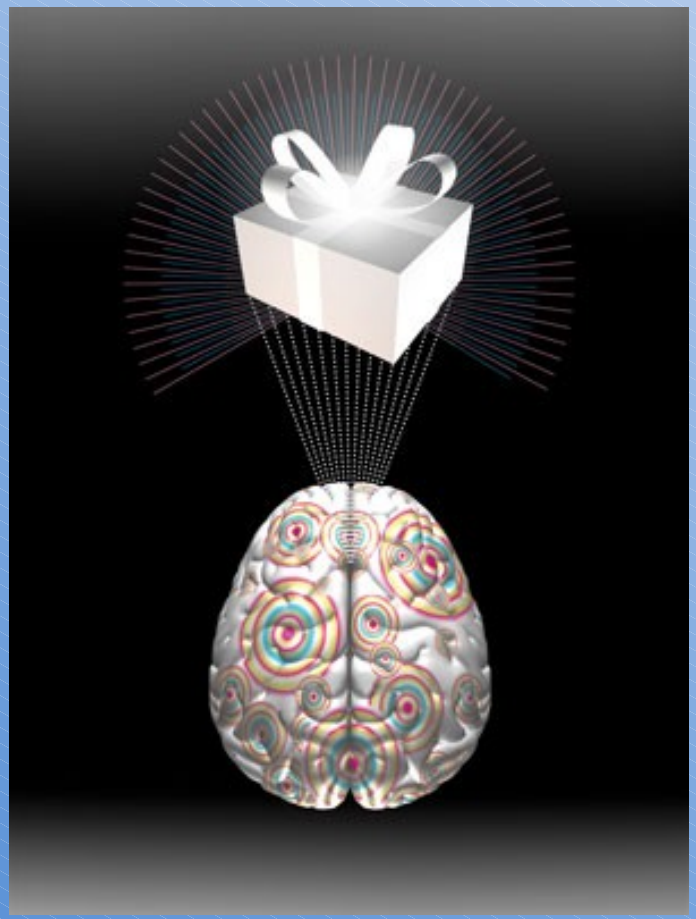
What is Brain STEPS?

- Brain injury consulting teams available to families and schools throughout Pennsylvania.
- Teams are extensively trained in the educational needs of students returning to school following brain injury.
- Teams will work with local school staff to develop educational programs, academic interventions, strategy implementation, and monitoring of students.

- Team members provide training and consultation regarding Brain Injury:
  - identification
  - school re-entry planning
  - IEP development
  - intervention selection & implementation
  - long-term monitoring

Brain Injury Association of Pennsylvania, Inc.

Pennsylvania's Brain STEPS Program is Considered a National Model for Brain Injury School Re-Entry!



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Team Membership

- Schools
- Educational Intermediate Units
- Medical Rehabilitation Centers
- Community Agencies/Institutions
- Families

Brain STEPS Encompasses Acquired Brain Injuries

- **Traumatic Brain Injuries –**

  an injury to the brain caused by an external force

- **Non-Traumatic Brain Injuries –**

  an injury to the brain caused by an internal force

Acquired Brain Injuries only occur AFTER the birth process.

Brain STEPS Objectives

1. Increase awareness of children and youth with brain injury who are served by the school system

2. Provide training and technical assistance to schools, families & rehabilitation providers in early identification of children with brain injury.

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Brain STEPS Objectives

3. Partner with PA brain injury hospitals & rehabilitation providers to promote effective communication & consistent contacts between providers and educators to facilitate successful transition

4. Ensure that brain injured students re-entering school & those previously identified receive appropriate educations

5. Explore & direct families to community resources

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Brain STEPS Objectives

6. Participate in the student's Regular or Special Education planning process.

7. Offer consistent ongoing consultation with teachers regarding educational program & strategies.

8. Train educational professionals on brain injury effects when a student in their school has been identified

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Brain STEPS Team Members (2008-2009 School Year):

190

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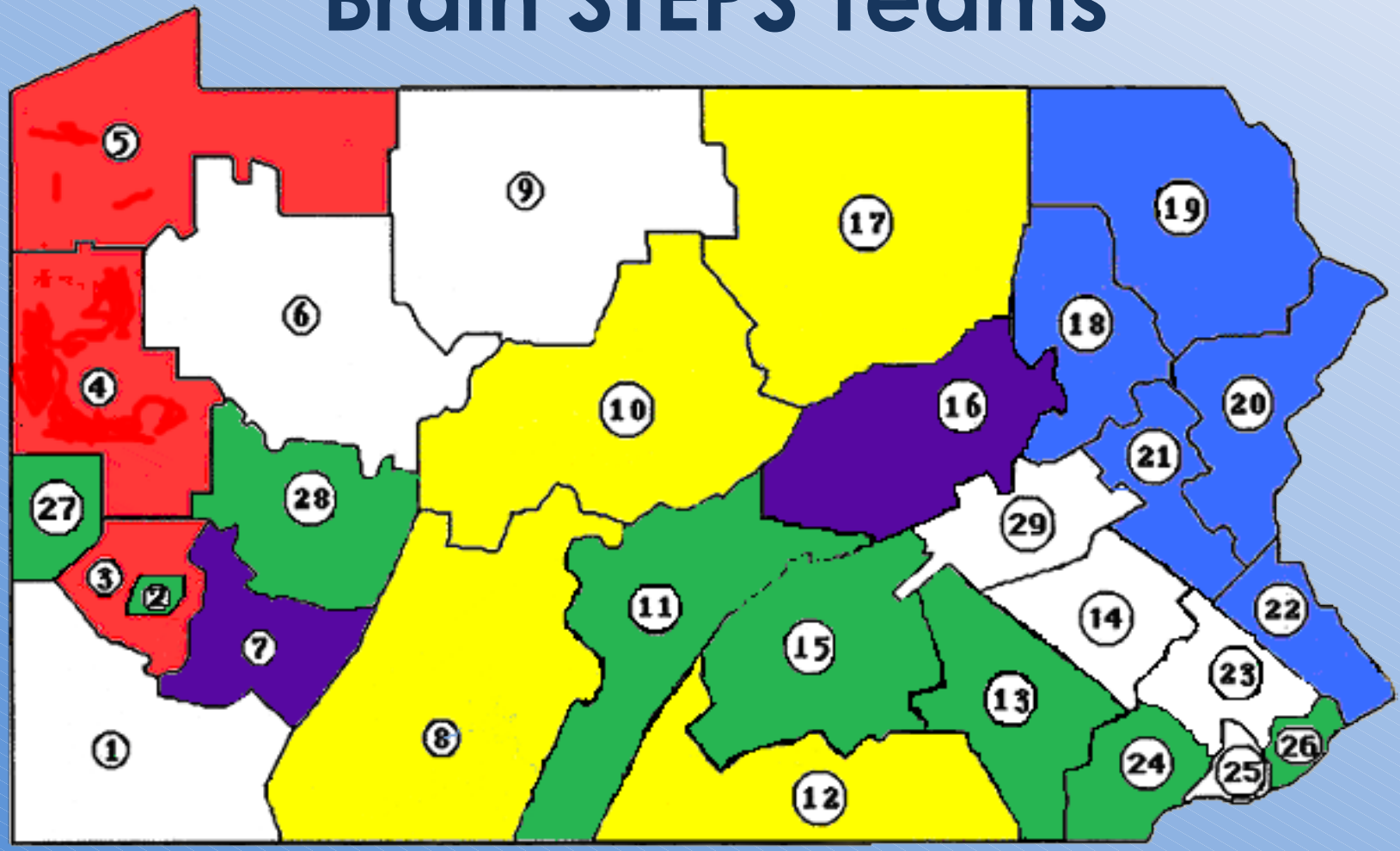
Over **400** student consultations were performed by Brain STEPS Team Members during a 7 month period in 2008.

Brain Injury Association of Pennsylvania, Inc.

The teams presented throughout their regions on "Brain Injury & School" reaching a total of over **2,300** professionals between March – December 2008

Brain STEPS Teams



Red, Yellow, Blue, Green = Trained & Functioning Brain STEPS Teams

Purple = Teams will Train During Fall 2009

Brain Injury Association of Pennsylvania, Inc.

Brain STEPS TEAM CONTACT LIST 2008-2009

When a child who attends a Pennsylvania public school has experienced educational effects following a brain injury, locate their county of residence and contact the coordinating Brain STEPS Team.

For General Information about the Brain STEPS Program Contact:

Brenda Eagan Brown, M.S.Ed., CBIS, Program Coordinator
Brain Injury Association of Pennsylvania
Email: eaganbrown@biapa.org
Phone: 724-944-6542

Intermediate Unit or School District Team	Pennsylvania Counties Served by Brain STEPS	Brain STEPS Team Leaders	Referral Phone Number	Referral Email Address
Allegheny IU #3	Allegheny	Kristen Haynes Erin Peterson	412-394-5787 412-394-5807	kristen.haynes@aiu3.net erin.peterson@aiu3.net
Midwestern IU #4	Butler Lawrence Mercer	Susan Black	724-458-6700 x253	susan_black@miu4.k12.pa.us
Northwest Tri-County IU #5	Crawford Erie Warren	Annette Eccles	814-734-5610 x8459	annette_eccles@iu5.org
Appalachia IU #8	Blair Bedford Cambria Somerset	Carol Hoover Mike Brink	814-940-0223 814-262-7392 x307	choover@iu08.org mbrink@iu08.org
Central IU #10	Centre Clearfield Clinton	Jeff Holter	814-342-0884	jholter@ciu10.org
Tuscarora IU #11	Fulton Huntingdon Juniata Mifflin	Mary Whittaker-Meyers Erin McManamon	814-542-2501	mmyers@tiu11.org emcmanamon@tiu11.org
Lancaster-Lebanon IU #13	Lancaster Lebanon	Anita Heller Anne Hohenwarter	717-606-1713 717-394-1252	anita_heller@iu13.org annehh@acadiarehab.com
BLaST IU #17	Bradford Lycoming Sullivan Tioga	Mark Nevill	570-323-8561	mnevill@iu17.org
Lincoln IU #12	Adams Franklin York	Lincoln Intermediate Unit 12 Brain STEPS Referral Phone Line	1-888-487-1544 x5067 717-624-4616 x5067	
Canton School District	Bradford	Alison Polly	570-673-3983	apolly@canton.k12.pa.us
Capital Area IU#15	Cumberland Dauphin Perry Northern York	Ann Hoffman Elizabeth Panek Rich Billings	717-732-8400 x8584 x8670 717-531-7306	ahoffman@caiu.org epanek@caiu.org rbillings@caiu.org

Brain Injury Association of Pennsylvania, Inc.

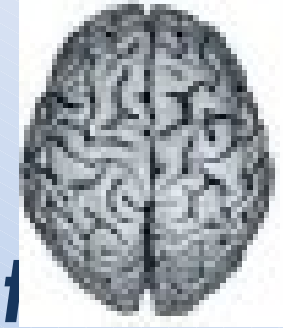
What Can You Do?

1. Ensure that EVERY child diagnosed with a BRAIN INJURY is referred to the Brain STEPS Team in your region.

1. If you are in an IU region without a Brain STEPS team, help us partner to form one for this fall 2009.

Brain Injury Association of Pennsylvania, Inc.

MARK YOUR CALENDARS!!!



PaTTAN's "Low Incidence Institut

Aug. 3-6, 2009

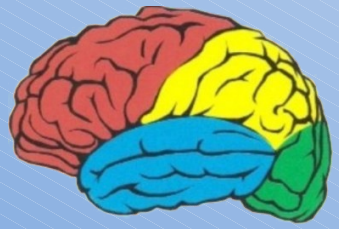
Traumatic Brain Injury!

1. **Dr. Jeannie Dise-Lewis**, author, Brain STARS Manual
   Monday, Aug. 3, PM and All Day Tuesday, Aug. 4, 2009

1. **Dr. Gerry Gioia**, world renowned pediatric neuropsychologist and expert - Concussions/School
   Wednesday, Aug. 5, 2009 ALL DAY

3. **MAPS/PATHS Inclusion Facilitation-Teaming Process!**
   Thursday, Aug. 6, 2009 ALL DAY

Brain Injury Association of Pennsylvania, Inc.



For More Information on the Brain STEPS Program

Contact:

Brenda Eagan Brown, M.S.Ed., CBIS
Program Coordinator
Brain STEPS
Brain Injury School Re-Entry Program
Brain Injury Association of Pennsylvania

Phone: 724-944-6542
Email: eaganbrown@biapa.org

Brain Injury Association of Pennsylvania, Inc.

Brain Injury Association of Pennsylvania

1-866-635-7097
Toll Free Brain Injury Resource Line

www.biapa.org

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