

Developmental Stages and Brain Injury

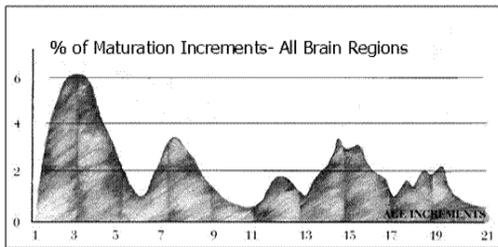


Developmental Stages

- Brain injury disrupts normal process of development
- Abilities that are just emerging are most susceptible to disruption
- These tend to be weak areas beyond childhood
- Skills and abilities learned at one stage of development provide foundation for skills learned at later stages
- Knowledge of age of injury can assist in understanding and implementing interventions

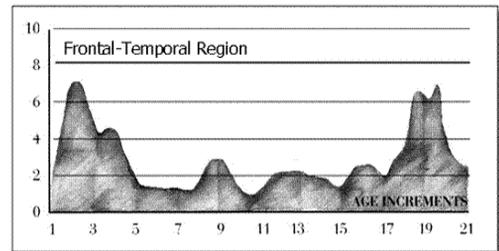
BrainSTARS, Dise-Lewis, J., 2002.

Percent of Maturation Increments-All Brain Regions



Savage, 1999

Brain Maturation Frontal Lobe



Savage, 1999

Developmental Stage: Infancy (Birth–3)



- Refinement of sensory and motor systems
- Language acquisition
- Basic understanding of cause and effect
- Regulation of sleep-wake cycles
- Beginning awareness of self and others
- Emotions and emotional regulation

BrainSTARS, Dise-Lewis, J., 2002.

Impacts of ABI During Infancy

- Poor self-regulation
- Slow language development
- Difficulty with toilet training
- Limited understanding of cause and effect
- Impulsivity
- Uninhibited behaviors (e.g. biting, hitting)
- Difficulty with transitions
- Sleep/wake cycles impacted



BrainSTARS, Dise-Lewis, J., 2002.

Interventions: Infancy (Birth–3)

- Establish routines to create understanding of cause effect relationships
- Maintain a calm and predictable environment
- Label emotions and teach self-calming routines
- Teach functional behavior routines

BrainSTARS, Dise-Lewis, J., 2002.

Developmental Stage: Preschool (3-6 years)



- Sensory well developed
- Ability to understand cause-effect
- Ability to see another person's perspective
- Ability to accept change in plans
- Ability to judge right from wrong
- Ability to inhibit aggressive behavior
- Development of friendship skills
- Gain understanding of preschool concepts

BrainSTARS, Dise-Lewis, J., 2002.

Impacts of ABI during Preschool

- Poor understanding of cause-effect
- Delay or regression in toilet training
- Impulsiveness
- Emotional regulation
- Rigid thinking
- Difficulty with change, temper tantrums
- Aggressive behaviors (e.g. kicking, hitting)
- Poor acquisition of preschool concepts



BrainSTARS, Dise-Lewis, J., 2002.

Interventions: Preschool (3-6 years)

- Teach the child to stop and calm down before acting
- Provide continuous structure and adult support
- Schedule daily activities and increase predictability
- Provide assistance to get through transitions

BrainSTARS, Dise-Lewis, J., 2002.

Developmental Stage: Elementary School Years (6-12 years)

- Understanding of multiple cause-effect relationships
- Mastery of academic skills, including strategies for new learning and memory
- Development of self-image (e.g. hard worker, smart, good friend)
- Good social skills
- Ability to work with others as a team



BrainSTARS, Dise-Lewis, J., 2002.

Impact of ABI during Elementary Years

- Academic difficulties, especially with new learning
- Uneven performance ("good days and bad days")
- Difficulties with organization
- Mental inflexibility
- Impulsivity
- Difficulty reading social cues
- Behaviors during unstructured times
- Social isolation/withdrawal from peers

BrainSTARS, Dise-Lewis, J., 2002.

Interventions: Elementary School Years (6-12 years)

- Recognize that problems are not reflective of a child's motivation, effort or desire to change
- Reduce the complexity of life and the number of demands your child needs to meet
- Create functional, context-based, multisensory learning experiences to increase comprehension and reduce the impact of specific cognitive deficits on learning

BrainSTARS, Dise-Lewis, J., 2002.

Interventions: Elementary School Years (6-12 years)

- Reduce amount of coursework and homework to fit a reasonable, preset time limit
- Involve the child in a structured activity, group, club, or individual (as opposed to "team") sport

Developmental Stage: Early Adolescence (12-16 years)

- Ability to consider many aspects of a problem simultaneously
- Development of abstract reasoning
- Ability to plan and organize complex projects
- Ability to learn new information independently
- Maturing social skills



BrainSTARS, Dise-Lewis, J., 2002.

Impact of ABI during Early Adolescence

- Difficulty with summarizing, planning, organizing
- Uneven cognitive skills, learning deficits
- Rigid, inflexible thinking
- Judgment and reasoning difficulties
- Uncertainty about self and abilities
- Dependence on others
- Withdrawal from peers, limited socialization

BrainSTARS, Dise-Lewis, J., 2002.

Interventions: Early Adolescence (12-16 years)

- Provide opportunities to talk with nonfamily members about the emotional impact of the injury
- Conduct a comprehensive evaluation of cognitive strengths and weaknesses to adequately understand the sources of learning difficulties
- Create accommodations necessary for school and social success
- Increase structure in the environment

Interventions: Early Adolescence (12-16 years)

- Limit homework assignments
- Increase communication between home and school regarding assignments, tests, and upcoming topics
- Use videos, movies, picture books, and field trips to create context and familiarity with new school topics
- Identify clear roles and responsibilities at home

BrainSTARS, Dise-Lewis, J., 2002

Developmental Stage: Late Adolescence (16-19 years)

- Complex reasoning and judgment
- Ability to create and accomplish goals independently
- Sense of personal identity
- Development of vocational plans and goals
- Sophisticated social skills
- Emancipation from home



BrainSTARS, Dise-Lewis, J., 2002.

Impact of ABI during Late Adolescence

- Rigid thinking
- Slow processing speed
- Difficulty attending to complex situations
- Difficulty identifying important part of problem
- Poor decision-making and judgment
- Poor organizational skills
- Social awkwardness
- Defensiveness regarding cognitive difficulties
- Depression

BrainSTARS, Dise-Lewis, J., 2002

Interventions: Late Adolescence (16-19 years)

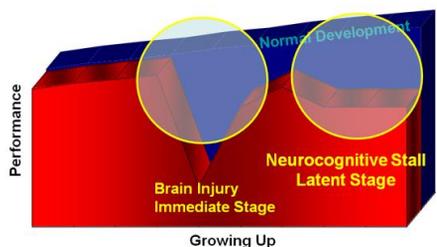
- Recognize the rippling effects of the injury on personal, emotional, and social life
- Identify roles and responsibilities within the competence of the adolescent
- Provide a forum for expression of feelings and exploration of coping skills
- Clarify the nature of learning difficulties

Interventions: Late Adolescence (16-19 years)

- Reduce course load, tailoring coursework to student's strengths
- Waive grade point average requirements for participation in school sports
- Provide a counselor or other professional at school for the student to check in with on a daily basis

BrainSTARS, Dise-Lewis, J., 2002

Pediatric TBI: Two Stages of Recovery



(Chapman, 2007)