Brain Development and Adolescent Mental Health: *Implications for Juvenile Justice*

MARILYN B. BENOIT, M.D., FAACAP
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Goals of Presentation

• Overview of Adolescent Developmental Goals.
• Brain Development: optimal and disordered.
• What this means for youth in JJ system.
• What we can do.
Adolescent Development

• Passage towards adulthood which leads to:
  – Identity consolidation
  – Self efficacy
  – Self agency
  – Autonomy
  – Development of significant intimate relationship
What Mentally Healthy Adolescents look like:

- Flexible emotional regulation
- Pro-social behavior
- Empathy
- Sense of well-being and self-esteem
- Coherent “life-story”

Siegel, D.
Maria Montessori wrote about a child’s experience of the environment:

“These impressions not only penetrate the mind of the child, but they form it. They become incarnated, for the child makes his own mental flesh in using the things that are in his environment. We have called this type of mind the absorbent mind and it is difficult for us to conceive the magnitude of its powers.”
From IOM’s *Neurons to Neighborhoods*

- “The purpose of a brain is to store, use, and create information.”
- Humans acquire information primarily from experience, including their systems for thinking, feeling and communicating.
From IOM’s *Neurons to Neighborhoods*

- New experiences trigger new brain growth and this is how memories, knowledge and learning takes place across the life span.
- Genes and environment have delicate interplay (nurture/nature).
- Relationships provide critical transactional variable.
From IOM’s *Neurons to Neighborhoods*

- All children are born wired for feelings and ready to learn.
- Early environments matter.
- Nurturing relationships are essential.
- Concepts of sensitive periods and developmental plasticity.
Mental Health as Social-Emotional Intelligence

• Gardner describes emotional intelligence as “the capacity to discern and respond appropriately to the moods, temperaments, motivations and desires of other people.”
Mental Health as Social-Emotional Intelligence (Valliant)

• “The benefits of being able to read feelings from non-verbal cues have been demonstrated in almost a score of countries. These benefits include being better emotionally adjusted, more popular, and more responsive to others. Empathic children, without being more intelligent, do better in school and are more popular with their peers.”
Neuroscience Insights Cont’d

• Large amount of brain dedicated to social-emotional tasks.

• Different systems do not necessarily grow “in sync.”
Mental Health as Social-Emotional Intelligence (Valliant)

• Criteria for social-emotional intelligence:
  – Accurate conscious perception and monitoring of one’s own emotions.
  – Modification of one’s emotions so that their expression is appropriate. This involves the capacity to self soothe anxiety and to shake off hopelessness and gloom.
  – Accurate recognition of and response to emotions in others.
Mental Health as Social-Emotional Intelligence (Valliant)

• Criteria Cont’d:
  – Skill in negotiating close relationships with others.
  – Capacity for focusing emotions (motivation) on a desired goal. This involves delayed gratification and adaptively displacing and channeling impulse.
Insights from Brain Research

- Frontal lobe rapid growth ages 3 to 6: attention, vigilance, alertness.
Insights from Brain Research Cont’d

• Temporal/parietal lobes ages 7 to 15 rapid growth with focus on language and mathematics.
Cerebellar Development for 145 Children and Adolescents (Ages 4-22) Based on 243 Brain MRI Scans

Graph showing the percentage of adult total volume relative to age for different brain regions:
- Total Brain
- Cerebellum
- Frontal
- Temporal
- Parietal

Key:
- Peak
- Cerebellum vs. Other Peaks:
  * < .002, ** < .0001
Brain development during Adolescence

- Concept of adolescence as “Second Chance.”
- Significant neural maturation takes place during puberty and into late adolescence.
Adolescent Brain Development

- Frontal lobe structures highly affected throughout adolescence and involve:
  - regulation of affective behavior
  - cognitive/emotional link leading to self-control
Insights from Brain Research Cont’d

- Frontal lobe from age 16 to 20 undergoes dendritic pruning with focus on self control, planning, behavior regulation.
Brain Development in Healthy Children and Adolescents: Longitudinal and Cross-Sectional Data (243 Scans from 145 Subjects)

Frontal Gray Matter

Age in years

Volume in
Executive Functions

- Organizing
- Prioritizing
- Planning
- Utilizing working memory
- Accessing recall
- Focusing
- Work Initiation
- Sustaining a task

- Shifting attention (transitioning)
- Regulating alertness
- Pacing oneself (time management)
- Managing frustration
- Modulating emotions

Brown, T. CHADD Attention Feb. 2003
Role of Stress

• Small amounts have neutral effect on memory.
• Moderate amounts facilitate memory.
• Large amounts overwhelm the system and impair memory.

Seigel, 1999
Brain Development & Early Trauma

- Amygdala and role in fear arousal.
- High arousal and its effect on logical thinking and decision making.
Risk Factors In JJ Youth

- Dorothy Ortnow Lewis reported increased incidence of learning disabilities in juvenile detainees.
- Also increased rates of head trauma in their histories.
RISK FACTORS OF NEGLECT & ABUSE

- Head trauma
- Traumatic separations
- Attachment difficulties: “The disruption of attachment is itself a primary form of trauma, which may intensify the effects of other stressors, particularly if disruption occurs at critical stages of development.” (Bowlby, 1973)
RISK FACTORS

• Regulation problems (sleep, impulse control, affect regulation, behavioral regulation).

• Psychosocial stress *in the first two years of life* may have an enduring negative effect on children’s brain development, emotional regulation, and social development.

• Stress has suppressive effect on hippocampal neurogenesis (*this may at some point be irreversible*).
• “The most debilitating disturbances in self-esteem are those resulting from childhood trauma, particularly repetitive traumatization in an abusive family.”

Elizabeth Waites in *Trauma and Survival* 1993
Northwestern Juvenile Project

- 66% of males and 75% females met diagnostic criteria for one or more psychiatric disorders.
- Most common disorders were substance use disorders and disruptive disorders.
Psychiatric Outcomes

- Developmental disorders
- Reactive Attachment Disorders
- ADHD; ODD
- PTSD
- Dissociative Disorders
Psychiatric Disorders Cont’d

- Mood disorders
- Anxiety disorders
- Impulse control disorders
- Narcissistic problems
- Personality disorders
Psychiatric illnesses are BRAIN BASED DISORDERS.
From IOM’s *Neurons to Neighborhoods*

- Safe and nurturing environments promote healthy physical, cognitive, linguistic, social, emotional, and moral development.
- *We should integrate above in designing juvenile detention centers for our troubled youth.*
Helping Kids with Mastery

- Provide a sense of Safety
- Focus on the positive
- Start with success
- Consistency
- Rituals
- Predictability
- Secondary relationships that endure
• The Juvenile Justice system was initially intended to rehabilitate “wayward youth.”
• Given the high prevalence of psychiatric disorders in the JJ population, it is imperative that each detainee be screened for psychiatric illness.
• We should have our policies driven by science, not by political whims.