**BABY BLUES** / by Rick Kirkman & Jerry Scott

**Panel 1:**
- Zoe, if you're finished eating, bring your dishes to the sink!
- Okay!

**Panel 2:**
- Thank you, sweetheart! Very good!

**Panel 3:**
- See how much fun it is when you help?
- Wheee...
Purpose

- Give an overview of brain development
- Describe effects of stress on development
- Review decision-making process
- Discuss the developing brain and decision-making
- Review some research-based guidelines for working with children in a court context
Brain Development

- Brain achieves approximately 80% of its adult weight during first 2 yrs of life

- By age 5, brain is 90% of adult size

- Brain continues refining itself throughout life, especially through adolescence
Brain Cell Functions and Changes

**Neurons:**
- Specialized cells
- Receive, process, and transmit information
- Establish neural pathways for communication which makes thinking easier
- Pathways become stronger with practice
- Pathways that are not used are “pruned” out (or eliminated)
- Pruning continues through middle adolescence
Brain Development, continued

- **Myelination:**
  - Insulates axons
  - Enhances communications between neurons
  - Important indicator of functional brain development
  - Occurs into adolescence
  - Improves cognitive functioning
In the synapse, or intersection between an axon and dendrite, neurotransmitters carry information from one neuron to another.
Importance of Stimulation

- **Stimulation is necessary for maturity of the brain**

- **Lack of stimulation (as seen in neglected children) may cause deficits in:**
  - cognitive abilities
  - language abilities
  - information processing abilities
  - understanding and controlling emotion
Corpus Callosum

- Important for integration of information from both sides of the brain
- Believed to develop from infancy through adolescence
  - Makes it very vulnerable to stress
- Increase in size due to ongoing myelination
  - If myelination is impaired due to stress hormones, thinking will likely be slower, inefficient
Without integration of the two sides, social/emotional perceptions could not be combined with logical thought, etc.
Stress and Trauma

- Stress causes brain growth patterns that diverge from ordinary trajectories.

- In general, the more rapid development is, the more vulnerable the brain is.

- High stress during active development can lead to:
  - Neural loss
  - Impairments in mylenation and pruning
  - Pathological emotion and cognitive functioning
The Stress Response System

- Activated when threat is perceived
- Mobilizes resources
- Action
- Reduction of stimulation

- *Chronic* activation of the stress system can lead to pathology
- Psychological stressors can activate the system;
Maltreatment and Chronic Stress

- Increases learning and expression of fear
- Decreases ability of the prefrontal cortex to control fear-related responses
- Stress-related alterations may impair ability to distinguish between threatening and safe environments
Brain Structures
Affected by Stress

- **Lymbic System**
  - Involved in stress response and emotion
  - Portions function with prefrontal cortex
  - Portions still actively developing in early adolescence
  - Consider 3 parts of the limbic system:
    - amygdala, hippocampus, and hypothalamus
Structures in the Lymbic System

- **Amygdala**
  - Processing emotions and emotional memories, evaluating emotional significance or meaning, assessing threat
  - Identifying facial expressions; Damage may cause inability to identify facial expressions or respond to anger or fear
  - In some children, repeated trauma may cause: fear conditioning, hyperactive or under-controlled amygdala, hyper-sensitivity to fearful stimuli, inappropriate impulsivity or anxiety
  - Adults with a “normal” childhood are able to regulate amygdala more successfully because of more mature connections of amygdala to other parts of the brain
  - Chronic stress alters neural communications
Structures in the Lymbic System

- **Hippocampus**
  - Important in learning and memory (episodic & contextual)
  - Damage impairs ability to interpret and categorize incoming information
  - Vulnerable to stress because it develops over a long period
    - Contains large number of stress hormone receptors
    - Saturation of stress hormones may cause deficits in learning new things and memory function (adults)
  - Stress may cause a reduction in size of hippocampus
Structures in the Lymbic System

- **Hypothalamus**
  - Regulates autonomic functions like heart rate and blood pressure
  - Initiates stress response system
Prefrontal Cortex

- Another brain structure affected by stress
- Center for Executive Functioning skills
  - Attention,
  - working memory,
  - impulse control,
  - response selection,
  - planning,
  - reasoning,
  - decision-making,
  - coordinating messages from other brain areas
Prefrontal Cortex

- Involved in self- and emotional regulation

- Growth spurt begins at about age 4, begin to see results at about 5,6

- Uses emotional/social information from the limbic system to guide behavior

- Continues developing into early adulthood
Ventromedial Prefrontal Cortex

- The limbic system matures before the prefrontal cortex including the ventromedial part.

- With the limbic system in greater control (*more developed*) than the prefrontal cortex, adolescents are vulnerable to risky decisions.
Brain Functioning

- Though people of different ages may perform similarly on a task, different parts of the brain are being used to perform the task
  - Some are more efficient than others

- Different parts of the brain develop at different rates, important for thinking about developmental differences in behavior
Brain Development ↔ Cognitive Function

- Attention,
- sustained attention,
- selective attention,
- Shifting attention

*are inter-related constructs, but different*

*skills improve from 5 to 16 years*
Attention

- The ability to focus thought
- Attending is possible before age two
- Paying attention to just one thing is possible by age four
Sustained Attention

- Ability to focus over a period of time
- More difficult for children on tasks that are not self-initiated
- Ability to sustain attention varies over development and by task requirement
Selective Attention

- Ability to focus or sustain attention on relevant stimuli without becoming distracted by the irrelevant

- Around age 10, most children are able to attend to tasks without distraction from other stimuli
Shift Attention

- Ability to shift focus from one thing to another
- Shifting also involves inhibition and set shifting
Set Shifting

- Ability to follow a rule, then change to follow a contradictory rule—like in sorting

- The more complex the rules, the more difficult performance becomes

- Using rules that must be inferred, is rarely seen before adolescence
Inhibition

- Ability to suppress irrelevant or interfering thoughts, emotions, or behaviors in order to perform a task
- May involve stopping a response
- Controlling impulses, delaying gratification
Memory

Just a note

- Memory is poor in childhood
  - Dramatic improvement by age 10
  - Children need to be taught memory strategies

- Manipulation of information is more difficult than just remembering
  - Improved performance is related to maturity of brain regions, using different regions to complete tasks
Decision-Making

- Involves
  - Controlling thought to assess options systematically (elementary school)
  - Considering possible outcomes of options (middle adolescence)
  - Evaluating and keeping track of alternatives (early adolescence)
Emotion and Decision-Making

- We know that emotions are important for making good decisions.

- Emotions provide clues about what is happening in the environment, responses, and opportunities to adjust our behavior.

But what about regulation of emotions?
Emotional Regulation

- The ability to manage emotional arousal and meet social or personal goals
- Includes ability to identify and understand emotions

Understanding of emotions and Expression of emotions

Change with development
Through research we have learned:

- The older the child gets, the better the choices
- Children & adolescents seem to be more sensitive to frequency of punishment decision outcomes
- Children make better decisions when punishment is frequent
- Children first consider frequency of punishment, then magnitude of punishment
- Males seem to make better long-term choices, whereas females are more sensitive to punishment frequency
- Older children seem to have greater levels of awareness than younger
- Higher levels of awareness are associated with better choices
A Few Suggestions...
Things to consider...

- Children, especially adolescents, want a voice in the decisions that affect them.

- Children and adolescents need time to reflect and time to form a response.

- Language and vocabulary may still be developing—give them time to find their words.

- Maltreated or deprived children may have poor language skills and slower processing speed.
Assisting Children with Decisions

List options  *(be careful)*

Consider possible outcomes and *consequences*

Consider *likelihood* of outcome

Determine *value* of each outcome

*Combine* likelihood and value to identify best option

DON’T ask children to make adult decisions
Make sure you understand...
Also Consider

- The child’s emotional distress
- Watch facial expression and body language
- Pay attention to your own body language and expressions—many children who have been abused are hypersensitive to this
Maltreated children

- Maltreated or deprived children may have delayed or distorted emotional understanding and regulation.

- They may not have experience discussing their own emotions

- They may need assistance in identifying and discussing their emotions.
Very Young Children

- Between ages 3-6

- Able to sustain attention most easily when activities are *self-initiated*

- Sustaining attention in adult-oriented settings will be difficult, especially under stress
More for the Very Young

- May have a hard time differentiating between concepts (ex: home and mother)—explore the differences
- Limit options and discussion of those options
- Don’t underestimate the significance of punishment or consequences—be sure the child is not blaming himself for what has happened
Use Props with the Very Young

- Children’s books that explore feelings can help
- Have children draw their feelings
- Perhaps use puppets
- Do not suggest feelings that encourage them to agree with you
- Do not make them think a particular answer is right
- Use short and simple questions, open-ended
Middle Childhood

- Ages 7-12
- Stressful situations affect ability to filter irrelevant information
- Be sensitive to the complexity of the information they are processing
- Expect difficulty making inferences
- Take a break if a child seems overwhelmed
More for Middle Childhood

- May experience mixed emotions, but may not understand or be able to articulate them.
- Discussing specific incidents may help them understand their feelings better.
Preadolescence to Adolescence

- Asking about their future plans may give insight as to their capabilities to be realistic.
- Control of thought is difficult in emotional, complex, or stressful situations.
- Predicting the consequences of decisions and potential outcomes is still difficult, as well as making inferences based on past experiences.
- May be dealing with extreme mixed emotions.
Preadolescence through Adolescence

- Adolescents may need assistance identifying and verbalizing all the factors they are considering.

- Meet them where they are, try to understand their perceptions, feelings, and needs.

- Keeping a journal or writing a letter to their parents or to the judge may help them sort their feelings.
Also consider...

- Use open-ended questions
- Don’t ask more than one thing in a single question
- “What” questions allow more focus on specifics than “why” questions
- Be careful not to convey judgment or evaluation
- Don’t try to be their buddy or convey an egalitarian relationship—they may feel betrayed later.
Also...

- Consider ethical implications of exploring children’s feelings and thoughts of traumatic experiences outside of a therapeutic environment.

- Strategies for working with children are continually being refined as the research continues to advance.