Misdiagnosis of ADD – is it really what you think it is?

ROCHELLE MANOR PH.D.

The Dynamic Brain

Potential for Misdiagnosis of ADD:

- Attention Deficit Hyperactivity Disorder
- Sensory Processing
- Trauma reaction
- Learning Disorders
- Autistic Spectrum Disorders
- Bipolar
- Depression
- Anxiety
- Medical concerns

Criteria for Diagnosis of ADD

Six (or more) of the following symptoms of inattention have persisted for at least six months to a degree that is maladaptive and inconsistent with developmental level:

Inattention

- often fails to give close attention to details or makes careless mistakes in school work, work, or other activities
- Often have difficulty sustaining attention in tasks or play activities
- Often does not seem to listen when spoken to directly
- Often does not follow through on instructions or fails to finish schoolwork, chores, or duties in the workplace (not due to oppositional behavior or failure to understand instructions)
- Often has difficulty organizing tasks and activities
- Often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (such as schoolwork or homework)
- Often loses things necessary for tasks or activities (e.g., toys, school assignments, pencils, books, or tools)
- Is often easily distracted by extraneous stimuli
- Is often forgetful in daily activities

Criteria

Six (or more) of the following symptoms of hyperactivity-impulsivity have persisted for at least six months to a degree that is maladaptive and inconsistent with developmental level:

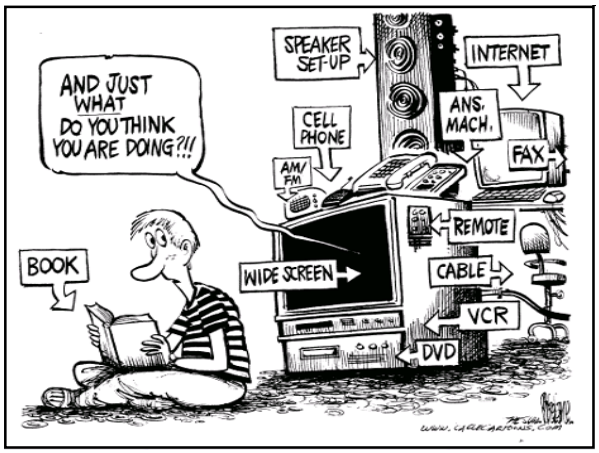
Hyperactivity

- Often fidgets with hands or feet or squirms in seat
- Often leaves seat in classroom or in other situations in which remaining seated is expected
- Often runs about or climbs excessively in situations in which it is inappropriate (in adolescence or adults, may be limited to subjective feelings of restlessness)
- Often has difficulty playing or engaging in leisure activities quietly
- is often "on the go" or often acts as if "driven by a motor"
- Often talks excessively

Criteria

Impulsivity

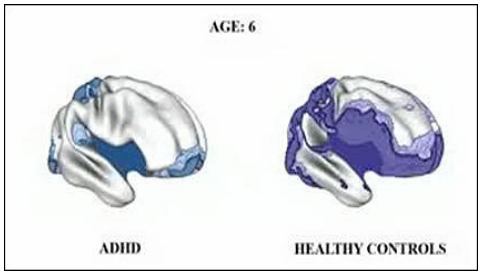
- Often blurts out answers before questions have been completed
- Often has difficulty a waiting turn
- Often interrupts or intrudes on others (e.g., butts into conversations or games)
- B. Some hyperactive-impulsive or inattentive symptoms that caused impairment were present before age 7 years.
- C. Some impairment from the symptoms is present in two or more settings (e.g., at school or work and home).
- D. There must be clear evidence of clinically significant impairment in social, academic, or occupational functioning.

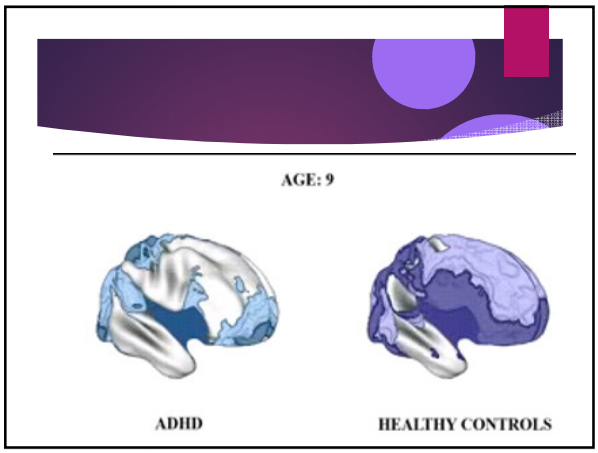


Neurology

- ADD is a Frontal Lobe Disorder
  - Focus – what's on your radar
  - Working memory
  - Sustained attention
  - Divided attention
  - Shifting set
  - Task persistence
  - Executive Functioning

ADHD is Different

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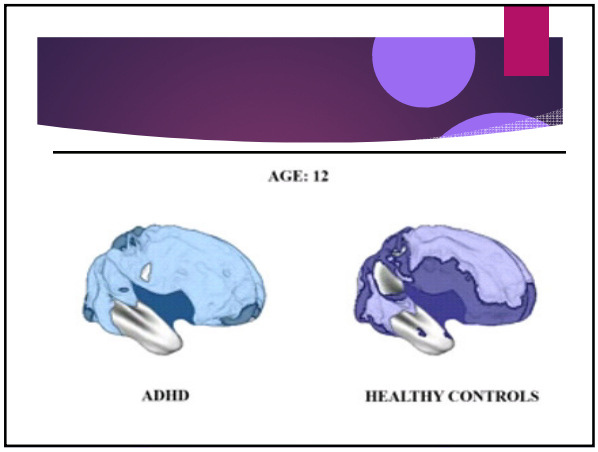
ADHD
HEALTHY CONTROLS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ADHD
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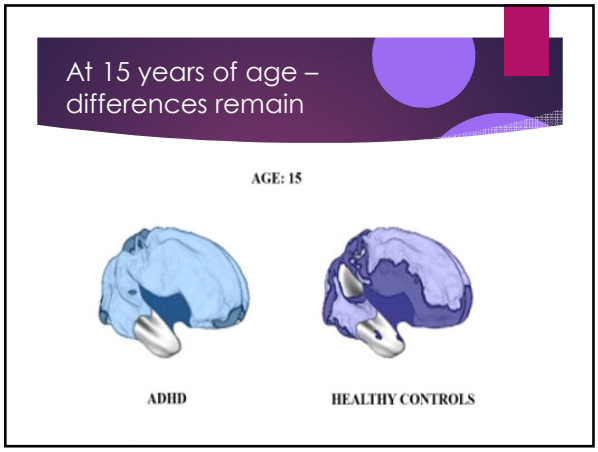

At 15 years of age – differences remain
AGE: 15
ADHD
HEALTHY CONTROLS

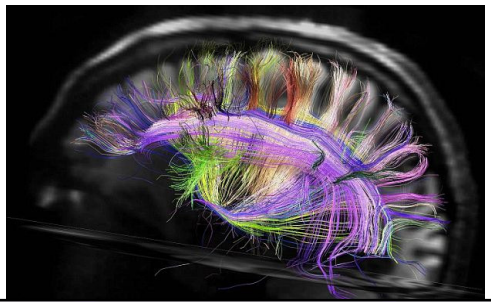
So: What Other Contributing Factors Lead to Difficulties?

- SPD was considered for inclusion in the Diagnostic and Statistical Manual V:
  - Sensory Processing disorder
    - Terminology: Sensory Integration Disorder, Regulation Disorder of Sensory Processing
      - These disorders seem to cause global challenges
    - Not to be confused with specific processing deficits that can be more clearly delineated
      - Visual or Auditory processing factors that contribute to specific areas of challenge

"Coming On-Line" – Regulation

- Sleep cycle
- Feeding/elimination – GI system
- Temperature regulation
- Tactile Processing
- Visual processing
- Auditory Processing
- Proprioceptive Processing
- Vestibular Processing

Orderliness of Axonal Connections



Sensory Integration

- Studied since A. Jean Ayres in 1972
- Many infants have trouble adjusting themselves to their environment (colic, sleep difficulties) but approximately 7% do not resolve with maturity.
- Self-regulation:
  - ability to console oneself
  - maintain attention
  - smoothly transition between different states.

Regulatory difficulties in infancy can be precursor of problems by 3 years of age

Degangi, Breinbauer, Roosevelt, Porges, & Greenspan (2000)

Infants with sleep, feeding, state control, self-calming, sensory reactivity, mood regulation, and emotional/behavioral control problems studied.

- At 36 months of age,--
  - 60% who had mild regulatory disorders as infants did not meet criteria anymore.
  - 95% of those with moderate regulatory disorders had delays in motor, language, and/or cognitive development. Parent-child relational problems.

Regulatory Disorders

- **Hypersensitivity**
  - fearful/cautious
    - excessively anxious, inhibited, and afraid
  - negative/defiant
    - persistent and controlling, difficulty making transitions, prefer repetition
- **Under reactivity**
  - withdrawn and difficult to engage
    - disinterested in toys, games, relationships
  - self absorbed
    - self absorbed in creative or imaginative play, escape into fantasy world, own sensations, thoughts, or emotions
  - repetitive behavior

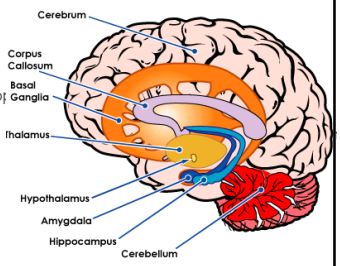
- **Motorically disorganized, impulsive**
  - impulsive pattern of behavior
  - poor behavioral control a long with craving for sensory input
  - some appear aggressive/fearless or impulsive/disorganized
- **Other**
  - infants who have sensory, sensory-motor, or processing difficulty but not a behavior pattern described in the domains above
- Note: Recent genetic information is identifying neuronal differences contributing to hypersensitivity in Fragile X – February 10, 2010: Critical Period Plasticity Is Disrupted in the Barrel Cortex of Fmr1 Knockout Mice
  http://download.cell.com/neuron/pdf/PIIS0896627310000504.pdf?intermediate=true

Neuroanatomical Factors

- Basal brain structures (not frontal) are typically involved in sensory deficits. As a result, thalamic relay to higher order areas of processing like the somatosensory cortex is errant.
- Medications for ADD are not commonly as effective
- Mood patterns vary depending on exposure to stimulus and provocation can be frequently stimulated with some predictability

Neuropathology

- Factors Involved
  - Basal Ganglia
    - Striatum
  - Thalamocortical Loo
  - Dopamine
  - Research underway involving the prefrontal cortex



Research from Proposal to Add SPD to DSM-V (March, 2008)

General Category		N	% Improved	% Worsened	% No Change
Stimulant	Adderall	36	25	64	11
	Ritalin	18	45	50	5
	Concerta	27	45	33	22
SSRI	Prozac	18	66	28	5
	Zoloft	15	80	13	7
SNRI	Stratera	21	39	19	43
α2 adrenergic agonist	Clonidine	19	53	21	26
Anti-psychotic	Abilify	11	64	18	18
	Risperdol	25	44	32	24
Psychotropic agent: dibenzothiazepine derivative	Seroquil	11	73	18	9

Forty seven percent of parents whose children were on medications felt that the medications had a deleterious effect (30%) or no effect (17%).

Delineating the Differences

ADHD

- Attention Deficits
  - Simple, Sustained, Divided
- Executive Functioning Deficits
- Symptoms present in multiple environments
- Treatment – typically responsive to medications

Sensory

- Inconsistent symptom presentation
- Attention may or may not be impaired
- Executive abilities are more commonly spared
- Treatment – medication typically not effective or only provide minimal response

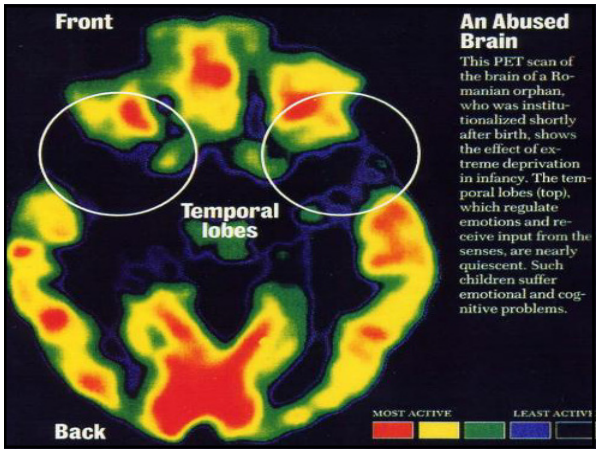
Right Brain Development & Attachment & Emotions

- The underpinnings for empathy, relationships, and emotions begin within the first 2 months of life.
- Over 500,000 children per year suffer "neglect"

Schore, A. (2005) Back to Basics: Attachment, Affect Regulation, & the Developing Right Brain, Pediatric Review 26; 204-217

But – What happens when there are issues with abuse or emotional trauma

- The Brain Changes in response to these conditions
  - Sometimes, tissue dies
  - Sometimes it does not develop the density or number of connections
  - there can be injury

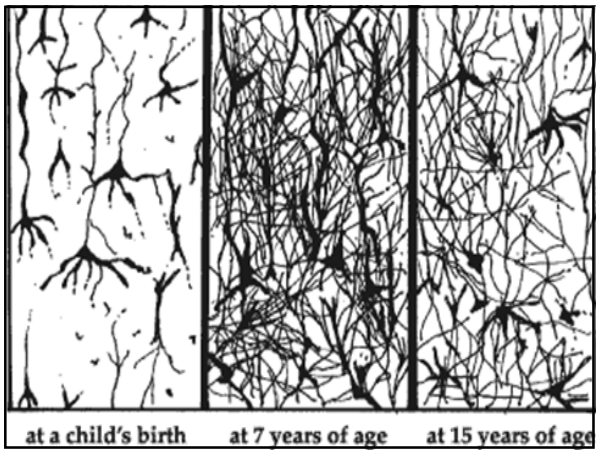


An Abused Brain

This PET scan of the brain of a Romanian orphan, who was institutionalized shortly after birth, shows the effect of extreme deprivation in infancy. The temporal lobes (top), which regulate emotions and receive input from the senses, are nearly quiescent. Such children suffer emotional and cognitive problems.

Life-long imprint

- By end of first year, imprint of right hemisphere is organized for non-conscious
  - reception,
  - expression,
  - communication,
  - regulation of emotion,
  - essential functions of social relationships.
  - Trust – empathy – moral development



U.S. Department of Health, Education and Welfare

10 Characteristics most associated with a Learning Disability

1. Hyperactivity
2. Perceptual-motor impairments
3. Emotional lability
4. General coordination deficits
5. Disorders of attention
6. Impulsivity
7. Disorders of memory and thinking
8. Specific learning disabilities
9. Disorders of speech and hearing
10. Equivocal neurological signs or irregular EEG

Learning Disabilities/Cognitive Impairment

Common Symptoms of LD

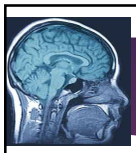
- Troubles being attentive in school
- Can become oppositional when challenged to complete class work
- Struggles with grades
- Increased prevalence of behavioral acting out
- Self-confidence can decrease
- Motivation can also diminish

Common Symptoms of CI

- Severe CI – typically identified
- Mild to Moderate CI – not always determined even into middle and possibly high school
  - Executive functioning deficits
  - Behavioral Dysregulation
  - Not learning concepts, but can be polite and seem to respond
  - Mood can vary from withdrawn/sad, anxious, or labile
  - Inconsistent response to interventions
  - Memory deficits

General Thoughts

- In Learning Disorders, higher level of cortical tissue is involved
  - In Sensory Processing Disorders – deeper brain structures are implicated before reaching higher levels – but they contribute to learning problems
  - ADHD implicates both higher level structures, but a general deficit in global brain maturation
  - Building blocks to learning disorders can be recognized before characteristics for LD can be diagnosed, but intervention, particularly when focal to weakness can be extremely useful



Head Injury

Emotional Symptoms

- Increased anxiety and/or depression
- Mood Swings
- Impulsive behavior/irritable
- Egocentric behaviors

Common Cognitive Symptoms

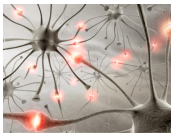
- Short or Long term memory loss
- Slowed information processing
- Trouble concentrating or attending
- Difficulty keeping up with a conversation; other communication
- Word finding problems
- Spatial disorientation
- Organizational problems
- Impaired judgment
- Trouble completing more than one thing at a time
- A lack of initiating activities, or once started, difficulty in completing tasks without reminders

Brain Injury Association of Michigan

Seizures:

Seizures

- Generalized
- Partial
  - Simple or Complex
- Absence seizures



Common Symptoms:

- Decreased short term memory
- Poor attention/concentration
- Can have verbal or visual memory deficits
- Disorientation pre or post event
- Executive functioning deficits
- Can be challenges with visual motor integration
- Learning struggles
- Mood lability/irritability

Sleep Deficits or Nutritional Deficits

The Brain

Without sufficient sleep and too much caffeine

[and he wonders why he could not take over the world]

Common Symptoms

- Easily fatigued
- Attention/concentration deficits
- Memory loss
- Slower processing speeds
- Performance declines in school or work
- Word finding struggles
- Difficulty with planning, organization, & executive functioning
- Poor mood control

Signs of nutritional deficiencies

- Irritability
- Anger/volatility/outbursts
- Mood and behavior changes
- Poor concentration/inattention
- Depression
- Anxiety

Signs of nutritional deficiencies

- Sleep disturbances
- Loss of appetite/food cravings
- Learning problems
- Frequent colds or illness
- Brittle bones, increased risk of injury, headaches, etc

Situational Factors

- Abuse/Neglect
- Financial Strain
- Peer relationships
- Drug/Alcohol
- Location of housing
- Family attitude about politics, learning, how to interact
- Church connections
- Cultural expectations

The person is Frustrated~

You get Frustrated~

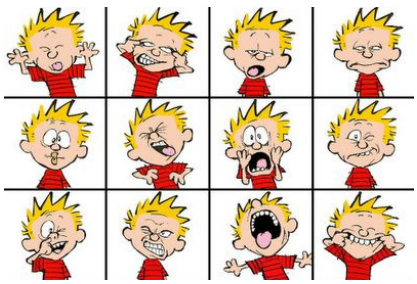
Children have an uncanny way of sensing adults' judgments, even if the adults don't express those judgments aloud.

And once children have sensed judgments, they internalize them as if they were facts.

Goal Directed Persistence

- May need to adjust plan, adjust action, adjust timeframe – but keep focusing on the goal

Remember: You sometimes don't know what you are going to get



Understanding "Behavior Problems"

- Remember ODD is extremely rare
- Dr. Stuart Ablon http://www.thinkkids.org/
- Dr. Ross Greene's site: http://www.ccps.info/index.html
- Treating Explosive Kids: The Collaborative Problem Solving Approach

What do we do and how to intervene?

- Accurate Delineation
  - Integrated Assessments
  - Put all the puzzle pieces on the table at one time

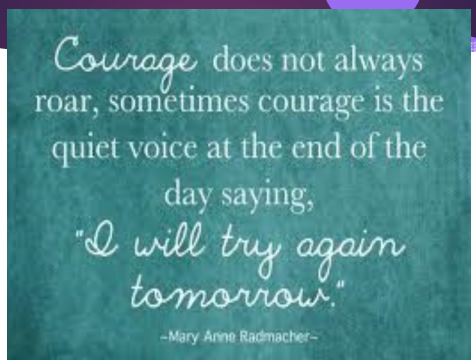
When students have positive ways to cope, they will use them.

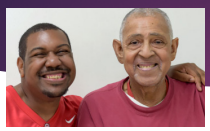
Maslow's Hierarchy
(decision tree for intervention)

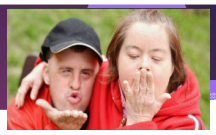
- Body – physical
- Social
- Success
- Achievement

Inside-Out and Outside-In

- Maximize brain functioning
  - Pharmacological
  - Neurofeedback
  - Sensory strategies
  - Teach specific skills
- Establish an environment where person can function
  - Accommodations
  - Visual cues/schedules
  - Supervision/monitoring
  - Productive activity







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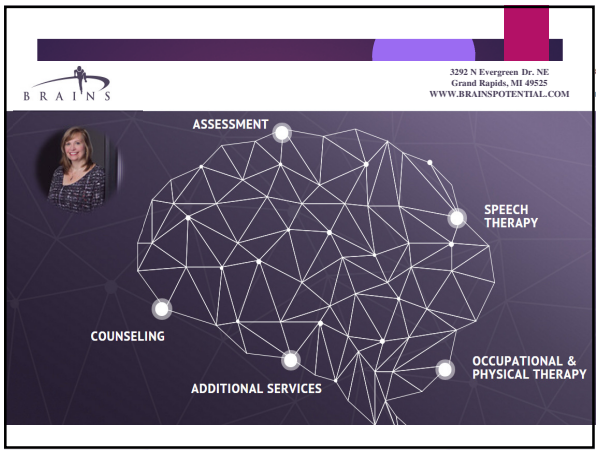
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3292 N Evergreen Dr. NE
Grand Rapids, MI 49525
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