

Sorting out ADHD and Autism: One, or the Other, or Both?

*Earl J. Soileau, MD, Adolescent Medicine Specialist,
LSU/Memorial Family Medicine Center, LSU School of
Medicine New Orleans, at Lake Charles, Louisiana*

jsoileau@lcmh.com

Disclosures

- No pharmaceutical company affiliations or support
- Assistant Professor LSU Health Sciences Center
- Some of the medications discussed may not be FDA approved in the manner in which they are discussed including diagnosis(es), combinations, age groups, dosing, or in context to other disorders (e.g. substance use disorders)

Learning objectives

- *Be more aware of the differences between Autism Spectrum Disorder and ADHD as well as a better understanding of their overlapping symptoms.*
- *Be more knowledgeable about the differences in response to various interventions in individuals with Autism Spectrum Disorder and ADHD and ways to provide optimal medical support*
- *Receive an overview of the effectiveness of various non medical therapies and modifications in this population in order to improve getting the best services for those with co-occurring Autism Spectrum Disorders and ADHD*

Autism Defined

- delayed and disordered language, impaired social interaction, isolated areas of interest, and an insistence on sameness in a spectrum of severities and content
- impairments in reciprocal social interactions; abnormal language development; and repetitive and ritualized behaviors (APA)

ADHD Defined

- Deficits in:
 - Sustained attention
 - Memory organization
 - Persistence in tasks
 - Filtering out distractions
 - Executive Function
 - Motor activity control
 - Impulse control
 - Others

Comparison

- Sometime executive function seems in overdrive – seem to be scheming to do something in their primary interest area or working out details in the background
- Motor activity control – clumsiness is common in ASD the mechanism is cerebellar, ADHD clumsiness appears to be from poor planning for movement, impulsive movement
- Impulse control in ASD appears more but is driven by the extreme desire to do or say something interesting to them, ADHD – say it now or forget it

Comparison

- Autism spectrum can hyper-focus but it's like borrowing focus from other areas. Struggle is to put aside primary interest thoughts and sustain focus on task at hand
- Very detailed memory organization for material that is highly interesting – where no interest, poor memory
- Can't stay focused but if mention one word in their primary interest area they will zoom in

Recurring theme

- Several in the literature have suggested that Autism Spectrum Disorders are on a continuum with ADHD
- There is much overlap in symptoms – at least what is observed although the cause of behavior and thought processing may be different in the two
- In higher functioning kids with ASD, ADHD may not be picked up and treated until later
- ADHD kids may have autism related symptoms that are impairing but may not be picked up until later

Co-occurring

- both disorders co-occur with a high frequency, with 20–50% of children with ADHD meeting criteria for ASD
- 30–80% of ASD children meet criteria for ADHD
- ADHD Study looking at ASD with ADHD sx: Parent, Teacher rating
 - Difficulty concentrating about 49 and 50%;
 - Easily distracted about 60 and 59%
 - Fidgets/wiggles/squirms, about 42 and 43%;
 - Overactive, 41 and 29%;
 - High energy level, 44 and 30%;
 - Short attention span, 54 and 47%. (AChild Adolesc Psychiatr Clin N Am. 2008 October ; 17(4): 713–vii)

Co-occurring

- 20–60 % of children with ADHD have ASD-like social difficulties
- Autistic traits are overrepresented in ADHD children when compared with control subjects.
- Presence of autistic traits in ADHD kids is associated with more severe psychopathology as well as more impaired interpersonal, school, family, and cognitive functioning.

Biologic Links Between ADHD and ASD

- Significant overlap of shared biological processes disrupted by large, rare copy number variants in children with ADHD and ASD. *J. Am. Acad. Child Adolesc. Psychiatry*, 2014;53(7):761–770.
- family and twin studies do provide support for the hypothesis that ADHD and ASD originate from partly similar familial/genetic factors



Company.



A crowd.



Crowd-ed.



Get
me out
of here!

Genomic Studies

- Found evidence for dysregulation in pathways governing cell number, cortical patterning, and differentiation in young autistic prefrontal cortex.
- In contrast, adult autistic prefrontal cortex showed dysregulation of signaling and repair pathways.
- Genes regulating cell cycle also exhibited autism-specific CNVs in DNA derived from prefrontal cortex, and these genes were significantly associated with autism in genome-wide association study datasets.

Genomics

- Our results suggest that CNVs (gene copy number variations) and age-dependent gene expression changes in autism may reflect distinct pathological processes in the developing versus the mature autistic prefrontal cortex.
- Hypothesis: that genetic dysregulation in the developing brain leads to abnormal regional patterning, excess prefrontal neurons, cortical overgrowth, and neural dysfunction in autism (this is not the case in ADHD)

PLoS Genet. 2012 Mar; 8(3): e1002592; J Dev Behav Pediatr 37:659–673,
2016

Medication Therapy for Autism

- Not very specific treatments
- Symptomatic treatment
- New treatments may be developed through neurophysiologic/neurotransmitter/imaging studies
- Treatment of associated or co-occurring conditions helps
- Often do not respond as expected

Medication Therapy for Autism

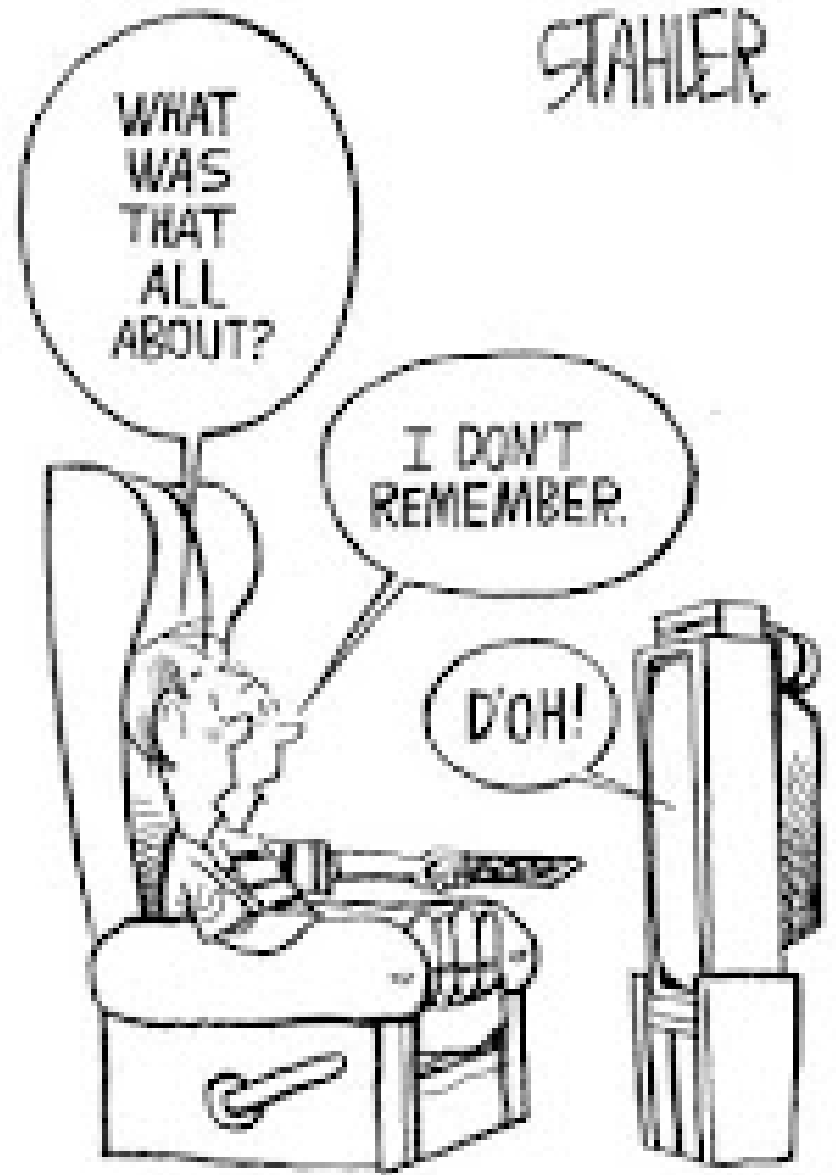
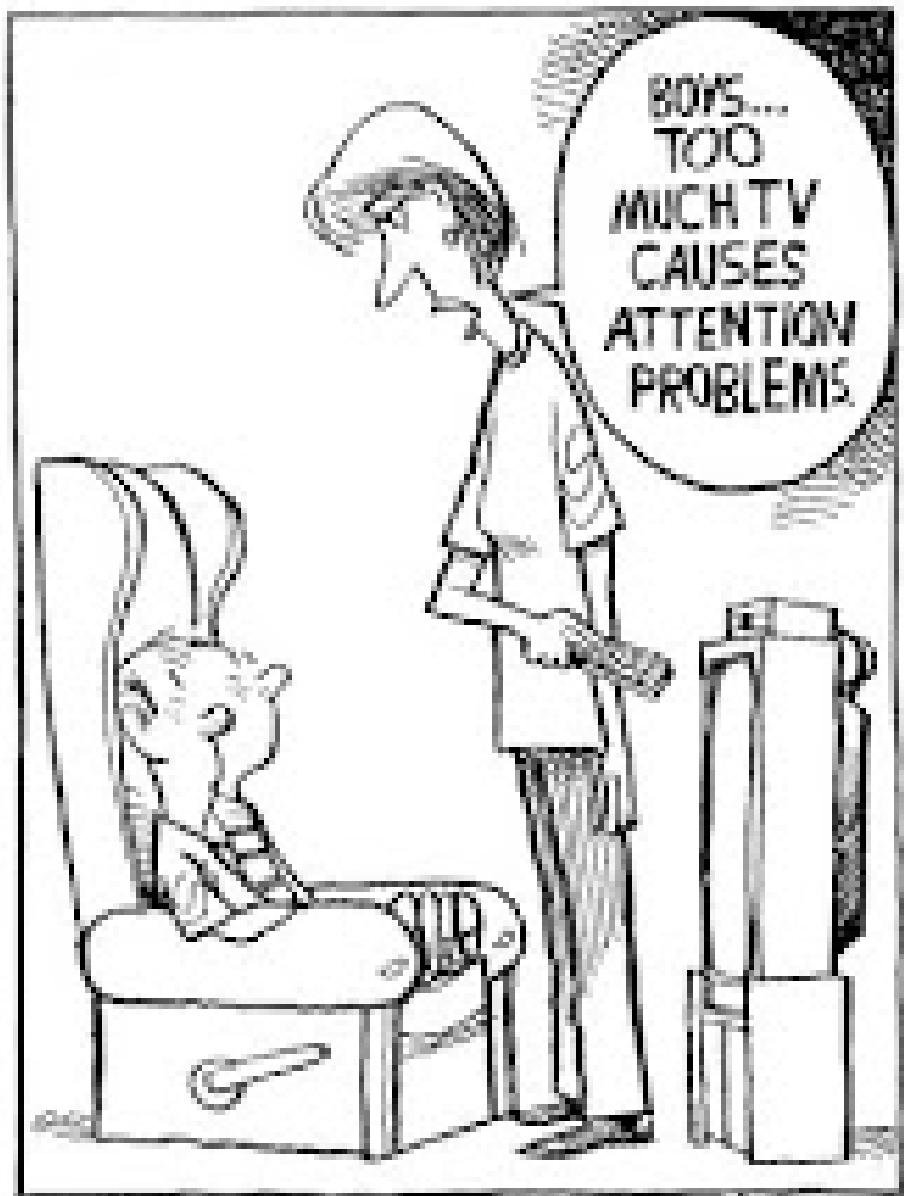
- Study of Arbaclofen on Fragile X and Autism Spectrum Disorder individuals – statistically no benefit but high benefit for a few
- Need to be able to separate out groups for whom medication is very specific and effective
- This research is in its infancy

ADHD Medical Treatment

- Specific to symptomatology and function
- Long history of successful interventions with medication
- They are very effective and target core symptoms
- Tend to help every area of symptomatology

Autism Associated Conditions

- 30 % with autism diagnosis in past would have seizure disorder some time in life, not for ADHD
- Some differences in immune modulation in autism being studied
- Some preventive associations are being studied – prenatal vitamin D, others?
- These are too early to give clear guidance
- No association has been shown to vaccination



LISTEN, THEY'RE ALL
THE SAME - IT'S OK
IF THEY TOUCH
EACH OTHER...



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Brain Overgrowth

- Head circumference at birth is normal in child with Autism compared with ADHD and typically developing child
- Head circumference at 2 years of age is 5-10% larger with frontal and temporal lobes being affected most, in general
- the typically-developing brain undergoes extensive dendritic arborization and active pruning of neuronal processes beginning about 2-2.5 years of age

Brain Overgrowth

- Insufficient synaptic pruning of connections between neurons would lead to an excessive number of synapses resulting in increased white matter.
- This may be part of the proneness to overstimulation in ASD
- This may be related to some of the hyper-focus, extreme detail learning of primary interest areas

how my brain works.



Physical Differences

- Head circumference tends to be bigger relative to height in ASD.
- Gray matter reduction in the cerebellum in ADHD is disorder specific relative to ASD whereas GM enlargement in the MTG/STG in ASD may be disorder specific relative to ADHD
- There are fMRI differences as well which are very specific, more research emerging constantly

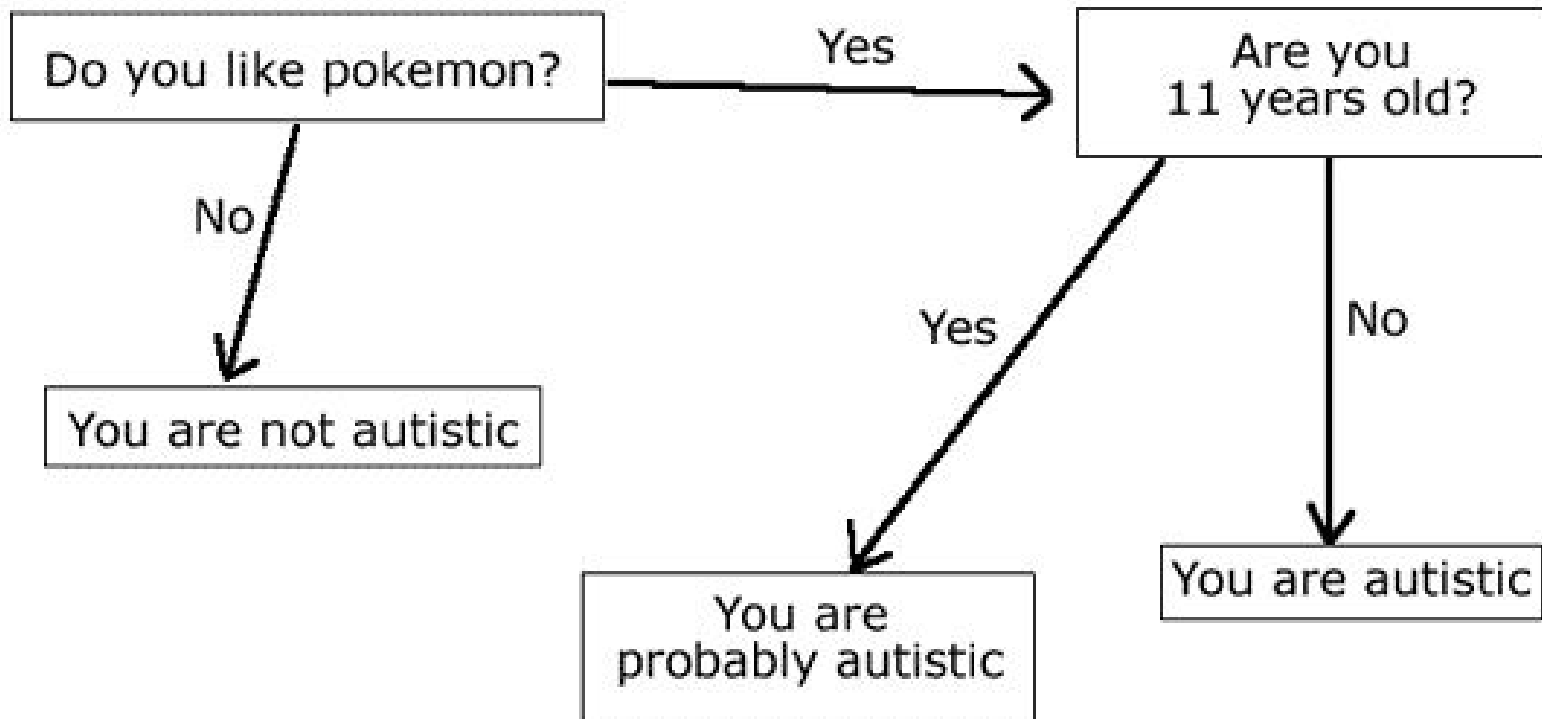
Intense World Theory

- proposed neuropathology is hyper-functioning of local neural microcircuits, best characterized by hyper-reactivity and hyper-plasticity. Such hyper-functional microcircuits are speculated to become autonomous and memory trapped leading to the core cognitive consequences of hyper-perception, hyper-attention, hyper-memory and hyper-emotionality.

Intense World Theory

- The progression of the disorder is proposed to be driven by overly strong reactions to experiences that drive the brain to a hyper-preference and overly selective state, which becomes more extreme with each new experience and may be particularly accelerated by emotionally charged experiences and trauma.
- The excessive reactivity and rapid memory formation of experiences boosted by an amplified emotional component may trigger the acceleration of brain maturation until the environment becomes painfully intense.
- treatment strategy is cocooning the autistic infant to protect from surprising situations

Autism Test



Sensory Over-responsiveness

- Children with SOR often react negatively to noisy or visually complex environments
- Bothered by tags or seams on their clothing
- May dislike being touched unexpectedly
- May not like hugs at all
- May not be able to look at bright lights
- It may be fine if it is their idea

Lance

- 13 years old in small private school
- Had social problems since school started in K or Pre K.
- Speech and Language Delay
- Some teasing at previous school
- Anger at home recently
- Brought gun to school and suicided in classroom as school beginning that day

Suicide in Autism

- ▶ 14% of children with autism 1–16 years had suicidal ideation or attempts. ▶ Demographic risk factors were male, ≥ 10 years, black or Hispanic, and lower SES. ▶ Depression, behavior problems, and teasing were associated with ideation and attempts. ▶ Autism severity or IQ did not alter the frequency of ideation and attempts. ▶ All children on the autism spectrum should be screened for ideation and attempts.

Unusual Fears

- More than half of children with unusual fears had fears of mechanical things, heights, and/or weather.
 - The most common unusual fear was fear of toilets, and the most common category was fear of mechanical things.
 - Many of the fears reported in our sample were described in children with autism 70 years ago by Kanner, including fear of vacuum cleaners, elevators, mechanical toys, swings, and the wind.
 - Children with autism perceive, experience, and react to the world differently than children without autism.
 - What is tolerable for most children (e.g., clouds in the sky, a change in activity or routine, sensory input, or a performance request) might be terrifying, distressing, or infuriating for a child with autism.
 - It is critical to assess for unusual and common fears in children with autism because they are present in the majority of these children, they further impair functioning, and effective treatment is available.

AUTISM

Persons with autism may possess the following characteristics in various combinations and in varying degrees of severity.



Inappropriate laughing or giggling



No real fear of dangers



Apparent insensitivity to pain



May not want cuddling



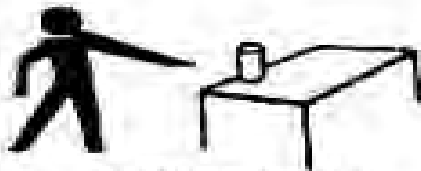
Sustained unusual or repetitive play; Uneven physical or verbal skills



May avoid eye contact



May prefer to be alone



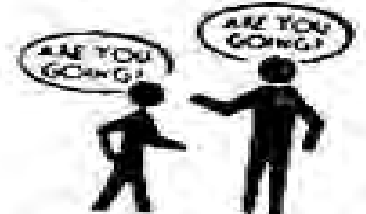
Difficulty in expressing needs; May use gestures



Inappropriate attachments to objects



Insistence on sameness



Echoes words or phrases



Inappropriate response or no response to sound



Spins objects or self



Difficulty in interacting with others

Kara

- Seems intelligent
- Sent for ADHD evaluation due to not doing well in school
- The school said not autistic at all, evaluated by autism specialist for the school system who agreed
- Got a zero on test the day before. Why did she get a zero?

Kara

- She answered the test in hieroglyphics
- They were accurate – mom had her explain the answers to her and it was accurate
- Did not like loud noises, commotion, tags
- Preferred doing things alone much of the time
- Misperceived social situations
- Over focus on certain subjects – Egyptian history and writing

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PRESSÉS ARE
ABOUT TO
ROLL.

BUT I'M
STILL
WRITING
MY
COLUMN!!

THE DAILY
SPHINX



Search: 365920762

ADHD vs. ASD

- Brain Gray Matter is larger in ASD vs ADHD individuals
- over 30% of children with high-functioning ASD met diagnostic criteria for ADHD and an additional 25% of them exhibited elevated ADHD symptoms ([Leyfer et al., 2006](#))

DSM 5

- **A. Persistent deficits in social communication and social interaction across multiple contexts, as manifested by the following, currently or by history**
- **B. Restricted, repetitive patterns of behavior, interests, or activities, as manifested by at least two of the following, currently or by history**

DSM 5

- Symptoms must be present in the early developmental period (but may not become fully manifest until social demands exceed limited capacities, or may be masked by learned strategies in later life).
- Symptoms cause clinically significant impairment in social, occupational, or other important areas of current functioning.

DSM 5 - Persistent deficits in social communication and social interaction

- 1. Deficits in social-emotional reciprocity, ranging, for example, from abnormal social approach and failure of normal back-and-forth conversation; to reduced sharing of interests, emotions, or affect; to failure to initiate or respond to social interactions.
- 2. Deficits in nonverbal communicative behaviors used for social interaction, ranging, for example, from poorly integrated verbal and nonverbal communication; to abnormalities in eye contact and body language or deficits in understanding and use of gestures: to a total lack of facial expressions and nonverbal communication.
- 3. Deficits in developing, maintaining, and understanding relationships, ranging, for example, from difficulties adjusting behavior to suit various social contexts; to difficulties in sharing imaginative play or in making friends; to abs

DSM 5 - Restricted, repetitive behavior, interests, or activities

- 1. Stereotyped or repetitive motor movements, use of objects, or speech (e.g., simple motor stereotypies, lining up toys or flipping objects, echolalia, idiosyncratic phrases).
- 2. Insistence on sameness, inflexible adherence to routines, or ritualized patterns of verbal or nonverbal behavior (e.g., extreme distress at small changes, difficulties with transitions, rigid thinking patterns, greeting rituals, need to take same route or eat same food every day).
- 3. Highly restricted, fixated interests that are abnormal in intensity or focus (e.g., strong attachment to or preoccupation with unusual objects, excessively circumscribed or perseverative interests).
- 4. Hyper- or hyporeactivity to sensory input or unusual interest in sensory aspects of the environment (e.g., apparent indifference to pain/temperature, adverse response to specific sounds or textures, excessive smelling or touching of objects, visual fascination with lights or movement).

Diagnostic Assessment for Autism

- Information gathering from parents, teachers or other caregivers
- Observation of behavior in order to evaluate presence of DSM 5 criteria
- Integration of the information above
- Planning for treatment
- Psychometric testing may be helpful but may be put off until more control has been obtained
- Medical history and physical evaluation to rule out physical causes or contributors
- Family history

Multiple Diagnostic Processes

- Autism Diagnostic Interview revised
- GARS (Gilliam Autism Rating Scale)
- CARS 2 (Childhood Autism Rating Scale)
- Many others
- Must look at the child and take the history
 - These are supposed to include personal observation but not sure this is adhered to
 - Not sure of the training of the evaluators at times

Diagnostic Assessment ADHD

- Information from observations of behavior by parents, teachers and the patient
- History of the condition with both behavior in the household, and academic function
- Family history
- General medical history and physical evaluation
- Psychometric testing is best held until improvement in function so artifact of untreated ADHD is not a problem

Autism and The Cerebellum

- It manages physical movement and fluidity
- Also, the cerebellum plays a role in
 - classic conditioned reflex responses,
 - mental imagery,
 - anticipatory planning,
 - aspects of attention,
 - affective behavior,
 - visual spatial organization
 - control of sensory data acquisition

Adaptation

- Adaptive functioning is generally impaired in both ASD and ADHD, but individuals with ASD show more severe impairments.
 - Social adaptation
 - Interpersonal adaptation
 - Schedule adaptation, shifting plans
 - Adapting to different expectations

Happy Camper by Anonymouse

Being as you have a problem with a short attention span, I'm going to send you to a summer camp that specializes in helping kids like you develop concentration skills.



Where's Billy?



I sent him to a concentration camp.



Carson

- 12 year old who has started home school two weeks ago because he could not tolerate school any more
- He began to cry in class and others teased him about it
- He cannot keep from telling others about what he knows
- He is very intelligent, has a generally very pleasant attitude

Carson

- Began to have panic attacks related to the difficulty he was having with relating to others
- When demonstrating how to correct over-breathing he could not accept that chest breathing is not functional
- Black and white, all or none orientation
- Full body tremor and panic attacks
- Reads constantly and absorbs all the info

Carson

- In ABA therapy for 3 months
- Just began fluoxetine 4 weeks prior to first visit with me
- Does he have ADHD
 - Excellent grades, very intelligent, whatever he thinks he has to say. But is it because he has extreme interest in it?

Medications use in ASD and ASD with ADHD

- Medications are often going to have odd responses and strange sensitivities
 - Very low dose may be needed, or very high
 - May have response to meds that others don't respond to
 - May have opposite response than what would be expected
 - Causes multiple failed attempts at meds with frustration for parent, patient and provider

Risperdal for Autism

- Well established help for mood dysregulation
- Seems to have other positive effects on communication, connectedness, perception in some, especially early on
- More sedating
- Weight gain is possible
- Breast development may be seen in older adults, not sure etiology. Breast development in younger patients most likely to be normal puberty

Aripiprazole for Autism

- Fairly good efficacy
- Less Sedating than risperidone
- Indicated for anger dysregulation
- May have other positive effects on perception
- May have some positive language effects

SSRIs for Autism

- Zoloft has best data but patchy
- Other SSRIs not highly effective
- Clomipramine which is moderately selective SSRI tricyclic – mildly effective
- Trazodone minimally effective

Alpha Adrenergics

- Clonidine IR and ER may help with impulsiveness and overactivity
- Guanfacine IR and ER may help with impulsiveness and overactivity as well

Acamprosate for Autism

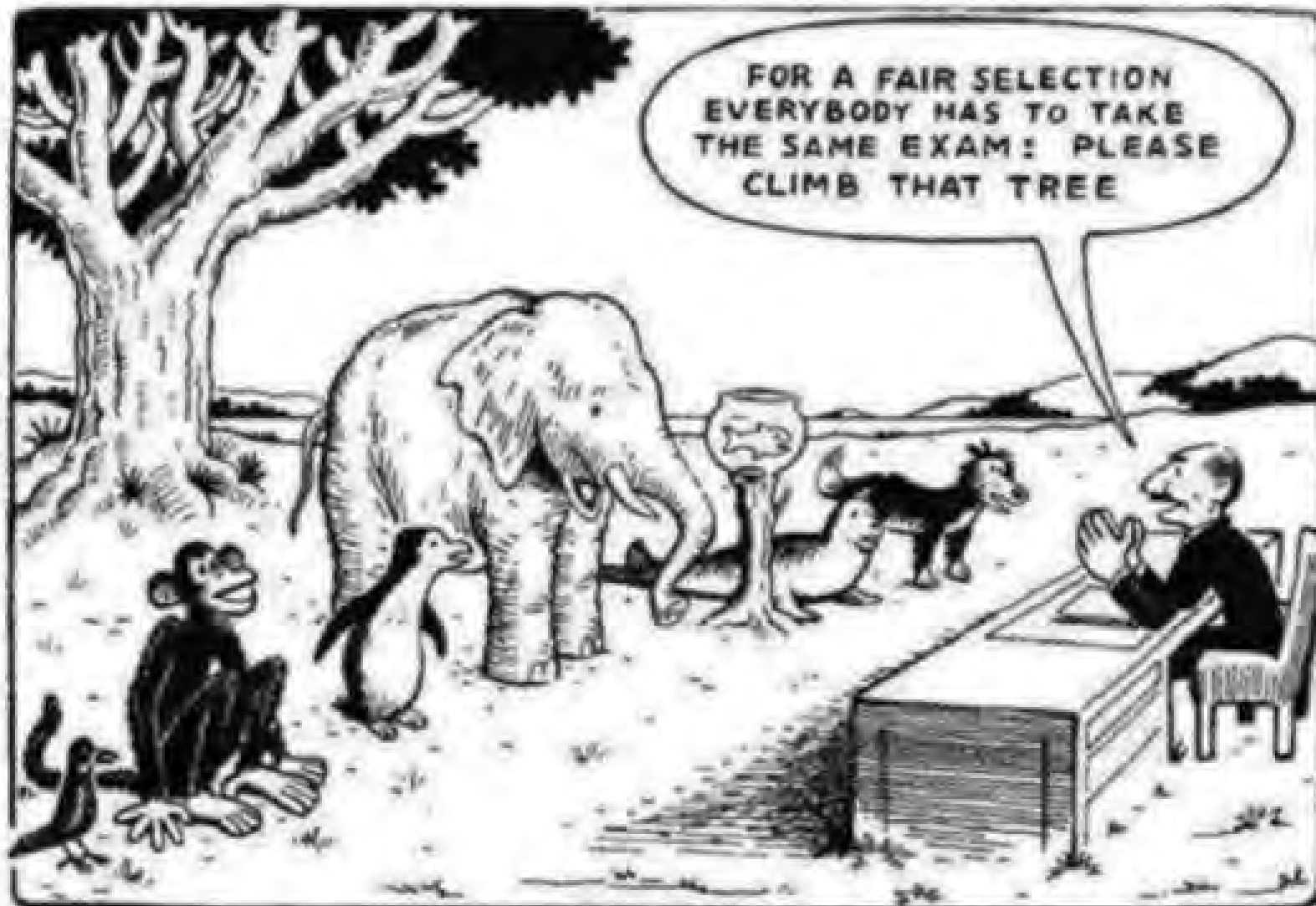
- open-label experience with acamprosate targeting social impairment in youth with autism
- five of six youth (mean age, 9.5 years) were judged treatment responders to acamprosate (mean dose 1,110 mg/day) over 10 to 30 weeks (mean duration, 20 weeks) of treatment.
- Acamprosate was well tolerated with only mild gastrointestinal adverse effects noted in three (50%) subjects.

Others

- Alzheimer medications
- Amantadine
- Others being looked at but none show great response and no substantial placebo controlled studies that would provide good evidence for efficacy yet

ADHD Treatment with Autism

- Often co-occurring with Autism
- Diagnosis is not mutually exclusive any more
- Stimulants are useful for ADHD but not directly for Autism symptoms
- If the stress level is better due to helping ADHD then Autism may be less symptomatic
- Can have a little more difficulty finding the right dose
- Strattera works well for some with or without a stimulant



Free empowering eBook at ADDCrusher.com

Our Education System

Non Pharm Therapies for ADHD

- Educational Modifications
- Parent Behavior Training
- Cognitive Behavioral therapy with limited results but may be getting better
- Chris Dendy, Russell Barclay and other have resources on particular educational strategies
- They will tend to work better with appropriate medication

Non-Pharm Therapy For Autism

- OT and/or PT for those with difficulty with clumsiness, strategies for reducing overstimulation,
- Hippotherapy/other service animals
- ABA
- Supportive psychotherapy
- Cognitive behavioral therapy

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THE SAME - IT'S OK
IF THEY TOUCH
EACH OTHER...



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Non-Pharm Therapy

Cognitive Behavioral Therapy

- Cognitive behavioral therapy has been successful to some extent in higher functioning autism spectrum disorder

(Wood, et al. J Child Psychol Psychiatry. 2009 March ; 50(3): 224–234. Lickel et al, J Autism Dev Disord. 2012 June ; 42(6): 992–1000)

- Can target specific anxiety and control symptoms – fear of driving, fear of checking out at the store or asking for help

Non-Pharm Therapy

Cognitive Behavioral Therapy

- Step 1: Identify critical behaviors
- Step 2: Determine whether critical behaviors are excesses or deficits
- Step 3: Evaluate critical behaviors for frequency, duration, or intensity (obtain a baseline)
- Step 4: If excess, attempt to decrease frequency, duration, or intensity of behaviors; if deficits, attempt to increase behaviors.

Non-Pharm Therapy

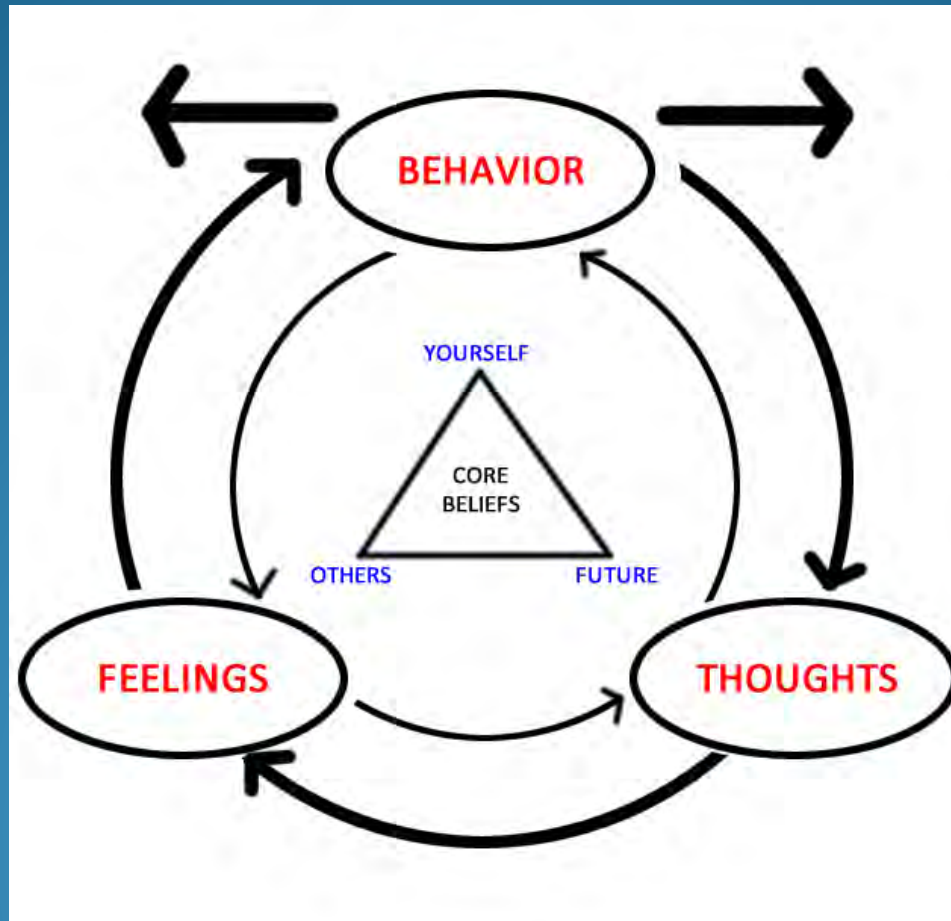
Cognitive Behavioral Therapy- 6 Phases

- Assessment or psychological assessment;
- Reconceptualization;
- Skills acquisition;
- Skills consolidation and application training;
- Generalization and maintenance;
- Post-treatment assessment follow-up.

Applied Behavior Analysis

- There is some evidence of improvement with ABA.
- It is very intensive 3-5 days a week.
- It is expensive.
- Not always available
- Need to have adequate function to work

Applied Behavioral Analysis



Social Opportunities

- Tai Kwan Do
- Scouting
- Church youth group
- 4 H caring for animal
- Hippotherapy/therapeutic riding or just riding lessons
- Drama clubs
- Sports programs

Aidan

- 14 year old with moderate autism but does well with school
- Very stuck on bus routes to and from school
- Poor focus when he is not treated for ADHD
- Can redirect from obsessing when on ADHD medication
- In Scouts and Martial Arts

Landon

- 6 years old
- Quiet in office
- Mention Batman and he will talk about him for 20 minutes, very hard to redirect
- Can redirect better when ADHD treated

Outcomes

- Autism – higher functioning is better
 - Judgment is often unpredictable long term
 - Living independently is most common goal
- ADHD has been studied far more. Without continued treatment there can be major life problems
 - Living independently is still a major goal
 - Successful life situation is a secondary goal
 - Avoidance of pitfalls – drugs, sex and legal consequences
- Both are highly multifactorial

Summary

- There is overlap between ADHD and ASD and often they occur together
- Medical treatment can be more challenging but can be helpful
- Behavioral interventions can be very helpful and can allow much more normal behaviors and function
- Separating the two not as important as recognizing the symptoms of both in a particular individual so they can be targeted

jsoileau@lcmh.com