

Behavior management and psychopharmacology
in children with autism spectrum disorders

James Coplan, MD
Neurodevelopmental Pediatrics of the Main Line
Rosemont, PA
info@drcoplan.com
www.drcoplan.com
(610) 520-2130



May 4, 2012

www.drcoplan.com

Disclosures

- Dr. Coplan is author of *Making Sense of Autistic Spectrum Disorders: Create the brightest future for your child with the best treatment options* (Bantam-Dell, 2010), and receives royalties on its sale



- This presentation will include a discussion of off-label drug use

www.drcoplan.com



Outline

- **Definitions**
- **Behavioral Interventions**
- **Neuropsychological Deficits**
- **Pharmacologic Interventions**
- **Summary**

Maladaptive Behavior

- **Externalizing**
- **Internalizing**

www.drcoplan.com

Disruptive (“Externalizing”) Behavior

- **Tantrums**
- **Property Destruction**
- **Aggression towards others**
- **Self-injurious behavior (SIB)**

www.drcoplan.com

**Social Functions of
Externalizing Behavior**

- **Attention**
- **Access to a preferred object**
- **Escape from a task**

www.drcoplan.com

“Internalizing” Behavior

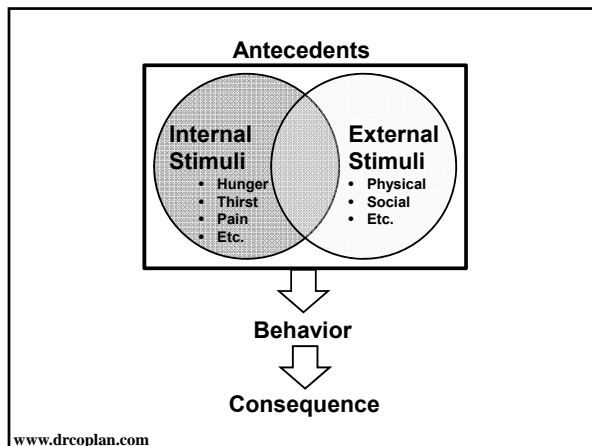
- **Anxiety**
- **Depression**
- **Obsessiveness / Rigidity**
- **Perfectionism**

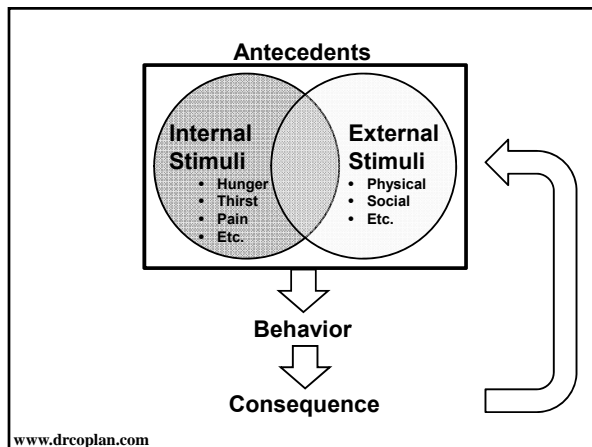
www.drcoplan.com

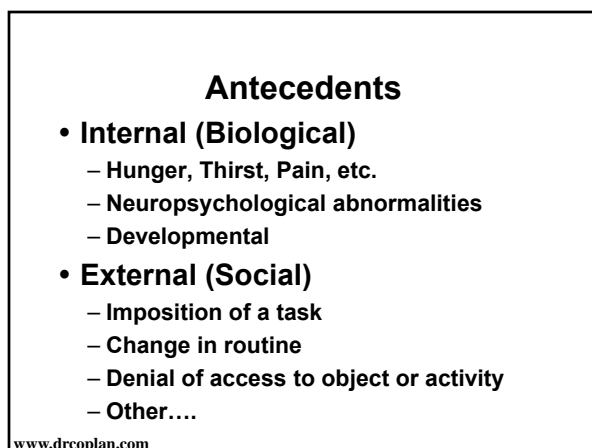
**The ABC’s of Behavior
Analysis**

- **What is the Antecedent?**
- **What is the Behavior?**
- **What is the Consequence?**

www.drcoplan.com







Antecedents - Developmental

- **What is the child's developmental level?**
- **Is the behavior normal for the child's developmental level?**
 - Tantrums / Noncompliance
 - "Impulsivity" / "Inattention"

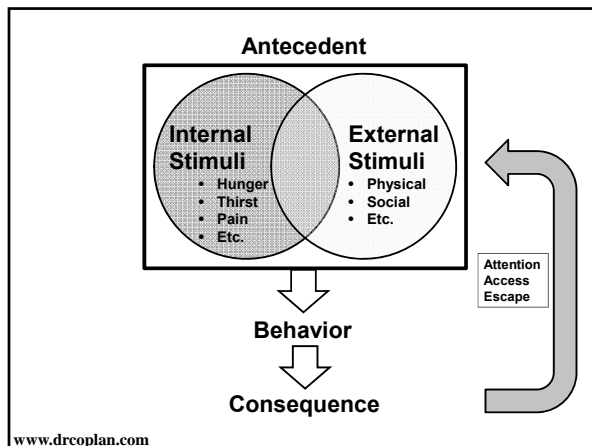
Antecedents - Developmental

- **What is the child's ability to communicate?**
 - Does "disruptive" behavior serve a communicative function?

Consequences 1: Reinforcers

- **Reinforcers (↑ likelihood of recurrence)**
 - Positive (add something)
 - Attention
 - Access
 - Negative (remove something)
 - Escape

www.drcoplan.com



Food Selectivity

Positive and Negative Reinforcement of unwanted behavior

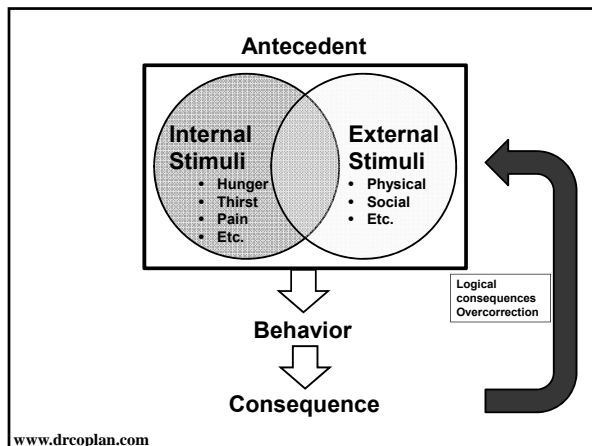
- Parent removes non-preferred food (negative reinforcement)
- Parent provides child with his/her preferred food (positive reinforcement)
- Alternatives
 - First Then
 - Put refusal on extinction
 - The kitchen is *closed* between meals
 - Desensitization (non-preferred food is on table, on plate, touch, lick, mouth, eat)

www.drcoplan.com

Consequences 2: Aversives

- Aversives lead to a *decrease* in the likelihood of recurrence of the antecedent behavior
- Logical Consequences
 - If child refuses to use toilet, child must carry backpack with spare clothes, when family is in public
- Over-correction
 - Must wash out soiled diaper
 - If the child spills milk on purpose: child must mop the entire kitchen floor

www.drcoplan.com



**Disruptive Behavior:
Function & Best Response**

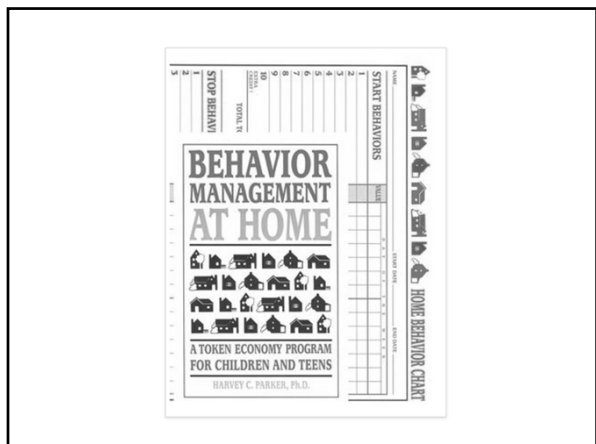
- **Attention**
 - 1-2-3 ➔ “Time Out”
- **Access**
 - Never grant access to desired object in response to disruptive behavior
- **Escape**
 - Never permit the child to terminate a task with disruptive behavior. Walk child through task first, then ➔ Time Out.

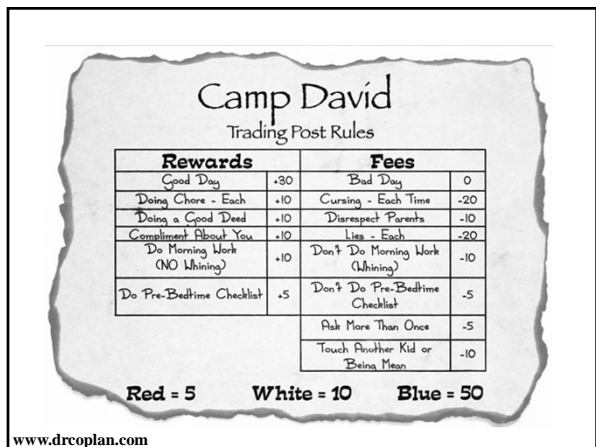
www.drcoplan.com

**Delayed Gratification:
Token Economy**

- **Concretely specified behaviors**
- **Earn and Lose Points (Tokens)**
- **Points ➔ Access to specified reward**
 - Reward determined by child's interests
 - Preferred toys, Computer time, etc.
 - NO access to reward at other times
 - “Extra” treats not as effective
- **Works with children who understand rule-based play (CandyLand, Uno, etc.)**

www.drcoplan.com





www.drcoplan.com

But.....

Children with ASD have atypical responses to external stimuli

- What good is Time Out if the child has no eye contact?

Children with ASD have a range of abnormal, autonomous, internal stimuli

- Obsessive behavior not the same as "ordinary" task refusal

www.drcoplan.com

Neuropsychological Abnormalities in Children with ASD

Core Deficits

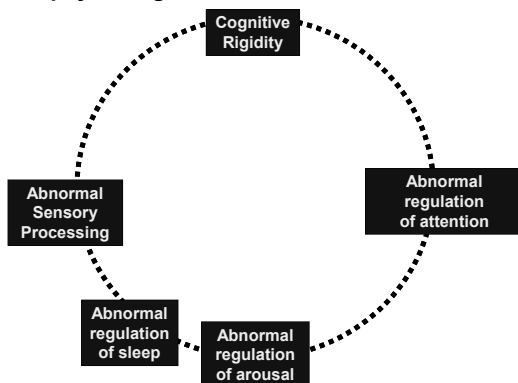
Cognitive Rigidity
Abnormal regulation of attention
Abnormal regulation of arousal
Abnormal regulation of sleep
Abnormal sensory processing

www.drcoplan.com

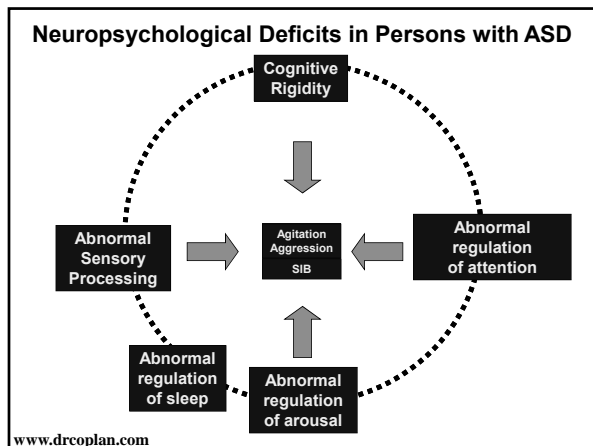


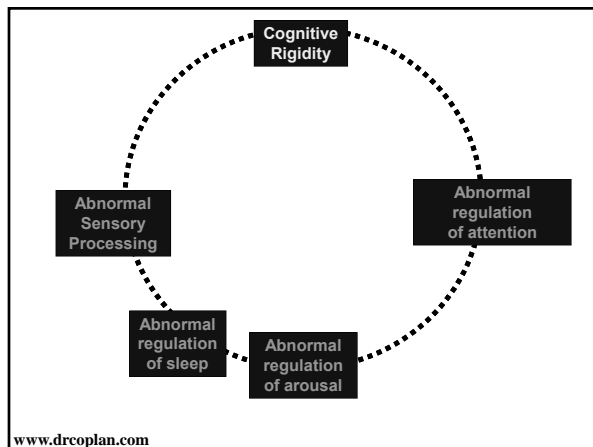
www.drcoplan.com

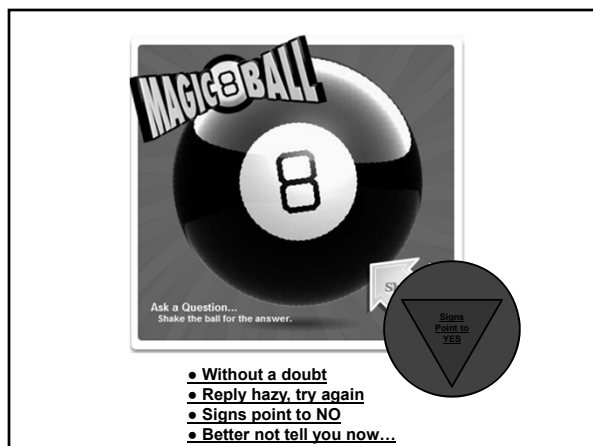
Neuropsychological Deficits in Persons with ASD

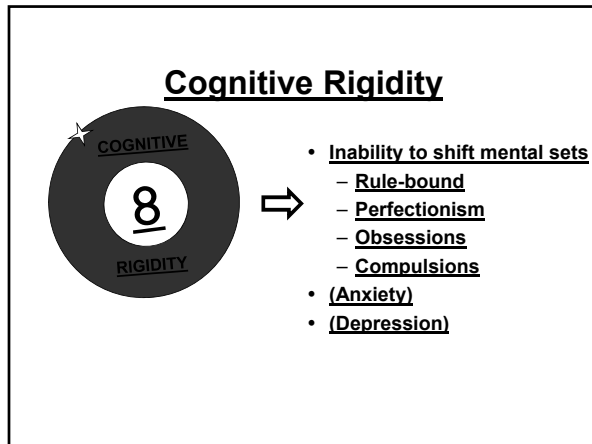


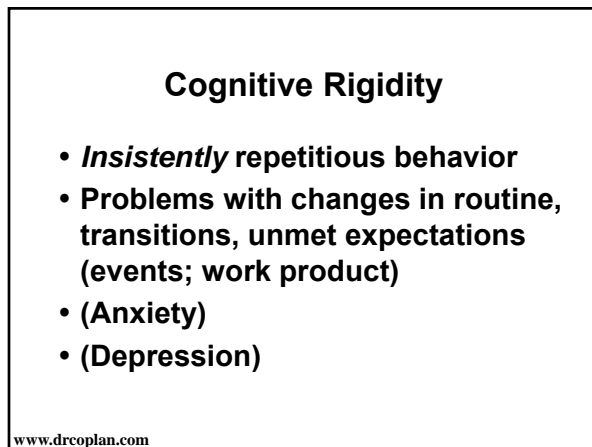
www.drcoplan.com

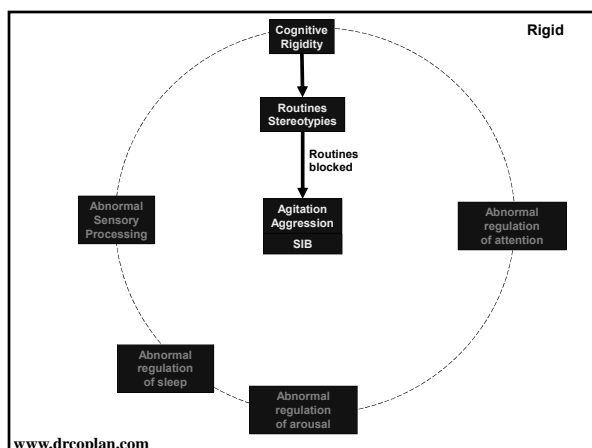












Cognitive Rigidity

- **Interventions**

- **Visual Schedules**

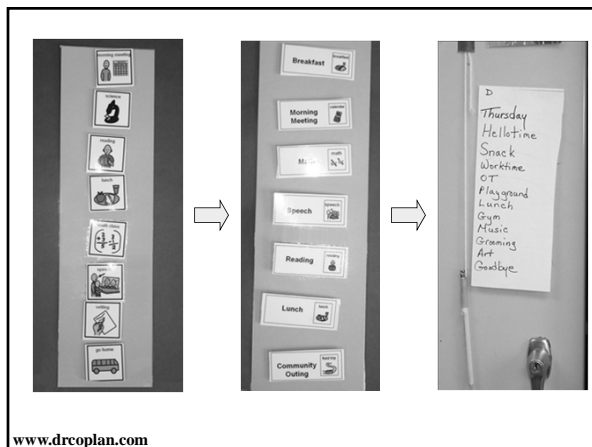
- What am I supposed to be doing *do now?*
 - What am I supposed to do *next?*
 - “Oops” cards

- **Relaxation Techniques**

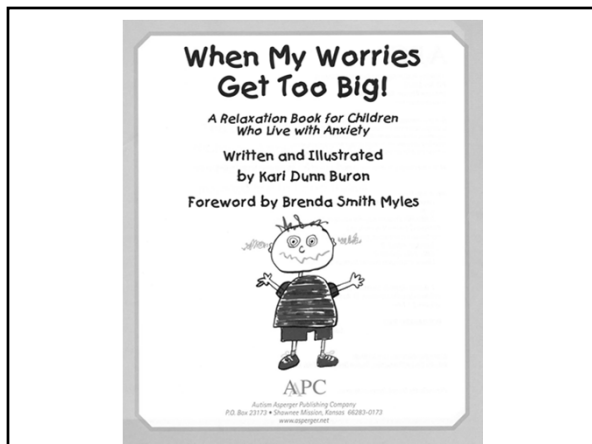
- Fidget toys, Deep Breathing, Isometrics
 - “Break” cards

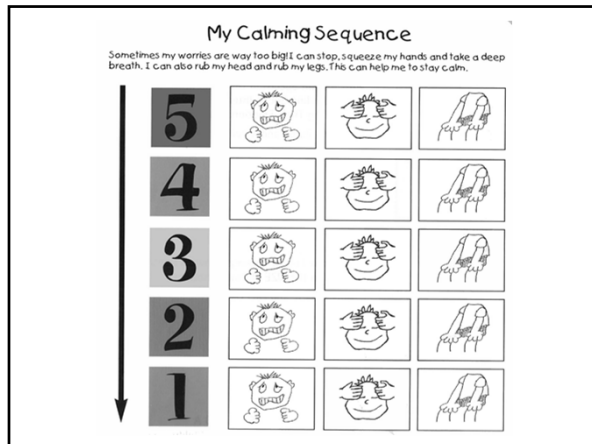
- **SSRIs**

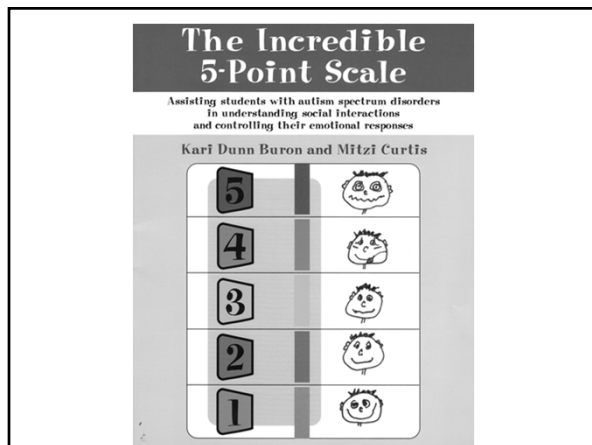
www.drcoplan.com



www.drcoplan.com



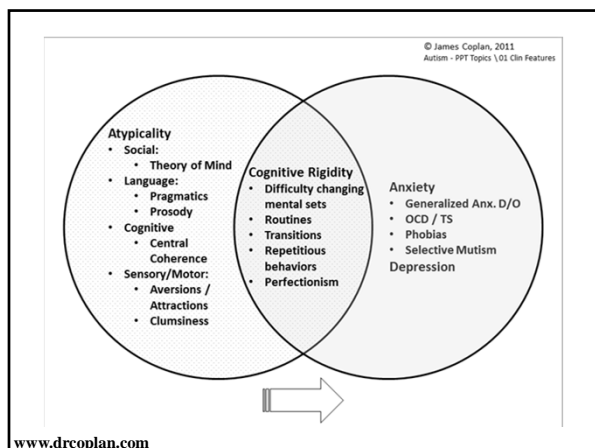


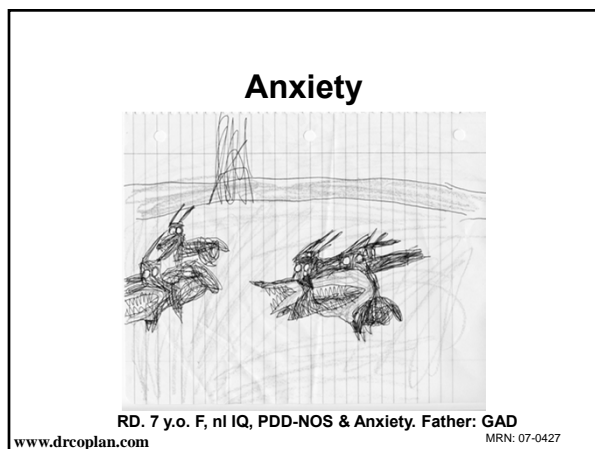


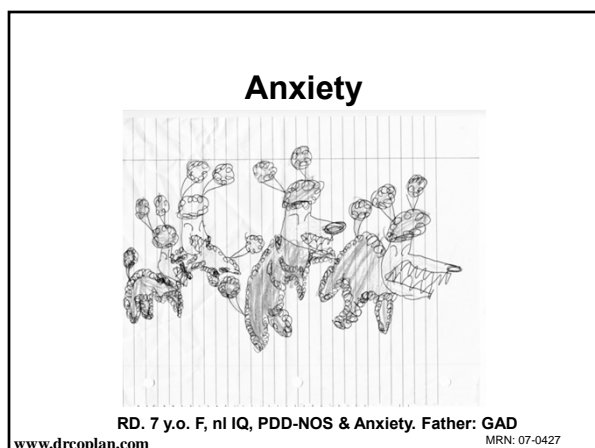
Cognitive Rigidity

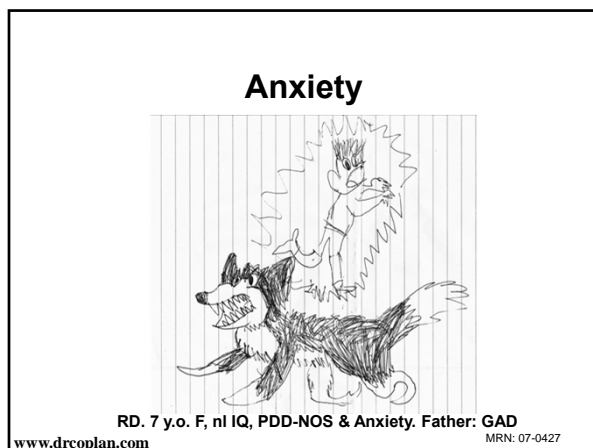
- ***Insistently*** repetitious behavior
- Problems with changes in routine, transitions, unmet expectations
- Perfectionism
- (Anxiety)
- (Depression)

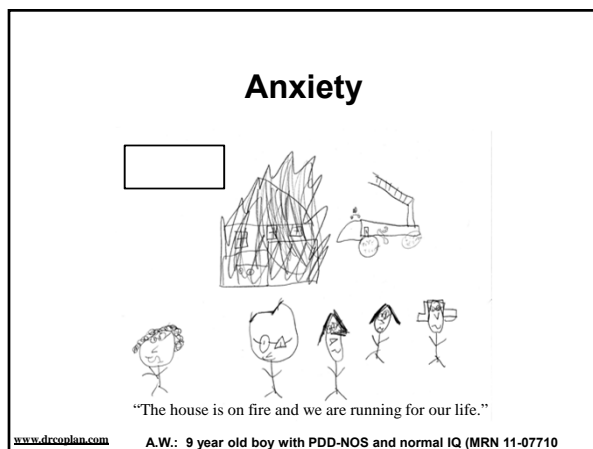
www.drcoplan.com

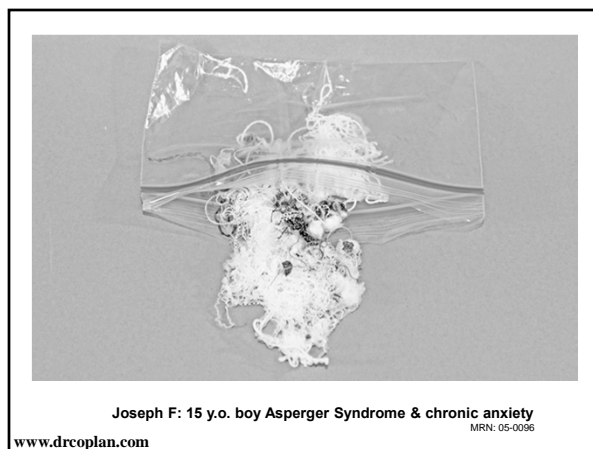


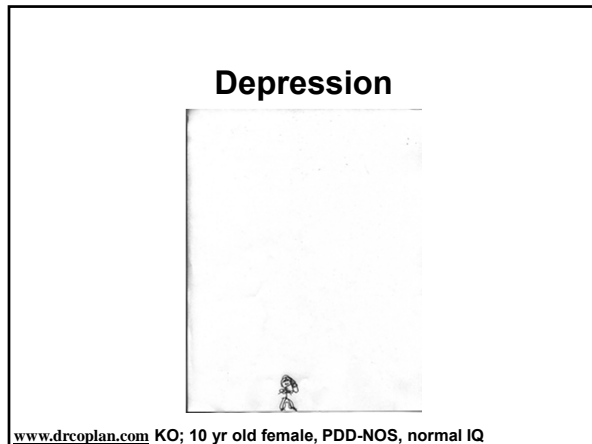








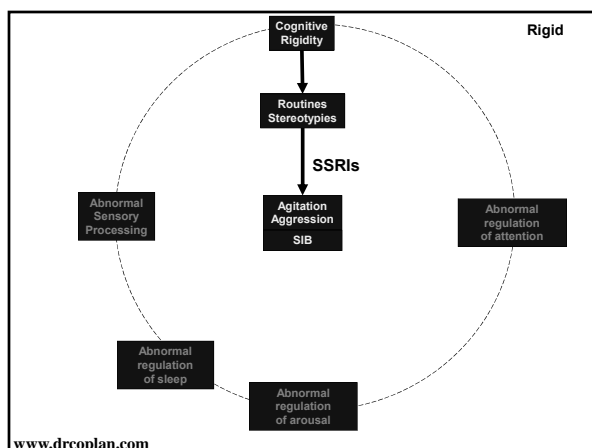


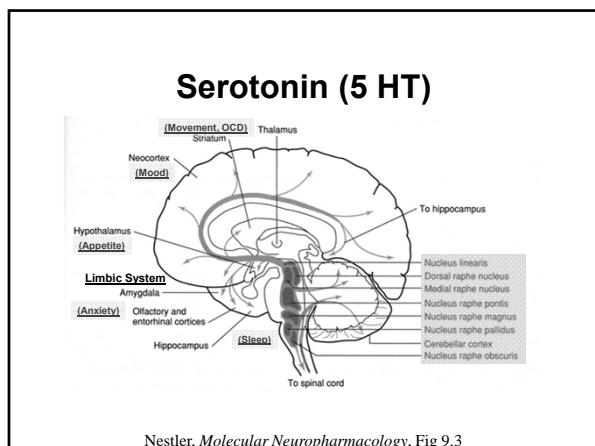


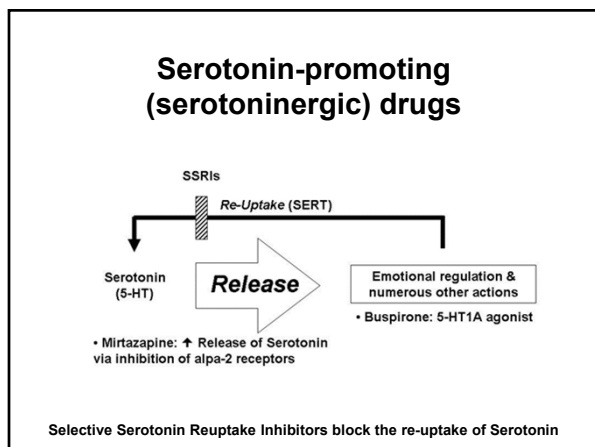
**Selective Serotonin Reuptake
Inhibitors (SSRIs) in ASDs**

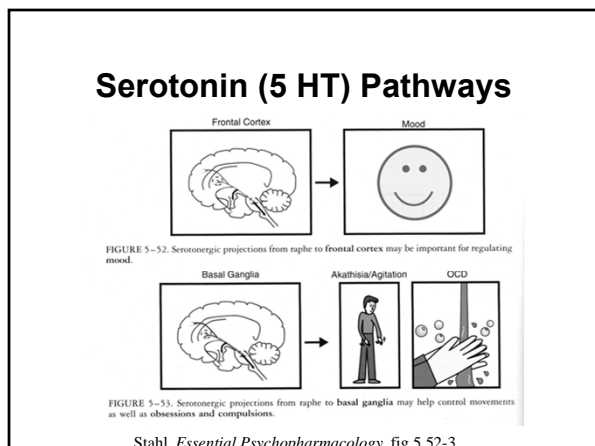
- **Primary targets**
 - Cognitive Rigidity
 - Anxiety
 - Obsessive / Perfectionistic behavior
 - Depression
 - Stereotypies: Probably not
- **“Downstream” benefit:**
 - ↓ Disruptive Behavior
 - ↑ Quality of Life

www.drcoplan.com







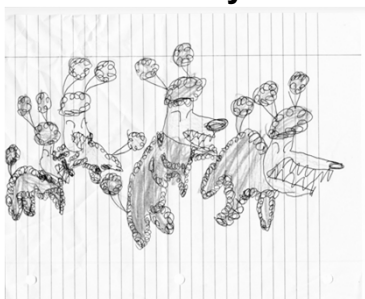


Pharmacotherapy for anxiety disorders in children and adolescents

Ipser JC, Stein DJ, Hawkrigge S, Hoppe L. Cochrane Database of Systematic Reviews 2009, Issue 3.

- **Studies reviewed: 22 RCTs/ 2,519 participants**
 - Short-term (average 11 wks)
 - Mean age 12 yrs
 - **Drugs studied (versus placebo)**
 - SSRIs :15 (fluoxetine 6, fluvoxamine 2, paroxetine 3, sertraline 4)
 - SNRIs: 5, (clomipramine 3), venlafaxine 2)
 - Benzodiazepines: 2: (alprazolam 1, clonazepam 1)
 - Tricyclic antidepressants: 1 (desipramine)
- **Meta-analysis**
 - Response rate: Medication 59%; Placebo 31%
 - 7.3% of subjects treated with SSRIs withdrew bec/o side effects
 - "The overwhelming majority of evidence of efficacy was for the SSRIs, with the most evidence in paediatric OCD"

Anxiety

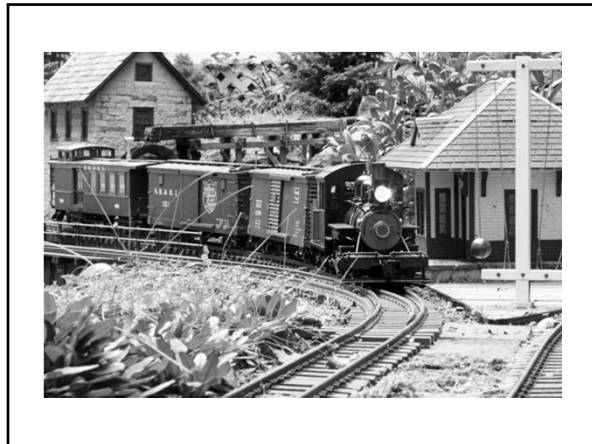


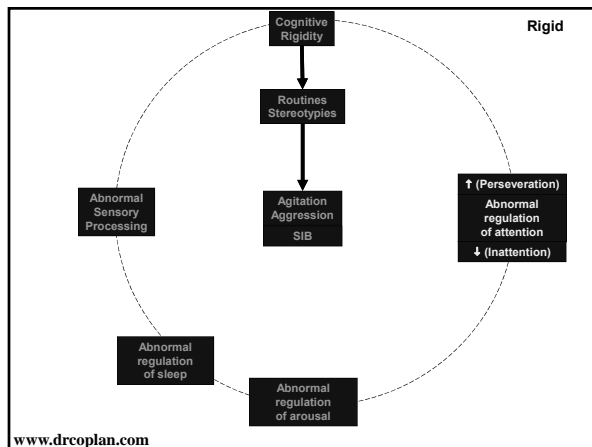
RD. 7 y.o. F, nl IQ, PDD-NOS & Anxiety. Father: GAD
www.drcoplan.com MRN: 07-0427

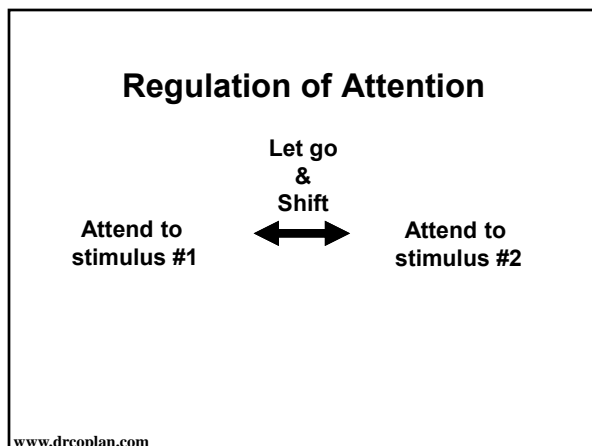
Anxiety after Rx with CBT & Escitalopram



RD. 9 y.o. F, nl IQ, PDD-NOS & Anxiety. Father: GAD
www.drcoplan.com MRN: 07-0427



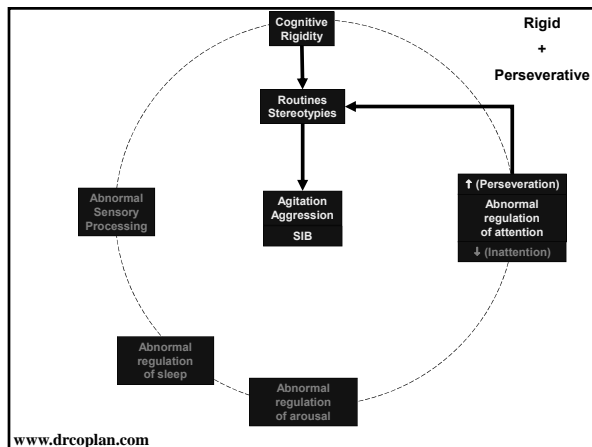




Abnormal Regulation of Attention - 1

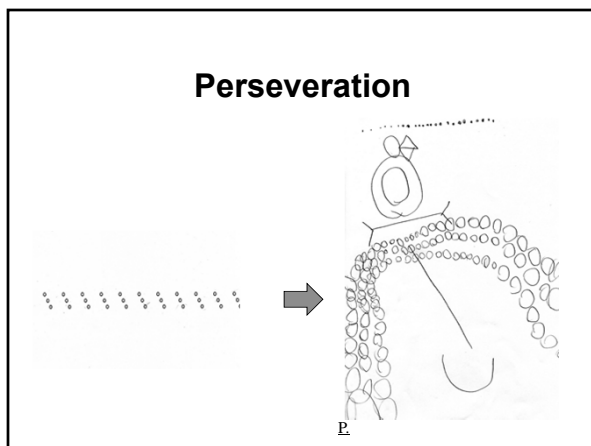
- **Perseveration**
 - Inability to “Let go and shift”
 - Gets “stuck”
 - “*Overattention Deficit Disorder*”
- **Compounds the effects of cognitive rigidity**

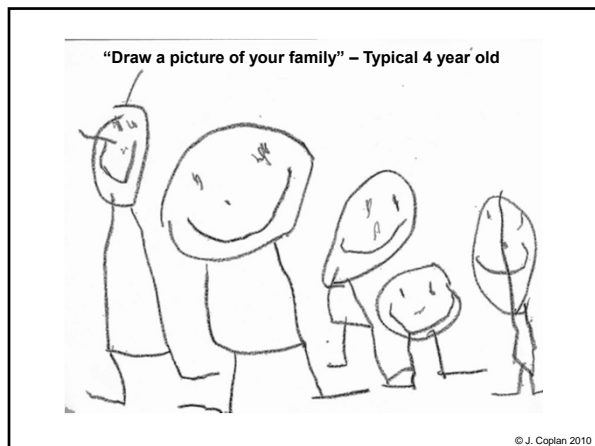
www.drcoplan.com



www.drcoplan.com

Perseveration





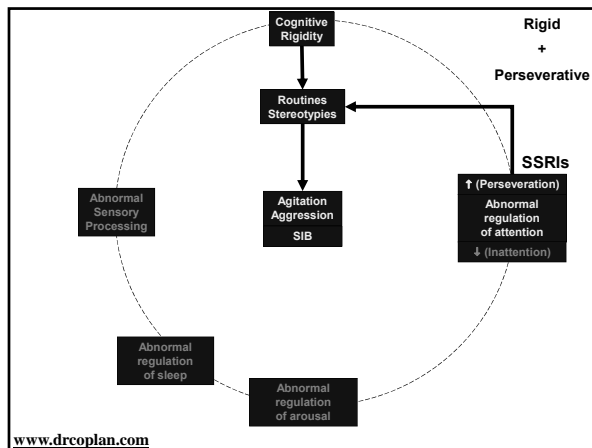


Abnormal Regulation of Attention (Perseveration)

• Interventions

- Verbal preparation for transitions
- Visual Schedules
- SSRIs (OCD: Proven; ASD: likely)

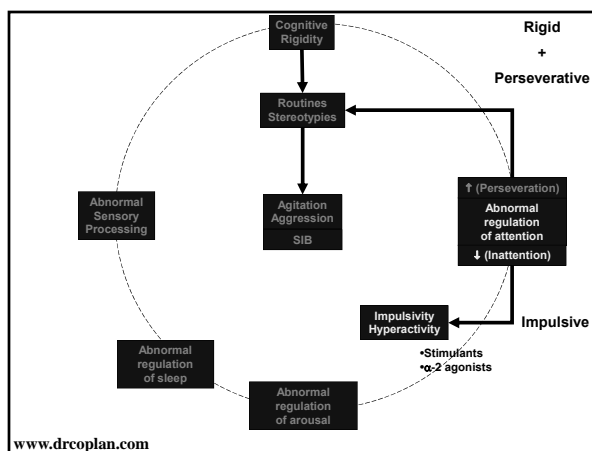
www.drcoplan.com



Abnormal Regulation of Attention - 2

- Inattention
 - Inability to focus
 - Impulsive
 - Distractible

www.drcoplan.com



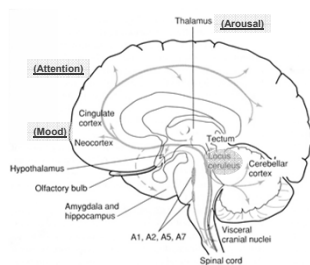
Inattention

• Interventions

- Limited stimuli
- Short work periods
- Medication
 - Stimulants (may ↑ anxiety / rigidity / agitation)
 - alpha-2 agonists

www.drcoplan.com

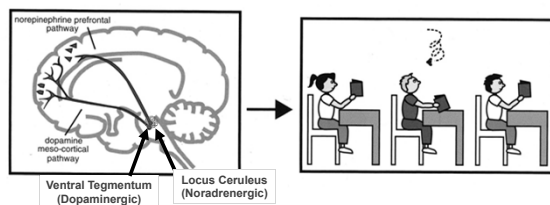
Noradrenergic pathways (Norepinephrine)



Locus Coeruleus ("blue spot"): Principal noradrenergic source in brain.

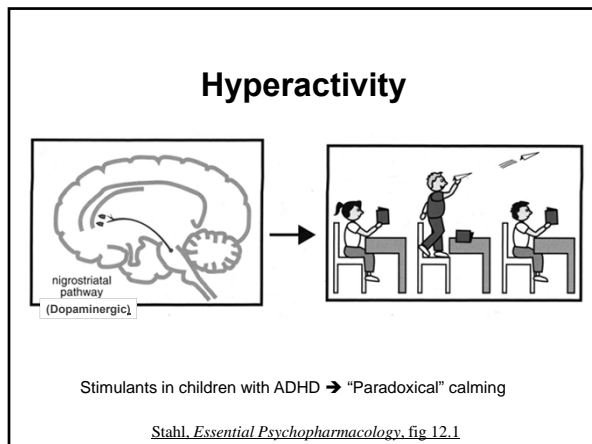
Nestler, Molecular Neuropharmacology, Fig 8.5

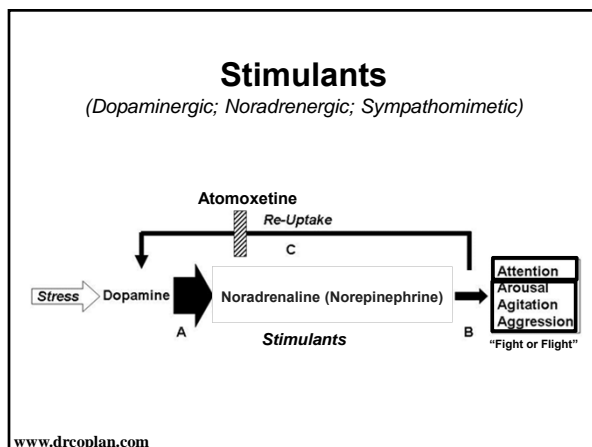
Inattention



Insufficient activation of frontal cortex → → → Inattention

Stahl, Essential Psychopharmacology, fig 12.1





Stimulants, Norepinephrine Reuptake Inhibitors (NRI's)

Generic Name(s)	Brand Name(s)	Comment
Amphetamine		FDA Schedule II
Dextroamphetamine	Dexedrine, Dextrostat	FDA Schedule II
Dextroamphetamine + amphetamine	Adderall	FDA Schedule II
Methylphenidate	Concerta, Ritalin, Metadate	FDA Schedule II
Dexmethylphenidate	Focalin	FDA Schedule II
Atomoxetine, Attentin	Strattera	Norepinephrine reuptake inhibitor (NRI), not FDA Schedule II

www.drcoplan.com

Alpha-2 Agonists

Generic Name	Brand Name(s)	Comment
Clonidine	Catapres	More sedating than guanfacine
Guanfacine	Tenex, Intuniv	

- Frontal cortex / Locus Ceruleus: post-synaptic alpha-2 receptors
- Sympathetic outflow (autonomic nervous system): Pre-synaptic autoreceptors ↔BP

www.drcoplan.com

Clinical Pearl

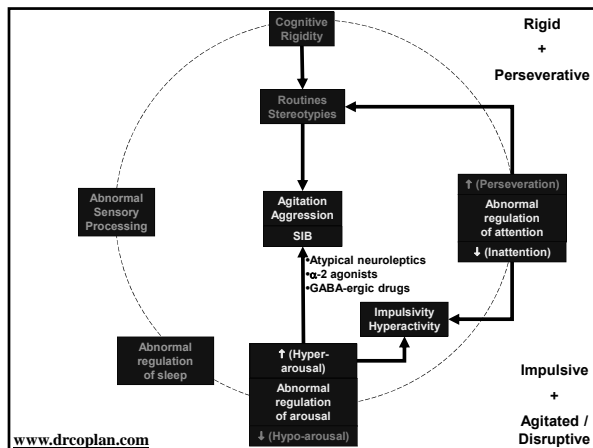
- **Beware of anxiety or perseveration masquerading as inattention**
 - Perseveration on inner stimuli: “Inattentive”
 - Perfectionism: “Problems w. task completion”
 - Anxiety: “Rushes through work”

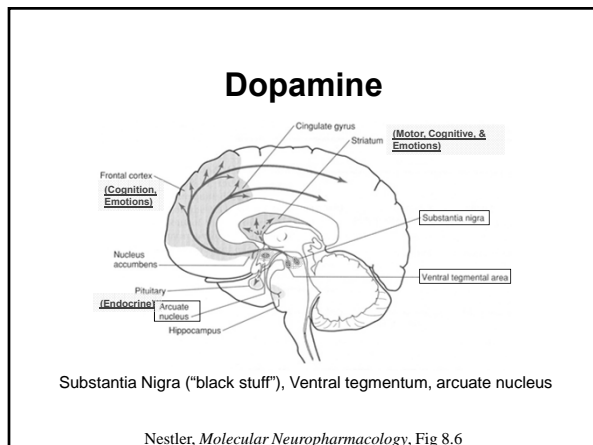
www.drcoplan.com

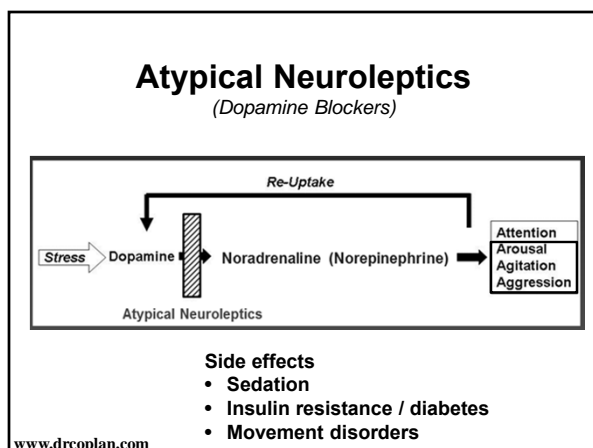


www.drcoplan.com









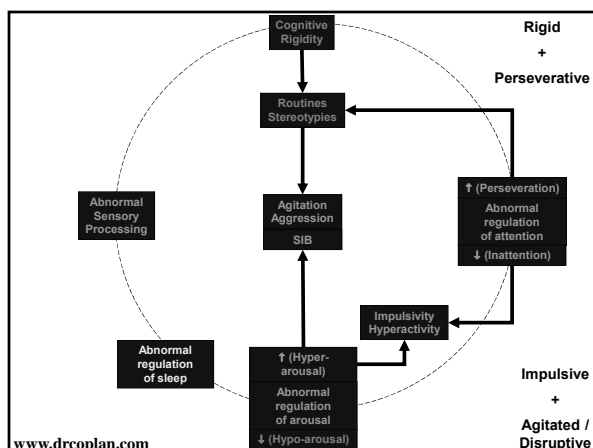
Atypical Neuroleptics

Generic Name	Brand Name	Comment
Aripiprazole	Abilify	<ul style="list-style-type: none"> • Relatively less risk of weight gain • FDA approved for Rx of ASD
Clozapine	Clozaril	<ul style="list-style-type: none"> • Bone marrow suppression
Olanzapine	Zyprexa	<ul style="list-style-type: none"> • Greater risk of weight gain
Quetiapine	Seroquel	<ul style="list-style-type: none"> • Greater sedation
Risperidone	Risperdal	<ul style="list-style-type: none"> • Greater risk of weight gain • FDA approved for Rx of ASD
Ziprazidone	Geodon	Relatively less risk of weight gain

www.drcoplan.com



www.drcoplan.com



www.drcoplan.com

Regulation of Sleep - 1

- **Melatonin**
 - Brain hormone
 - ↓ Metabolic rate (Heart, Temp)
 - “You’re sleepy now”
- **Suppressed by light**
 - 24 hr cycle
 - Seasonal cycle

www.drcoplan.com

Regulation of Sleep - 2

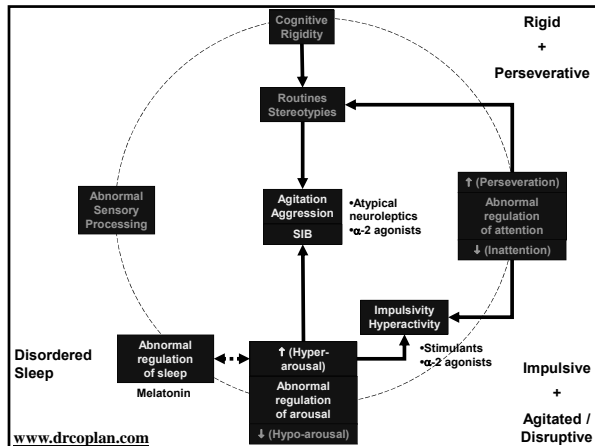
- **Abnormal melatonin cycling**
 - Primary disorders of sleep
 - Blindness
 - ASD
- **Symptoms**
 - Delayed onset of sleep
 - Shortened duration / frequent waking

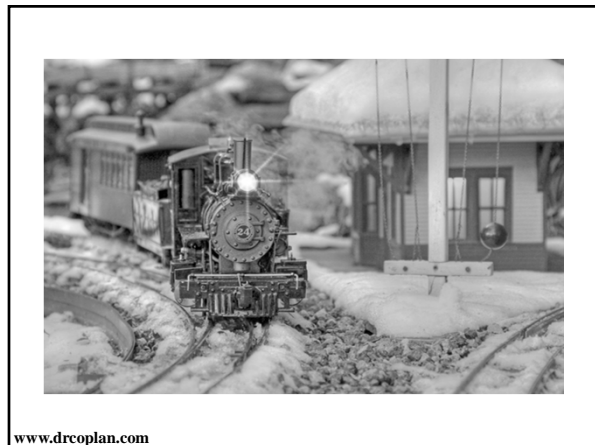
www.drcoplan.com

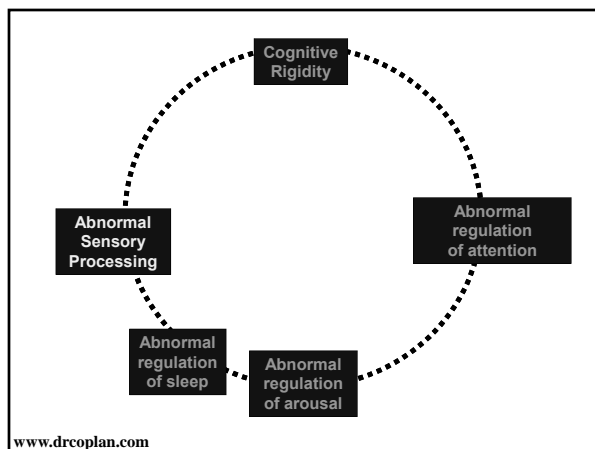
Regulation of Sleep - 3

- **Shared genetic control**
 - Regulation of sleep
 - Regulation of arousal
- **Family history of sleep disorder**

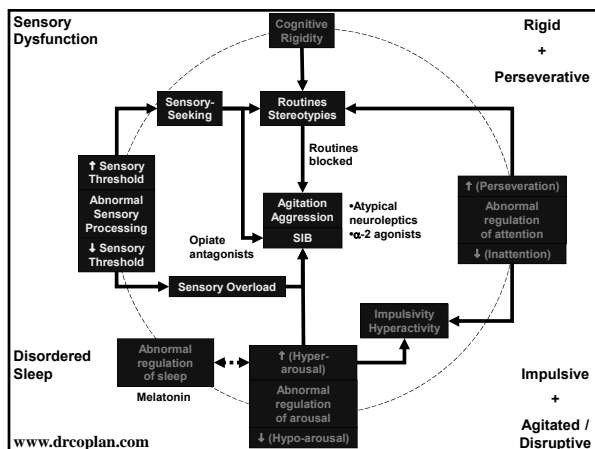
www.drcoplan.com

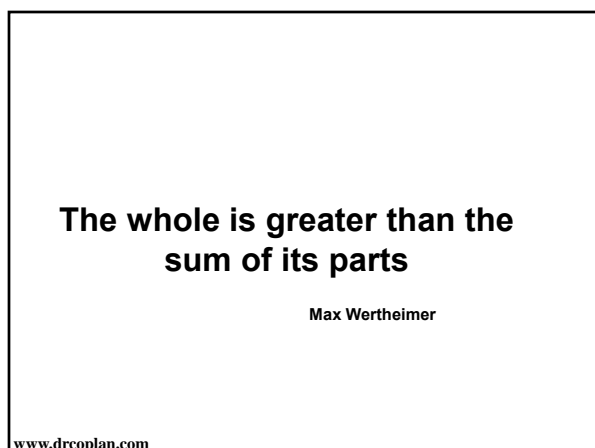


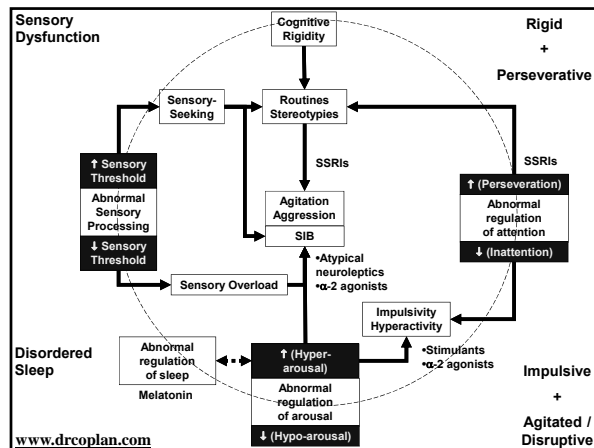












Summary

- **Why this child?**
 - What is this child's developmental Level?
 - Is this stage-appropriate behavior?
 - Does the behavior serve a social function?
 - Escape, access, attention
 - Is the classroom placement appropriate?
 - Language level?
 - Does this behavior occur in other settings?
 - Family factors?
 - Parents consistent at home?
 - Parental psychopathology? (Anxiety, Depression, Alcohol)

www.drcoplan.com

Summary

- **Why this child?**
 - Neuropsychological factors?
 - Cognitive Rigidity
 - Dysregulation of attention
 - Dysregulation of arousal
 - Sensory Seeking / Sensory Overload
- **Behavioral Intervention – Usually**
- **Change in classroom setting – sometimes**
 - Shift from rote to inferential learning (2nd - 3rd grade): challenge
- **Medication: Sometimes**

www.drcoplan.com

An ounce of prevention....

- Identify *internalizing* behaviors *before* they lead to *externalizing* behaviors
 - Behavior Management Plan that proactively seeks to avert or dissipate anxiety

www.drcoplan.com



Thank you

www.drcoplan.com

www.drcoplan.com