Medication and Autism:  
Parent, Sibling, Educator and  
Psychiatric Perspectives  

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Overview  
• Psychotropic Medications  
• Behavioral Educational Interventions  
• Parent Training  
• Behavior Intervention Plans  
• Functional Communication Training  
• Aversives  
• Applied Behavior Analysis and the Law  

Autism and Psychopharmacology  
• Autism has common comorbid conditions that may require medications  
• However, “Age data indicate that about 70% of children with autism  
  spectrum disorders age 8 years and up receive some form of  
  psychoactive medication in a given year.”  
• FDA Approved Medications for Irritability in Autism: Aripiprazole and  
  Risperidone  
• The 2 risperidone placebo-controlled trials in children and adolescents  
  (aged 5 to 16 years) measured the Irritability subscale of the Aberrant  
  Behavior Checklist (ABC-I)  
  • This included “aggression towards others, deliberate self-injuriousness, temper  
    tantrums, and quickly changing moods”  
  • Self-injuriousness not measured in isolation  
• Aripiprazole is FDA approved for irritability for autistic disorder (6 to 17  
  years of age) with behaviors including “tantrums, aggression, self-  
  injurious behavior”  
• The primary outcome measure in 2 placebo-controlled trials was the  
  ABC-I  
• Self-injurious behavior components little evidence vs. placebo  

Risperidone  
• There is a “greater sensitivity to somnolence (drowsiness) and sedation  
  in children and adolescents (eg, in 22%-30% of subjects taking  
  risperidone for pediatric mania and in 49% of risperidone monotherapy-  
  treated children in FDA registration trials for autism, in contrast to an  
  incidence of < 7% in adults with schizophrenia or of 5% in adults with  
  bipolar mania taking risperidone).”  

Aripiprazole  
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Adverse Reactions in the Aripiprazole FDA Registration Trials

- **Sedation:** 21% drug; 4% placebo
- **Fatigue:** 17% drug; 2% placebo
- **Somnolence:** 10% drug; 4% placebo
- **Lethargy:** 5% drug; 0% placebo


Dopamine

- Antipsychotics including risperidone and high doses of aripiprazole block dopamine transmission in the brain
- Dopamine makes positive reinforcement effective and necessary to change behavior and even make rewards an incentive to do well at school

ABA = Applied Behavior Analysis.


Risks Associated with Antipsychotics

- A study showed shrinking of the brain in individuals taking antipsychotics
- There is evidence that long-term exposure to antipsychotics in children "may decrease social functioning among young adults"
- In a study involving 9,013 adults with intellectual disability and 32,242 adults without intellectual disability, there was an increased risk of movement side effects, which included among others, neuroleptic malignant syndrome


Risks Associated with Antipsychotics (cont’d)

- One placebo-controlled study with 86 participants with intellectual disability—haloperidol or risperidone—concluded:
  - "Antipsychotic drugs should no longer be regarded as an acceptable routine treatment for aggressive challenging behaviour in people with intellectual disability."


ASD = autism spectrum disorder.


Risks Associated with Antipsychotics (cont’d)

- According to an analysis of 13 studies involving 185,105 individuals, just being on the antipsychotic for at least 3 months appeared to double to triple the risk of diabetes in youth, and having an ASD increased this risk
- According to a cohort study of 1,488,936 children in the United Kingdom, "Antipsychotics are prescribed predominately to those with intellectual difficulty/autism ... and ... can increase rates of respiratory disease, epilepsy, diabetes for all, and of hospital-admitted depression and injury in the intellectual difficulty/autism population."

ASD = autism spectrum disorder.


Antidepressants

- Serotonin has been found to be lacking in the frontal cortex and thalamus in boys with autism, although the right dentate nucleus showed elevated serotonin
- A literature analysis for autism, including 7 randomized controlled trials with 271 participants with fluoxetine, fluvoxamine, fenfluramine, and citalopram, concluded:
  - "There is no evidence of effect of SSRIs in children and emerging evidence of harm. There is limited evidence of the effectiveness of SSRIs in adults from small studies in which risk of bias is unclear."

SSRI = selective serotonin reuptake inhibitor.

Antidepressants and Diabetes

- A literature analysis of 20 studies showed an increased risk of type 2 diabetes in individuals taking antidepressants.
- According to another study of 199,608 youth aged 5-20 years, taking antidepressants at least 150 days almost doubled the risk of type 2 diabetes.

Antidepressants and Mood

- According to a study, type 2 diabetes increases the risk for an affective disorder 2.6 fold.
- Diabetes with fluctuating blood sugars can also cause insomnia.
- “In a patient with ASD, depression frequently presents as an increase of existent ASD symptoms. What is important to note is not the symptoms themselves, but their heightened intensity.”

Mood Stabilizers

- In a study with 35 individuals with ASD and 34 matched controls, elevated urinary homocysteine levels “was significantly and directly correlated with the severity of the deficit in communication skills, but was unrelated to deficit in socialization or repetitive/restricted behavior.”
- Mood stabilizers such as lamotrigine, carbamazepine, and lithium can further increase homocysteine levels.

Naltrexone

- Naltrexone is also used off-label for self-injurious behavior.
- The mechanism of use is as a possible aversive.
- While 3 smaller placebo-controlled trials showed improvement in self-injury, the largest placebo-controlled trial (N=26) showed no significant improvement.

Risk of Seizures

- Most psychotropic medications increase the risk for seizures.
- “Epilepsy is increasingly recognized as the most common medical disorder accompanying ASD.”
- Up to 60% of children with autism without clinical seizures have epileptiform discharges on EEGs according to published research.

Discomforting and Dangerous Side Effects

- Medications can cause discomforting and even painful side effects—such as constipation—that may manifest in increased agitation and dangerous behavior.
Medication and Psychosocial Interventions

“For many children and adolescents with ADHD and disruptive disorders, it is likely that aggression and disruptive behaviors are the clinical targets of antipsychotic treatment. Clinical practice guidelines addressing the management of aggression or disruptive disorders in children and adolescents recommend the use of psychosocial interventions before use of antipsychotics, including children with autism.”

Parent Training and Applied Behavior Analysis

• Children can have improved behavioral outcomes with lower doses of medication
• Parent training was found to be superior to parent education that did not include behavior management
• In one study on teacher training to improve positive reinforcement with verbal praise, using specific goal statements, and having teachers specify a desired frequency of reinforcement beforehand improved adherence

Mindfulness, Parent Training and ABA

• 432 families were studied using mindfulness to facilitate behavior parent training compared to parent training without mindfulness
• The components consisted of “listening with full attention,” “nonjudgmental acceptance of the self and child,” “emotional awareness of the self and child,” “self-regulation in parenting,” and “compassion for self and child”
• Improvements occurred in both groups in “multiple dimensions of parenting, including interpersonal mindfulness in parenting, parent-youth relationship quality, youth behavior management, and parent well-being.”
• The mindfulness intervention boosted and better sustained some of the effect and was especially helpful to fathers compared to standard parent training

Hospitalization and Applied Behavior Analysis

• One study comparing 218 psychiatrically hospitalized individuals with autism with 255 individuals also with autism who were not hospitalized, aged 4 to 20, showed 5 predictors of hospitalization
• These include adaptive functioning, ASD symptom severity, presence of a mood disorder, sleep problems, and living with a single caregiver, which is indicative of limited support
• A well done stimulus preference assessment to determine effective positive reinforcers, learning to wait for reinforcement with gradual time increases, or learning to use functional communication to request breaks can all improve mood

Preventing Abuse with Applied Behavior Analysis

• According to a literature analysis of 23 studies, “Childhood maltreatment is a significant risk factor for a host of psychiatric, developmental, medical, and neurocognitive conditions, often resulting in debilitating and long-term consequences.”
• According to a study involving 524,534 children, children with disabilities are at higher risk for maltreatment
  • “Although children with disabilities make up 10.4% of the population, they represent 25.9% of children with a maltreatment allegation and 29.0% of those with a substantiated allegation.”
  • “The largest number of allegations were for children with mental/behavioral disorders.”

Providing ABA, parent counseling and training, can help safely manage these behaviors and therefore decrease abuse
Talia’s Variable DRO with Response Cost

Variable Reinforcement

Matthew’s Various DROs with Response Cost

Key for Matthew’s Behavior Intervention Plan

- **DRO**: Differential reinforcement of other behavior. Using intervals established and based on the frequency of occurrence of problem behaviors, a specific interval is set up (may be as brief as 10 seconds or as long as a full day)
- **AGGRESS**: Aggression (bite, kick, push, grab, head-butt)
- **EdSoc**: Educational/Social: refuse to perform a learned task correctly
- **IVB**: Nag, not minding own business
- **HDB**: Hit self, bite self, head bang, pick/rub/scratch skin to bleeding
- **ON**: Overnight
- **OOS**: Rub fingers together, blow on fingers, grind teeth
- **Destroy**: Property destruction
Functional Communication Training

- Based on a literature analysis of 91 articles, consisting of 204 participants, “Functional communication training (FCT) is one of the most common and effective interventions for severe behavior problems.”
- “Functional communication training (FCT) is a differential reinforcement (DR) procedure in which an individual is taught an alternative response that results in the same class of reinforcement identified as maintaining problem behavior.”


Brushing My Daughter’s Hair before Functional Communication Training

My Brother’s Functional Communication Tokens

Because much of Matthew’s most problematic behavior is escape motivated, based upon his current Functional Behavior Assessment (FBA), several positive behaviors and program components have been designed to help him express his needs and desires in a more effective and socially appropriate way and to obtain breaks from activities in a more appropriate fashion.

Functional Communication Tokens: Matthew is being trained to use Functional Communication Tokens. Monday through Friday, he will receive 1 token every hour and can use it to escape from demands or access a specific snack/interest or activity. This will allow Matthew, who exhibits severe problem behaviors, to escape from tasks and activities and access breaks, helping to reduce the frequency and severity of his inappropriate behaviors.

Over the past year Matthew has used his Functional Communication Tokens (FCT) at a mean rate of 503 times per week, an increase over the previous year’s 253 times per week.

Brushing Hair with Functional Communication Training

Aversives

- In an analysis of 109 articles on positive behavior supports, the frequency of PB was suppressed by 90% in only about one-half of participants using positive approaches alone.
- Aversives are procedures that are arranged as consequences for undesired behaviors with the purpose of decreasing the future frequency of those behaviors.
- Disulfiram is an FDA approved medication for alcohol dependence and it is used as an aversive.

Aversives (cont’d)

- Aversives are effective when combined with dense positive reinforcement and aversives without dense positive reinforcement can increase agitation.

- The majority of studies on aversion therapy have used skin shock treatment. “Punishment may be critical to treatment success when the variables maintaining problem behavior cannot be identified or controlled.”

- There are 120 peer reviewed articles on skin shock treatment.

Aversives (cont’d)

- In one study using a skin shock device: Graduated Electronic Decelerator (GED), “aggression and self-abuse were so frequent that he had to be restrained….more than 70 times per week.”

- “[E]ach restraint required up to five teachers.”

- “[S]elf-injurious behaviors included ‘body hits to the environment, head hits to wall and floor, body punches, face or head hits, self-bites’ and hand contortions (intense wringing of hands and fingers). These behaviors caused ‘bruises, scratches, swelling of joints, cuts to forehead caused by intense head-to-floors (while wearing a protective helmet)….and] fractured bones in his hands on two occasions.’”

Aversives (cont’d)

- In one published study with 60 individuals with the GED, “[w]hen end-of-baseline data were compared with end-of-treatment data, CSS [contingent skin shock], as a supplement to positive programming, showed effectiveness (defined as a 90% or greater reduction from baseline) with 100% of the participants.”

- “Psychotropic medications were reduced by 98%, emergency takedown restraints were reduced by 100%, and aggression-caused staff injuries were reduced by 96%.”

- “As a result of the treatment, 38% of participants no longer required CSS and some returned to a normal living pattern.”

Aversives (cont’d)

- A literature analysis compared second generation antipsychotic medications (SGAs) to skin shock.

- With SGAs, 23 of 136 problem behaviors were eliminated in 88 subjects.

- With skin shock treatment, 83 of 117 problem behaviors were eliminated in 114 subjects.

- The mean daily rate of baseline problem behaviors were 5,300.23 in skin shock studies compared to 282.31 with SGAs, nearly 19 times as high as in the studies on SGAs.
My Brother before and after Aversives

Health Dangerous Behaviors
• Baseline 400–500 × month
• Positive Only Treatment 60–70 × month
• Supplementary Aversives most months less than 10, never more than 40, many months 0

Physical Aggression
• Baseline 900–1000 × month
• Positive Only Treatment 400–500 × month
• Supplementary Aversives 0–40 × month, most months 0

Property Destruction
• Baseline 80–90 × month
• Positive Only Treatment 50–60 × month
• Supplementary Aversives 0–2 × month

Now has paid job at school, goes on trips, no medications in 30 years, last skin shock over 6 years ago

Matthew’s Recent Major Self-Injurious Behavior

Matthew’s Recent Minor Self-Injurious Behavior

Matthew’s Recent Aggression

Side Effects of Aversives
• One study using the GED over 3 years to 60 individuals with 3,764 applications showed "occasional temporary discoloration of the surface of the skin that cleared up in a few minutes or days"
• In one study with 9 participants, positive verbal and nonverbal utterances, negative verbal and nonverbal utterances, and socially appropriate behaviors either improved or remained the same

Fading Aversives
• 5 published research studies describe individuals with dangerous behaviors who maintained their treatment gains after the shock devices were partially or completely faded
Matthew after Treatment

Matthew in the Community

My Brother Who Had No Applied Behavior Analysis

Applied Behavior Analysis and the Law

- In New York, on November 21, 2014, a new law permitted due process procedures for families to contest a proposed placement to extend to individuals over age 21, allowing my brother to remain at his ABA placement.
- This law extends only to continuing funding for a current placement when the proposed placement is inappropriate, but does not give individuals who are in an inappropriate placement or have no placement at all a right to effective treatment.

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More Perspectives

Problem Behavior

• Bottom Line: A problem behavior interferes with ones ability to learn in her environment.

• Important to identify "why" the behavior is occurring.

What is “playing” anyway?

Identify the target behavior you want to change so that it is specific, observable, and measurable.

Behavior linked to a skill deficit?

• Does the student understand the behavioral expectations?

• Does the student realize that he is engaging in unacceptable behavior?

• Does the student's demonstrate the ability to control the behavior?

Easy as ABC...

Behavior is a chain reaction

Behavior Consequences

• Consequences for behavior can be pleasant or unpleasant from the student's point of view.

• Consequences that increase future behavior are called reinforcement.

• Consequences that decrease future behavior are called punishment.
Teaching is based on **FUNCTION** not **FORM**

**Function??**
- Function of the behavior refers to the purpose of the behavior, or "why" the behavior occurs.

<table>
<thead>
<tr>
<th>Antecedent</th>
<th>Behavior</th>
<th>Maintaining Consequences</th>
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<tbody>
<tr>
<td>What might be setting the stage for challenging behaviors?</td>
<td>The behavior of concern (target behavior)</td>
<td>What happens after the occurrence of behavior?</td>
</tr>
<tr>
<td>When it's time to do a puzzle,</td>
<td>Joe starts playing with his laces and bothering Mark.</td>
<td>(What is the function of behavior?)</td>
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<tr>
<td></td>
<td></td>
<td>and teacher tells him to leave his seat and go to the time-out chair</td>
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**Types of functions**
- **Escape**: to escape or avoid non-preferred items
- **Attention**: seeks to get attention from others.
- **Tangible**: Behavior that occurs to get something (e.g., candy, activity, toys)
- **Sensory**: Behavior that occurs to fulfill some sensory stimulation (visual, auditory, tactile, gustatory, vestibular)

**Increase Positive Behaviors**
- Reinforce positive behaviors
- Identify the correct reinforcer
- Decrease the reinforcer
- Ensure the reinforcer is still working.

**Teach Replacement Skills**
- Back to the “function”
- Target the appropriate replacement
- Be proactive
- Reinforce the replacement behavior

You can change the world by helping one student at a time......

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