

Pervasive Developmental Disorders: Differential Diagnosis, Treatment, & Research Update

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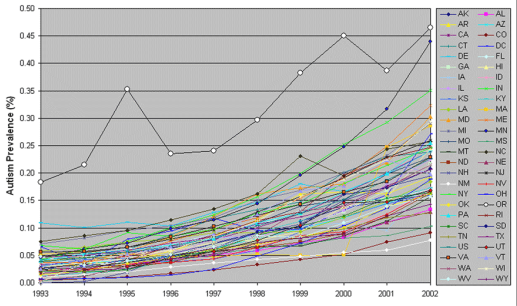


Pervasive Developmental Disorders/ Autism Spectrum Disorders

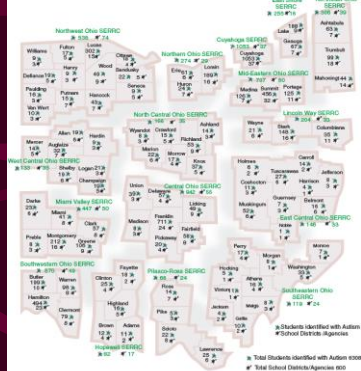


- 1 in 150 vs. 1-2 per 1000
 - Broader definition- PDD-NOS added 1987, Asperger's 1994
 - School policy in US- req'd to report spec. ed., incl PDD 1991
 - More help, less stigma
 - Re-labeling (dx did not fit, intervention was not effective- i.e., MR, LD)
- Variability in range of clinical presentation
- 10% have an associated medical condition
- NVLD vs. Asperger's vs. high fx Autism
- MR vs. Autistic D/O vs. Language D/O
- 2.8 to 7% sibling risk rates
- Chromosomes 7q & 13q most implicated

Autism Prevalence
by State and Year
[All States]



Students with Disabilities
Autism
2004 ODE Child Count



Pervasive Developmental Disorders (PDD)

- Autistic Disorder
- Asperger's Disorder
- Pervasive Developmental Disorder-NOS
- Rett's Syndrome
- Childhood Disintegrative Disorder

A (Brief) History of Autism

- 1908 Bleuler's initial identification of autism in adults
- 1943 Kanner describes 11 children with childhood autism
- 1944 Asperger describes "little professor" syndrome
- 1967 Bettelheim's *The Empty Fortress* published
- 1968 DSM-II lists autism as type of childhood schizophrenia
- 1980 Wing conceptualizes triad of autistic symptoms
- 1987 DSM-III-R places autism among personality disorders
- 1994 DSM-IV places autism among clinical disorders
- 1999 Federal autism research initiatives launched
- 2000 DSM-IV-TR clarifies PDD-NOS
- 2002 Vaccine/MMR controversy
- 2010 Change in DSM-V . . . ?

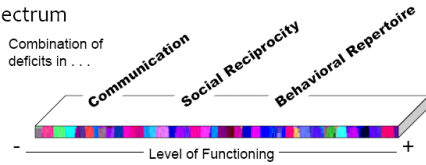
Current classification of autism

Categorical



Spectrum

Combination of deficits in . . .



Pervasive Developmental Disorders

Core features of PDDs / ASDs

- Limited social interaction
- Lack of verbal communication
- Narrow and repetitive behavior patterns



Multilevel Model of PDD



- Observable symptoms
- Core Behavioral Deficits
- Cognitive-Emotional-Behavioral Functioning
- Brain Structures and Neurologic Pathways
- Gene-Environment Interactions

Genes & the “Broader Autism Phenotype”

- Strong evidence of heritability
- Consistent 4:1 male-female ratio
- Likely genetic effects due to modifications of secondary or tertiary structures of DNA rather than primary changes in gene sequence (epigenesis)
- Current estimate is that between 5 and 100 loci involved



Characteristics of Autism Spectrum Disorder



Autism Society of North Carolina
 1025 South Branch Street, 200
 Raleigh, NC 27605-1242
 Tel: (919) 784-0200 • Fax: (919) 784-0202
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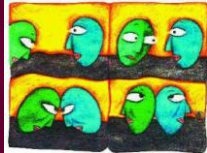
Key Diagnostic Features of PDD

- Impairment in *reciprocal* social interaction
- Stereotyped behaviors or interests (*perseveration*)
- Impaired or atypical language/communication
- Onset during infancy or childhood
- Behavior is atypical, not just delayed
- Wide range of functioning



Social Characteristics of PDD

- Inability to sustain “normal” social conversation
- Self-focused interpersonal style
- Difficulty interpreting subtle social cues
- Indiscriminate with affection or no affection
- Very literal or concrete interpretation
- Hypersensitivity
- “In their own world”



Sensory/Motor Characteristics of PDD

- Over-reactivity of sensory input
- Poor kinesthetic awareness
- Poor gross & fine motor skills
- Heightened/diminished pain threshold
- Repetitive or stereotyped movements
- Delays in written language
- Disrupted sleep cycles



Behavioral Characteristics of PDD

- Rigidity with routines
- Difficulty with changes or transitions
- Perseveration in areas of interest/activity
- Stereotyped movements/behaviors
- Overreliance on fantasy or make-believe



Language & Communication Characteristics of PDD

- Delayed onset of functional language (not Asperger's) or no expressive language
- Concrete use & understanding of language
- Poor pragmatic skills
- Unusual prosody
- Echolalia/perseveration
- Idiosyncratic word use



Affective Characteristics of PDD

- Affect may seem flat or blunted
- Limited ability to control emotional reaction
- Poor affective regulation
- Difficulty interpreting affect of others
- Unrealistic fears or worries



Cognitive & Learning Characteristics of PDD

- Excellent rote memory skills
- Poor reasoning & abstraction abilities
- Concrete & literal thinking skills
- Limited mental flexibility & divided attention
- Varied learning disabilities
- Poor organizational skills
- May have splinter skills



Differential Diagnosis

- Degree of impairment/severity
- Presence of significant language or cognitive delays
- Age of onset
- Period of normal development prior to onset
- Co-occurring conditions

DSM-IV Criteria for Autistic Disorder

- A. Six or more from (1), (2), & (3) with at least two from (1), one each from (2) & (3)
- B. Delays in social, language, & play skills
- C. Onset prior to age 3
- D. Not better accounted for by another diagnosis (i.e., Rett Disorder or CDD)

(1) Qualitative impairment in social interaction

- use of multiple nonverbal behaviors
- failure to develop peer relationships appropriate to developmental level
- lack of spontaneous seeking to share enjoyment, interests, or achievement with other people
- lack of social or emotional reciprocity

(2) Qualitative impairment in communication

- delay in or total lack of development of spoken language (no attempt at nonverbal gestures)
- if adequate speech, marked impairment in ability to initiate or sustain conversation
- stereotyped and repetitive use of language
- lack of varied spontaneous (developmentally appropriate) make-believe play or social imitative play

(3) Restricted repetitive and stereotyped patterns of behavior, interests, & activities

- encompassing preoccupation with one or more stereotyped & restricted patterns of interest that is abnormal in intensity or focus
- apparently inflexible adherence to specific, nonfunctional routines or rituals
- stereotyped & repetitive motor mannerisms
- persistent pre-occupation with parts of objects

DSM-IV Criteria for Asperger's Disorder

A. Qualitative impairment in social interaction as manifested by at least two of the following

- marked impairment in the use of multiple nonverbal behaviors
- failure to develop peer relationships appropriate to developmental level
- lack of spontaneous seeking to share enjoyment, interests, or achievements with other people
- lack of social or emotional reciprocity

B. Restricted, repetitive, & stereotyped patterns of behavior, interests, & activities as manifested by at least one of the following

- encompassing preoccupation with one or more stereotyped & restricted patterns of interest that is abnormal either in intensity or focus
- apparently inflexible adherence to specific nonfunctional routines or rituals
- stereotyped & repetitive motor mannerisms
- persistent preoccupation with parts of objects

C. Clinically significant impairments in social, occupational, or other areas of function

- D. No clinically significant general delay in language acquisition (single words used by age 2; communicative phrases by age 3)**
- E. No clinically significant delay in cognitive development, age-appropriate self-help, adaptive behavior, and curiosity about environment**
- F. Criteria are not met by other PDD or Schizophrenia**

PDD Not Otherwise Specified

- **Severe impairment in one or more key areas of social interaction, verbal/nonverbal communication**
- **Stereotyped, restricted interests & behaviors**
- **Criteria not met for another diagnosis**
- **“Atypical” Autism or PDD**
- **May be high functioning but delayed language**

Childhood Disintegrative Disorder

- A. Apparently normal development first 2 years after birth as manifested by the presence of age appropriate verbal & nonverbal communication, social relationships, & adaptive behavior**

B. Clinically significant loss of previously acquired skills (before age 10) in at least two of the following areas

- Expressive or receptive language
- Social skills or adaptive behavior
- Bowel & bladder control
- Play
- Motor skills

C. Abnormalities of functioning in at least 2 of 3 areas

- qualitative impairments in social interaction
- qualitative impairments in communication
- restricted repetitive & stereotyped patterns of behavior, interests, & activities including motor stereotypies & mannerisms

D. Disturbance is not better accounted for by another specific PDD or by Schizophrenia

Rett's Disorder

A. All of the following

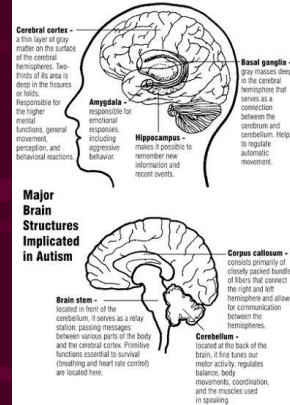
- apparently normal prenatal & perinatal course
- apparently normal psychomotor development for at least first 5 months of life
- Normal head circumference at birth

B. Onset of all of the following after the period of normal development

- Deceleration of head growth between ages 5 to 48 months
- Loss of previously acquired purposeful hand skills between ages 5 to 30 months with subsequent development of stereotyped hand movements
- Loss of social engagement early in the course
- Appearance of poorly coordinated gait or trunk movements
- Severely impaired expressive & receptive language development with severe psychomotor retardation

Differential Diagnosis

	Rett/CDD	Autism	Asperger's	PDD-NOS
Onset	Late	Early	Early	Early?
Social Impairment	+	+	+	+
Repetitive Behavior	+	+	+	+/-
Language Impairment	+	+	+/-	+/-
Language Delay	-	+/-	-	+/-
Cognitive Impairment	+	+/-	-	+/-



Structural Imaging Studies: Brain Volume

- Evidence of brain enlargement (regional rather than global)
- Postmortem megalencephaly
- Brain volume overgrowth limited to early childhood
- Smaller rate of linear age increase in white matter volume
- Decrease in gray tissue volume between ages 2 - 9

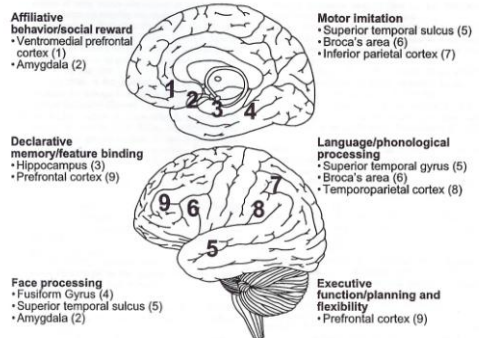


Figure 2. Candidate traits underlying the autism broader phenotype.

Functional Imaging Studies

- **Social cognition** - less activation of frontal regions, enhanced activation in STG, no activation in amygdala
- **Face processing** - more activation in right ITG, less in right fusiform gyrus
- **Executive Functions** - less activation in right DLPFC, more in right ventral occipitotemporal
- **Language Processes** - less typical left hemisphere dominance, decreased activation in PFC

Intervention & Treatment

- Observable Symptoms
 - Behavioral therapy
- Core Behavioral Deficits
 - Cognitive therapy
- Cognitive-Behavioral-Emotional Functioning
 - Speech/Language therapy; Social skills training
- Brain structures & neurologic pathways
 - Psychopharmacological treatment
- Gene-Environment Interactions
 - Parenting & family support

Treatment

- Resource Services – pullout/itinerant
- Specific intervention programs
- Support Services & Therapy
- Visual Supports (schedules with pictures)
- Picture Exchange Communication System
- Classroom Modifications
- Pharmacological Intervention

Applied Behavior Analysis

- Discrete trial learning
- Reward approximations
- One-on-one (30-40 hours/wk)
- Specific, intensive (before age 6)
- Move from tangible to social reinforcement
- Consistent across settings
- Parent training/maintenance schedule

TEACCH

- “Treatment & Education of Autistic & related Communication-handicapped **CH**ildren”
- Structure environment to enhance visual learning style
- Organize space (location, transitioning)
 - Assess to address unique sensory/spatial needs
 - Identify location of activities
 - Organize/refine structure of space
 - Locate/label materials & supplies
 - Continued evaluation of efficacy

Floortime

- Emphasis on social/emotional interactions
- Developmental perspective
 - Start at basics of social/emotional awareness
 - Gradually progress through “milestones”
- 20-30 minutes of intensive, interactive, child-directed, 1:1 play
 - Primarily with parent or family member
 - Additional support by other professionals
 - Actively follow the **child's lead**
 - Focus on **creating interactions**



Support Services/Therapy

- Parent training/Support network
- Occupational Therapy
- Physical Therapy
- Speech Therapy
- Developmental Therapy
- Music/Art Therapy
- Vocational/Daily living skills



Strategies for Teaching Students with ASDs

- Students with autism often need structured visual teaching
 - main elements of structured teaching include: daily schedules, individual work systems, and classroom arrangement
1. This makes the environment predictable
 2. Reduces student stress, confusion, anxiety, and behavior problems
 3. Builds on the student's strengths
 - desire for routine, predictability, and organization
 - comfort with repetitive tasks
 - need to finish
 - visual learning styles
 4. Leads toward independence

Teaching Strategies, Cont.

- Teach the meaning and value of a schedule
 - Focus on what you want the child to do:
 1. Use daily schedules, calendars, & lists to assist in sequencing of activities and aid in transitions
 2. Use a variety of visual cues (objects, photos, icons, words, sentences, check lists)
 3. Individualize to the student's developmental level and skills
 4. Determine the length of the schedule based on student skill level
 5. Independence is the goal (not sophistication)

Examples of Daily Schedules



Picture Exchange Communication System



- PECS allows the child to initiate communicative interaction by exchanging/ giving a visual representation to another person
- Can be used in conjunction with ABA techniques

Phases:

- I Students initiate communication by exchanging a single picture for a highly desired item
- II Students actively seek out their pictures and to travel to someone to make a request
- III Students discriminate pictures and to select the picture that represents the item they want
- IV Students use sentence structure to make a request in the form of "I want _____"
- V Students respond to "What do you want?"
- VI Students comment about things in their environment spontaneously & in response to a question



Classroom Environment

- Carpet square/assigned desk for each child
- Tape to designate structured spot
- Limiting extraneous visual stimuli on walls
- Activity areas with physical boundaries
- Tangible time cues
- Picture/checklist schedules
- Sensory break area with materials
- Integrating computers



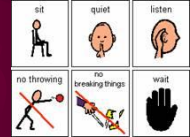
Teaching Strategies, Cont.

- Consider location, distractions, boundaries (i.e., buzzing lights, motors, hallway sounds, visual distractions, and smells can interfere with concentration)
 1. It should be visually clear what activities happen in which areas
 2. Furniture and materials should be clearly organized
 3. Locate the student near/ facing the teacher or at the end of a row
 4. In large groups, place between two model students
 5. Use visual barriers or study carrels



More Teaching Strategies

- Behavior is communication
- Work at reading the behavior and not taking it personally
 1. Write behavior rules for the child to read when necessary
 2. Use story webs and role playing to model appropriate behavior in social situations
 3. Positive rewards work better than punishment
 4. Use if/then patterns to aid in understanding
 5. Teach the child ways to be flexible
 6. Set your priorities (safety first -- you may need to let some of the "little things" go)



Pharmacological Interventions

- Often symptom-based treatment
- Stimulants (e.g., methylphenidate, Adderall)
- SSRIs (e.g., Prozac)
- Anti-convulsants (e.g., Tegretol, Trileptal)
- Neuroleptics or atypical anti-psychotics (e.g., Risperdol, Geodon)



Stimulant Medication

- Ritalin, Dexedrine, Adderall, Focalin
- Benefits:
 - Increase attention span
 - Decrease distractibility
 - Short half-life & act immediately
- Side Effects:
 - Decreased appetite
 - Insomnia
 - Somatic discomfort
 - Not approved for < age 6
 - May aggravate pre-existing tics



Anti-depressant Medication

- Tofranil, Wellbutrin, Prozac Effexor, Zoloft, Remerol, Paxil, Celexa
- Benefits:
 - Improves compulsive/perseverative behavior
 - Diminishes impulsivity
 - Decreases hyperactivity
 - Helps with mood disturbance
 - Decreases bedwetting
- Side Effects:
 - Irregular heartbeat
 - May aggravate seizure condition
 - May cause drowsiness/tremor/daytime sleepiness
 - Can't be used if risk for psychosis



Anti-convulsant Medication

- Tegretol, Depakene, Topomax, Neurontin
- Benefits:
 - May be used to control hyperactivity & mood swings in patients with seizures
 - Decreases aggression
- Side Effects:
 - Requires monitoring blood levels, bone marrow, & liver function



Anti-hypertensives

- Catepres (clonidine), Tenex (guanfacine)
- Benefits:
 - May improve ADHD-like symptoms
 - May help compulsive behavior
 - Improves sleep
- Side Effects:
 - Lowers blood pressure
 - Drowsiness
 - Requires cardiac monitoring
 - Rebound hypertension with quick withdrawal



Ohio's Autism Scholarship Program

- Program of the Ohio Department of Education (ODE)
- Allows ODE to pay a scholarship to the parents of a qualified child with autism
- Through the scholarship, parents have a choice of sending their child to a special education program, other than the one operated by their child's school district, to receive the services outlined in the child's individualized education program (IEP)
- Refer to the ODE- Autism Scholarship Program: http://olrs.ohio.gov/ASP/olrs_AutismScholarship.asp

PDD/ASD Websites

- www.ocali.org (OH Center for Autism & Low Incidence)
- www.ode.state.oh.us (OH Department of Education)
- www.autismlink.com
- www.asperger.org
- www.autism-society.org
- www.autism-pdd.net
- www.nimh.nih.gov/publicat/autism.cfm
- www.patientcenters.com/autism