An Introduction to Autism and the Autism Spectrum for Teachers

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Autism and Related Disorders

- **Before 1980**
  - Autism Not recognized as disorder
  - Confusion with schizophrenia
- **1980 DSM-III – infantile autism**
  - Pervasive Developmental Disorder =
  - Autism Spectrum Disorder
- **1994 DSM-IV**
  - Autistic disorder
  - Asperger's Disorder
  - Rett's Disorder
  - Childhood Disintegrative Disorder
  - PDD-NOS

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Leo Kanner: Early Infantile Autism

- **1943**
- **Reported 11 children**
- **Two Essential Features**
  - Autism
  - Resistance to change
- **Congenital in nature**
- **Developmental Issues**

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Asperger - 1944

- **Series of cases - all male**
- **Marked social problems**
- **Good cognitive/language**
- **Motor problems**
- **Circumscribed interests**
- **+ Family Hx (esp. fathers)**
- **"Autistic Psychopathy"/ Autistic personality disorder**

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What causes Autism?

- **Early notions of experience**
  - Feral children
  - Blaming parents
- **1970's evidence of biological factors**
  - High rates of seizures
  - Genetic factors
    - Twin studies

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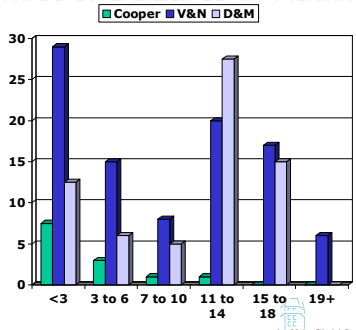
Onset of Seizures in Autism



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How common is Autism? – Is the frequency increasing?

- **No question that more cases are being identified but is there a 'real' increase?**
- **Issues:**
  - Changes in definition
  - Better diagnosis at both 'ends' of the spectrum
  - More awareness of the condition
  - Implications for service (diagnostic substitution)

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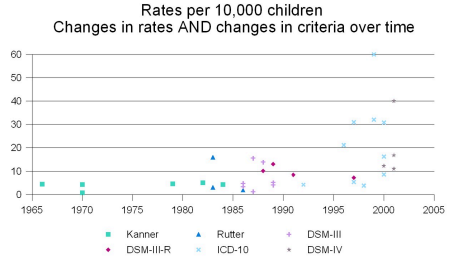
Epidemiology of Autism



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Understanding the Social Brain in Autism- Implications for school!

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The Social Nature of Autism

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What attracts the interest of most young adults?

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Face Recognition: Normal Development

- **Birth: preferential interest in face/ voice, top ½ face,**
- **2-3 months: face recognition (internal features)**
- **6 months: inversion effect, gender discrimination**
- **9 months: strong stranger response, species effects**
- **Subsequent changes in strategies with greater expertise as children become older**

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Face Recognition in Autism

- **Large literature on different approaches used by individuals with autism**
  - Do not do well on normed facial recognition tasks
  - Do as well recognizing inverted faces as correctly oriented ones
  - Rely less on salient features of face for recognition (e.g., may focus on other characteristics)
- **Limitations: use of still faces**

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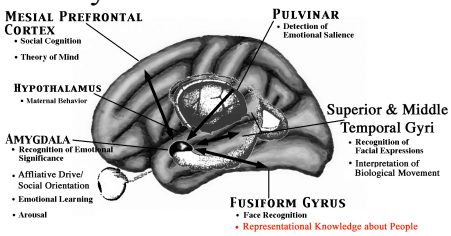
Circuitry of the Social Brain



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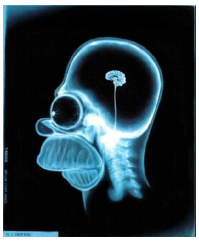
MRI vs. fMRI

MRI studies brain anatomy.



Functional MRI (fMRI) studies brain function.

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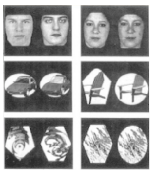
Face Discrimination

Schultz, et al.Archives of Gen. Psych., **57**, 331-340

fMRI study

- comparison to normal controls
- task: same or different:
  - people
  - objects
  - patterns
- regions of interest:
  - fusiform gyrus (face)
  - inferior temporal gyrus (objects)
- Both groups equally accurate
  - (tasks set up that way!)
- Finding now replicated 9 times



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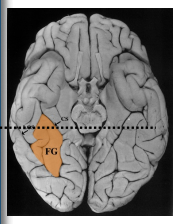
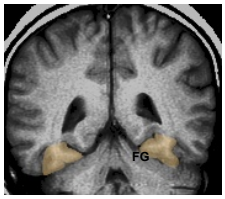
Neuroanatomy of Face Recognition: The Fusiform Gyrus

Underside of Actual Brain line



Coronal MRI Slice Along dotted line



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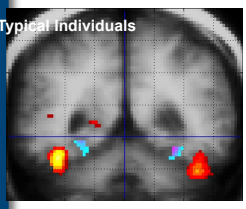
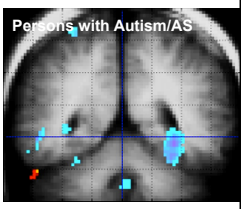
Face Recognition: Fusiform Gyrus Group Differences





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Eye tracking research

- **Ecological validity**
  - Viewing the world with new eyes
- **Choice of subject – concerns and choices**
  - Intensely social (small number of people)
  - Minimize action/objects (aka no terminator 2)
  - Black and white initially
  - Show short segments (not entire film)
  - Chose movie about a pleasant dinner party at a small New England college with 2 faculty members and their wives

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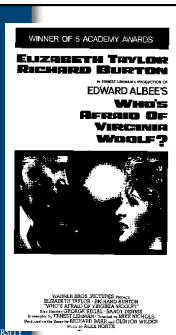

Viewer with autism

Age: 38, FSIQ: 119,
ADOS-4 / ADI-R +,
Vineland Socialization: 69

Typical Viewer

Age: 27, FSIQ: 110

Klin et al. (2002). *American Journal of Psychiatry*, **159**, 895-908.

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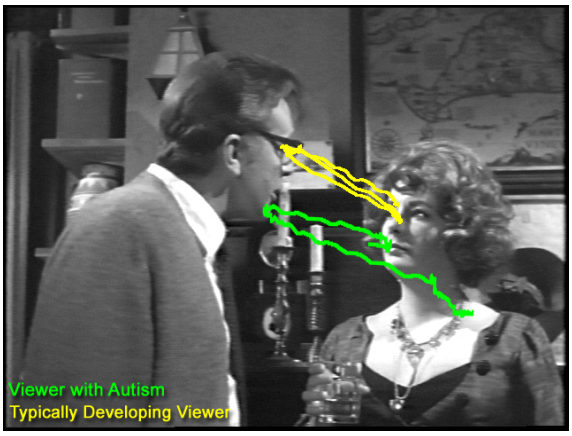

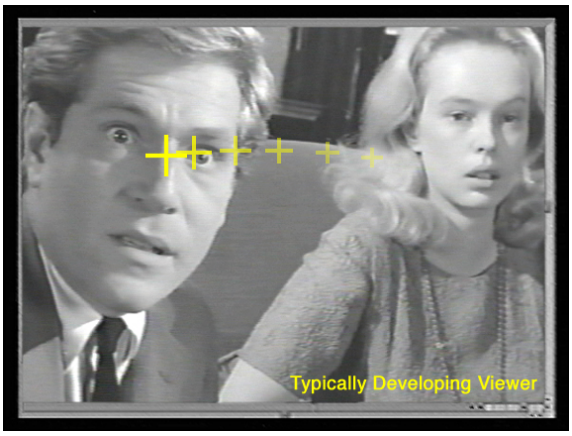

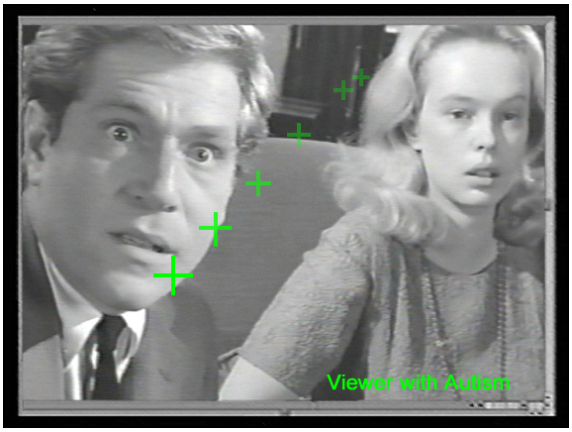

Focus on mouths vs. focus on eyes ➔ lose about 90% relevant information

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Information Lost by focusing on Mouth:

All the social (nonverbal) cues of the nonspeaker

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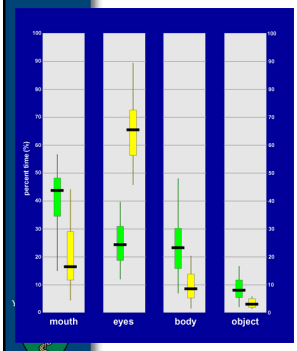

Group Results

	Autism Group	Normal Controls	*t* values
mouth	**41.21** (14.97)	**21.18** (12.12)	4.026, $p < .000$
eyes	**24.63** (8.07)	**65.44** (12.78)	-10.455, $p < .000$
body	**24.57** (12.41)	**9.65** (5.74)	4.226, $p < .000$
object	**9.58** (6.46)	**3.71** (2.44)	3.286, $p < .003$

values given as percent time **mean** (standard deviation)

Effect size (eyes): d=3.81

Klin, Jones, Schultz, Volkmar, & Cohen (2002). *Archives of General Psychiatry*, **59**, 809-816.

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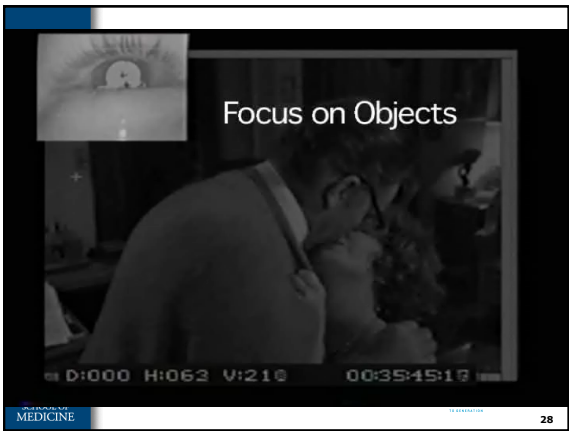

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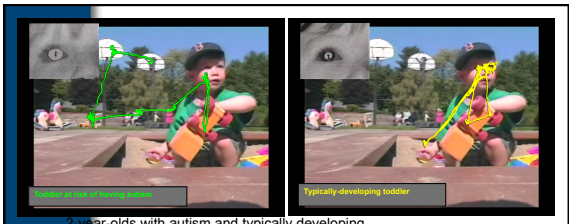
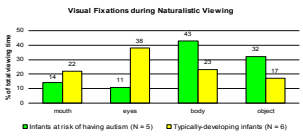


2-year-olds with autism and typically developing



Group Data

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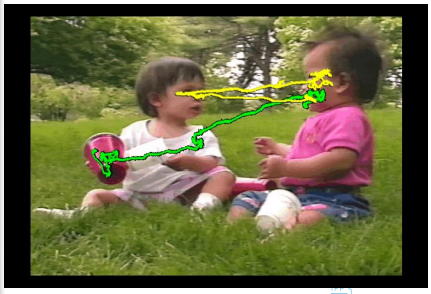
Toddler's viewing Toddlers

which child do you think might have autism?



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History: Autism Interventions

- **Intervention 1950-1980**
  - psychodynamic models – AKA blame the parents
  - Only a minority (maybe 20%) of children went to school, most 'written off'
- **PL 94-142 (1975)**
  - Mandate for school as a right
  - Beginning of a shift in treatment
- **1980**
  - First official recognition
  - Work on interventions ↑

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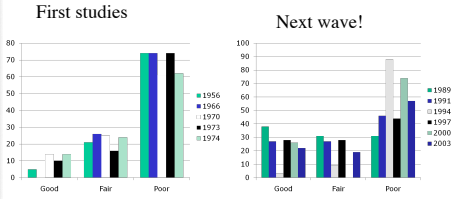
Outcome – two snapshots!



Data adapted from Howlin, 2005
Good: independent, Fair: Semi-independent
Poor: 24/7 care

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Why is outcome better?

- **Probably several factors are involved**
  - Greater awareness ➔ more acceptance and knowledge ➔
  - Earlier diagnosis ➔ earlier intervention ➔ increased development
  - And "learning to learn" orientation (using various procedures)➔
  - Substantial decrease in children with cognitive impairment
- **Other factors**
  - PL 94-142 ➔ schools mandated to provide service

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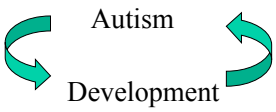
Contributions from/to Development



Autism has an impact on development
Development has an impact on Autism

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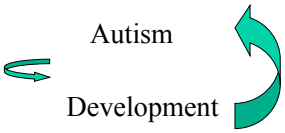
Developmental issues in treatment



Minimize the impact of autism
Maximize developmental gains

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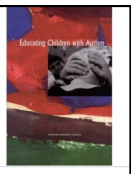
Model Programs



- **Background**
- **NRC report**
  - Structured intensive intervention
  - Commonalities (and differences) in programs
  - NOT every child gets better
  - As a group improved/improving outcomes
  - Early intervention
- **Some interesting issues**
  - University based/affiliated
  - Intensive
    - Average about 25 hours a week

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Translation into School Settings

- Recognize child's difficulties in responding to complex (social/ nonsocial) environments
- Balance of "pull out", small group, classroom-based, and unstructured environments
- Classroom environment
- Continuity and consistency
  - across settings and across people
- Monitoring and flexibility
  - team approach and collaboration
- School - home communication

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Social Skills

- Balance of methods
  - Adult instruction, peer, hybrid
  - Teach self-management and social skills
  - Goals
    - ☒ initiations and responses with/to peers
- Used for all ages and levels of severity
- Most research has been done with young children

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Language-Communication

- Language functioning at age 5 is one of the two strong predictors of outcome
- Probably at least 75% of preschoolers with autism can develop useful speech
- Even for individuals with minimal verbal speech teaching alternative COMMUNICATION skills is critical
- Importance of augmentative approaches
  - Visual strategies
  - Picture Exchange
  - Organizational aids
  - Simple ➔ complex approaches

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Other aspects of communication

- **Context:**
  - We are teaching (or encouraging) skills that most typical babied have by 9 to 12 months: prosody, loudness, turn taking, language segmentation
- **"register" and prosody**
  - Teach 3 voices
- **Teach idiom, figure of speech**
- **Teach about jokes and humor**
- **Implied meaning is VERY difficult to learn**

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Behavioral issues

- **Teaching new and desired behaviors**
  - Discrete trial, peer mediation, naturalistic, pivotal response
- **Decrease problem behaviors**
  - Behaviors that interfere with learning
  - Methods:
    - Functional analysis, extinction, examination of antecedents and consequences
- **Importance of having a 'vision' of what is wanted and what needs to be taught!**

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Adaptive skills & Generalization

- **Identify appropriate targets for intervention**
  - Use of Vineland and IQ levels
- **Generalization across settings, people, contexts at every opportunity**
- **Do NOT teach skills in isolation**
- **Encourage functional independence and self-sufficiency**
- **Coordination with home/family**

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Sensory and motor issues

- **Sensory issues/sensitivities**
  - Individualized program
  - Deal with sensory issues in appropriate ways
- **Encourage gross and fine motor skills**
  - Writing, keyboarding
- **Feeding/eating and oral-motor issues**

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Implications for teaching: translating what we know to the classroom

- **Problems in organization**
  - Stepwise approach, consistency, routines, visual aids, sufficient time
- **Attentional problems**
  - Isolate relevant information, structure environment, support attention
- **Sequencing**
  - Visual cues, predictability, consistency

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Implications for Teaching II

- **Gestalt learning style (learning in 'chunks')**
  - Present materials across settings, encourage generalization, family involvement
- **Visual learning style**
  - Use visual supports, give adequate time, limit verbal language, short simple language

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Implications for Teaching III

- **Trouble with time and temporal sequences**
  - Visual supports, concrete instructions, adequate time, clear expectations, clear outcome and feedback
- **Trouble understanding Social Cues**
  - Exaggerate, pair gestures and words, teach in context, avoid overly elaborate language, explicit teaching

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Technology helps!

- **Low tech**
  - Pictures, visual schedules, cues
  - Keyboarding, organizers, Power point
  - Tape to mark spots!
  - Seating and classroom
- **High tech**
  - MANY programs available (and more all the time)
  - Apple has MANY ap

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Challenges for higher functioning children

- Unawareness of the extent and impact of social disabilities & lack of appreciation of the child's disability: e.g., "too bright", "too verbal"
- Variability of the child's profile and presentation across settings
- Behavioral problems may takes precedence over the child's social disability -
  - "SEM", "SED", "ED", "BD"
  - worst mismatch ➔perfect misplacement
- Advocacy and services

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Interventions in Asperger's

- Use strengths to address weaknesses
  - Make things verbal
  - Explicit, explicit, explicit
  - Parts to whole learning
- Teach awareness of feelings, problem situations (Anxiety, novelty, depression) then teach explicit coping strategies

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Interventions in Asperger's

- **Teach verbal scripts for coping**
- **Use behavioral approaches informed by an understanding of the child's difficulties**
- **Have a proactive plan IN ADVANCE**
- **Teach conversation skills, self-monitoring**
  - Explicit rules/guidelines
  - Self-correcting mechanisms ("Am I talking to much")

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The Snakes of the Battle of Gettysburg

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Educational Setting – for more able students

individualized program

- Communication specialist input (despite good vocabulary!)
- Opportunities for social interaction in structured and supervised settings
- Acquisition of real life skills, anticipate troubles
- Willingness to adapt curriculum and be flexible (longer-term perspective)
- In-house coordinator of services: advocate, counselor, 'safe address' for the child in school

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Vocational/College Issues

- Address social disabilities, eccentricities, and anxiety-related vulnerabilities
  - Teach grooming, presentation, application letter writing, Practice job interview process
- College/vocational experience
  - facilitated by individualized approach
  - Note: relevant law, resources
- Job Choice
  - Neuropsychologically informed and Socially less demanding
- Use resources (e.g., job coaches, transition agencies, parent support networks)

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Family involvement/Support

- **Family involved at every stage of process**
- **Importance for generalization of skills**
- **Support from parents/siblings and others**
  - Support groups for parents/sibs
  - Basic information from school/ professionals
  - Internet and other resources

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Drug Treatments

- **Importance of Double blind, placebo controlled studies**
  - Major "placebo effect"
- **Medications most frequently studied**
  - Risperidone and newer 2nd generation neuroleptics – work well and quickly
  - SSRIs – used anxiety/depression, rigidity but seem to work less well in children, better in adolescents and adults
- **Side effects and balance of risk and benefit**

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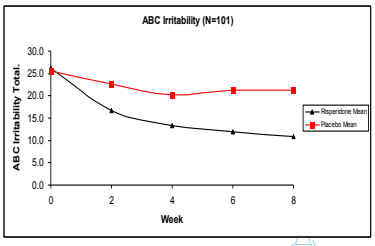
RUPP Autism Network: Irritability Scale



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Common sources of confusion!

- **HYPERLEXIA is common**
  - Child may READ much better than she/ he understands
- **Vocabulary can be an isolated strength**
- **For the most able children academic achievement >> real world**
- **Child with Asperger's**
  - Commonly seen as "SEM" and put in with 'really' bad boys
- **Transitions and overstimulation➔ trouble!**

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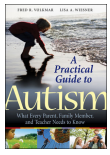
For parents

- **Providing quality <u>and</u> understandable information**
- **Use/limitations of internet!**
  - Yale You Tube lectures!
- **Importance (& downsides) of networking**
- **Considerable amount of miss-information available**
- **Evaluation of CAM particularly important**
- **Helping parents be informed consumers and advocates**



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CAM (complementary and alternative treatments)

- **Very frequently used**
- **Complimentary**
- **Alternative**
- **Sources of information for parents**
- **Sources of information for professionals**
- **Practical guidance on CAM**
- **(A few good books available)**

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In Summary

- **Many advances and an exciting time to be in autism research/service**
- **With earlier intervention and education we are making a BIG difference!**
- **Issues**
  - Need for research
  - Integration of research translation and communication regarding effective practices
  - Developing quality resources/ programs/ models of care is a priority!

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