



# Autism Spectrum Disorders Diagnosis

March 9, 2009

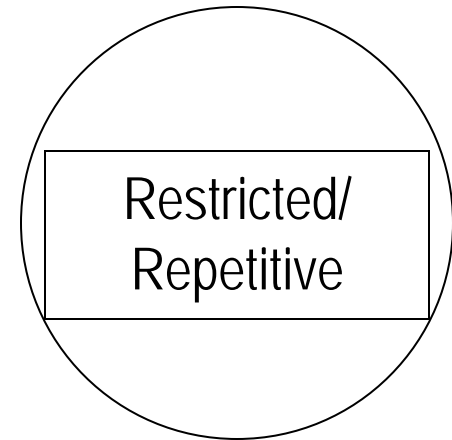
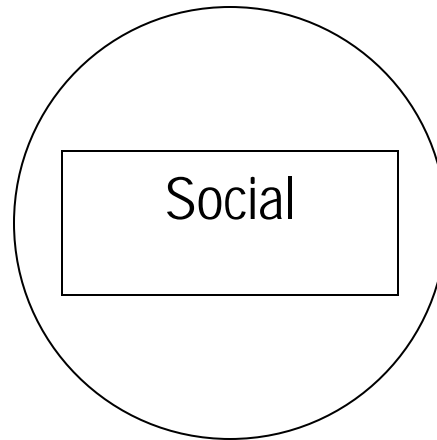
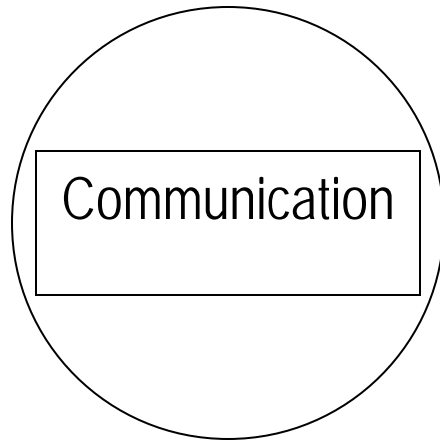
LEND Training Program

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# Autism Spectrum Disorders



## Autism Spectrum Disorders

(Pervasive Developmental Disorders)

Autism (Autistic Disorder)

Pervasive Developmental Disorder-Not Otherwise Specified (PDD-NOS)

Asperger's Disorder (Asperger Syndrome)



Rett's Disorder

Childhood Disintegrative Disorder



# ASD Assessment Core Elements

Descriptive diagnosis (no blood test--  
based on observations of behavior)

- Clinical history of development in all domains
- Health history, family history, physical exam, neurological exam
- Use of strategies to distinguish between ASDs and Developmental Disabilities

# Who can *diagnose* ASDs?

- WA State Division of Developmental Disabilities (DDD) Eligibility
- “...requires a diagnosis by a qualified professional of autism or autistic disorder per 299.00 in the DSM-IV-TR...”



# WA State DDD Eligibility

- “The following professionals are qualified to give this diagnosis:
  - Board eligible neurologist;
  - Board eligible psychiatrist;
  - Licensed psychologist; or
  - Board certified developmental and behavioral pediatrician”



# Best practices in ASD diagnostic evaluation

- Child seen by interdisciplinary team
- Information to come from multiple sources
  - Not just one test
  - Not just one interview
  - Not just one observation



# Clinical Diagnosis Guidelines

- Multiple sources
  - Family
  - Medical Evaluation
  - Psychological Evaluation
  - School
  - Additional clinical specialties as needed (SLP, OT, GI, Sleep, Nutrition)



# Overview of Assessment— Knowledge of Development

- Must understand behavior in a developmental context given strong association of autism and developmental delay
- Knowledge of typical development is critical in understanding the complexities of social, cognitive, language, and play development in individuals with autism
- Understanding behavior in context helps delineate treatment goals for child



# Knowledge of Development (cont.)

- Think about:
  - What is different about someone with autism than someone with communication difficulties and social skills difficulties?
  - What is different about autism than developmental delays, intellectual disability?



# Overview of Assessment: Key Indicators



- Autism spectrum disorders involve two different kinds of symptoms:
  - Typical behaviors that fail to develop at the expected time (such as response to distress, pretend play, joint attention (social interest, pointing), eye contact, and friendships)
  - Unusual behaviors that are typically not present in other children (such as repetitive body movements, restricted interests, viewing objects from the periphery)
- Typically developing children can exhibit some of these symptoms – difference is in the effect on functioning and clustering of symptoms

# DSM-IV TR Criteria: Autistic Disorder

- Impairment in 3 domains:
  - Social interaction
  - Language and communication
  - Repetitive behaviors, restricted range of interests
  - (specific criteria total of at least 6)
- Delays or abnormal functioning in at least one of the following areas with onset prior to age of 3: 1) social interaction, 2) social communication, or 3) symbolic or imaginative play



# PDD-NOS: Diagnostic Criteria

- For those children that are within the autism spectrum, but do not fully meet criteria for Autistic Disorder or Asperger's Disorder (\*are there “hundreds of kinds of autism”?)
- Social impairments are some combination within the 3 domains (but not all 3 required), without meeting other PDD criteria.



# Diagnostic Criteria for Asperger Syndrome



- Same criteria for social deficits and for restricted patterns of behavior as in ASD
- Significant disturbance in social, occupational, and other areas of functioning
- No significant language delay, but pragmatic deficits common
- No significant delay in cognitive development, self help skills or curiosity

# Medical Evaluation



- Complete history
  - Neurodevelopmental history
  - General developmental history
  - Family history
- Physical exam (looking for signs of)
  - Specific genetic, metabolic, neurological, or other medical conditions (see following slides)



# Medical Evaluation- physical exam

- Physical workup (looking for signs of)
  - Specific genetic disorder (Fragile x, array comparative genome hybridization)
  - Metabolic disorder (indicated if other specific symptoms such as lethargy or cyclical vomiting)
  - Neurological disorders (EEG indicated if seizures suspected, or regression is present, MRI not indicated unless other co-existing condition)
  - Other tests such as allergy testing, immune system workup, or heavy metal assays only if clinical features of these disorders present



# Medical Evaluation- physical exam (cont.)

- Audiological evaluation
- Vision exam
- Skin exam (for signs of neurocutaneous disorders such as tuberous sclerosis)
- Lead screening (if risk child has been exposed or if developmental delay present)
- Evaluation of GI function
- Sleep evaluation (sleep problems present in 75-95% of those diagnosed with ASDs)

# Associated and/or Comorbid Diagnoses

- ASD often mis-diagnosed as ADHD or Behavior Disorder (ODD)
- Mental Retardation or Developmental Delay
- Sensory Integration Disorder or Dysfunction
- Semantic-Pragmatic Language Disorder
- Features of Obsessive/Compulsive Disorder
- Anxiety and/or Depression
- Nonverbal Learning Disorder (NLD)
- Seizures
- Tourette's Disorder
- Psychotic Disorders
- Adulthood-Schizotypal/Schizoid PD





# Autism Spectrum Disorders: Social and Emotional Concerns

- A range of social-cognitive deficits negatively impact the child's ability to navigate and appropriately interact in social situations
- These social challenges can lead to stress, frustration and place the child at risk for (secondary) anxiety and depressive disorders.

# Anxiety and Mood Disorders



- Anxiety
  - Panic attacks
  - Compulsive behavior
  - Prolonged periods of anxiety can lead to Obsessive Compulsive Disorder
- Depression
  - Perfectionism
  - Negative self-talk



# Developmental History

- Primary source: parent interview
- Must establish whether delays were present prior to age three
- Identification of family history of ASDs or related issues
- Critical information regarding differential diagnosis
- Medical history and symptoms
- Evidence of regression/loss of skills?

# General Evaluation Guidelines, cont. (WA State Autism Task Force, 2008)

- The family is an essential member of the diagnostic team. Family members contribute by providing important historical information. They can optimize their roles by becoming familiar with the features of ASD and helping the diagnostic team recognize the features that may or may not be present in the child.



# Autism Diagnostic Interview-Revised (ADI-R)

- Ann Le Couteur, M.B.B.S., Catherine Lord, Ph.D., and Michael Rutter, M.D., F.R.S.
- “The Autism Diagnostic Interview-Revised is a semi-structured diagnostic interview to assess behaviors related to autism or Autistic Spectrum Disorders. Based on DSM-IV and ICD-10 criteria for autism and pervasive developmental disorders, the ADI-R contains questions about children’s early development, communication, social interaction, and patterns of behaviors.”





# Autism Diagnostic Interview- Revised (ADI-R)

- “The ADI-R yields scores for current behaviors and history and results in cutoff scores indicating presence of autism. A classification of autism is given when scores in all 3 domains of communication, social interaction, and patterns of behavior meet or exceed the specified cutoffs, and onset of the disorder is evident by age 3.”
- “Inter-rater and test-retest reliability, as well as internal validity, have been demonstrated for the ADI-R. The ADI-R and its previous version, the ADI, have been widely used in research and in academic centers for over 15 years.”



# Using the ADI-R

- “The ADI-R typically takes between 90 minutes to 3 hours and is administered by an experienced clinician to the caregiver(s) of an individual with autism. The ADI-R should be used by professionals who are very familiar with autistic spectrum disorders and who have experience in clinical interviewing and assessment of individuals with autism and other developmental disabilities. The examiner’s clinical skills and experience with the ADI-R are crucial to administration. Requirements of your profession determine if you should administer the instrument if you are using it for clinical purposes only.”

# What scores result from the ADI-R?

- “The ADI-R results in cutoff scores on the Diagnostic algorithms indicating a classification of Autism based on the child’s developmental history. Individuals must meet the cutoff for Autism on the Reciprocal Social Interaction domain; the Communication domain; the Restricted, Repetitive, and Stereotyped Patterns of Behavior domain; and Age of Onset to receive a classification. There is no total score on the ADI-R.”





# What scores result from the ADI-R?

- Currently, “scores on the ADI-R are not interpreted as a measure of symptom severity. In other words, scores cannot be compared across long time periods or across individuals in any simple way. Within a group of individuals of the same age, Nonverbal IQ, and expressive language, a higher score would mean that the person has more symptoms and/or more intense symptoms than someone with a lower score. Research is in progress to develop severity scores for the ADI-R.”



# Ages and the ADI-R

- “The ADI-R can be used to assess an individual of any age or from any setting, so long as the individual’s mental age equivalent is at a developmental level of at least 2 years, 0 months. Again, the ADI-R has been used with children functioning below that level; however, the results need to be interpreted with caution, as they can result in overclassification.”



# ADI and Diagnosis

“Like the ADOS, the ADI-R scores do not result in a diagnosis of Autism. The scores result in a classification of Autism, which can be used to support a diagnosis. It is one tool in an overall evaluation and diagnosis. The ADI-R is useful in establishing a developmental history, as well as obtaining information about specific current behaviors. It is recommended that other methods be used to add to the results of the ADI-R, such as individual standardized testing, structured observations (such as the ADOS), rating scales, etc.”



# ADI-R and Diagnosis

- “The ADI-R also does not provide separate cutoffs or criteria for ASDs other than Autism, such as Asperger Syndrome and Pervasive Developmental Disorder-Not Otherwise Specified (PDD-NOS). Cutoffs on the ADI-R only indicate a classification of Autism versus not Autism.”

[www.umaccweb.com](http://www.umaccweb.com)



# Social Communication Questionnaire (SCQ)

- Michael Rutter, M.D., FRS, Anthony Bailey, M.D., and Catherine Lord, Ph.D.
- “The Social Communication Questionnaire (SCQ) is a screening instrument designed to evaluate communication skills and social functioning in children who may have autism or autism spectrum disorders (ASD).
- The SCQ provides a measure of ASD symptoms, with a cutoff score that can be used to indicate the likelihood that the individual has an ASD.”



# Social Communication Questionnaire (SCQ)

- “Questions on the SCQ were developed based on items from the Autism Diagnostic Interview (Le Couteur, Rutter, et al., 1989), a measure that has been shown to identify autism spectrum disorders accurately and to differentiate them from other developmental disorders.
- The SCQ may be most useful as a screener for research projects with parents who already know about autism and autistic spectrum disorders symptoms. It may be less useful as a screening instrument for young children and for families who are less familiar with autism spectrum disorders.”



# General Evaluation Guidelines (WA State Autism Task Force, 2008)

- In addition to a medical evaluation, school-age children should undergo formal psychological evaluation by a child psychologist experienced in evaluating children with ASD. As a component for this assessment, the use of well-recognized diagnostic tools is imperative because of the presence of less-obvious symptoms in this age group.



# Psychological Evaluation

- Structured observation of social, communication, and play skills, direct interaction with child
  - ADOS—module-specific tasks
- Cognitive skills assessment
  - Verbal (when possible) and nonverbal abilities
- Adaptive functioning assessment
  - Via parent interview, such as the Vineland (communication, social skills, daily living skills)
- Older children: Executive Functioning
  - Parent report (BRIEF), direct child assessment (D-KEFS, etc.)
- Sensory Processing
  - Parent report, such as Short Sensory Profile, Sensory Profile
- Additional Neuropsychological Testing as indicated (memory, problem-solving)



# Psychological Evaluation (cont.)

- Standardized assessment if valid
  - Intellectual abilities
  - Academic abilities (if appropriate)
  - Neuropsychological Pattern (6 and older)
  - Used with caution! (social skills, communication skills, motivation all affect validity)
- Caregiver interview
- Teacher interview
  - Determine child's peer social, classroom independence, and academic skills

# Other Components of Multidisciplinary Evaluation

- Speech and Language Pathology
  - functional language (receptive/expressive/articulation)
  - Pragmatics
  - In many interdisciplinary team models, SLPs administer or help administer the ADOS
- Occupational Therapy
  - fine motor and adaptive skills
  - Overall motor skills
  - sensory processing
- Physical Therapy
  - gross motor skills



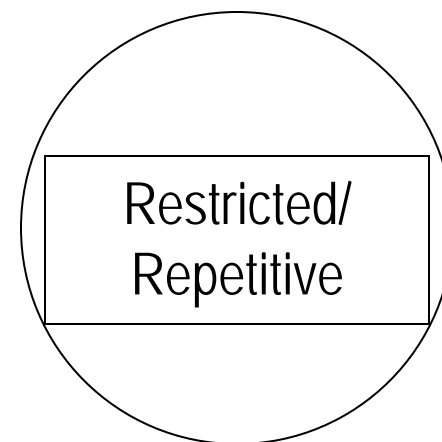
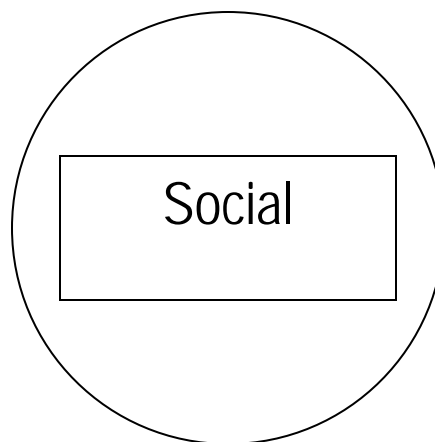
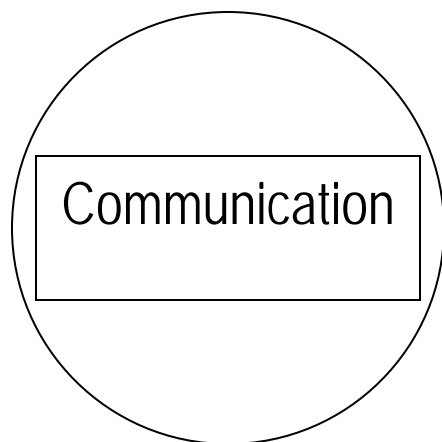
# General Evaluation Guidelines, cont. (WA State Autism Task Force, 2008)

- The school has a role in the diagnostic assessment of a school-age child for possible ASD. In addition to being a source of referral for diagnostic evaluation, school personnel can assist by providing accounts of behavioral observations and academic and psychological testing information. For some children, a school visit by a member of the diagnostic team may be valuable. The diagnostic assessment of a school age child should occur through a multidisciplinary approach.





# Autism Spectrum Disorders



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Asperger's Disorder (Asperger Syndrome)



Rett's Disorder

Childhood Disintegrative Disorder

# Communication Impairments in ASD

- Language develops slowly or not at all
- Inability to initiate or sustain a conversation
- Immediate or Delayed Echolalia (repeating of words/phrases)
- Pitch, intonation, rate, rhythm may be odd
- Pragmatics (social use) of language is disturbed
- Use of hand as a tool
- Under developed gesture use
- Don't typically ask questions



# Social Impairments in ASD



- Unusual responses to people
- Rather spend time alone than with others
- Doesn't imitate others' actions
- Poor joint attention skills
- Lack of showing/giving/sharing
- Impaired social or emotional reciprocity
- Atypical quality of empathy
- Less responsive to social cues such as smiles or eye contact
- Less frequent social initiations

# Types of Restricted Interests and Repetitive Behaviors

- Motor mannerisms
- Nonfunctional use of objects
- Restricted interests
- Preference for sameness
- Repetitive play
- Perseverative speech





# Behavior Patterns in ASD

- Repetitive body movements (hand flapping, hand twisting, body rocking)
- Nonfunctional toy play
  - Attachments to objects
  - Rank ordering, lining things up
  - Spin objects
  - Peripheral examination of toys/objects
- Resistance to changes in routine
- Self injurious behavior
- Perseveration on a single item, idea or person

# Autism Diagnostic Observation Schedule (ADOS)

- Catherine Lord, Ph.D., Michael Rutter, M.D., F.R.S., Pamela DiLavore, Ph.D., and Susan Risi, Ph.D.
- The Autism Diagnostic Observation Schedule is a standardized observation designed to assess behaviors related to autism or Autistic Spectrum Disorders.





# Autism Diagnostic Observation Schedule (ADOS)

- “The ADOS is a semi-structured, standardized assessment of communication, social interaction, and play or imaginative use of materials for individuals who have been referred because of possible autism or an autistic spectrum disorders. The ADOS can be used to evaluate individuals at different developmental levels and chronological ages, from toddlers to adults, from individuals with no speech to those who are verbally fluent.”



# Autism Diagnostic Observation Schedule (ADOS)

- “The goal of the ADOS is to provide standardized information concerning the diagnosis of autism in the areas of social behavior, use of vocalizations/speech and gesture in social situations, and play and interests. Structured activities and materials provide standard contexts in which social interactions, communication, and other behaviors relevant to autistic spectrum disorders are observed. Inter-rater and test-retest reliability, as well as internal validity, have been demonstrated for the ADOS.”



# Using the ADOS

- “The ADOS should be used by professionals who are very familiar with autistic spectrum disorders and who have experience in clinical assessment of individuals with autism and other developmental disabilities, such as physicians, psychologists, social workers, occupational therapists, and speech-language pathologists who evaluate and treat children with autism or autism spectrum disorders. The examiner’s clinical skills and experience with the ADOS are crucial to administration.”



# ADOS Scores

- “The ADOS results in cutoff scores indicating a classification of Autism or Autism Spectrum. Individuals must meet the cutoff for Autism or Autism Spectrum on the Communication Domain, the Reciprocal Social Interaction domain, and the Total Score to receive a classification.”



# ADOS Scores

- “...scores on the ADOS are not interpreted as a measure of symptom severity. In other words, higher scores do not necessarily indicate that an individual is “more autistic” or “lower functioning” than those who receive lower scores. Higher scores indicate the presence of more or more prevalent symptoms; however, the numbers that are added to create total scores do not represent real intervals. Research is in progress to develop severity scores that could then be used in measuring intervention or medication effects.” [www.umaccweb.com](http://www.umaccweb.com)



# ADOS and Diagnosis

- “Scores on the ADOS result in a classification rather than a diagnosis. Cutoff scores result in a classification of Autism or a classification of Autism Spectrum. Although there are separate cutoffs, these should not be interpreted as equivalent to distinguishing Asperger Syndrome or Pervasive Developmental Disorder-Not Otherwise Specified (PDD-NOS) from Autism.”



# ADOS and Diagnosis

- “Our research suggests that a significant minority of children with milder ASDs (such as Asperger or PDD-NOS) may not consistently score in the Autism Spectrum range on the ADOS. Many meet Autism cutoffs, most meet the Autism Spectrum cutoffs, and some score in the nonspectrum range. You will have to weigh the results of the ADOS with other information to distinguish among Autism PDD-NOS, and Asperger Syndrome. The ADOS should be used as one tool in an overall evaluation and diagnosis of Autism or other ASDs, along with a parent history and information from other sources, such as teachers. While it yields important information, scores should not be used alone in diagnosing Autism and other ASDs.” [www.umaccweb.com](http://www.umaccweb.com)



# Age and the ADOS

- “The ADOS can be used with toddlers up to adults, with individuals who are nonverbal to individuals who are verbally fluent. The manual recommends a minimum mental age equivalent at a developmental level of 18 months. The ADOS has been used with children who have mental age equivalents below that level; results for children with nonverbal mental age equivalents below 15 months need to be interpreted with caution. Adults who are nonverbal can also receive Module 1 of the ADOS, although some of the tasks and materials involved will not be age-appropriate.”

# Clinical observations (such as those made in ADOS)

- Did the child/how did the child/adolescent:
  - Explore materials symbolically?  
Functionally?
  - Stay with an activity for an appropriate length of time?
  - Spontaneously seek engagement with the examiner?



# Clinical observations (such as those made in ADOS)

- Did the child/how did the child/adolescent:
  - Share enjoyment?
  - Socially direct behavior?
  - Request/get needs met?
  - Pretend?
  - Participate?
  - Initiate?



# Clinical observations (such as those made in ADOS)

- Did the child/how did the child/adolescent:
  - Use gesture?
  - Report a familiar event?
  - Convey continuity in a story?
  - Appropriately modify detail to context?
  - Comment on own or others' emotions?
  - Show insight into social relationships?





# Childhood Autism Rating Scale (CARS)

- Schopler, Reichler, & Renner, 1988
- “The CARS is a 15-item behavioral rating scale developed to identify children with autism, and to distinguish them from developmentally handicapped children without the autism syndrome. It further distinguishes children with autism in the mild to moderate range from children with autism in the moderate to severe range.” (CARS manual, Western Psychological Services, 1992)



# CARS observations and ratings

- “The CARS ratings can be made from such different sources of observations as during psychological testing or classroom participation, from parent reports, and from history records. Any of these sources can be used *as long as they include the information required for rating all the scales.*”



# CARS Scale Items

1. Relating to people
2. Imitation
3. Emotional response
4. Body use
5. Object use
6. Adaptation to change
7. Visual response

# CARS Scale Items (cont.)

8. Listening response
9. Taste, smell, and touch response and use
10. Fear or nervousness
11. Verbal communication
12. Nonverbal communication
13. Activity level



# CARS Scale Items (cont.)

14. Level and consistency of intellectual response

15. General impressions





# CARS ratings

- 1 Within normal limits for that age
- 1.5 Very mildly abnormal for that age
- 2 Mildly abnormal for that age
- 2.5 Mildly-to-moderately abnormal for that age
- 3 Moderately abnormal for that age
- 3.5 Moderately-to-serverely abnormal for that age  
age
- 4 Severely abnormal for that age



# CARS Users

- “The CARS was initially developed and used by professionals with extensive experience in the field of autism; however, this scale is also intended for use by professionals in other fields who may have only limited experience with autism, but who would find the scale useful in screening children to determine those requiring further assessment and treatment by experts in the field.”



# CARS Intended Users and Uses

- “...professionals such as physicians, special educators, school psychologists, speech pathologists, and audiologists, who have had only minimal exposure to or training about autism, can be trained through brief written and/or videotaped instructions to administer the CARS.”



# CARS instructions

- “Child’s behavior should be compared with that of a normal child of the same age.”
- Consider the peculiarity, frequency, intensity, and duration of the behaviors.
- “Classification using the CARS is not intended as an endpoint in assessment...it should serve as the beginning point of a process to the point of a process to point the way for individualized assessment needed...”

# Assessment Difficulties in ASD

- Wide scatter across abilities
- Wide discrepancy of abilities across environments
- Motivation to perform on tests can be variable, difficult to establish
- Often discrepancies between others' estimation of child's abilities



# Autism Spectrum Disorders

- There is a great deal of variance within the spectrum
  - Age and course of onset
  - Specific symptoms and IQ
  - Outcome varies from child to child
  - Development changes symptom expression



# ASD Defies Generalization

- Measured Intelligence  
*severe.....gifted*
- Communication  
*nonverbal.....verbal*
- Behaviors  
*intense.....mild*
- Sensory  
*hyposensitive....hypersensitive*
- Motor  
*uncoordinated.....coordinated*





# Assessment Strategies

Combine information across skill areas and settings

- Academic: overall, areas of interest, splinter skills
- Cognitive: verbal, visual/spatial, memory, executive functioning
- Adaptive: classroom, home, executive functions, ability to use visual supports to become independent
- Social: peers vs. adults, structured vs. unstructured, large group vs. 1 to1



# Assessment Strategies

Combine information across skill areas and settings

- Emotional: ability to regulate in classroom vs. 1 to 1, structured vs. unstructured, ability to use coping strategies with visual supports
- Language: overall, speech production, pragmatic, receptive instruction, processing speed, MLU
- OT/PT: gross, fine motor, writing skills, planning, sensory issues



# Individual strengths

May include:

- Visual-spatial skills and/or verbal skills
- Excellent knowledge & passion related to interests (e.g., computer)
- Good attention to areas of interest
- Good rote memory, memory for facts
- Original way of thinking
- Strong moral code, sense of justice
- Honesty, loyalty
- Recognizing order, following rules
- Independence
- Exceptional talents