Assessment of Autism Spectrum Disorders: Birth to Three

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Agenda

• Introduction
• Snapshot of current research relevant to prevalence, assessment/diagnostics
• Planning and Conducting an Assessment
  – Important Domains
  – Examples of Assessment
• Concluding Remarks

Please note: This free session is sponsored by Pearson Clinical Assessment. The presenter is the director of training and Consultation; therefore, Pearson Clinical Assessment Examples of products relevant to ASD will be shared.

What is Autism?

• Common definitions of autism all include mention of:
  – Impairment in social skills and social interactions
  – Impairment in communication skills
  – Restricted and repetitive behavior

• Key indicators of autism include issues regarding:
  – Joint Attention
  – Executive Function
  – Social Reciprocity
  – Language Acquisition
  – Theory of Mind
  – Behavior Control
  – Sensory Integration
Key Findings: Research Scan

- Review of the results of published epidemiological surveys between 1966 and 2010 (61 studies) estimates the rate for autistic disorder is about 22/10,000 and that for all forms of PDD is around 70/10,000.
- Prevalence approximately 6 per 1000 births.
- Average age of diagnosis = 48 months (CDC).

Other Findings

- Numerous IMFAR presentations reported on the predictive validity of screening during the second year, with generally positive results.
  - An Australian longitudinal study found that receptive language at 12 months was predictive. (IMFAR)
  - A study of early screening found that parents' concerns (especially regarding social and communication) become predictive of later diagnosis starting at about 12 months; concerns at 6 months are not predictive. (IMFAR)

Key Findings: Research Scan

- Evidence for a single or dominant type or cause is not emerging.
  - Multiple types of genetic abnormalities can lead to the chemical abnormalities that produce the syndromes.
  - Current evidence has not pointed to a single genetic marker.
Conclusions Regarding Prevalence Studies

- Upward trend in the rates likely explained by changes in case definition and identification, public awareness, social services and policies, and study design variables.
- True changes in the underlying incidence of PDDs cannot be ruled out.
- Surveillance of epidemiological trends in PDD incidence is required in future years.
- Saracino, Noseworthy, Steiman, Reisinger, Fombonne (2010)

Key Findings: Research Scan

- Focus on specific markers
- Much research is in the area of screening younger children (12-26 months)
  - Focus on parental concerns, emerging language, unusual/repetitive behaviors
- Effort toward early diagnosis
  - American Academy of Pediatrics recommendation to consider screening all 18-24 months
- Growing interest in assessing co-morbid disorders (e.g. ADHD, anxiety, etc.)

Other Findings

- Abnormal amygdala development (Mosconi et al, 2009; Archives of General Psychiatry) - enlargement of the amygdala is related to (does not necessarily cause) atypical social orienting behaviors and joint attention.
- Wolf JM, Tanaka JW, & Klaiman C (2008) findings indicate that the face-processing deficits in ASD reflect a category-specific impairment of faces characterized by a failure to form view-invariant face representations and discriminate information in the eye region of the face.
Are Their Brains Different?

- Special brain mechanisms have evolved for perceiving faces: for ASD children objects are recognized as quickly as faces; faces carry no special status and are seen as component parts, not wholes.
- Typically developing children focus on eyes, ASD children focus on mouths or incidental objects.
- See recent CNN reports from Children's Hospital of PA.

Other Findings

- Ozonoff S, Macari S, Young GS et. al. (2008) Autism: Studied object exploration behavior in 66 12-month-old infants. The autism/ASD outcome group displayed significantly more spinning, rotating, and unusual visual exploration of objects than two comparison groups. The average unusual visual exploration score of the autism/ASD group was over four standard deviations above the mean of the group with no concerns at outcome.
Cognitive Development

- At 9 and 18 months major shifts in representational competence
- At 18 months increase in communication symbols, pretend play and the ability to solve object permanence problems
- ASD children perform well on mental problem solving and object permanence, but pretend play, communicative words and gestures and imitation are delayed or absent
- ASD children do well on seriation, conservation and classification but impaired on appearance-reality problems

Social and Emotional Development

- Babies are usually particularly responsive to faces and voices and they engage in face to face affective sharing and turn taking
- By the end of 1st year, become more active in attachment relationships
- Retrospective research suggests that these social interactions are disrupted from the start, disrupting later social exchanges

Social Development, cont.

- Baby begins to communicate with parents regarding aspects of external world
  - Requesting behavior
  - Affiliative interaction
  - Joint attention (eye contact, gestures to coordinate attention)
  - Social referencing (learns about the world by observing the emotional reaction of caregiver)
- ASD children do make advances but they are not well integrated
Self-Awareness

- 2nd and 3rd years the emergence of self-recognition and awareness
- Self-conscious emotions emerge: embarrassment, shame, pride
- Empathy and attempts to influence the emotions of others
- Self-recognition is generally intact in ASD youngsters, but complex emotional regulation is impaired

Executive Functions

- The organization of goal directed behavior
- Integration of information from a variety of sources such as perception and memory to select an appropriate response
- Regulating one’s behavior, emotions, attention
- Planning, inhibiting pre-potent responses, controlling impulses, engaging in organized search, maintaining or flexibly switching response sets

Language Functioning

- The acquisition of vocabulary and grammar (when it occurs) emerges similarly to typically developing children
  - But, they show a lack of flexibility in language use
- Greatest impairments are seen as pragmatics develop: the integration of language within the social context in order to achieve effective communication (prosody, echolalia, pronoun reversals, volume modulation, stilted, awkward conversation)
Remember - Autism Can Be Reliably Diagnosed Prior to 36 Months

- Differences in ASD are measurable by 18 months of age.  
  - problems with eye contact,  
  - orienting to one's name,  
  - pretend play,  
  - imitation,  
  - nonverbal communication,  
  - language development  
- Most parents of toddlers diagnosed with ASD and non-ASD related developmental delays indicated that the area of first concern was in communication.  
  - However, the age of first concern was significantly younger for toddlers with an ASD diagnosis.  
  - Kozlowski, Matson, Horovitz, Worley, Neal (2011)

What Criteria are often Used? DSM-IV TR

A. A total of six or more items from (1), (2) and (3) with at least two from (1) and one each from (2) and (3).

1. Qualitative impairment in social interaction:
   a. marked impairment in the use of nonverbal behaviors such as eye to eye gaze, facial expressions, body posture or gestures to regulate social interactions.  
   b. failure to develop peer relations appropriate to developmental level  
   c. lack of spontaneous seeking to share enjoyment, interests, or achievements with other people  
   d. lack of social or emotional reciprocity

2. Qualitative impairment in communication:
   a. delay in or total lack of the development of spoken language (not accompanied by an attempt to compensate through alternative modes of communication such as gestures or mime)  
   b. in individuals with adequate speech, marked impairment in the ability to initiate or sustain conversation with others  
   c. stereotyped and repetitive use of language or idiosyncratic language  
   d. Lack of varied, spontaneous make-believe play or social imitative play appropriate to developmental level
DSM-IV Criteria cont.

3. Restricted repetitive and stereotyped patterns of behavior, interests, and activities, as manifested by at least one of the following:
   a. encompassing preoccupation with one or more stereotyped and restricted patterns of interests that is abnormal in intensity and/or focus
   b. apparently inflexible adherence to specific nonfunctional routines and rituals
   c. stereotypic and repetitive motor mannerisms, such as hand flapping, twisting, or whole body movements
   d. persistent preoccupation with parts of objects

Autism DSM-IV, Continued

B. Delays or abnormal functioning in at least one of the following with onset prior to age 3 years:
   1. Social interaction,
   2. Language as used in social communication, or
   3. Symbolic or imaginative play

Autism DSM-IV, Continued

• C. The disturbance is not better accounted for by Rett’s Disorder or Childhood Disintegrative Disorder

• Separate criteria provided for Rett’s, Asperger’s, Childhood Disintegrative, and PDD
  - Key for Asperger’s = no significant general language delay
DSM-V Proposed New Diagnostic Criteria

Autism Spectrum Disorder

- Must meet criteria 1, 2, and 3:
  1. Clinically significant, persistent deficits in social communication and interactions, as manifest by all of the following:
     a. Marked deficits in nonverbal and verbal communication used for social interaction;
     b. Lack of social reciprocity;
     c. Failure to develop and maintain peer relationships appropriate to developmental level.
  2. Restricted, repetitive patterns of behavior, interests, and activities, as manifested by at least TWO of the following:
     a. Stereotyped motor or verbal behaviors; or unusual sensory behaviors
     b. Excessive adherence to routines and ritualized patterns of behavior
     c. Restricted, fixated interests
  3. Symptoms must be present in early childhood (but may not become fully manifest until social demands exceed limited capacities)

Assessment of ASD is a Process

Rule in and Rule out Disorders
Comorbidity Specific to Infants and Toddlers

- Fodstad, Rojahn and Matson studied developing comorbid psychiatric conditions in toddlers with ASD and compared them to toddlers at risk for developmental delay but without ASD.
- Toddlers with ASD had more severe comorbid psychiatric symptoms than non-ASD toddlers with an accelerating trend of comorbid behaviors as age increased.
  - one of the first studies that points toward an elevated vulnerability of children with ASD for comorbid psychiatric conditions at a very young age as compared to other non-typical populations.
- Among the many comorbid behavior problems, feeding problems are common among children with ASD.
  - However, the assessment of feeding behavior in this population has received little attention.

Co-morbidities: Conditions to Rule-out/Rule-in

- Mental retardation (60-75%)
- Epilepsy (5% in children, 30% in adults)
- Phenylketonuria if untreated (5%)
- Tuberous sclerosis (<1%)
- Learning disabilities
- Tics
- Congenital malformations
- Cerebral palsy
- Down syndrome
- Hearing impairments
- Vision impairments

Best Practices: Example

- Research suggests importance of looking at executive
  - ADHD and autism might clinically co-exist
    - But: DSM-IV TR and ICD-10 currently don't support this dual-diagnosis.
    - Evidence from clinical, neuroimaging and neuropsychological domains was reviewed, with similarities and differences between the disorders
- Suggested future research into the comorbid profiles of the disorders
  - Placed strong emphasis on the neuropsychological assessment of executive functioning as a potentially useful tool for both identifying similarities, and differentiating the disorders.
- Gargaro, Rinehart, Bradshaw, Tonge, Sheppard (2011)
Best Practices (Example – Continued)

- Inhibitory control performance directly related only to the ADHD symptom of impulsive behavior.
- Relationship between social difficulties associated with ASD and theory of mind ability,
  - no such relationship with behaviors relating to ADHD.
- Ames & White (2011)

The Importance of Screening

AAP Guidelines

Pervasive Developmental Disorders Screening Test-II

- Birth to 48 months
- The older the child the more specific
- Test Components
  - Manual
  - 3 Response Forms = 3 “Stages”
  - 3 Stages of Screening
Stage 1: Primary Care Screener

- Typically used in a pediatric or family practice setting but can be used as a screening for child find
- Screening Question: "Is this child typically developing?"
- Screening may be prompted when the parent/caregiver raises concerns over child’s achievement of developmental milestones—including teachers and educators
- Locate children with a likelihood of a developmental delay, possibly ASD, but can be other types of delays

Do parents provide reliable information regarding their child’s development?

- In several studies (n=737 children), parental concerns about speech and language development, behavior, or other developmental issues were highly sensitive (i.e., 75% to 83%) and specific (79% to 81%) in detecting global developmental deficits.
- The absence of such concerns had modest specificity in detecting normal development (47%).
- In a study that combined parental concern with a standardized parental report found this to be effective for early behavioral and developmental screening in the primary care setting.

Here is what parents have seen-

- "Even as an infant, our daughter liked being alone…. She never cried for me when she awoke. I would either have to wake her, or she would be awake, lying sweetly looking at the ceiling. She did not make eye contact when breastfed, but looked at ceiling fans or something behind me. I could feel the disconnect, but, as mothers do, I blamed myself, and tried to be a more perfect mom. The disconnect only grew."
- "He began screaming when showering, claiming that the water felt like needles, became highly overwhelmed in loud or public places, and he also started having problems maintaining eye contact."
Stage 2: Developmental Clinic Screener

- Typically the point of entry to developmental services for most children – Early Start, Child Find, special education services
- Screening question: “Does this child have an ASD or some other developmental delay?”
- Objective: Separate the children with a possible ASD from those who have a non-autistic development delay

PDDST-II Level 3 Uses

- Typically used at an autism-specific center or clinic
- Screening question: “Where is this child likely to fall in the autistic spectrum?”
- Parents are often concerned about severity after the initial diagnosis
- Objective of screening is to begin to differentiate autism from other pervasive developmental disorders in order to provide an estimate of severity

Relevant Assessment Domains to Consider

- Ages birth through 2
  - Cognition
  - Language and communication
    - Receptive language
    - Expressive language
  - Social/emotional behavior
  - Adaptive behavior
  - Behavior and self-regulation
    - Executive Functions
  - Motor skills
  - Sensory-motor abilities
  - Feeding and swallowing

- Ages 3-4
  - Cognition
  - Language and communication
    - Receptive language
    - Expressive language
    - Pragmatics
  - Social perception
  - Adaptive behavior
  - Executive Functions
    - Motor skills
    - Sensory-motor abilities
    - Visual-perceptual skills
Planning and conducting an evaluation for a student with a suspected ASD:

- Avoid removing the student from preferred planned activities
- Determine motivators ahead of time through discussion with classroom staff and parents, and have these items readily available for use
- Consider seeing the youngster at the same time each day versus a variety of times, depending on what is being assessed and the student's need for consistency
- Address potential safety concerns by having another trusted adult present during testing, if necessary.

Assessing Cognition, Information Processing and Other Domains

<table>
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<th>Matched Control</th>
<th>Group Mean Comparison</th>
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<tr>
<td>SE</td>
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<tr>
<td>Lang</td>
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<td>ASD</td>
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Children With Pervasive Developmental Disorder – Bayley-III
NEPSY-II SOCIAL PERCEPTION SUBTESTS

- Social Perception Domain
  - Affect Recognition - tests the ability to recognize affect from photographs of children's faces
  - Theory of Mind -
    - Part A - assesses the ability to understand mental functions such as belief, deception, etc. and the fact that others have their own thoughts, ideas, etc.
    - Part B - assesses the ability to understand how emotions relate to social context

Theory of Mind

- To Be Able To Reflect on One's Own and Other's Minds.
- Another Person Can Have Differing Thoughts and Beliefs From One's Own.
- Understanding That Others Don't Know What You Are Doing If They Have Not Been Present.

Theory of Mind - A Core Deficit in Autism Spectrum Disorders

- "Theory of Mind" refers to the ability to infer the full range of mental states:
  - Beliefs
  - Desires
  - Emotions
  - Deception
  - Imagination
  - Intentions
Considerations in Interpreting ToM

- Typically developing children
  - no differential effects of presentation mode
- Children with SLI
  - highest test scores were consistently evidenced in the line-drawing mode
  - scores also correlated significantly with their short-term memory,
- Children with ASD, test performance depended on the mode of presentation, and correlated with their verbal age.

These findings demonstrate that performance on theory-of mind tests clearly depend upon mode of test presentation as well as the children’s cognitive and linguistic abilities (van Buijsen, Hendriks, Ketelaars, Verhoeven, 2011).

KABC-2 Autism-Points to Consider

- Face recognition
- Object recognition
- Cognitive shift
- Executive functioning

Motor Skills

- Children with ASD may have weak motor skills
- Motor skills are heavily interdependent with cognitive and social skills
  - Imitation
  - Social understanding (adjustment to another person’s posture)
  - Social gracefulness (adjustment of gait pattern to conversational partner’s movements)
  - Miller Function and Participation Scales, NEPSY, Bayley-III, Behavioral Observations, OT assessment
Motor Skills

- Miller Function and Participation Scales
  - Norm referenced
  - 2005
  - 2:6 through 7:11 (there are others that go to 9)
  - Scaled scores: Fine motor, Gross motor, Visual motor
  - Simulates school and home activities well in addition to getting a motor measure
  - Hands on and fun for kids
  - Covers lower range of function

Adaptive/Behavioral/Social-Emotional

The role of checklists and rating scales

Structured Ratings May Play Important Role in Under-representation of Minorities

- Compared to the known community prevalence, ethnic minorities were under-represented among children referred to autism institutions.

- Pediatricians more often referred for autism when judging clinical vignettes of European majority cases than vignettes including non-European minority cases.

- When ratings of the probability of autism were conducted, the effect of ethnic background disappeared.

Begeer, El Bouk, Boussaid, Terwogt, Koot (2009)
Adaptive skills comprise everyday competence.

- Adaptive skills are defined as
  - practical, everyday skills
  - needed to function and
  - meet the demands of one's environment
  - necessary to effectively and independently take care of oneself
  - to interact with other people
- Patterns Emerge with ASD
- Multiple raters should be used

- Results of a study with Vineland-II confirm previous findings of:
  - relative weaknesses in Socialization
  - relative strengths in Daily Living Skills
  - intermediate scores in Communication

Supplemental Analysis for the Social-Emotional Scale (Bayley-III or Greenspan)

- Items 1–8 of the Social-Emotional Scale assess the child’s sensory processing capacities (e.g., sensitivity to colors, sounds, touch, or movement) and is called the Total Sensory Processing Score.

- The Social-Emotional Growth Chart allows the practitioner and caregiver to see a visual representation of how the child is progressing according to milestones.

Performance of the Special Groups On the Social-Emotional Scale of the Bayley-III (Greenspan)

<table>
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<th>Clinical Group</th>
<th>Clinical</th>
<th>Matched Control</th>
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</tr>
</thead>
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<tr>
<td>Asphyxia</td>
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<td>39</td>
</tr>
<tr>
<td>At Risk</td>
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<td>0.00</td>
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<tr>
<td>Cerebral Palsy</td>
<td>21.31</td>
<td>5.64</td>
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</tr>
<tr>
<td>Down Syndrome</td>
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<tr>
<td>FAS/PAD</td>
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<tr>
<td>Language Impairment</td>
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<td>81</td>
</tr>
<tr>
<td>Prematurity</td>
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<td>1.23</td>
<td>81</td>
</tr>
<tr>
<td>PDD</td>
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<td>0.00</td>
<td>81</td>
</tr>
<tr>
<td>SGA</td>
<td>4.65</td>
<td>2.33</td>
<td>43</td>
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ITSEA
Developmentally Age-Appropriate Measure

- Profiles problems & competencies in terms of four domains
  - Externalizing
  - Internalizing
  - Dysregulation
  - Competence
- Measures a variety of other child behaviors:
  - Social relatedness, maladaptive behaviors
  - And other “red flag” indicators

ITSEA
Developmentally Age-Appropriate Measure

- Identifies key indicators of:
  - Autism
  - Pervasive development disorders
- Assists in formulating intervention plans
  - Identify areas of concern
  - Use strengths to overcome weaknesses
- National normative model based on 2002 Census

Between Groups Validity: ASD on ITSEA

- Children with autism compared to:
  - Developmentally delayed
  - Typically developing children
  - Matched for mental age and socio-demographic factors.
- Children with autism show significant elevations relative to both contrast groups on ITSEA scales and indices below:
  - Atypical Behaviors
  - Social Relatedness
  - Maladaptive Index
  - Depression/Social Withdrawal
Between Groups Validity: Autism

- Also, children with autism significantly delayed relative to other groups in these Competence areas:
  - Empathy
  - Prosocial Peer Relations
  - Imitation/Play
  - Mastery Motivation

BASC-2

- Profiles on the BASC-2 related to Autism Spectrum
  - Withdrawal Scale
  - Atypicality Scale
  - Developmental Social Disorders Content Scale
  - Adaptive Scale Composite
  - DSM-IV items on ASSIST Plus
  - Autism/Asperger's group profile

BASC-2 ASSIST-Plus: Developmental Social Disorders Content Scale

- The tendency to display behaviors characterized by deficits in social skills, communication, interests, and activities. Such behaviors may include self-stimulation, withdrawal, and inappropriate socialization.
- May be due to deficits in social reasoning, social efficacy, social opportunities, social behaviors, social acceptance, empathy.
- High scores may indicate symptoms of Asperger's
- Autism could be suspected if Atypicality, Withdrawal, and Attention Problems scales also elevated
- May be indicative of Autism when this scale is elevated but Conduct Problems and Aggression are not
Recent Study with the BASC-2 PRS

- Children in an Autism Disorders (AD) group obtained significantly higher scores on the Developmental Social Disorders (DSD) scale than children in the PDD-NOS or Global Developmental Delay/Language Delay (GDD/LD) groups.
- Children in the AD group also scored significantly higher on the Attention Problems scale than the GDD/LD group, and significantly lower on the Social Skills scale than the PDD-NOS group. No significant differences between the PDD-NOS group and the GDD/LD group on this scale.
- Data suggest that DSD scale of the BASC-2 PRS-P accurately distinguishes between children with Autistic Disorder and those diagnosed with PDD-NOS or other developmental delays.

Juechter, Robins, Kamphaus, Fein (2011)

Sensory Issues

- Individuals with ASD may exhibit sensory issues
  - Rituals
  - Easy upset by noises
  - Distractibility
  - Difficulty filtering out irrelevant
  - Trouble with regulation
- Sensory Profile Family

Sensory Processing Problems are Important to Assess and Address

- Sensory processing abilities are aberrant in 42% to 88% of autistic individuals
- Sensory Problems Include
  - over- or under responsiveness to environmental stimuli
  - preoccupation with sensory features of objects
  - paradoxical responses to sensory stimuli
- Learning and social functioning can be affected if these are not addressed
Clinical Reasoning Process

- What are the child’s sensory processing patterns?
- How do the patterns affect desired activities?
- What creates the best match of
  - Activity,
  - Environment
  - Sensory processing pattern

Understanding affects success of child and helps the teacher or caregiver adapt and help

Examples of Pearson Tools for ASD Assessment (0-3)

- Screening: PDDST-II, Greenspan Social and Emotional Growth Chart, BITSE
- Cognitive Development/Functioning: Bayley III Cognitive Scale, Mullen Scales of Early Learning, DAS-II, KABC-2
- Language Domain: Bayley III Language, PLS-4, Mullen Scales of Early Learning
- Social Emotional Domain: Bayley III Social Emotional Scale, ITSEA, Greenspan Social Emotional Scale (same as Bayley III Social Emotional Scale)
- Adaptive Behavior Domain: Bayley III Adaptive Behavior Scale, Vineland Adaptive Behavior Scale, ITSEA

Suggested Pearson Tools

- Motor Domain: Bayley III Fine Motor Scale, Bayley III Gross Motor Scale, Mullen Scales of Early Learning
- Behavior/Regulation: BITSE/ITSEA, BASC Teacher Rating Scale (age 2+), BASC Student Observation System (age 2+), BASC Parent Rating Scale
- Social Perception Area: NEPSY-II
- Sensory Domain: Infant/Toddler Sensory Profile
- Feeding and Swallowing Disorders: Feeding and Swallowing Disorders in Infancy: Assessment and Management; Pre-Feeding Skills, Second Edition; Pediatric Videofluoroscopic Swallow Studies; Mealtime Participation Guide; Feeding and Nutrition for the Child with Special Needs: Handouts for Parents; Pre-Feeding Skills, Second Edition: A Comprehensive Resource for Mealtime Development
The Proper ASD Evaluation is Complex

• Understanding the needs and strengths of a child suspected of having an ASD is a complex process that requires:
  – A careful analysis of individual characteristics across key domains to:
    • conduct differential
    • plan appropriate treatment
  – Ruling in and ruling out various explanations/conditions
• Working with parents and a multi-disciplinary team using numerous approaches to assessment (understanding needs) comprises “best practice”

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Specific Webinar-Related Comments or Questions
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