Clinical Practice Guidelines (CPG): Autism update

Company

Humana Military

Client interest

Screening for Autism in the Primary Care Setting

Response

The goal of this work will be to create tools that can assist clinicians in the screening and identification of *Autism Spectrum Disorder (ASD) in the Primary Care Setting*. The purpose of these tools are:

- To enable screening of patients in the primary care setting and appropriately identify patients with a higher likelihood for the diagnosis of ASD and who require further evaluation
- To inform family and providers regarding the appropriate need for referral for specialty care and to avoid excessive or inappropriate referrals for a false-positive diagnosis of ASD

Key questions

The report shall address the following key questions:

1. Who should be screened (asymptomatic as well as symptomatic patients)?
2. What are the benefits of early identification and treatment?
3. Which screening tools are best?
4. How should borderline screening results be interpreted?
5. When should patients be referred for further testing or evaluation and what type of services or referrals are best?
6. What are good resources for further education to recommend for families who have children with suspected autism?

Background

Autism is a neurodevelopmental disorder that can cause significant impairment in social, emotional/behavioral, and communication skills. Individuals with autism characteristically exhibit restricted, repetitive, and stereotypical patterns of behavior. Autism is described as a spectrum due to the wide range of disability and severity of symptoms associated with it. Although the severity of the symptoms can vary greatly, all persons with autism exhibit some level of impairment in the area of social interactions/relationships, verbal and nonverbal communications, and limited interests in activities or play. Symptoms are generally noticed during the child's first three years. There can be considerable variation in cognitive, intellectual, emotional, psychiatric, and neurological comorbidities.

Epidemiology

The prevalence of autism has increased in recent years and is reportedly estimated to affect one in 88 children.[16] It is unknown if this reflects a true increase in prevalence or if improved case ascertainment coupled with increased awareness has caused the rise.vi. It is four times more common in boys than girls.[21] Evidence also suggests that siblings of affected children are at elevated risk compared with the general population.[25] Other risk factors include extreme premature birth (< 26 week gestation), advanced maternal or paternal age, close spacing of pregnancies, family members with learning or language disabilities, and genetics.[21]

Developmental assessments in the primary care setting

Routine well-child visits with the primary care professional provide an opportunity to identify and address developmental concerns that may be related to early identification of autism. Behavioral patterns and developmental progress (or regression) are critical in the diagnosing of autism. The primary care provider is often the first healthcare professional that parents alert regarding these developmental concerns.

Although symptoms may appear earlier and parental concerns may be heightened, the Centers for Disease Control and Prevention (CDC) reports that the median age at diagnosis for autistic disorder is 48 months. There is even further delay in diagnosis for ASD pervasive developmental disorder (PDD) and Asperger's disorder up to 53 to 75 months of age. Developmental assessments in the primary care setting may reverse the trends reported by the CDC regarding delayed diagnosis of autism. Children whose diagnoses are delayed may miss the opportunity to receive early intervention services to improve developmental outcomes and quality of life.[4]

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Developmental evaluations in the primary care office are divided into two categories: surveillance and screening according to the American Academy of Pediatrics (AAP):

Surveillance

Surveillance is the process of recognizing children who may be at risk of developmental delays. Developmental surveillance is a flexible, longitudinal, continuous, and cumulative process whereby knowledgeable healthcare professionals identify children who may have developmental problems. Areas of interest usually include fine motor, gross motor, social–emotional, self-help, expressive and receptive language. Developmental patterns are assessed for delays, deviance, and most importantly regression.

There are five components of developmental surveillance:

- Eliciting and attending to the parents' concerns about their child's development
- Documenting and maintaining a developmental history
- Making accurate observations of the child
- Identifying the risk and protective factors
- Maintaining an accurate record and documenting the process and findings

Developmental screening

Developmental screening is the administration of a brief standardized tool aiding in the identification of children at risk for a developmental disorder. Developmental screening that targets the area of concern is indicated whenever a problem is identified during developmental surveillance.

Screening for autism

Screening for autism is a specific systematic interview. The process usually involves a standardized validated instrument primarily filled out by the parents. Questions should address social-communications, gross and fine motor, self-regulation, sensory regulatory functions, autonomy, affect, restrictive, repetitive, or stereotypical patterns of behavior and interaction with people.

Diagnosis

There is no imaging or laboratory test that can diagnose autism. Developmental pediatricians, psychologists, and specially trained physicians administer specific behavioral evaluations designed to assess the child's behavior relating to the core symptoms of autism. The autism evaluation also includes a comprehensive medical history and physical exam and auditory evaluations.

The most current diagnostic criteria used when evaluating children is provided by The Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5).

The symptom profile required to meet the diagnosis of autism includes the following:

1. Persistent deficits in social communication and social interaction across multiple settings; manifested by deficits in the following (either currently or by history):
   a. Social-emotional reciprocity (e.g., failure of back-and-forth conversation; reduced sharing of interests, emotions, failure to initiate or respond to social interactions).
   b. Nonverbal communicative behaviors used for social interaction (e.g., poorly integrated verbal and nonverbal communication; abnormal eye contact or body language; poor understanding of gestures; most severe includes lack of facial expression and nonverbal communication).
   c. Developing, maintaining, and understanding relationships (e.g., difficulty adjusting behavior to social setting; difficulty making friends; lack of interest in peers; adjusting behavior to social context, problems sharing imaginative play, absence of interest in peers).

2. Restricted, repetitive patterns of behavior, interests, or activities; demonstrated by two or more of the following (either currently or by history):
   a. Stereotyped or repetitive movements, use of objects, or speech (e.g., stereotypes, echolalia, ordering toys, flipping objects, etc.).
   b. Insistence on sameness, unwavering adherence to routines, or ritualized patterns of behavior (verbal or nonverbal); manifests by significant distress with small changes or transitions, rigid thinking patterns, greeting rituals, or need to take the same route or eat the same food every day.
   c. Highly restricted, fixated interests that are abnormal in strength or focus (e.g., preoccupation with certain objects; perseverative interests).
   d. Increased or decreased response to sensory input or unusual interest in sensory aspects of the environment (e.g., adverse response to particular sounds; apparent indifference to temperature or pain; excessive touching/smelling of objects, visual fascination with lights or movement).

3. Other key components include:
   a. Onset should take place in early developmental period, although may not manifest as clearly until social demands are increased
   b. Clinically significant impairment in social, occupational, or other important areas of current functioning is present.
   c. Intellectual disability or a global developmental delay does not better explain deficits. If intellectual disability is present, social communication should be below that expected for general developmental level. (Approximately 50% have severe or profound Intellectual Disability (ID), approximately 35% have mild to moderate ID, and the other 20% have IQs in the normal range. Verbal skills are usually more impaired than nonverbal skills.

Key questions

1. **Who should be screened (asymptomatic as well as symptomatic patients) and when?**

   Children should be screened specifically for autism in response to parental or clinician concerns related to delays in achieving language and communication milestones and/or regression in social skills. Children should also be screened if found to be exhibiting stereotypical behaviors known to be associated with autism and children who have a sibling with a confirmed diagnosis of autism.

   In addition, all children should be screened during the 18 and 24 months well-child visit regardless of symptoms or concerns.

   Brief clinical observations and developmental surveillance may not provide enough information about atypical behaviors and may fall short in reliably detected autism risk. Clinical impression may miss delays in the domain of social and communication skills. Studies have shown that children who screen positive for autism using an ASD-specific screening instrument had not previously raised parental concerns when screened with a standardized general developmental questionnaire.[14] Autism-specific screening tools are designed to detect subtle and often unrecognized deficits or deviations from normal.[25] Since approximately one-third of children with ASD show developmental regression on average between 18 and 30 months, autism-specific screening of "asymptomatic" children during these well-child visits is valuable.[14] While delays in social communication may be subtly present near 12 months of age, they may not be specific to autism at that young age. Early screening for autism may be associated with higher false-positive rates but may be of value in detecting other developmental delays.[25]

2. **What are the benefits of early identification and treatment?**

   The AAP Council on Children with Disabilities has recognized early identification of developmental disorders as an integral function of the primary care medical home and the responsibility of all clinicians. The National Institute of Mental Health recommends early treatment to reduce individual difficulties while assisting with the acquisition of new skills and optimizing individual strengths.

   Early identification allows for access to early childhood educational services (especially in the public sector), speech therapy, physical and occupational therapy, and medical care planning. Many of these early interventions are publicly available following a positive screening, even before a diagnosis is confirmed.[11] Earlier intervention maximizes outcomes, including core deficits of ASD (i.e., social attention), IQ, language, and symptom severity.[25] Early intervention may prevent secondary effects of atypical development and the emergence of a more fully developed autism profile. Theories regarding the neuroplasticity of the developing brain postulate that interventions are optimized when rendered during periods of rapid brain development.[20]

   Because of their frequent contact with their children in various social situations, parents are likely to be the best judges of their children's behaviors. Literature shows that if a parent is concerned, there is a high probability of a problem.[19] This perception of a problem increases family stress and may drive frequent physician visits with multiple providers. Early identification can put an end to the diagnostic odyssey that may assist the family in managing the stress related to this disorder. Parental stress may also be eased with community-based services, support groups, and respite care.

Early identification also initiates an etiologic investigation and family counseling regarding recurrence risk. If a genetic condition is identified, counseling can be offered to help inform future reproductive decisions.

3. **Which screening tools are best?**

When choosing a test, consider the following:[6]

- Age of child
- Length of time to complete
- Length of time to score
- Paper versus electronic
- Languages available
- Administered by provider, trained office staff, or parent
- Difficulty in interpreting/scoring
- Sensitivity/specificity

A validated screening tool should meet an appropriate level of sensitivity and specificity. Sensitivity is the ability of the test to correctly identify young children with ASD risk. Specificity is the ability of the test to differentiate ASD from other global developmental disorders (including language disorders). Recommendations suggest that both specificity and sensitivity for developmental screening instruments should be no less than 80%.[22] There are not such recommendations for positive predictive value (PPV) and negative predictive value (NPV) as these values are related to the base rate of a disorder. In universal screening of a general population, even an ASD instrument with the recommended sensitivity and specificity (> 0.80) will yield a poor PPV. Many of the studies evaluating the screening tools were conducted in high-risk populations and may therefore show a higher PPV then might be demonstrated in routine universal screening samples. No screen is perfect and all will yield a percentage of false results. It is generally agreed that it is preferable to potentially over-identify ASD risk in children who may have other developmental delays (false-positives) than to miss large numbers of children who are truly at risk for ASD (false-negatives).[22]

Each screening instrument was designed and validated for a specific age range. Tools should be selected to meet the practice needs (i.e., targeted population). Most screening tools are available in several languages.

One of the main barriers to universal screening has been limited time and resources (e.g., staff). The selected instrument should be comprehensive in assessing the core domains affected by ASD and require a reasonable amount of time for administration. Most Level 1 tests are administered to parents in the form of a questionnaire and can be completed in 10 to 20 minutes. Follow-up interviews and/or Level 2 testing if indicated (for positive screen on Level 1) will require additional time by a dedicated, trained staff member.

A brief summary of selected screening tools is included below. Screening instruments designed for older children and youth (e.g., Autism Spectrum Screening Questionnaire [ASSQ]) were not included in this report as the focus was directed at early identification and intervention. Information on additional developmental screening tools is in available in Appendix A.

Screening tools for toddlers (< three years of age)

M-CHAT R/F (Modified Checklist for Autism in Toddlers Revised with Follow-up)

The M-CHAT-R/F, a two-stage process, is one of the most widely used ASD screening instruments for universal toddler screening designed for age 16 to 30 months of age. The MCHAT R/F was modified from the original MCHAT to reduce the number of cases that initially screened positive and needed the follow-up, while maintaining high sensitivity. It was validated in a study of 16,071 low-risk toddlers.[16] The questionnaire assesses core domains of autism, including sensory abnormalities, motor abnormalities, social interchange, early joint-attention, and early language and communication. A positive screen (3 or more endorsed answers) is followed up with a structured interview with the parent to obtain additional examples and further assess risk. The follow-up interview is designed to be completed by a pediatric extender or support staff. Scoring of the M-CHAT-R/F is based on total scores from parent report and/or interview. It is available free to providers.

ESAT (Early Screening for Autism Trait)

ESAT is a 14-item questionnaire instrument designed for earlier screening than the MCHAT R/F (14-15 months). It

is completed by a parent and/or childcare worker. The questionnaire assesses major domains of development, including pretend play, joint-attention, interest in others, eye contact, verbal and nonverbal communication, stereotypes, preoccupations, reaction to sensory stimuli, emotional reaction, and social interaction. The test was assessed in a sample of 14- to 15-month-olds (n=31,724) population, with a low case detection rate (< 1 in 1000) and a PPV of 0.25, which would potentially lead to the referral of a large number of toddlers without ASD based on a positive screen. This study recommended a second screening at 24 months of age to identify children who regress after age 18 months or those who are missed for other reasons.[25]

STAT (Screening Test for Autism in Toddlers and Young Children)

STAT is a semi-structured play-based interactive screening tool designed for children aged 12 to 36 months when developmental concerns are suspected. It consists of 12 activities from four domains (two-four items each): play, requesting, directing attention, and motor imitation. The STAT is clinician administered and takes approximately 20 minutes. This test is generally designed as a second-stage screen and requires a specially trained staff to administer and score. In a small study (n=59), Stone and colleagues found the test to be most accurate when used in toddlers aged > 14 months with a specificity of 83% and sensitivity of 93%.[20]

ITC (Infant Toddler Checklist)

The ITC is a 24-question screening tool completed by the primary caregiver of children from eight to 24 months of age. It is a part of the Communication and Symbolic Behavior Scales (CSBS) that assess prelinguistic communication, including eye contact and emotion, both early features of ASD. ITC yields three subscale scores (social composite, speech composite, and symbolic composite) in addition to a total score. The screen assesses emotion, eye gaze, communication, gestures, sounds and words, understanding, and object use. The ITC is scored relative to a normative table and while capable of detecting risk for developmental delays and language delays, it falls short in discriminating between ASD risk and other developmental delays.[20]

SORF (Systematic Observation of Red Flags)

SORF is an observational measure that was designed for children who have received the Communication and Symbolic Behavior Scales. The SORF was designed as a screening measure to identify children who should be referred for a diagnostic evaluation by a professional with expertise in ASD. The SORF is a coding system designed to detect 22 Red Flags (RF) for ASD in toddlers based on current DSM-5 providing an autism screening observation measure with 11 items from each domain—Social Communications and Restricted Repetitive Behaviors.[7] Observations may include lack of showing, pointing, coordination of nonverbal communication, shared interest, appropriate gaze/eye contact, warmth/joyful expressions, response to contextual cues, response to name, etc.

ADEC (Autism Detection in Early Childhood)

Autism Detection in Early Childhood (ADEC) (Young, 2007) was developed as a Level 2 clinician-administered autistic disorder (AD) screening tool that was time-efficient, suitable for children under three years of age, easy to administer, and suitable for persons with minimal training and experience with AD. ADEC has been found to to be a sound and effective ASD screening tool, suitable for use with young children ranging from 12 to 36 months of age. It should be used to complement other developmental surveillance and assessment processes.

4. **How should borderline screening results be interpreted?**

   Borderline screening results should prompt candid dialogue between the provider and the parent regarding developmental milestones, red flags, and future plans. Additional assessments should be scheduled in advance of the regular well-child visit to reassess and check developmental progress.[3]

   Studies using the MCHAT-R/F placed children in three different risk ranges: low (< 3 items endorsed), medium (3-7 items endorsed), and high (> 7 items endorsed). Low risk did not require any follow-up interview or evaluation. Children at medium risk had a follow-up interview and if two items remained positive, they were referred on for a diagnostic evaluation. Children in high-risk groups were referred directly for further assessment without any follow-up interview.[25]

Some practices utilize a two-tiered approach to autism screening. In the first tier, a level 1 tool is usually completed by the parent and scored using a standard algorithm. It is designed to differentiate children at risk for autism from normally developing children. Level 1 tools require minimal time and are often available to practices at no cost. They are dependent on parents' knowledge and awareness regarding their child. In the two tier model, a child who screens positive on a Level 1 should be followed up with a Level 2 screen. Level 2 can be useful at differentiating between autism risk and other developmental disorders. The Level 2 tools are generally more time consuming and require a staff member trained to administer and score the results.

Care must be exercised in managing the "borderline" result. False-positives may cause undue parental stress and added expense related to more robust testing. False-positives may also overextend subspecialists causing backlogs in available appointments for ASD evaluations. False-negatives may lead to delays in diagnosis, thus depriving the child of needed educational services.[3]

5. **When should patients be referred for further testing or evaluation and what type of services or referrals are best?**

   A positive screen should be validated with clinical judgment and a thorough review of past medical history, family history, and a physical exam. Most positive screens are referred to a specialist for an autism evaluation. Reported positive rates of 3% to 24% are complemented with a referral rate of 3% to 32%.[4]

   The AAP recommends that children screened positive be referred for ASD diagnostic evaluation and for early intervention services, which may include nonspecific ASD services provided by a public entity such as speech therapy or early childhood education programs.

   The comprehensive diagnostic evaluation involves a multidisciplinary team led by a developmental pediatrician, child psychologist, a pediatric neurologist, or child psychiatrist trained in autism detection. The team may include a speech and language pathologist, a physical therapist, and an occupational therapist. In addition to subspecialty referral, the child should be referred to an audiologist for a thorough hearing evaluation and tested for lead poisoning and possible metabolic testing. If there is concern for seizure activity an electroencephalogram (EEG) is indicated. A genetics referral may be indicated especially in the presence of dysmorphic features. Additional testing should be left to the discretion of the clinical specialist who will complete the diagnostic evaluation.v.

6. **What are good resources for further education to recommend for families who have children with suspected autism?**

   - The "Autism A.L.A.R.M.": a flyer that highlights the prevalence of autism, the importance of screening and listening to parents' concerns, and the urgency of making simultaneous referrals to specialists in ASDs and early intervention programs to promote improved outcomes. (CDC - Treatment and Intervention for Autism Spectrum Disorder)
   - Learn the Signs. Act Early (CDC)
   - Autism Toolkit
   - Healthy Children: Words of Support for Parents of a Child with Autism
   - ASD Resources for Healthcare Providers, Advocates and Families

Professional guidelines: American Academy of Pediatrics (AAP)

Identification, Evaluation, and Management of Children with Autism Spectrum Disorder, Hyman et al., 2020, Pediatrics.

"...The AAP recommends screening all children for symptoms of ASD through a combination of developmental surveillance at all visits and standardized autism specific screening tests at 18 and 24 months of age in their primary care visits because children with ASD can be identified as toddlers, and early intervention can and does influence outcomes.[48] This autism specific screening complements the recommended general developmental screening at nine, 18, and 30 months of age. Efficient screening of all children would be aided by inclusion of valid screening tools in the electronic health record... Developmental surveillance for ASD includes asking caregivers about concerns they have about their child's development or behavior, informal observation, and monitoring of symptoms in the context of routine health supervision"

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US Preventive Services Task Force (USPSTF)

Screening for Autism Spectrum Disorder in Young Children - A Systematic Evidence Review for the USPSTF (February 2016).This systematic evidence report resulted in the following: Screening for Autism Spectrum Disorder in Young Children US Preventive Services Task Force Recommendation Statement (February 2016)

This recommendation statement is not a recommendation against screening; it is a call for more research. This recommendation applies to children aged 18 to 30 months who have not been diagnosed with ASD or developmental delay and for whom no concerns of ASD have been raised by parents, other caregivers, or health care professionals.[ix]

The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of screening for ASD in young children for whom no concerns of ASD have been raised by their parents or a clinician.[viii]

National Institute for Health and Care Excellence (NICE)

Autism spectrum disorder in under 19s recognition, referral and diagnosis (2011, updated 2017)

The signs and symptoms are described in tables representing a combination of delay in expected features of development and the presence of unusual features. No specific screening tools is recommended. The features described on the tables are intended to alert professionals to the possibility of autism in a child or young person about whom concerns have been raised. They aid in recognizing patterns of impairments in reciprocal social and communication skills, together with unusual restricted and repetitive behaviors. The tables are designed for three different age groups (Preschool, primary school-age and secondary school age)[iii]

American Academy of Child and Adolescent Psychiatry

(2014) Autism

This guideline is primarily targeting diagnosis and treatment, although a small section is dedicated to screening. A Table of screening tools is included in the article describing age ranges, method of administration, and scale characteristics of each screening tool.[i]

American Academy of Neurology

(2000, reaffirmed 2014) Screening and Diagnosis of Autism

Level 1: Routine developmental surveillance screening specifically for autism

Developmental surveillance should be performed at all well-child visits from infancy through school-age, and at any age thereafter if concerns are raised about social acceptance, learning, or behavior (Level* B)[vii]

Research approach

Search strategy:

- **Search terms:** (Autism or ASD) and screen* and (Primary care or pediatric*)
- **Search limits:** Reviews, with abstracts
  - **Time Period:** 10 years
  - **Subjects:** humans
  - **Language(s):** English
- **Search yield:** 343 citations
  - Included in reference list: 25 abstracts

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