Putting the Pieces Together

A Primary Care Provider's Guide to Autism Spectrum Disorder

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Part I: Screening and Diagnosis

On completion of this article, the reader should be able to:

- *Discuss the importance of using an appropriate tool such as the Modified Checklist for Autism in Toddlers to screen for autism spectrum disorder (ASD) in all children at 18 and 24 months and recognize the importance of early intervention.*
- *Recognize the importance of diagnosing and treating common comorbid psychiatric and medical conditions for ASD.*

The prevalence of autism spectrum disorder (ASD) spiked in the 1990s and has continued to skyrocket. Today, ASD is nine times more prevalent than in 1997 (147 vs 16 diagnosed cases per 10,000 children).[1,2] It remains a matter of debate whether this dramatic increase can be attributed to greater awareness, more sensitive screening tools, or an actual increase in the number of cases due to environmental or other factors. What is not debatable, however, is that—whatever the cause of the increase—the effect will be many more children and adults with a diagnosis of ASD. Developmental pediatricians alone cannot manage this population, and it will increasingly fall to pediatricians and adult primary care providers to do their part. And yet a 2011 study found that less than half of pediatricians routinely complete formal developmental screening as part of their well-child care.[3]

Since pediatricians and other primary care providers are undoubtedly already seeing patients with ASD and since that number is likely to grow, they should be familiar with the most recent guidelines on ASD management, including the 2007 policy statement by the American Academy of Pediatrics (AAP)[4] and the 2014 practice parameter from the American Academy of Child and Adolescent Psychiatry.[5] Both policy statements reiterate the importance of early diagnosis—made possible by screening all children for ASD at an early age—to provide children with ASD the early intervention they need to reach their full potential. They also emphasize that pediatricians should continue to treat the child with ASD throughout childhood and adolescence, serving as the child's medical home and coordinating all of the multidisciplinary services he or she will require.

The parents of a child with ASD may feel overwhelmed by the challenges they face in caring for their child, the ASD diagnosis itself, and the scope and variety of services their child needs. By serving

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Developmental pediatrician Dr. Jane Charles has devoted her career to caring for children with ASD.

as advocates for children with ASD and providing care that is in line with national recommendations, summarized here, pediatricians can help them "put the pieces together." They can assist parents in obtaining the support they will need to ensure their child lives as full and independent a life as possible.

Understanding ASD

Despite its growing prevalence, ASD remains poorly understood by the general public and many clinicians. People often fear what they do not know, and physicians may be reluctant to suggest that a child could have ASD, fearing parents' reactions. Removing some of the mystery around ASD could facilitate communication between physician and parent. Learning that some children can achieve excellent outcomes if intervention is begun early could convince parents of the value of early diagnosis and treatment.

The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (*DSM-V*), published in 2013, recognizes delays in social communication and repetitive or "perseverative" behaviors as the two primary diagnostic criteria for ASD. The *DSM-V* also uses the umbrella term *autism spectrum disorder* to replace a number of related diagnoses in the *DSM-IV*, including autism, Asperger's syndrome, PDDNOS (pervasive developmental disorder not otherwise specified), Rett syndrome, and childhood disintegrative disorder.

Social Communication

Difficulty with social communication is the core feature of ASD. Children with ASD find it hard to interpret facial expressions, making it challenging for them to "read" social situations and develop social skills. Many children with ASD will have language delays. Those with cognitive skills above the range for intellectual disability may begin to speak on time but will have issues with the practical social use of language (i.e., pragmatic language).

Repetitive/Stereotyped Patterns of Behavior

People with ASD often engage in repetitive "perseverative" behaviors—they do not like to vary from their routines, become preoccupied with a specific object or interest, and often engage in the same action time and again. Those with high-functioning autism focus on one or two favorite subjects to the virtual exclusion of all else and may develop astonishing proficiency in their narrow areas of interest.

Sensory Overload

We make sense of the world outside us through our senses. Our brain tells us which sensory data deserve our attention—a truck horn warning us it is not safe to cross the street—and which can be safely ignored.

In people on the autism spectrum, the brain's role as arbiter of sensory data may be compromised. According to **Jane M. Charles, M.D.**, a developmental pediatrician at MUSC Children's Hospital who specializes in autism, "In your brain you have a policeman that organizes all of the input and makes sense of it for you—that little policeman is not working very well in some people with ASD."

As a result, people with ASD can feel barraged by and have trouble making sense of excess sensory stimuli. For example, they can feel anxious in noisy crowds or under bright fluorescent lights or be repelled by the textures of certain foods or items of clothing.

Etiology and Risk Factors

Autism spectrum disorder is extremely heterogeneous, making it difficult to identify a single etiology. It is estimated that 20% to 25% of children with ASD will experience seizures,[5] suggesting a neurobiological basis for the disorder. Imaging studies have shown white tract abnormalities in these children and differences in the areas of the brain associated with sensory stimuli processing and social judgments.[5] A functional magnetic resonance imaging study published in late 2014 by **Jane E. Joseph, Ph.D.**, Professor in the Department of Neuroscience at MUSC, confirmed that children with ASD and their siblings process faces differently—using different areas of the brain—than typically developing children.[6]

Genetics are also known to be involved—ASD is heritable and siblings of children with ASD are ten times more likely to develop the disorder.[5] Hundreds of copy number variations—the most significant of which occur at chromosomes 16p11.2, 15q11.2-13.1, 17q12, and 7q11.23—have been identified in children with ASD, but these genetic alterations account for only a fraction of cases.[7] Variations in copy number increase with age, putting fathers of advanced age more at risk of having a child with ASD.[8] A number of *de novo* mutations with strong association for ASD—most notably in genes *SCN2A*, *KATNAL2* and *CHD8*—have also been identified,[9] and more studies using whole-genome sequencing in children with ASD and their siblings are under way to identify additional clinically relevant mutations. Babies born extremely preterm or at a very low weight are also at increased risk of ASD,[10] as are those who were exposed to infection prenatally, suggesting an immune component.

Despite some parents' beliefs that childhood vaccines, including the measles-mumps-rubella vaccine, increase risk for ASD—a concern fueled by social media—no such link has been established in the scientific literature.[11] Failing to vaccinate a child puts him or her at greater risk of infection and increases the likelihood that diseases once under control could make a comeback.

Clinical psychologist Dr. Laura Carpenter specializes in the diagnosis of ASD.

Screening

Early diagnosis and intervention can make dramatic differences in outcomes in children with ASD.[12] However, outcomes are best when appropriate therapies begin early, ideally by 18 months of age or even earlier.[5] Although physicians should remain vigilant for early signs of autism, relying solely on clinical impressions of behavior gleaned during a brief visit will lead to missed cases of ASD.[13] Physicians should be responsive to parents' concerns, realizing that they have seen a far larger sample of their child's behavior and are more likely to notice the subtle, early signs of autism. These include problems with "joint attention" (i.e., a shared focus with another person on an object or another person expressed through a point or gaze), a lack of "pretend play" (i.e., the use of one object or toy to represent another), and a failure to respond when the child's name is called. The delay in developing social skills that is one of the central characteristics of ASD is not typical of most neurodevelopmental disorders, and so parental concerns about social skills should prompt a referral to a developmental pediatrician for an autism assessment.

To help ensure that all children with ASD benefit from early intervention, the 2007 AAP policy statement recommends that all children be screened for ASD at 18 and 24 months using an appropriate screening tool, such as the Modified Checklist for Autism in Toddlers (available at https://www.m-chat.org).

According to **Laura A. Carpenter, Ph.D.**, a clinical psychologist at MUSC Children's Hospital who specializes in the diagnosis of ASD, "The nice thing about this screening instrument is that it is completely free for pediatricians. Parents just complete it in the waiting room, and then the pediatrician reviews it. In all but 10% of cases, it either gives you a screen positive or negative right away." The test will miss some children with milder symptoms of ASD, such as those formerly classified as having Asperger's syndrome. The second screen at 24 months is important because some children with ASD experience regression of their social and communication skills in the first year or two of life and could be missed with a single screen. Although applied behavioral analysis (ABA), the gold standard for early intervention, can be administered to children who are diagnosed at an older age, outcomes will likely not be as good because the opportunity to intervene during critical developmental years has been missed. (Read more about ABA therapy in Part II of this series, which will appear in the Summer 2015 issue of *Progressnotes*.)

Establishing a Definitive Diagnosis of ASD

A child who screens positive for ASD should be referred to a developmental pediatrician for a full assessment and a definitive diagnosis. If a child is thought to have ASD, he or she is typically assessed using the Autism Diagnostic Observation Schedule, Second Edition, which involves the child being asked to engage in a number of tasks involving social interaction between the child and the examiner. The examiner observes and categorizes the child's behavior, and those categories are used to establish quantitative scores that can determine whether the child has ASD and, if so, identify his or her particular strengths and weaknesses. Interventions can then be tailored to target areas of deficit.

Assembling the Multidisciplinary Care Team

It is the pediatrician's responsibility to coordinate the multidisciplinary consultations and services a child with ASD requires. Any child with a speech delay should be referred to an audiologist to rule out hearing loss as a cause for communication and social skill delays.[5] Genetic screening can be useful in identifying chromosomes known to be associated with ASD.[5] If the child is experiencing seizures, as approximately 20% to 25% of children with ASD do, a neurophysiological assessment is recommended.[5] The child should be assessed for common comorbid medical conditions, such as gastrointestinal issues (particularly constipation and gastroesophageal reflux disorder) and sleep disorders, as well as common comorbid psychiatric conditions (see "Common Comorbid Psychiatric Disorders"). Properly diagnosing and treating these comorbid disorders improves the child's receptivity to therapeutic interventions.

Many parents with autistic children turn to complementary/alternative therapies, and the pediatrician should ascertain which ones they are using to ensure that there are no contraindications with prescribed medications. There is no evidence base to support the benefits of these therapies in children with ASD, and some have been proven or suggested not to work, including intravenous infusion of secretin,[14] oral vitamin B6 and magnesium supplementation,[15] a

casein-free diet,[16] administration of oral human immunoglobulin,[17] and omega 3 fatty acid supplementation.[18] In a few cases, such as heavy metal chelation therapy,[19] complementary/alternative therapies can be dangerous.

Common Comorbid Psychiatric Disorders

In a 2008 study of 112 ten- to fourteen-year-old children from a population-derived cohort of patients with ASD, 70% had at least one comorbid disorder and 41% had at least two.[20] Social anxiety disorder (29.2%), attention-deficit/hyperactivity disorder (ADHD) (28.2%), and oppositional defiant disorder (28.1%) were the most commonly observed.[20] The odds of having a second psychiatric disorder were increased in those with epilepsy. A 2011 review by the Interactive Autism Network of a national online registry of more than 4,000 children with ASD for parent-reported comorbid psychiatric disorders revealed that 26.9% had one comorbid diagnosis, 14% had two, and 6.3% had three.[21]

Faced with managing a complex disorder such as ASD, physicians can miss comorbid psychiatric conditions by blaming psychiatric symptoms on the disorder itself—a phenomenon known as *diagnostic overshadowing*. Accurately diagnosing comorbid psychiatric conditions is essential, because effective medications are available to treat them, whereas there is currently no effective pharmacological treatment for the core symptoms of ASD. It should be noted, however, that some medications (i.e., stimulants) used to treat children with ADHD may not be as effective in children who also have ASD.

Additional Resources on Diagnosing ASD

The AAP offers a number of good resources for ASD, including a publication called "Understanding Autism Spectrum Disorders" and a 2007 resource toolkit "Caring for Children with Autism Spectrum Disorders: A Resource Toolkit for Clinicians." An innovative web-based tool—the ASD Video Glossary—is available at firstsigns.org to help parents and professionals recognize early red flags and diagnostic features of ASD.

Part II of this article will appear in the summer issue and will focus on management, including early interventions, techniques for addressing disruptive behavior, and resources for helping teens transition to adult care.

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