Autism Spectrum Disorder in Children

By: Kathryn Brohl, MA, LMFT

Learning objectives

This workshop is designed to help you:

- Describe symptoms and impact of Autism Spectrum Disorder (ASD).
- Apply updated DSM-5 criteria and information.
- Analyze the levels of severity for ASD.
- Assess current ASD treatment options.

Introduction

A growing number of children are being diagnosed with autism spectrum disorders (ASD), prompting a need for mental health professionals to learn more about these developmental disorders. The Centers for Disease Control and Prevention (2012) estimates that 1 in every 88 children (11.3 per 1,000) has been identified with an autism spectrum disorder (ASD). This represents a 23 percent increase since national data collected in 2009 and a 78 percent increase since 2007. Some of the increase is due to the way children are identified, diagnosed and served in their local communities; although exactly how much is due to these factors in unknown.

Autism was formerly a “catch-all” term that include a range of autistic disorders. The current term for autism is autism spectrum disorders (ASD). ASD is one of the invisible disabilities and is extremely complex with many different symptoms that can occur in various combinations. These symptoms or characteristics range from mild to severe. At the mild end of the ASD spectrum, a child is able to participate in typical classroom activity and, with appropriate support, may no longer show symptoms of autism at an older age. On the severe end of the spectrum, a child may need continuous supervision and basic needs care. Mental health practitioners know that each child with ASD is unique and distinctive with his or her own traits.

The mid-20th century view of autism as a form of childhood psychosis is no longer held. The first operational definition appeared in the third edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-III), and was strongly influenced by Michael Rutter’s conceptualization of impaired social development and communicative development, insistence on sameness, and onset before 30 months of age. The subsequent revisions in the fourth edition (DSM-IV) and the 10th revision of the International Classification of Diseases (ICD-10), in which autism was referred to as pervasive developmental disorder, emphasized the early onset of a triad of features: impairments in social interaction; impairments in communication; and restricted, repetitive, and stereotyped behavior, interests, and activities.

The latest revision of DSM, the DSM-5, published in May, 2013, adopted the umbrella term autism spectrum disorder without a definition of subtypes, and reorganized the triad into a dyad: difficulties in social communication and social interaction; and restricted and repetitive behavior, interests, or activities. Atypical language development (historically linked to an autism diagnosis) was removed from the criteria, and is now classified as a co-occurring condition, even though large variation in language is characteristic of autism.

The new criteria give improved descriptions and organization of key features, emphasize the dimensional nature of autism, provide one diagnostic label with individualized specifics, and allow for an assessment of the individual’s need for support (helping provision of clinical services). How prevalence estimates will be affected by the new criteria and how autism spectrum disorder will relate to the newly created social (pragmatic) communication disorder (defined by substantial difficulties with social uses of both verbal and non-verbal communication, but otherwise not meeting criteria for autism spectrum disorder) remain to be assessed.

The DSM-5 combined the previously separate subtypes of autistic disorder, Asperger syndrome and pervasive developmental disorder—not otherwise specified (PDD-NOS) into one diagnosis of autism spectrum disorder (ASD). It also revised the criteria for diagnosis. Published by the American Psychiatric Association (APA), the Diagnostic and Statistical Manual of Mental Disorders (DSM) is used to diagnose mental and behavioral conditions and is a living document that has changed several times over the last few decades to reflect new research and ongoing psychiatric practice. The criteria were changed to improve the accuracy of the diagnoses and to allow clinicians the ability to describe specific symptoms seen in individuals.

According to the American Psychiatric Association (2013), one of the most important changes in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) is to autism spectrum disorder (ASD). The revised diagnosis represents a new, more accurate, and medically and scientifically useful way of diagnosing individuals with autism-related disorders.

Previously using the DSM-IV, patients could be diagnosed with four separate disorders:

- Autistic disorder
- Asperger’s disorder,
- Childhood disintegrative disorder.
- The catch-all diagnosis of pervasive developmental disorder not otherwise specified.

Researchers found that these separate diagnoses were not consistently applied across different clinics and treatment centers. Anyone diagnosed with one of the four pervasive developmental disorders (PDD) from DSM-IV should still meet the criteria for ASD in DSM-5 or another, more accurate DSM-5 diagnosis. While DSM does not outline recommended treatment and services for mental disorders, determining an accurate diagnosis is a first step for a clinician in defining a treatment plan for a patient.
What are the new criteria?

There are two domains where people with ASD must show persistent deficits. They include 1) persistent social communication and social interaction, and 2) restricted and repetitive patterns of behavior.

More specifically, people with ASD must demonstrate (either in the past or in the present) deficits in social-emotional reciprocity, deficits in nonverbal communicative behaviors used for social interaction, and deficits in developing maintaining and understanding relationships. In addition, they must show at least two types of repetitive patterns of behavior including stereotypy or repetitive motor movements, insistence on sameness or inflexible adherence to routines, highly restricted, fixated interests or hyper or hyper reactivity to sensory input or unusual interest in sensory aspects of the environment (Autism Speaks, 2014).

Under the new DSM-5, clinicians should also rate the severity of these deficits, based what level of support they require.

The Neurodevelopmental Work Group, led by Susan Swedo, MD, senior investigator at the National Institute of Mental Health, recommended the DSM-5 criteria for ASD to be a better reflection of the state of knowledge about autism. The Work Group believes a single umbrella disorder will improve the diagnosis of ASD without limiting the sensitivity of the criteria, or substantially changing the number of children being diagnosed.

People with ASD tend to have communication deficits, such as responding inappropriately in conversations, misreading nonverbal interactions, or having difficulty building friendships appropriate to their age. In addition, people with ASD may be overly dependent on routines, highly sensitive to changes in their environment, or intensely focused on inappropriate items. The symptoms of people with ASD will fall on a continuum, with some individuals showing mild symptoms and others having much more severe symptoms. This spectrum will allow clinicians to account for the variations in symptoms and behaviors from person to person.

Under the DSM-5 criteria, individuals with ASD must show symptoms from early childhood, even if those symptoms are not recognized until later. This criteria change encourages earlier diagnosis of ASD but also allows people whose symptoms may not be fully recognized until social demands exceed their capacity to receive the diagnosis. It is an important change from DSM-IV criteria, which was geared toward identifying school-aged children with autism-related disorders, but not as useful in diagnosing younger children.

The DSM-5 criteria were tested in real-life clinical settings as part of DSM-5 field trials, and analysis from that testing indicated that there will be no significant changes in the prevalence of the disorder. More recently, the largest and most up-to-date study, published by Huerta, et al, in the October 2012 issue of American Journal of Psychiatry, provided the most comprehensive assessment of the DSM-5 criteria for ASD based on symptom extraction from previously collected data. The study found that DSM-5 criteria identified 91 percent of children with clinical DSM-IV PDD diagnoses, suggesting that most children with DSM-IV PDD diagnoses will retain their diagnosis of ASD using the new criteria. Several other studies, using various methodologies, have been inconsistent in their findings.

New Category under DSM-5

Changes to the DSM-5 also brought forth a new category of diagnosis, which is Social (Pragmatic) Communication Disorder 315.39 (F80.89). Separate from ASD but related in nature, its diagnostic criteria includes:

A. Persistent difficulties in the social use of verbal and nonverbal communication.

B. The deficits result in functional limitations in effective communication, social participation, social relationships, academic achievement, or occupational performance, individually or in combination.

C. The onset of the symptoms is in the early developmental period (but deficits may not become fully manifest until social communication demands exceed limited capacities).

D. The symptoms are not attributable to another medical or neurological condition or to low abilities in the domains or word structure and grammar, and are not better explained by autism spectrum disorder, intellectual disability (intellectual developmental disorder), global developmental delay, or another mental disorder. (Autism Speaks, 2014)

How will these changes affect my (or my child’s) diagnosis, treatment and support services?

First, all individuals who currently have a diagnosis on the autism spectrum, including those with Asperger syndrome or PDD-NOS, will not lose their ASD diagnosis. In other words, if you have a diagnosis for ASD, you have a diagnosis of ASD for your life and should be entitled to appropriate interventions for the rest of your life. Need for individualized services may change, and you or your child may need different levels of support or different interventions as you or your child age.

No one should be reevaluated or “lose” their diagnosis because of administrative reasons of the DSM-5.

Second, the revisions are intended to more reliably capture all those who would have legitimately received a diagnosis of ASD under DSM-IV. The intent is not to exclude or reduce the number of individuals being diagnosed. However, there is a need for ongoing monitoring of how the DSM-5 criteria affect diagnosis, especially those adults and very young children, two groups for whom we still have relatively little information. The committee has stressed that the new DSM-5 criteria represent a “living document,” in which changes can and likely will be made as new studies are conducted.

This course will provide readers with a brief history on ASD, discuss shared ASD characteristics, impart ASD statistics, as well as describe current ASD treatment options.

ASD statistics

According to Autism Society (2014):

- 1 percent of the population of children in the U.S. ages 3-17 have an autism spectrum disorder.
- Prevalence is estimated at 1 in 68 births.
- 1 to 1.5 million Americans live with an autism spectrum disorder.
- Fastest-growing developmental disability; 1,148 percent growth rate.
- 10 – 17 percent annual growth.
- $60 billion annual cost.
- 60 percent of costs are in adult services.

- Cost of lifelong care can be reduced by 2/3 with early diagnosis and intervention.
- In 10 years, the annual cost will be $200-400 billion.
- One percent of the adult population of the United Kingdom have an autism spectrum disorder.
- The cost of autism over the lifespan is 3.2 million dollars per person.
- Only 56 percent of students with autism finish high school.
- The average per-pupil expenditure for educating a child with autism was estimated by SEEP to be over $18,000 in the 1999-2000 school year. This estimate was nearly three times the...
The unemployment rate for people with disabilities was at 14 percent, compared with 9 percent for people without a disability. Additionally, during the same period, only 21 percent of all adults with disabilities participated in the labor force as compared with 69 percent of the non-disabled population.

Research also indicates that possibly half of all children with ASD can recover enough to form relationships, be mainstreamed in school, hold jobs, and lead full lives when they receive early intensive intervention.

Defining autism

Autism is a complex developmental disability that typically appears during the first three years of life and affects a person’s ability to communicate and interact with others. Autism is defined by a certain set of behaviors and is a “spectrum disorder” that affects individuals differently and to varying degrees. It is considered to be a set of heterogeneous neurodevelopmental conditions, characterized by early-onset difficulties in social communication and unusually restricted, repetitive behavior and interests.

There is no known single cause of autism, but increased awareness and funding can help families today (Autism Society, 2014).

The word “autism” is derived from Greek and means “autos or self.” There are earlier published descriptions, but a Swiss psychiatrist named Eugene Bleuler coined the term in 1911 with schizophrenic patients. These patients were observed to be isolated from the outside world and excessively self-absorbed.

Two doctors, Dr. Leo Kanner in the United States and Dr. Hans Asperger in Austria, working separately during the same time period (1943 and 1944), conducted research in which they both described the same autistic characteristics. Drs. Kanner and Asperger are now considered to be the pioneers in what is identified as “autism” today. Through their work, both physicians described children with similar characteristics.

ASD is a developmental disorder and not a disease. It is a condition where a child or youth’s usual stage in typical physical and/or psychological development is disturbed. This disturbance retards development and generally appears in a child’s first years of life.

The condition can affect a child’s ability to:

- Connect with other people.
- Socialize.
- Display normal behavior patterns.
- Experience sensory stimulation normally.
- Communicate.
- Use imagination.

Decades ago, ASD was considered quite rare. Only one in 10,000 children were diagnosed. According to the Centers for Disease Control, (CDC), ASD now affects one out of 166 children. The overall ratio of boys with ASD to girls with ASD is four to one. One possible reason for this ratio may be that girls with normal IQ’s and ASD are not being recognized and diagnosed.

Throughout the 1990’s, new cases of ASD were increasingly reported to the CDC. In 2002, the U.S. Department of Education reported that autism rates nationwide had increased 556 percent in just one decade.

It is popularly theorized that those numbers indicated that ASD is now better understood and defined, prompting greater reporting, diagnosing and intervention. Physicians are more aware and able to assess and diagnose the disorder.

Many individuals may wish to retain their previous diagnosis as the label is considered part of their identity or may reflect a peer group with whom they identify. This is perfectly acceptable. A clinician can diagnose both the DSM-5 diagnosis as well as the previous diagnosis, such as Asperger syndrome, in an individual’s clinical record.

The DSM-5 text states “Individuals with a well-established DSM-IV diagnoses of autistic disorder, Asperger’s disorder, or pervasive developmental disorder not otherwise specified should be given the diagnosis of autism spectrum disorder”.

Concerns of new DSM-5 criteria for autism

The federal Interagency Autism Coordinating Committee (IACC) has issued a statement urging concern about how practitioners are applying the DSM-5 criteria for autism introduced last May “so as to not have the unintended consequence of reducing critical services.”

The statement supports Autism Speaks’ long-standing concerns that the DSM-5 criteria can exclude some individuals who would have previously received an autism diagnosis under the DSM-IV system. As a result these individuals may no longer qualify for services through their educational systems or health insurers.

The new IACC statement emphasizes that individuals previously diagnosed with an autism spectrum disorder under DSM-IV should retain their diagnosis and not be required to be re-evaluated under DSM-5 to keep services. The DSM-5 manual states this explicitly.

Yet reports received through Autism Speaks’ online DSM-5 survey indicate that such re-evaluations are occurring and, in at least some cases, resulting in lost services. According to one parent: “The regional center which funds services for my son is seeking to have my son reevaluated despite a 10-year, well-established diagnosis of PDD-NOS. [They] are saying any PDD-NOS case needs re-evaluation.” Despite the clear statement in DSM-5 that individuals with well-established diagnoses merit continued diagnosis with ASD, it appears that some insurance companies and some school districts are requesting these re-evaluations.

Early evaluations of the DSM-5 system suggested that it might result in a social communication disorder (SCD) diagnosis for up to a third of children who would have previously been diagnosed with the autism subtype PDD-NOS (pervasive developmental disorder-not otherwise specified).

Recommendations for SCD

In its statement, the IACC likewise states that many of the children now being diagnosed with SCD would benefit from therapies and educational services designed to help children with autism overcome social communication challenges. In addition, the committee members suggest that individuals with SCD may benefit from therapies for pragmatic language disorder (not an official DSM-5 diagnosis).

However, the symptoms used to diagnose SCD don’t typically emerge until after 4 years of age. As a result, the diagnosis isn’t likely to help children receive the early intervention services that can best improve outcomes.

So a young child with some symptoms of either ASD or SCD may qualify for state-mandated early intervention services. Parents can request a free developmental assessment through their state department of health.
In addition, the IACC noted that too little is known about how reliably the new DSM-5 system can identify autism in children under 3, adults or individuals from diverse ethnic backgrounds. The committee urges practitioners to pay special attention to individuals in these groups who narrowly miss the DSM-5 criteria for autism.

“Services should be based on need rather than diagnosis,” the IACC states. For example, the committee argues that a toddler who shows impaired social skills or communication would benefit from early intensive behavioral intervention aimed at improving those skills, regardless of diagnosis.

Similarly, it states that an autism evaluation for an adult should take into account a complete lifetime history. This may reveal repetitive behaviors or sensory issues that were more obvious in childhood.

## Causes

There is no known single cause for autism, but it is generally accepted that it is caused by abnormalities in brain structure or function. Brain scans show differences in the shape and structure of the brain in children with autism versus in neurotypical children. Researchers are investigating a number of theories, including the links among heredity, genetics and medical problems.

In many families, there appears to be a pattern of autism or related disabilities, further supporting the theory that the disorder has a genetic basis. While no one gene has been identified as causing autism, researchers are searching for irregular segments of genetic code that children with autism may have inherited. It also appears that some children are born with a susceptibility to autism, but researchers have not yet identified a single “trigger” that causes autism to develop.

Other researchers are investigating the possibility that under certain conditions, a cluster of unstable genes may interfere with brain development, resulting in autism. Still other researchers are investigating problems during pregnancy or delivery as well as environmental factors such as viral infections, metabolic imbalances and exposure to environmental chemicals.

Autism tends to occur more frequently than expected among individuals who have certain medical conditions, including Fragile X syndrome, tuberous sclerosis, congenital rubella syndrome, and untreated phenylketonuria (PKU). Some harmful substances ingested during pregnancy also have been associated with an increased risk of autism.

Research indicates other factors besides the genetic component are contributing to the rise in increasing occurrence of autism, such as environmental toxins (e.g. heavy metals such as mercury), which are more prevalent in our environment than in the past. Those with autism (or those at risk) may be especially vulnerable, as their ability to metabolize and detoxify these exposures can be compromised.

## Diagnosis

When parents or support providers become concerned that their child is not following a typical developmental course, they turn to experts, including psychologists, educators and medical professionals, for a diagnosis.

At first glance, some persons with autism may appear to have an intellectual disability, a sensory integration disorder, or problems with hearing or vision. To complicate matters further, these conditions can co-occur with autism. However, it is important to distinguish autism from other conditions, since an accurate diagnosis and early identification can provide the basis for building an appropriate and effective educational and treatment program. There are also other medical conditions or syndromes that can present symptoms that are confusingly similar to autism’s. This is known as differential diagnosis.

A brief observation in a single setting cannot present a true picture of an individual’s abilities and behaviors. Parental (and caregiver) and/or teachers’ input and developmental history are important components of making an accurate diagnosis.

There are many differences between a medical diagnosis and an educational determination, or school evaluation, of a disability. A medical diagnosis is made by a physician based on an assessment of symptoms and diagnostic tests. A medical diagnosis of autism spectrum disorder, for instance, is most frequently made by a physician according to the Diagnostic and Statistical Manual (DSM-5) of the American Psychological Association (2013). This manual guides physicians in diagnosing autism spectrum disorder according to a specific number of symptoms.

An educational determination, in contrast, is made by a multidisciplinary evaluation team comprised of various school professionals. The evaluation results are reviewed by a team of qualified professionals and the parents to determine whether a student qualifies for special education and related services under the Individuals with Disabilities Education Act (IDEA).

Diagnosis requires proper assessment, education, intervention, and follow-up. Behavioral presentation across different contexts should be investigated. Ideally, a standardized, structured interview should be incorporated into the assessment process. Adaptive skills should be checked with standardized instruments (i.e., Vineland adaptive behavior scales). In children, parent–child interaction and parent coping strategies should be specifically investigated, because they are relevant for the planning of interventions.

The interview of the parent or caregiver should cover the gestational, birth, developmental, and health history, and family medical and psychiatric history. It should have specific focus: the development of social, emotional, language and communication, cognitive, motor, and self-help skills; the sensory profile; and unusual behaviors and interests.

Brain images (i.e., magnetic resonance imaging or computed tomography scans) can provide clues to the cause of autism and show abnormalities. These abnormalities are not disease specific, but they are highly prevalent among those with autism. Brain images can be especially useful in ruling out other conditions that may explain a child’s behavior.

## When to Refer

When parents or support providers become concerned that their child is not following a typical developmental course, they turn to experts, including psychologists, educators and medical professionals, for a diagnosis.

At first glance, some persons with autism may appear to have an intellectual disability, a sensory integration disorder, or problems with hearing or vision. To complicate matters further, these conditions can co-occur with autism. However, it is important to distinguish autism from other conditions, since an accurate diagnosis and early identification can provide the basis for building an appropriate and effective educational and treatment program. There are also other medical conditions or syndromes that can present symptoms that are confusingly similar to autism’s. This is known as differential diagnosis.

A brief observation in a single setting cannot present a true picture of an individual’s abilities and behaviors. Parental (and caregiver) and/or teachers’ input and developmental history are important components of making an accurate diagnosis.

There are many differences between a medical diagnosis and an educational determination, or school evaluation, of a disability. A medical diagnosis is made by a physician based on an assessment of symptoms and diagnostic tests. A medical diagnosis of autism spectrum disorder, for instance, is most frequently made by a physician according to the Diagnostic and Statistical Manual (DSM-5) of the American Psychological Association (2013). This manual guides physicians in diagnosing autism spectrum disorder according to a specific number of symptoms.

An educational determination, in contrast, is made by a multidisciplinary evaluation team comprised of various school professionals. The evaluation results are reviewed by a team of qualified professionals and the parents to determine whether a student qualifies for special education and related services under the Individuals with Disabilities Education Act (IDEA).

Diagnosis requires proper assessment, education, intervention, and follow-up. Behavioral presentation across different contexts should be investigated. Ideally, a standardized, structured interview should be incorporated into the assessment process. Adaptive skills should be checked with standardized instruments (i.e., Vineland adaptive behavior scales). In children, parent–child interaction and parent coping strategies should be specifically investigated, because they are relevant for the planning of interventions.

The interview of the parent or caregiver should cover the gestational, birth, developmental, and health history, and family medical and psychiatric history. It should have specific focus: the development of social, emotional, language and communication, cognitive, motor, and self-help skills; the sensory profile; and unusual behaviors and interests.

Brain images (i.e., magnetic resonance imaging or computed tomography scans) can provide clues to the cause of autism and show abnormalities. These abnormalities are not disease specific, but they are highly prevalent among those with autism. Brain images can be especially useful in ruling out other conditions that may explain a child’s behavior.

## When to Refer

When parents or support providers become concerned that their child is not following a typical developmental course, they turn to experts, including psychologists, educators and medical professionals, for a diagnosis.

At first glance, some persons with autism may appear to have an intellectual disability, a sensory integration disorder, or problems with hearing or vision. To complicate matters further, these conditions can co-occur with autism. However, it is important to distinguish autism from other conditions, since an accurate diagnosis and early identification can provide the basis for building an appropriate and effective educational and treatment program. There are also other medical conditions or syndromes that can present symptoms that are confusingly similar to autism’s. This is known as differential diagnosis.

A brief observation in a single setting cannot present a true picture of an individual’s abilities and behaviors. Parental (and caregiver) and/or teachers’ input and developmental history are important components of making an accurate diagnosis.

There are many differences between a medical diagnosis and an educational determination, or school evaluation, of a disability. A medical diagnosis is made by a physician based on an assessment of symptoms and diagnostic tests. A medical diagnosis of autism spectrum disorder, for instance, is most frequently made by a physician according to the Diagnostic and Statistical Manual (DSM-5) of the American Psychological Association (2013). This manual guides physicians in diagnosing autism spectrum disorder according to a specific number of symptoms.

An educational determination, in contrast, is made by a multidisciplinary evaluation team comprised of various school professionals. The evaluation results are reviewed by a team of qualified professionals and the parents to determine whether a student qualifies for special education and related services under the Individuals with Disabilities Education Act (IDEA).

Diagnosis requires proper assessment, education, intervention, and follow-up. Behavioral presentation across different contexts should be investigated. Ideally, a standardized, structured interview should be incorporated into the assessment process. Adaptive skills should be checked with standardized instruments (i.e., Vineland adaptive behavior scales). In children, parent–child interaction and parent coping strategies should be specifically investigated, because they are relevant for the planning of interventions.

The interview of the parent or caregiver should cover the gestational, birth, developmental, and health history, and family medical and psychiatric history. It should have specific focus: the development of social, emotional, language and communication, cognitive, motor, and self-help skills; the sensory profile; and unusual behaviors and interests.

Brain images (i.e., magnetic resonance imaging or computed tomography scans) can provide clues to the cause of autism and show abnormalities. These abnormalities are not disease specific, but they are highly prevalent among those with autism. Brain images can be especially useful in ruling out other conditions that may explain a child’s behavior.

When parents or support providers become concerned that their child is not following a typical developmental course, they turn to experts, including psychologists, educators and medical professionals, for a diagnosis.

At first glance, some persons with autism may appear to have an intellectual disability, a sensory integration disorder, or problems with hearing or vision. To complicate matters further, these conditions can co-occur with autism. However, it is important to distinguish autism from other conditions, since an accurate diagnosis and early identification can provide the basis for building an appropriate and effective educational and treatment program. There are also other medical conditions or syndromes that can present symptoms that are confusingly similar to autism’s. This is known as differential diagnosis.

A brief observation in a single setting cannot present a true picture of an individual’s abilities and behaviors. Parental (and caregiver) and/or teachers’ input and developmental history are important components of making an accurate diagnosis.

There are many differences between a medical diagnosis and an educational determination, or school evaluation, of a disability. A medical diagnosis is made by a physician based on an assessment of symptoms and diagnostic tests. A medical diagnosis of autism spectrum disorder, for instance, is most frequently made by a physician according to the Diagnostic and Statistical Manual (DSM-5) of the American Psychological Association (2013). This manual guides physicians in diagnosing autism spectrum disorder according to a specific number of symptoms.

An educational determination, in contrast, is made by a multidisciplinary evaluation team comprised of various school professionals. The evaluation results are reviewed by a team of qualified professionals and the parents to determine whether a student qualifies for special education and related services under the Individuals with Disabilities Education Act (IDEA).

Diagnosis requires proper assessment, education, intervention, and follow-up. Behavioral presentation across different contexts should be investigated. Ideally, a standardized, structured interview should be incorporated into the assessment process. Adaptive skills should be checked with standardized instruments (i.e., Vineland adaptive behavior scales). In children, parent–child interaction and parent coping strategies should be specifically investigated, because they are relevant for the planning of interventions.

The interview of the parent or caregiver should cover the gestational, birth, developmental, and health history, and family medical and psychiatric history. It should have specific focus: the development of social, emotional, language and communication, cognitive, motor, and self-help skills; the sensory profile; and unusual behaviors and interests.

Brain images (i.e., magnetic resonance imaging or computed tomography scans) can provide clues to the cause of autism and show abnormalities. These abnormalities are not disease specific, but they are highly prevalent among those with autism. Brain images can be especially useful in ruling out other conditions that may explain a child’s behavior.
should be done. Other laboratory tests such as electroencephalography when awake and asleep if seizures are suspected, neuroimaging when intracranial lesions are suspected, and metabolic profiling when neurometabolic disorders are suspected can be done as necessary.

**ASD Diagnosis Criteria According to DSM-5:**
Autism Spectrum Disorder 299.00 (F84.0)

Diagnostic Criteria
A. Persistent deficits in social communication and social interaction across multiple contexts, as manifested by the following, currently or by history (examples are illustrative, not exhaustive, see text):

1. Deficits in social-emotional reciprocity, ranging, for example, from abnormal social approach and failure of normal back-and-forth conversation; to reduced sharing of interests, emotions, or affect; to failure to initiate or respond to social interactions.

2. Deficits in nonverbal communicative behaviors used for social interaction, ranging, for example, from poorly integrated verbal and nonverbal communication; to abnormalities in eye contact and body language or deficits in understanding and use of gestures; to a total lack of facial expressions and nonverbal communication.

3. Deficits in developing, maintaining, and understanding relationships, ranging, for example, from difficulties adjusting behavior to suit various social contexts; to difficulties in sharing imaginative play or in making friends; to absence of interest in peers.

Specify current severity:
Severity is based on social communication impairments and restricted repetitive patterns of behavior (listed below).

B. Restricted, repetitive patterns of behavior, interests, or activities, as manifested by at least two of the following, currently or by history (examples are illustrative, not exhaustive; see text):

1. Stereotyped or repetitive motor movements, use of objects, or speech (e.g., simple motor stereotypies, lining up toys or flipping objects, echolalia, idiosyncratic phrases).

2. Insistence on sameness, inflexible adherence to routines, or ritualized patterns or verbal nonverbal behavior (e.g., extreme distress at small changes, difficulties with transitions, rigid thinking patterns, greeting rituals, need to take same route or eat food every day).

3. Highly restricted, fixed interests that are abnormal in intensity or focus (e.g., strong attachment to or preoccupation with unusual objects, excessively circumscribed or perseverative interest).

4. Hyper- or hypo-reactivity to sensory input or unusual interests in sensory aspects of the environment (e.g., apparent indifference to pain/temperature, adverse response to specific sounds or textures, excessive smeling or touching of objects, visual fascination with lights or movement).

Specify current severity:
Severity is based on social communication impairments and restricted repetitive patterns of behavior (see below).

C. Symptoms must be present in the early developmental period (but may not become fully manifest until social demands exceed limited capacities, or may be masked by learned strategies in later life).

D. Symptoms cause clinically significant impairment in social, occupational, or other important areas of current functioning.

E. These disturbances are not better explained by intellectual disability (intellectual developmental disorder) or global developmental delay. Intellectual disability and autism spectrum disorder frequently co-occur; to make comorbid diagnoses of autism spectrum disorder and intellectual disability, social communication should be below that expected for general developmental level.

**Note:** Individuals with a well-established DSM-IV diagnosis of autistic disorder, Asperger’s disorder, or pervasive developmental disorder not otherwise specified should be given the diagnosis of autism spectrum disorder. Individuals who have marked deficits in social communication, but whose symptoms do not otherwise meet criteria for autism spectrum disorder, should be evaluated for social (pragmatic) communication disorder.

Specify if:
- With or without accompanying intellectual impairment
- With or without accompanying language impairment
- Associated with a known medical or genetic condition or environmental factor (Coding note: Use additional code to identify the associated medical or genetic condition.)
- Associated with another neurodevelopmental, mental, or behavioral disorder (Coding note: Use additional codes to identify the associated neurodevelopmental, mental, or behavioral disorder[s].)
- With catatonia (refer to the criteria for catatonia associated with another mental disorder, pp. 119-120, for definition) (Coding note: Use additional code 293.89 [F06.1] catatonia associated with autism spectrum disorder to indicate the presence of the comorbid catatonia.)

**Severity levels**
Let’s take a look at the identified severity levels for autism spectrum disorder:

- **Level 3**
  “Requiring very substantial support”
Severe deficits in verbal and nonverbal social communication skills cause severe impairments in functioning, very limited initiation of social interactions, and minimal response to social overtures from others. For example, a person with few words of intelligible speech who rarely initiates interaction and, when he or she does, makes unusual approaches to meet needs only and responds to only very direct social approaches.

Inflexibility of behavior, extreme difficulty coping with change, or other restricted/repetitive behaviors markedly interfere with functioning in all spheres. Great distress/difficulty changing focus or action.

- **Level 2**
  “Requiring substantial support”
Marked deficits in verbal and nonverbal social communication skills; social impairments apparent even with supports in place; limited initiation of social interactions; and reduced or abnormal responses to social overtures from others. For example, a person who speaks simple sentences, whose interaction is limited to narrow special interests, and how has markedly odd nonverbal communication.

Inflexibility of behavior, difficulty coping with change, or other restricted/repetitive behaviors appear frequently enough to be obvious to the casual observer and interfere with functioning in a variety of contexts. Distress and/or difficulty changing focus or action.

- **Level 1**
  “Requiring support”
Without supports in place, deficits in social communication cause noticeable impairments. Difficulty initiating social interactions and clear examples of atypical or unsuccessful response to social overtures of others may appear to have decreased interest in social interactions. For example, a person who is able to speak in full sentences and engages in communication but whose to-and-fro conversation with others fails, and whose attempts to make friends are odd and typically unsuccessful.

Inflexibility of behavior causes significant interference with functioning in one or more contexts. Difficulty switching between activities, and problems of organization and planning hamper independence.
ASD and brain function

Neural research has discovered that children with ASD experience a circuitry disruption within their brains. Some parts of their brains are over-connected while others are under-connected. In addition, people with ASD process information in different parts of the brain than those who do not have ASD. In other words, they may identify alphabet letters in a part of their brains that typically identifies shapes.

Early developmental cues in ASD children identify certain brain abnormalities, such as smaller head size at birth, followed by a period of excessive head growth between 6 months to 2 years of age. During this period, the frontal lobes, responsible for social reasoning and decision making, experience the greatest increase even though they are normally the last regions of the brain to develop. Consequently, children with ASD generally have problems in social reasoning and decision-making.

Sharing normal growth guidelines with caregivers

It benefits mental health professionals to understand normal growth in children in order to guide parents when they share concerns.

These simple child growth guidelines have been printed by the Centers for Disease Control (www.cdc.gov/actearly) 1-800-CDC-INFO. Mental health practitioners can make them available for clients and use as a handy reference. Remember that children are very different, and their milestones may occur slightly before or after other children their own age.

By the end of 7 months, many children are able to:
- Turn head when name is called.
- Smile back at another person.
- Respond to sound with sounds.
- Enjoy social play (such as peek-a-boo).

By the end of 1 year (12 months), many children are able to:
- Use simple gestures (waving “bye-bye”).
- Make sounds such as “ma” and “da.”
- Imitate actions in their play (clap when you clap).
- Respond when told “no.”

By the end of 1 1/2 years (18 months), many children are able to:
- Do simple pretend play (“talk” on a play phone).
- Point to interesting objects.

By the end of 2 years (24 months), many children are able to:
- Look at an object when you point at it and tell them “look!”
- Use several single words unprompted.

By the end of 3 years (36 months), many children are able to:
- Show affection for playmates.
- Use two-to-four-word phrases.
- Follow simple instructions.
- Become more interested in other children.
- Point to an object or picture when named.

By the end of 4 years (48 months), many children are able to:
- Use five to six word sentences.
- Follow three-step commands: “Get dressed. Comb your hair. Wash your face.”
- Cooperate with other children.

ASD Causal Theories

Genetics
One specific genetic connection with ASD is the fragile X syndrome, which is the most common cause of genetically inherited mental retardation.

Research has also discovered that if a parent gives birth to a child with an ASD, there is a one in 20 chance that she will give birth to another child with an ASD. And if one identical twin has an ASD, there is a 90 percent chance that the other twin will have an ASD as well. There is a 3 percent chance if the twins are fraternal twins or siblings. (Autism Speaks, 2014)

Researchers have also identified a number of genes that may play a role in ASD onset. Some of these genes might be responsible for inherited traits that don’t cause ASD but are associated with them. These traits are being identified in family members of children with ASD and include large head size, abnormal brain processing of faces and existence of mind-blindness.

Mind-blindness is the inability of a person to empathize or understand that people think or feel differently. Mind-blindness has nothing to do with intelligence.

As the genetics of autism unfolds, information is continually updated. The rapid progress of genetics, along with animal model systems and systems biology methods will enable the identification of diverse etiologies and common molecular and cellular pathways crucial for neurodevelopment in autism. Such clarification could affect how the autisms are classified, diagnosed, and treated in the future.

Environment
It has been suggested that children may be born with a genetic predisposition to ASD whose onset is then triggered by an environmental factor.

Immune disorders
Another theory suggests that certain disorders of the immune system may prompt ASD onset as well.

Pregnancy
Scientific speculation connects pregnant women and ASD to the labor-inducing drug pitocin, yeast infections, viral infections in the placenta, poor diet, and hormonal or immune system changes during pregnancy.

Immunizations
There has also been speculation that immunizations may contribute to the onset of ASD, although to date, no scientific study has discovered beyond a doubt that a link exists.

Is there a cure for autism spectrum disorders?

Currently there is no cure for ASD, although research is rapidly progressing to identify its causes. However, early diagnosis and intense intervention can greatly benefit children.
Prognosis and Outcome

A meta-analysis showed that individuals with autism have a mortality risk that is 2.8 times higher (95 percent) than that of unaffected people of the same age and sex. This difference is mostly related to co-occurring medical conditions. Studies done before the widespread application of early intervention programs showed that 58–78 percent of adults with autism have poor or very poor outcomes in terms of independent living, educational attainment, employment, and peer relationships. Higher childhood intelligence, communicative phrase speech before age 6 years, and fewer childhood social impairments predict a better outcome. Yet, even for individuals without intellectual disability, adult social outcome is often unsatisfactory in terms of quality of life and achievement of occupational potential, although it is associated with cognitive gain and improved adaptive functioning during development. Childhood follow-up studies have shown varying developmental trajectories in children with autism and in their siblings. The best possible outcome (i.e., reversal of diagnosis, negligible autistic symptoms, and normal social communication) has also been reported.

Transition to adulthood, which often involves loss of school support and child and adolescent mental health services, is a challenge. The end of secondary education is often accompanied by slowed improvement, probably due to reduced occupational stimulation and insufficient adult services. More than half of young people in the USA who have left secondary education in the past 2 years are not participating in any paid work or education. The mean proportion of adults with autism in employment (regular, supported, or sheltered) or full-time education is 46 percent. Furthermore, little is known about how ageing affects people with autism. (APA, 2013)

Early signs and screening

Early identification allows early intervention. Previously, children with autism were often identified when older than 3-4 years, but toddlers are now frequently diagnosed because atypical development is recognized early. Early indicators are deficits or delays in the emergence of joint attention (i.e., shared focus on an object) and pretend play, atypical implicit perspective taking, deficits in reciprocal affective behavior, decreased response to own name, decreased imitation, delayed verbal and non-verbal communication, motor delay, unusually repetitive behaviors, atypical Visio motor exploration, inflexibility in disengaging visual attention, and extreme variation in temperament. These indicators contribute to screening and diagnostic instruments for toddlers. However, identification of high-functioning individuals is still often later than it should be, particularly for females. (APA, 2013)

Variability in age, cognitive ability, and sex leads to differential presentation and the need for appropriate screening instruments. Care should be taken during selection of screening instruments (and the cutoff for further action), because the target sample and purpose of screening vary. Routine early screening at ages 18 and 24 months has been recommended. The advantages and disadvantages of action after a positive result should be carefully considered, as should the identification and management of individuals who have false-positive results.

- **Qualitative impairment in social interaction**
  Children with ASD frequently show an intense interest in objects, rather than other children. They maintain little to no eye contact, unemotional facial expressions, and demonstrate little real empathy.

- **Qualitative impairments in communication**
  Children with ASD may have no speech, delayed speech, or idiosyncratic or repetitive speech. Many do not speak at all, and those who do speak may be unable to initiate or hold a two-way conversation, or engage in make-believe play.

  One type of impaired communication includes “echolalia.” It is speech repetition without comprehension-repeating words, phrases or songs that can mean nothing to the child with ASD.

  Since impaired theory of mind was specifically reported in children with autism in 1985, difficulties with mentalizing (i.e., understanding of mental states in both self and others) are believed to be core to social-communication deficits. Studies have confirmed that development is atypical not only for the behavioral expressions of mentalizing, but also for their developmental precursors in triadic social interaction through joint attention and pretend play as well as dyadic social perception via eye contact, emotion perception, action-perception mirroring, social orienting, biological motion processing, and face processing.

  Although many (high-functioning) individuals with autism achieve some degree of explicit or controlled mentalizing, the implicit, automatic, and intuitive components are still impaired, even in adulthood. Early-onset mentalizing difficulties seem to be specific to autism, but late-onset deficits are reported in disorders such as schizophrenia. Mentalizing is closely entwined with executive control and language, so that the dichotomous view of social versus non-social cognition is potentially misleading in autism.

  Historically, the domain of mentalizing has been largely centered on others, but self-referential cognition and its neural substrates are also atypical in autism. Therefore, deficits in the social domain are not only about difficulties in the processing of information about other people, but also about processing of self-referential information, the relationship that self has in a social context, and the potential for using self as a proxy to understand the social world.

- **Restricted, repetitive and stereotyped patterns of behavior, interests, and activities**
  Children with ASD obsess on objects and topics to the extent that nothing else exists. They may exhibit repetitive actions or movements such as hand flapping or rocking called “stereotypes.” And they can fixate on a specific routine or ritual, such as closing all the doors when entering or leaving a house.

Food allergies, gastrointestinal problems, metabolic errors

Many children with ASD suffer from enhanced behavior problems and lack of focus due to the inability of their bodies to break down certain proteins. They also suffer from food allergies, gastrointestinal problems and higher yeast levels. In addition, some children can suffer from metabolic errors that may be treated with larger amounts of vitamins.

The relationship between autism and parenting stress

A study conducted by Shieve, Blumberg, Rice, Visser and Boyle for the Centers for Disease Control and Prevention, concluded that parents of children with autism were more likely to score in the high aggravation range (55 percent), than parents of children with developmental problems other than autism (44 percent), parents of special health care needs children without developmental problems (12 percent), and parents of children without special health care needs (11 percent). However, within the autism group, the proportion of parents with high aggravation was 66 percent for those whose child recently needed special services, and 28 percent for those whose child did not. The parents of children with autism and recent special service needs were substantially more likely to have high aggravation than parents of children with recent special service needs in each of the three comparison groups.
Conversely, parents of children with autism but without recent special service needs were not more likely to have high aggravation than parents of children with other developmental problems. Therefore, parenting a child with autism with recent special service needs seems to be associated with unique stresses.

**ASD definition check-in**

- **Aphasia:** The loss of ability to implement or comprehend language.
- **Apraxia:** A disorder in which persons suffer partial or total loss of voluntary movement, while retaining muscular power and coordination. (The disorder most often affects speech.)
- **Autistic savant:** A person who expresses exceptional mental abilities, occurring most often in the field of numerical calculation, art, or music.
- **Central auditory processing disorder:** While retaining hearing, a person experiences difficulty understanding and/or processing spoken language.
- **Dysfluency:** An interruption in the flow of speech, such as stuttering.
- **Dyslexia:** A learning disability which affects one’s ability to read.
- **Echolalia:** A condition in which a person repeats previously heard words or phrases with diminished understanding of their meaning. Delayed echolalia can occur days or weeks after initially hearing the word or phrase.
- **Hyperlexia:** An ability for a person to read at an early age without total comprehension.
- **Pedantic speech:** Tiresome speaking that emphasizes self-absorption more than salient fact.
- **Pica:** Ingestion of nonfood items.
- **Pincer grasp:** The use of thumb and forefinger to grasp small objects.
- **Prosody:** The style of speech identified by intonation, pitch, loudness, and tempo of spoken words.
- **Tactile defensiveness:** A marked overreaction to touch.

**AUTISTIC SPECTRUM DISORDER INTERVENTIONS**

While there is no known “cure,” treatment for ASD is rapidly changing and progressively getting better. Research continues that may help to detect and treat ASDs before age 1 as researchers are studying the visual, social, and verbal skills of infant siblings of children with ASDs to see if early detection can be developed.

**Applied behavior analysis (ABA)**

ABA has been well researched and documented as an intervention to assist children with ASD. It builds important skills and reduces problematic behaviors. In addition to teaching basic skills, it also focuses on play, social skills, communication, and relationship building.

ABA was pioneered by Dr. Ivar Lovaas and was based on B.F. Skinner’s conditioning theories to reward and reinforce behavior without punishment. It incorporates different procedures that break down tasks for children so they can learn them more easily.

There are different models for implementing ABA, and they are usually customized to meet each child’s specific need. ABA sessions are generally structured, and caregivers participate with their children as well.

The US Health Resources and Services Administration and the UK National Institute for Health and Care Excellence have provided clinical guidelines for behavioral interventions. They stress that comprehensive intervention should immediately follow diagnosis, and should be individualized (on the basis of developmental level, needs, and assets) and engage the family. Additionally, they emphasize that social-communication training (with a focus on social skills) should be offered, and non-verbal individuals should have opportunities to use the Picture Exchange Communication System (or alternative communication interventions if that is unsuccessful).

The guidelines stress that functional analysis should be integrated into design of interventions for challenging behaviors. Supported employment should be offered for adults who have difficulty obtaining or maintaining jobs. Support for families is crucial. Importantly, more randomized controlled trials are needed for all intervention models to improve evidence for choosing an intervention for each individual and family. Finally, creation of autism-friendly environments is essential. Future research needs to focus on monitoring of outcomes, understanding of specific needs for preverbal and non-verbal individuals as well as adolescents and adults, and identification of key components in effective strategies. Generalization of skills is still a major challenge.

**Medications**

Medications are prescribed for children with ASD in order to alleviate specific symptoms. To date, there is no ASD antidote, but most of the medications prescribed address:

- Depression.
- Anxiety.
- Attention disorders.
- Behavior problems.

In addition, many children with ASD have acquired other medical conditions and may take several different medications. Regular assessments and re-evaluation of medications is necessary with ASD youngsters.

No biomedical agent has been shown to reliably improve social communication; experimental trials of drugs targeting various systems (e.g., oxytocin, and cholinergic and glutamatergic agents) are in progress. Antipsychotic drugs have been shown to effectively reduce challenging and repetitive behaviors in children with autism, and insufficient evidence of usefulness in adolescents and adults is available. The risk of adverse effects is grounds for concern. Serotonin reuptake inhibitors might reduce repetitive behaviors, although findings are inconsistent. The effect of stimulants on co-occurring symptoms of attention-deficit hyperactivity disorder requires more study but is promising and has been recommended. Initial evidence suggests that atomoxetine also reduces co-occurring symptoms of attention-deficit hyperactivity disorder. (Autism Speaks, 2014)

Some complementary and alternative medicines might be tolerated (e.g., melatonin, vitamins, a gluten-casein-free diet, omega-3 fatty acids), but their effectiveness is not established. No treatment benefit of secretin has been recorded. Chelation therapies, hyperbaric oxygen therapy, intravenous immunoglobulin, and antifungal agents all have serious safety concerns without evidenced benefits, and should not be used.
Occupational therapy (OT) can be an important intervention in helping children with ASD because OT helps build their neuromuscular, visual, sensory, and gross/fine motor skills. Often used with sensory integration therapy, it works to help children absorb and process sensory information, especially when children have sensory system dysfunction that over-responds or under-responds to environmental stimulation. Through OT, children learn how to complete daily living tasks, respond to touch, communicate, as well as balance their weight. OT can also help a child draw or write. OT techniques are reinforced in the child’s home setting and they include joint compression, wearing weighted vests, and deep pressure. One form of sensory integration is called auditory integration training. (Physical or speech therapy is used with sensory integration as well.)

Floortime

Floortime literally occurs on the floor in order for a child and caregiver or therapist to engage and spontaneously interact with one another. Floortime is also known as DIR or developmental-individual-difference-relationship based, and focuses on assisting children with ASD to learn building blocks of communication and thinking. Floortime was developed by Dr. Stanley Greenspan and capitalizes on a child’s motivations and interests. It engages a child to play with another person rather than perpetuation of self-absorption through self-play. Utilizing Floortime creates “circles of communication.” For example, a parent may line a truck with her/his child’s lined cars.

Physical therapy

Physical therapy (PT) helps children with their gross and fine motor skills, and enhances their physical capabilities because children with ASD often struggle with body awareness, diminished coordination, poor posture and muscle tone, as well as balance. Individual PT sessions are the norm, and include:
- Muscle strength and endurance exercises.
- Breathing exercises.
- Aerobic exercises.
- Aquatic exercises.
- Passive, active and resistance exercises.

Social skills training

Social skills training teaches appropriate social interactions. A trained social skills facilitator uses a variety of activities to promote friendships and appropriate social behavior in children with ASD. They are taught in groups, peer or video modeling sessions, and one-on-one. Short narrative stories can assist parents in teaching children how to appropriately respond in a social setting. Other activities include games, role-play, discussion, and targeted activities that promote two-way communication, understanding, and empathy.

Pivitol response training

Pivitol response training (PRT) works to improve pivotal behaviors such as responses to cues and stimulation, as well as motivation in children. PRT is designed to work with a child’s everyday life at home and school. Consequently, parent involvement is crucial. PRT focuses on the natural interests of a child to build skills, and includes changing and correcting behaviors, positive reinforcement and working with a child’s preferences. It also helps to create effective social interactions and lengthen attention spans. Drs. Lynn and Robert Koegel worked to develop this comprehensive approach as an outgrowth of applied behavioral analysis.

TEACCH

TEACCH, or treatment and education of autistic and related communication for handicapped children, was developed during the 1970’s at the University of North Carolina’s School of Medicine. TEACCH is a structured and comprehensive teaching intervention that incorporates several techniques and methodologies to address social, coping and communication needs of children with ASD. It was the first statewide program to diagnose, treat and educate children with ASD and works on the premise that a child’s environment should be modified to meet her/his needs and not the other way around.

Speech and language therapy

Speech and language therapy is administered by a speech and language pathologist, or SLP. Through this intervention children learn how to use language to initiate and sustain conversation, as well as improve oral motor abilities. Speech and language therapy utilizes language-based exercise, games and activities to help a child communicate verbally and nonverbally through words and/or body language. (Auditory treatment examples include music therapy, Earobics and Fast ForWord.)

Alternative treatments

Conventional ASD treatments are frequently partnered with alternative interventions that can include:
- Dietary supplements such as Vitamin B-6, cod liver oil supplements, calcium and other vitamins, as well as mixtures of magnesium.
- Body manipulation such as acupuncture, energetic, or massage therapy.
- Music therapy.
- Animal therapy.
- Art therapy.
- Dietary intervention – Many ASD children suffer from food allergies and the inability to break down certain proteins. Consequently their diet removes foods containing wheat, oats,
gluten, rye and dairy products. One known diet for children with ASD is the GF/CF, or gluten-free/casein-free diet.

- Osteopathy.

In her book, “The Autism Sourcebook,” author Karen Siff Exkorn states that she used a variety of interventions for her son. In her son’s case, “when he was 2, we used the more conventional treatments (one-on-one sessions of ABA, speech therapy and OT) as the foundation for his treatment regimen, and added on others that may be considered alternative and complementary (cranial-sacral osteopathy, gluten-free/casein-free diet, vitamin supplements, such as B-6/magnesium, homeopathy, and even energetic therapy.)”

Ms. Exkorn further explains in the book that as her son became older, his treatment/intervention regimen was modified to meet his emerging needs. Some of her son’s interventions were discontinued or lessened, as others were introduced.

**Conclusion**

Autism is a complex condition and new research and modifications to official diagnosis criteria result in continued changes on varying levels. Understanding of autism has changed substantially in the 70 years since it was first described. With the recent exponential increase in research and the inclusion of scientists from a wide range of disciplines, understanding will continue to evolve at an accelerated rate.

The specialty has achieved much: it has reached a consensus about behavioral definition; accepted the increased prevalence; improved understanding about early presentation; established systematic clinical assessments and evidence-based interventions; clarified specific cognitive processes; and used a multi-domain, systems-level approach to understand neurobiology. It is discovering rare and common, mutated and transmitted genetic variants, and potential epigenetic and environmental factors.

Future work in the field is needed in a variety of areas. First, to understand etiologies and development, clarification of the substantial heterogeneity by subgrouping is essential. Second, progress needs to be made in understanding of early developmental mechanisms on which early recognition and interventions rely. Third, effective individualized educational and biomedical interventions for the whole lifespan need to be established. Fourth, key environmental factors that interact with the complex genetic architecture of autism need to be identified. Fifth, how autism affects individuals in different cultural contexts needs to be understood. Finally, environments should be made more autism friendly.

According to Autism Speaks (2014), the five major changes brought forth by the DSM-5 criteria for autism are:

1. The new classification system eliminates the previously separate subcategories on the autism spectrum, including Asperger syndrome, PDD-NOS, childhood disintegrative disorder and autistic disorder. These subcategories will be folded into the broad term autism spectrum disorder (ASD).
2. Instead of three domains of autism symptoms (social impairment, language/communication impairment and repetitive/restricted behaviors), two categories will be used: social communication impairment and restricted interests/repetitive behaviors. Under the DSM-IV, a person qualified for an ASD diagnosis by exhibiting at least six of twelve deficits in social interaction, communication or repetitive behaviors. Under the DSM-5, diagnosis will require a person to exhibit three deficits in social communication and at least two symptoms in the category of restricted range of activities/repetitive behaviors. Within the second category, a new symptom will be included: hyper- or hypo-reactivity to sensory input or unusual interests in sensory aspects of the environment.
3. Symptoms can currently be present, or reported in past history.
4. In addition to the diagnosis, each person evaluated will also be described in terms of any known genetic cause (e.g. fragile X syndrome, Rett syndrome), level of language and intellectual disability and presence of medical conditions such as seizures, anxiety, depression, and/or gastrointestinal (GI) problems.
5. The work group added a new category called Social Communication Disorder (SCD). This will allow for a diagnosis of disabilities in social communication without the presence of repetitive behavior.

**Professional organizations on autism information for mental health practitioners**

Mental health practitioners can provide to their clients the following list of organizations that report on child development research, as well as best practice for children with ASD. They include:

- Autism Connect.
- Autism Society of America.
- American Academy of Child and Adolescent Psychiatry (AACAP).
- American Academy of Family Physicians (AAFP).
- American Neurological Association.
- American Psychiatric Association.
- Association for Behavior Analysis International.
- Centers for Disease Control Autism Information Center.
- Child Neurology Society.
- National Association of Pediatric Nurse Practitioners (NAPNP).
- National Institute of Mental Health.
- Parent Information and Resource Center.
- Society for Research on Child Development.
- The Studies to Advance Autism Research and Treatment Network.

**Bibliography**


- The University of Chicago Healthline (2006), Asperger’s Syndrome, Chicago, Il.
1. The Centers for Disease Control and Prevention (2012) estimates that 1 in every ____ children (11.3 per 1,000) has been identified with an autism spectrum disorder (ASD).
   a. 42.
   b. 65.
   c. 88.
   d. 100.

2. ASD is one of the invisible _____________ and is extremely complex with many different symptoms that can occur in various combinations.
   a. Diseases.
   b. Disabilities.
   c. Diagnoses.
   d. Determinants.

3. The DSM-5, published in May, 2013, adopted the umbrella term autism spectrum disorder without a definition of _____________.
   a. Medical complexity.
   b. Success.
   c. Subtypes.
   d. Factors.

4. ________ (historically linked to an autism diagnosis) was removed from the criteria, and is now classified as a co-occurring condition, even though large variation in language is characteristic of autism.
   a. Communication disorder.
   b. Behavioral tracking.
   c. Trauma induced function.
   d. Atypical language development.

5. According to the DSM-5, there are two domains where people with ASD must show persistent deficits. They include 1) persistent social communication and social interaction, and 2) restricted and __________ patterns of behavior.
   a. Repetitive.
   b. Responsive.
   c. Reactive.
   d. Redacted.

6. In addition to eliminating the various types of Autism, the DSM-5 created a new category that while separate but related to ASD is called:
   a. Rhett Syndrome.
   b. Social Communication Disorder.
   c. Symptomatic Social Disorder.
   d. Maladaptive Communication Syndrome.

7. Research indicates other factors besides the _____________ are contributing to the rise in increasing occurrence of autism, such as environmental toxins (e.g. heavy metals such as mercury), which are more prevalent in our environment than in the past.
   a. Exposure to illegal substances.
   b. Premature birth factor.
   c. Genetic component.
   d. Lack of healthy food intake.

8. Diagnostic assessment should be _______________ and use a developmental framework of an interview with the parent or caregiver, interaction with the individual, collection of information about behavior in community settings (i.e., school reports and job performance), cognitive assessments, and a medical examination.
   a. Multidisciplinary.
   b. Brief.
   c. Educational.
   d. Extensive.

9. The severity level of ASD as indicated by “requiring substantial support” is known as:
   a. Level 1.
   b. Level 2.
   c. Level 3.
   d. Level 4.

10. The US Health Resources and Services Administration and the UK National Institute for Health and Care Excellence have provided clinical guidelines for behavioral interventions. They stress that ________ should immediately follow diagnosis, and should be individualized (on the basis of developmental level, needs, and assets) and engage the family.
    a. Medication.
    b. Follow up appointments.
    c. Comprehensive intervention.
    d. Medicaid applications.