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Everything You Need to Know About Autism Spectrum Disorder (ASD)



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ASD describes a group of neurodevelopmental conditions that become evident during early childhood. Certain genetic and environmental factors can contribute to its development.

What is autism?

Autism spectrum disorder (ASD), or autism, is a broad term used to describe a group of neurodevelopmental conditions.

These conditions are characterized by differences in communication and social interaction. People with ASD often demonstrate restricted and repetitive interests or patterns of behavior.

ASD is found in people around the world, regardless of race and ethnicity, culture, or economic background.

According to the Centers for Disease Control and Prevention (CDC), ASD is diagnosed more often in boys than in girls. A study of 8-year-olds in 11 locations throughout the United States found a [4.3-to-1, boy-to-girl ratio](#) in 2016. About 1 in 54 of the study participants had ASD.

There are indications that instances of autism are on the rise. Some attribute this increase to environmental factors. However, experts debate whether there's an actual increase in cases or just more frequent diagnoses. [Compare autism rates in different U.S. states.](#)

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What are the symptoms of autism?

Symptoms of ASD typically become clearly evident during early childhood, between ages 12 and 24 months. However, symptoms may also appear [earlier](#) or [later](#).

Early symptoms may include a marked delay in [language](#) or social development.

The DSM-5 divides symptoms of ASD into two categories:

- problems with communication and social interaction
- restricted or repetitive patterns of behavior or activities

To be diagnosed with autism, a person must experience symptoms in both of these categories.

Problems with communication and social interaction

ASD can involve a range of issues with [communication](#), many of which appear before age 5.

Here's a general timeline of what this might look like:

- **From birth:** trouble maintaining eye contact
- **By 9 months:** not responding to their name
- **By 9 months:** not displaying facial expressions reflective of their emotions (like surprise or anger)
- **By 12 months:** not engaging in basic interactive games, like peek-a-boo or pat-a-cake
- **By 12 months:** not using (or only using a few) hand gestures, like hand-waving
- **By 15 months:** not sharing their interests with others (by showing someone a favorite toy, for example)
- **By 18 months:** not pointing or looking where others point
- **By 24 months:** not noticing when others appear sad or hurt
- **By 30 months:** not engaging in "pretend play," like caring for a baby doll or playing with figurines
- **By 60 months of age:** not playing turn-taking games, like duck-duck goose

Additionally, autistic children might have trouble expressing their feelings or understanding those of others starting at 36 months.

As they age, they might have difficulty talking or very limited speaking skills. Other autistic children might develop language skills at an uneven pace. If there's a particular topic that's very interesting to them, for example, they might develop a very strong vocabulary for talking about that one topic. But they might have difficulty communicating about other things.

As autistic children begin talking, they might also talk in an unusual tone that can range from high-pitched and "sing-songy" to robotic or flat.

They might also show signs of [hyperlexia](#), which involves reading beyond what's expected of their age. Children on the autism spectrum might learn to read earlier than their neurotypical peers, sometimes as early as age 2. But they tend to not comprehend what they're reading.

While hyperlexia does not always accompany autism, [research](#) suggests nearly 84 percent of

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children with hyperlexia are on the spectrum.

As they interact with others, autistic children might have difficulty sharing their emotions and interests with others or find it hard to maintain back-and-forth conversation. Nonverbal communication, like maintaining eye contact or [body language](#), might also remain difficult.

These challenges with communication can persist throughout adulthood.

Restricted or repetitive patterns of behavior or activities

In addition to the communication and social issues mentioned above, autism also includes symptoms related to body movements and behaviors.

These can include:

- repetitive movements, like rocking, flapping their arms, spinning, or running back and forth
- lining objects, like toys, up in strict order and getting upset when that order is disturbed
- attachment to strict routines, like those around bedtime or getting to school
- [repeating](#) words or phrases they hear someone say over and over again
- getting upset over minor changes
- focusing intently on parts of objects, like the wheel of a toy truck or the hair of a doll
- unusual reactions to sensory input, like sounds, smells, and tastes
- obsessive interests
- exceptional abilities, like musical talent or memory capabilities

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Other characteristics

Some autistic people might experience additional symptoms, including:

- delayed movement, language, or cognitive skills
- seizures
- gastrointestinal symptoms, like constipation or diarrhea
- excessive worry or stress
- unusual levels of fear (either higher or lower than expected)
- [hyperactive, inattentive, or impulsive behaviors](#)
- unexpected emotional reactions
- unusual eating habits or preferences
- unusual sleep patterns

What is stimming?

“Stimming” is a term used to describe self-stimulating behaviors, often involving repetitive motions or speech.

For example, someone might clap their hands, rub an object, or repeat a phrase. It’s typically associated with autistic people, but nearly everyone does some form of stimming, whether that’s rubbing their hands together or biting their nails.

For autistic people, stimming can sometimes get in the way of daily life or cause physical harm. But it can also serve as a helpful coping mechanism for dealing with [sensory overload](#) or navigating uncomfortable situations, among other things.

[Learn more about stimming and how it shows up.](#)

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What are the different types of autism?

The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) is published by the American Psychiatric Association (APA). Clinicians use it to diagnose a variety of psychiatric disorders.

The most recent fifth edition of the DSM was released in 2013. The DSM-5 currently recognizes five different ASD subtypes, or specifiers. They are:

- with or without accompanying intellectual impairment
- with or without accompanying language impairment
- associated with a known medical or genetic condition or environmental factor
- associated with another neurodevelopmental, mental, or behavioral disorder
- with [catatonia](#)

Someone can receive a diagnosis of one or more specifiers.

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Before the DSM-5, autistic people may have received a diagnosis of:

- autistic disorder
- [Asperger's syndrome](#)
- [pervasive development disorder-not otherwise specified \(PDD-NOS\)](#)
- childhood disintegrative disorder

It's important to note that a person who received one of these earlier diagnoses has not lost their diagnosis and will not need to be reevaluated.

According to the DSM-5, the broader diagnosis of ASD encompasses conditions such as Asperger's syndrome. [Learn more about Asperger's syndrome and the other older classifications for autism.](#)

What causes autism?

The exact cause of ASD is unknown. The most current research demonstrates there's no single cause.

Some suspected risk factors for ASD include:

- having an immediate family member who's autistic
- certain genetic mutations
- [fragile X syndrome](#) and other genetic disorders
- being born to [older parents](#)
- low birth weight
- metabolic imbalances
- exposure to heavy metals and environmental toxins
- a maternal history of [viral infections](#)
- fetal exposure to the medications valproic acid or thalidomide (Thalomid)

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According to the [National Institute of Neurological Disorders and Stroke \(NINDS\)](#) , both genetics and environment may determine whether a person develops ASD.

However, multiple sources, [old](#) and [new](#) , have concluded that vaccines do not cause ASD.

A controversial 1998 study proposed a link between autism and the [measles, mumps, and rubella \(MMR\) vaccine](#). However, that study has been debunked by other research and was eventually [retracted](#) in 2010. [Read more about autism and its risk factors.](#)

What tests are used to diagnose autism?

An ASD diagnosis involves:

- several screenings
- genetic tests
- evaluations

Developmental screenings

The [American Academy of Pediatrics \(AAP\)](#) recommends that all children undergo ASD screening at ages 18 and 24 months.

Screening can help identify ASD in children earlier than later. They may benefit from early diagnosis and support.

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The [Modified Checklist for Autism in Toddlers \(M-CHAT\)](#) is a common screening tool many pediatric offices use. Parents fill out the 23-question survey. Pediatricians can then use the responses to help identify children who may have an increased chance of developing ASD.

It's important to note that screening is not a diagnosis. Children who screen positively for ASD do not necessarily have it. Additionally, screenings do not always identify every child who's autistic.

Other screenings and tests

Your child's [physician](#) may recommend a combination of tests for autism, including:

- DNA testing for genetic diseases
- behavioral evaluation
- [visual](#) and [audio](#) tests to rule out any issues with vision and hearing that aren't related to ASD
- occupational therapy screening
- developmental questionnaires, such as the Autism Diagnostic Observation Schedule, Second Edition (ADOS-2)

Determining the diagnosis

A team of specialists typically makes the diagnosis. This team may include:

- child psychologists
- occupational therapists
- speech and language pathologists

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[Learn more about the tests these specialists use to diagnose ASD.](#)

What support is available for autistic people?

There are [no “cures”](#) for ASD. Rather, for some autistic people, [supportive therapies and other considerations](#) can help them feel better or alleviate certain symptoms.

Many approaches involve therapies such as:

- [behavioral therapy](#)
- [play therapy](#)
- [occupational therapy](#)
- physical therapy
- [speech therapy](#)

[Massages](#), weighted clothing and [blankets](#), and [meditation techniques](#) may also help some autistic people manage symptoms. However, results will vary. Some people may respond well to certain approaches, while others may not.

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Alternative remedies

Research on alternative remedies is mixed, and some remedies can be dangerous. These alternative remedies include things like:

- high-dose vitamins

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- [chelation therapy](#), which involves flushing metals from the body
- [hyperbaric oxygen therapy](#)
- [melatonin](#) to address sleep issues

Before investing in any alternative therapy, parents and caregivers should weigh the research and financial costs against any possible benefits.

When in doubt, it's always best to talk with a healthcare professional. [Learn more about alternative remedies for autism.](#)

Can diet have an impact on autism?

There's no specific diet designed for autistic people. Nevertheless, some autism advocates are exploring dietary changes as a way to help minimize behavioral issues and increase overall quality of life.

A foundation of the autism diet is the avoidance of artificial additives. These include:

- preservatives
- [colors](#)
- [sweeteners](#)

An autism diet may instead focus on whole foods, such as:

- fresh [fruits](#) and [vegetables](#)
- lean poultry
- [fish](#)
- [unsaturated fats](#)
- [lots of water](#)

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Some autism advocates also endorse a [gluten-free diet](#). The protein gluten is found in:

- [wheat](#)
- [barley](#)
- other grains

Those advocates believe that gluten creates [inflammation](#) and adverse bodily reactions in certain autistic people. However, [scientific research](#) is inconclusive on the relationship between autism, gluten, and another protein known as [casein](#).

Some studies, and anecdotal evidence, have suggested that diet can help improve symptoms of [attention deficit hyperactivity disorder \(ADHD\)](#), a condition that may be similar to autism. [Find out more about the ADHD diet.](#)

How does autism affect kids?

Autistic children may not reach the same [developmental milestones](#) as their peers, or they may demonstrate the loss of previously developed social or language skills.

For instance, a 2-year-old without autism may show interest in simple games of [make-believe](#). A 4-year-old without autism may enjoy engaging in activities with other children. An autistic child may have trouble interacting with others or dislike it altogether.

Autistic children may also engage in repetitive behaviors, have [difficulty sleeping](#), or [compulsively eat nonfood items](#). They may find it hard to thrive without a structured environment or consistent routine.

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If your child is autistic, you may have to work closely with their teachers to ensure they succeed in the classroom.

Many resources are available to help autistic children as well as their loved ones. Local support groups can be found through the national nonprofit the [Autism Society of America](#).

Autism and exercise

Autistic children may find that certain exercises can help in easing frustrations and promoting overall well-being.

Any type of exercise that your child enjoys can be beneficial. Walking and simply having fun on the playground are both ideal.

Swimming and other in-water activities can serve as both exercise and a [sensory play activity](#). Sensory play activities can help autistic people who may have trouble processing signals from their senses.

Sometimes contact sports can be difficult for autistic children. You can instead encourage other forms of challenging yet strengthening exercises. [Get started with these tips on arm circles, star jumps, and other autism exercises for kids](#).

How does autism affect girls?

Because of its greater rate in boys, ASD is often stereotyped as a “boys’ disease.”

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According to a 2020 study of 11 regions throughout the United States, ASD is [4.3 times more common](#)  in 8-year-old boys than in 8-year-old girls. The research was based on data from 2016.

A 2017 literature review concluded that the male-to-female ratio for autistic youth was actually closer to [3 to 1](#).

Either way, this does not mean that ASD doesn’t occur in girls. ASD may simply present differently in girls and [in women](#).

In comparison to recent decades, ASD is now being tested earlier and more often. This leads to higher reported rates in both boys and girls.

How does autism affect adults?

Families who have autistic loved ones may be concerned about what life with ASD looks like for an adult.

Some autistic adults go on to live or work independently. Others may require continued aid or support throughout their lives. Each autistic person is different.

Sometimes autistic people don't receive a diagnosis until much later in life. This is due, in part, to a previous lack of awareness among medical practitioners.

It's never too late to receive a diagnosis, though. [Read this article if you suspect you have adult autism.](#)

Why is autism awareness important?

April 2 is [World Autism Awareness Day](#). April has also become known as Autism Awareness Month in the United States. However, many community advocates have rightly called for the need to increase awareness about ASD year-round, not just during 30 select days.

The Autism Society of America and other advocates have even proposed that April be designated [Autism Acceptance Month](#) instead.

Autism acceptance requires empathy and an understanding that ASD is different for everyone.

Certain therapies and approaches can work for some people but not others. Parents and caregivers can also have differing opinions on the best way to advocate for an autistic child.

Understanding autism and autistic people starts with awareness, but it doesn't end there. [Check out one father's story on his "frustrations" with autism awareness.](#)

What is the difference between autism and ADHD?

Autism and ADHD are sometimes confused with one another.

Children with an ADHD diagnosis consistently have issues with [fidgeting](#), [concentrating](#), and maintaining eye contact with others. These [symptoms](#) are also seen in some autistic people.

Despite some similarities, ADHD is not considered a spectrum disorder. One major difference between the two is that people with ADHD do not tend to lack socio-communicative skills.

If you think your child may be [hyperactive](#), talk with their doctor about possible [ADHD testing](#). Getting a clear diagnosis is essential to ensure that your child is receiving the right support.

It's also possible for a person to have both autism and ADHD. [Explore the relationship between autism and ADHD.](#)

What is the outlook for autistic people?

The most effective therapies involve early and intensive behavioral support. The earlier a child is enrolled in these programs, the better their outlook will be.

Remember, ASD is complex. It takes time for an autistic person — whether a child or adult — to

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