

# Autism Spectrum Disorder



National Institute  
of Mental Health

# What is autism spectrum disorder?

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Autism spectrum disorder (ASD) is a neurological and developmental disorder that affects how people interact with others, communicate, learn, and behave. Although autism can be diagnosed at any age, it is described as a “developmental disorder” because symptoms generally appear in the first two years of life.

According to the *Diagnostic and Statistical Manual of Mental Disorders (DSM-5)*, a guide created by the American Psychiatric Association that health care providers use to diagnose mental disorders, people with ASD often have:

- Difficulty with communication and interaction with other people
- Restricted interests and repetitive behaviors
- Symptoms that affect their ability to function in school, work, and other areas of life

Autism is known as a “spectrum” disorder because there is wide variation in the type and severity of symptoms people experience.

People of all genders, races, ethnicities, and economic backgrounds can be diagnosed with ASD. Although ASD can be a lifelong disorder, treatments and services can improve a person’s symptoms and daily functioning. The American Academy of Pediatrics recommends that all children receive screening for autism. Caregivers should talk to their child’s health care provider about ASD screening or evaluation.

# What are the signs and symptoms of ASD?

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The list below gives some examples of common types of behaviors in people diagnosed with ASD. Not all people with ASD will have all behaviors, but most will have several of the behaviors listed below.

Social communication and social interaction behaviors may include:

- Making little or inconsistent eye contact
- Appearing not to look at or listen to people who are talking
- Infrequently sharing interest, emotion, or enjoyment of objects or activities (including infrequently pointing at or showing things to others)
- Not responding or being slow to respond to one’s name or to other verbal bids for attention
- Having difficulties with the back and forth of conversation
- Often talking at length about a favorite subject without noticing that others are not interested or without giving others a chance to respond
- Displaying facial expressions, movements, and gestures that do not match what is being said
- Having an unusual tone of voice that may sound sing-song or flat and robot-like

- Having trouble understanding another person's point of view or being unable to predict or understand other people's actions
- Difficulties adjusting behavior to different social situations
- Difficulties sharing in imaginative play or in making friends

Restrictive/repetitive behaviors may include:

- Repeating certain behaviors or having unusual behaviors, such as repeating words or phrases (a behavior called *echolalia*)
- Having a lasting intense interest in specific topics, such as numbers, details, or facts
- Showing overly focused interests, such as with moving objects or with parts of objects
- Becoming upset by slight changes in a routine and having difficulty with transitions
- Being more sensitive or less sensitive than other people to sensory input, such as light, sound, clothing, or temperature

People with ASD also may experience sleep problems and irritability.

People on the autism spectrum also may have many strengths, including:

- Being able to learn things in detail and remember information for long periods of time
- Being strong visual and auditory learners
- Excelling in math, science, music, or art

## What are the causes and risk factors for ASD?

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Researchers don't know the primary causes of ASD, but studies suggest that a person's genes can act together with aspects of their environment to affect development in ways that lead to ASD. Some factors that are associated with an increased likelihood of developing ASD include:

- Having a sibling with ASD
- Having older parents
- Having certain genetic conditions (such as Down syndrome or Fragile X syndrome)
- Having a very low birth weight

Not everyone who has these risk factors develops ASD.

## How is ASD diagnosed?

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Health care providers diagnose ASD by evaluating a person's behavior and development. ASD can usually be reliably diagnosed by the age of 2. It is important to seek an evaluation as soon as possible. The earlier ASD is diagnosed, the sooner treatments and services can begin.

## Diagnosis in Young Children

Diagnosis in young children is often a two-stage process.

### Stage 1: General Developmental Screening During Well-Child Checkups

Every child should receive well-child checkups with a pediatrician or an early childhood health care provider. The American Academy of Pediatrics recommends that all children receive screening for developmental delays at their 9-, 18-, and 24- or 30-month well-child visits, with specific autism screenings at the 18- and 24-month well-child visits. A child may receive additional screenings if they are at high risk for ASD or developmental problems.

Considering caregivers' experiences and concerns is an important part of the screening process for young children. The health care provider may ask questions about the child's behaviors and evaluate those answers in combination with information from ASD screening tools and clinical observations of the child. To learn more about ASD screening tools, visit the Centers for Disease Control and Prevention (CDC) website at [www.cdc.gov/ncbddd/autism/hcp-screening.html](http://www.cdc.gov/ncbddd/autism/hcp-screening.html).

If a child shows developmental differences in behavior or functioning during this screening process, the health care provider may refer the child for additional evaluation.

### Stage 2: Additional Diagnostic Evaluation

It is important to accurately detect and diagnose children with ASD as early as possible, as this will shed light on their unique strengths and challenges. Early detection also can help caregivers determine which services, educational programs, and behavioral therapies are most likely to be helpful for their child.

A team of health care providers who have experience diagnosing ASD will conduct the diagnostic evaluation. This team may include child neurologists, developmental behavioral pediatricians, speech-language pathologists, child psychologists and psychiatrists, educational specialists, and occupational therapists.

The diagnostic evaluation is likely to include:

- Medical and neurological examinations
- Assessment of the child's cognitive abilities
- Assessment of the child's speech and language abilities
- Observation of the child's behavior
- An in-depth conversation with the child's caregivers about the child's behavior and development
- Assessment of age-appropriate skills needed to complete daily activities independently, such as eating, dressing, and toileting
- Questions about the child's family history

Because ASD is a complex disorder that sometimes occurs with other illnesses or learning disorders, the comprehensive evaluation may include blood tests and a hearing test.

The outcome of this evaluation may result in a formal diagnosis and recommendations for treatment.

## Diagnosis in Older Children and Adolescents

Caregivers and teachers are often the first to recognize ASD symptoms in older children and adolescents who attend school. The school's special education team may perform an initial evaluation and then recommend that a child undergo additional evaluation with their primary health care provider or a health care provider who specializes in ASD.

A child's caregivers may talk with these health care providers about the child's social difficulties, including problems with subtle communication. These subtle communication differences may include problems understanding tone of voice, facial expressions, or body language. Older children and adolescents may have trouble understanding figures of speech, humor, or sarcasm. They also may have trouble forming friendships with peers.

## Diagnosis in Adults

Diagnosing ASD in adults is often more difficult than diagnosing ASD in children. In adults, some ASD symptoms can overlap with symptoms of other mental health disorders, such as an anxiety disorder or attention-deficit/hyperactivity disorder (ADHD).

Adults who notice signs and symptoms of ASD should talk with a health care provider and ask for a referral for an ASD evaluation. Although evaluation for ASD in adults is still being refined, adults can be referred to a neuropsychologist, psychologist, or psychiatrist who has experience with ASD. The expert will ask about:

- Social interaction and communication challenges
- Sensory issues
- Repetitive behaviors
- Restricted interests

The evaluation also may include a conversation with caregivers and other family members to learn about the person's early developmental history, which can help ensure an accurate diagnosis.

Obtaining a correct diagnosis of ASD as an adult can help people understand past challenges, identify personal strengths, and find the right kind of help. Studies are underway to determine the types of services and supports that are most helpful for improving the functioning and community integration of autistic transition-age youth and adults.

# What treatment options are available for ASD?

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Treatment for ASD should begin as soon as possible after diagnosis. Early treatment for ASD is important because proper care and services can reduce individuals' difficulties while helping them learn new skills and build on their strengths.

People with ASD may face a wide range of issues, which means there is no single best treatment for ASD. Working closely with a health care provider is an important part of finding the right combination of treatments and services.

## Medication

A health care provider may prescribe medication to treat specific symptoms. With medication, a person with ASD may have fewer problems with:

- Irritability
- Aggression
- Repetitive behavior
- Hyperactivity
- Attention
- Anxiety and depression

Read more about the latest medication warnings, patient medication guides, and information on newly approved medications at the Food and Drug Administration (FDA) website at [www.fda.gov/drugsatfda](http://www.fda.gov/drugsatfda).

## Behavioral, Psychological, and Educational Interventions

People with ASD may be referred to health care providers who specialize in providing behavioral, psychological, educational, or skill-building interventions. These programs are typically highly structured and intensive, and they may involve caregivers, siblings, and other family members. These programs may help people with ASD:

- Learn social, communication, and language skills
- Reduce behaviors that interfere with daily functioning
- Increase or build on strengths
- Learn life skills for living independently

## Other Resources

Many services, programs, and other resources are available to help people with ASD. Here are some tips for finding these additional resources:

- Contact a health care provider, local health department, school, or autism advocacy group to learn about special programs or local resources.
- Find an autism support group. Sharing information and experiences can help people with ASD and their caregivers learn about treatment options and ASD-related programs.

- Record conversations and meetings with health care providers and teachers. This information helps when it's time to decide which programs and services are appropriate.
- Keep copies of health care reports and evaluations. This information may help people with ASD qualify for special programs.

## Where can I find resources about ASD?

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For more information about ASD, visit:

- *Eunice Kennedy Shriver* National Institute of Child Health and Human Development  
[www.nichd.nih.gov/health/topics/autism](http://www.nichd.nih.gov/health/topics/autism)
- National Institute of Neurological Disorders and Stroke  
[www.ninds.nih.gov/Disorders/All-Disorders/Autism-Spectrum-Disorder-Information-Page](http://www.ninds.nih.gov/Disorders/All-Disorders/Autism-Spectrum-Disorder-Information-Page)
- National Institute on Deafness and Other Communication Disorders  
[www.nidcd.nih.gov/health/autism-spectrum-disorder-communication-problems-children](http://www.nidcd.nih.gov/health/autism-spectrum-disorder-communication-problems-children)
- Centers for Disease Control and Prevention  
[www.cdc.gov/autism](http://www.cdc.gov/autism)
- Interagency Autism Coordinating Committee  
<https://iacc.hhs.gov>

## What should I know about clinical trials?

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Clinical trials are research studies that look at new ways to prevent, detect, or treat diseases and conditions. Although individuals may benefit from being part of a clinical trial, participants should be aware that the primary purpose of a clinical trial is to gain new scientific knowledge so that others may be better helped in the future.

Talk to a health care provider about clinical trials, their benefits and risks, and whether one is right for you or a loved one. For more information, visit [www.nimh.nih.gov/clinicaltrials](http://www.nimh.nih.gov/clinicaltrials).

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## For More Information

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NIMH website

[www.nimh.nih.gov](http://www.nimh.nih.gov)

[www.nimh.nih.gov/espanol](http://www.nimh.nih.gov/espanol) (en español)

MedlinePlus (National Library of Medicine)

<https://medlineplus.gov>

<https://medlineplus.gov/spanish> (en español)

ClinicalTrials.gov

[www.clinicaltrials.gov](http://www.clinicaltrials.gov)

<https://salud.nih.gov/investigacion-clinica> (en español)

### National Institute of Mental Health

Office of Science Policy, Planning, and Communications

6001 Executive Boulevard

Room 6200, MSC 9663

Bethesda, MD 20892-9663

Toll-free: 1-866-615-6464

Email: [nimhinfo@nih.gov](mailto:nimhinfo@nih.gov)

Website: [www.nimh.nih.gov](http://www.nimh.nih.gov)



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