

A hand holding a green puzzle piece against a background of floating puzzle pieces and a blue sky. The puzzle pieces are in various colors (yellow, blue, white, green) and are scattered across the upper half of the image. The hand is holding a green puzzle piece in the lower half of the image. The background is a soft, out-of-focus blue sky with a green field at the bottom.

Autism Spectrum Disorder

What is autism spectrum disorder?

Autism spectrum disorder (ASD) is a term for a group of developmental disorders described by:

- Lasting problems with social communication and social interaction in different settings
- Repetitive behaviors and/or not wanting any change in daily routines
- Symptoms that begin in early childhood, usually in the first 2 years of life
- Symptoms that cause the person to need help in his or her daily life

The term “spectrum” refers to the wide range of symptoms, strengths, and levels of impairment that people with ASD can have. The diagnosis of ASD now includes these other conditions:

- Autistic disorder
- Asperger’s syndrome
- Pervasive developmental disorder not otherwise specified

Although ASD begins in early development, it can last throughout a person’s lifetime.

What are the signs and symptoms of ASD?

Not all people with ASD will show all of these behaviors, but most will show several.

People with ASD may:

- Repeat certain behaviors or have unusual behaviors
- Have overly focused interests, such as with moving objects or parts of objects
- Have a lasting, intense interest in certain topics, such as numbers, details, or facts
- Be upset by a slight change in a routine or being placed in a new or overstimulating setting
- Make little or inconsistent eye contact
- Tend to look and listen less to people in their environment

- Rarely seek to share their enjoyment of objects or activities by pointing or showing things to others
- Respond unusually when others show anger, distress, or affection
- Fail or be slow to respond to their name or other verbal attempts to gain their attention
- Have difficulties with the back and forth of conversations
- Often talk at length about a favorite subject but won't allow anyone else a chance to respond or notice when others react indifferently
- Repeat words or phrases that they hear, a behavior called echolalia
- Use words that seem odd, out of place, or have a special meaning known only to those familiar with that person's way of communicating
- Have facial expressions, movements, and gestures that do not match what they are saying
- Have an unusual tone of voice that may sound sing-song or flat and robot-like
- Have trouble understanding another person's point of view, leaving him or her unable to predict or understand other people's actions

People with ASD may have other difficulties, such as sensory sensitivity (being sensitive to light, noise, textures of clothing, or temperature), sleep problems, digestion problems, and irritability.

People with ASD can also have many strengths and abilities. For instance, people with ASD may:

- Have above-average intelligence
- Be able to learn things in detail and remember information for long periods of time
- Be strong visual and auditory learners
- Excel in math, science, music, and art

NOTICING ASD IN YOUNG CHILDREN

Some babies with ASD may seem different very early in their development. Others may seem to develop typically until the second or even third year of life, but then parents start to see problems. Learn more about developmental milestones that young children should reach at www.cdc.gov/ncbddd/actearly/milestones.

How is ASD diagnosed?

Doctors diagnose ASD by looking at a child's behavior and development. Young children with ASD can usually be reliably diagnosed by age 2.

Older children and adolescents should be screened for ASD when a parent or teacher raises concerns based on observations of the child's social, communicative, and play behaviors.

Diagnosing ASD in adults is not easy. In adults, some ASD symptoms can overlap with symptoms of other mental health disorders, such as schizophrenia or attention deficit hyperactivity disorder (ADHD). However, getting a correct diagnosis of ASD as an adult can help a person understand past difficulties, identify his or her strengths, and obtain the right kind of help.

Diagnosis in Young Children

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

General Developmental Screening During Well-Child Checkups

Every child should receive well-child check-ups with a pediatrician or an early childhood health care provider. Specific ASD screening should be done at the 18- and 24-month visits.

Earlier screening might be needed if a child is at high risk for ASD or developmental problems. Those at high risk include those who:

- Have a sister, brother, or other family member with ASD
- Have some ASD behaviors
- Were born premature, or early, and at a low birth weight

Parents' experiences and concerns are very important in the screening process for young children. Sometimes the doctor will ask parents questions about the child's behaviors and combine this information with his or her observations of the child. Read more about screening instruments at www.cdc.gov/ncbddd/autism/hcp-screening.html.

Children who show some developmental problems during this screening process will be referred for another stage of evaluation.

Additional Evaluation

This evaluation is with a team of doctors and other health professionals with a wide range of specialties who are experienced in diagnosing ASD. This team may include:

- A developmental pediatrician—a doctor who has special training in child development
- A child psychologist and/or child psychiatrist—a doctor who knows about brain development and behavior
- A speech-language pathologist—a health professional who has special training in communication difficulties

The evaluation may assess:

- Cognitive level or thinking skills
- Language abilities
- Age-appropriate skills needed to complete daily activities independently, such as eating, dressing, and toileting

Because ASD is a complex disorder that sometimes occurs along with other illnesses or learning disorders, the comprehensive evaluation may include:

- Blood tests
- A hearing test

The outcome of the evaluation will result in recommendations to help plan for treatment.

Diagnosis in Older Children and Adolescents

Older children who begin showing symptoms of ASD after starting school are often first recognized and evaluated by the school's special education team and can be referred to a health care professional. Parents may talk with their child's pediatrician about their child's difficulties with social interaction, including problems with subtle communication, such as understanding tone of voice or facial expressions, body language, and lack of understanding of figures of speech, humor, or sarcasm. Parents may also find that their child has trouble forming friendships with peers. At this point, the pediatrician or a child psychologist or psychiatrist who has expertise in ASD can screen the child and refer the family for further evaluation and treatment.

Diagnosis in Adults

Adults who notice the signs and symptoms of ASD should talk with a doctor and ask for a referral for an ASD evaluation. While testing for ASD in adults is still being refined, adults can be referred to a psychologist or psychiatrist with ASD expertise. The expert will ask about concerns, such as social interaction and communication challenges, sensory issues, repetitive behaviors, and restricted interests. Information about the adult's developmental history will help in making an accurate diagnosis, so an ASD evaluation may include talking with parents or other family members.



What are the treatments for ASD?

Treating ASD early and getting proper care can reduce a person's difficulties and increase his or her ability to maximize strengths and learn new skills. While there is no single best treatment for ASD, working closely with the doctor is an important part of finding the right treatment program.

Medications

There are a few classes of medications that doctors may use to treat some difficulties that are common with ASD. With medication, a person with ASD may have fewer problems with:

- Irritability
- Aggression
- Repetitive behaviors
- Hyperactivity
- Attention problems
- Anxiety and depression

Read more about the latest news and information on medication warnings, patient medication guides, or newly approved medications at the Food and Drug Administration's (FDA) website at www.fda.gov.

Who is affected by ASD?

ASD affects many people, and it has become more commonly diagnosed in recent years. More boys than girls receive an ASD diagnosis.

What causes ASD?

Scientists don't know the exact causes of ASD, but research suggests that genes and environment play important roles.

- Researchers are starting to identify genes that may increase the risk for ASD.
- ASD occurs more often in people who have certain genetic conditions, such as Fragile X syndrome or tuberous sclerosis.
- Many researchers are focusing on how genes interact with each other and with environmental factors, such as family medical conditions, parental age and other demographic factors, and complications during birth or pregnancy.
- Currently, no scientific studies have linked ASD and vaccines.

Where can I find more information?

To learn more about ASD, visit:

Centers for Disease Control and Prevention

<http://www.cdc.gov/ncbddd/autism>

Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD)

<http://www.nichd.nih.gov/health/topics/autism/Pages/default.aspx>

MedlinePlus (National Library of Medicine)

<https://medlineplus.gov>

(En Espanol: <http://medlineplus.gov/spanish>)

National Institute on Deafness and Other Communication Disorders (NIDCD)

<http://www.nidcd.nih.gov/funding/programs/vsl/pages/autism.aspx>

National Institute of Neurological Disorders and Stroke (NINDS)

<http://www.ninds.nih.gov/disorders/autism/autism.htm>

For information on clinical trials, visit:

ClinicalTrials.gov: <http://www.clinicaltrials.gov>



For more information on conditions that affect mental health, resources, and research, go to MentalHealth.gov at <http://www.mentalhealth.gov>, the NIMH website at <http://www.nimh.nih.gov>, or contact us at:

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