Autism spectrum disorders (ASDs) are a range of brain disorders characterized by restricted patterns of behavior and impairments in social communication and interactions. These disorders share common origins and features but are classified as spectrum disorders because symptoms and severity vary among individuals. Autism spectrum disorders include autism, Asperger's disorder, and other disorders that affect social behavior and cognition.

Autism, commonly referred to as autism, is the most prevalent ASD and severely impairs a child's social interaction and communication abilities. Asperger's disorder is a milder form of autism, typically associated with higher language development and normal intellectual ability, but may be socially disinterested. Children with Asperger's do not compensate for their limited language use by using nonverbal means of communication, limiting their peer relationships.

Other disorders in the spectrum include pervasive developmental disorder not otherwise specified (PDDNOS), childhood disintegrative disorder (CDD), and Rett's syndrome. PDDNOS features are similar to autism but do not meet all criteria for the disorder. CDD, which affects more boys than girls, develops normally until two years, then regresses in most areas and continues to worsen. Rett's syndrome is a genetic disorder found almost exclusively in females and is characterized by autistic symptoms that begin between 6 and 18 months.

Who Gets It
Autism spectrum disorders are usually evident by age 3, though diagnosis may be made as early as 12 to 18 months, and as late as 4 to 6 years. Prevalence ranges from 2 to 6 per 1,000 children, three to four times more common in boys than girls. However, girls with autism tend to have more severe symptoms and lower intelligence. Some children require ongoing supervision, while others, with the right support, may pursue higher education and fulfilling jobs. These disorders affect people of all racial, ethnic, and socioeconomic groups.

Symptoms
Symptoms of autism can range from mild to severe and may appear gradually or suddenly. They include deficits in social interactions and communication, as well as repetitive behaviors or interests. Atypical development may be observed from birth or become noticeable during the 12- to 36-month period.

Social Deficits - Children with autism have difficulty in social interactions. They may avoid eye contact and resist or passively accept attention. They are often unable to read social cues or exhibit emotional reciprocity. Thus, they are unable to predict or understand other people's behavior. They may also have difficulty controlling emotion, be disruptive or aggressive at times, or may lose control, especially when frustrated or presented with a new situation or environment. Head-banging, hair-pulling, and arm-biting may occur.

Communication - Communication skills are affected in children with autism, but difficulties vary. Some may have good basic language, while others exhibit difficulty initiating or sustaining conversations. They often do not match verbal content with emotions. Intense preoccupation with certain topics, such as repeating phrases or parroting what they hear, may occur. Body language is also often hard to read in children with autism.

Repetitive Behaviors - Patterns of behavior, interests, and activities may be restricted, repetitive, or stereotyped. For example, a child may spend long periods of time arranging specific toys in a particular manner, rather than playing with the toys. Odd repetitive movements, such as arm-flapping, freezing, and rocking back and forth, may also occur. People with autism may demand consistency in their environment. A minor change in routine may be tremendously upsetting.
**Sensory Difficulties** - In children with autism, the brain seems unable to balance the senses appropriately. Many autistic children are highly attuned or even painfully sensitive to certain sounds, textures, tastes or smells. Some seem oblivious to cold or pain, but react hysterically to things that wouldn't bother other children. In some people, the senses are even scrambled. For example, touching a certain texture may induce a gagging response.

**Unusual Abilities** - In rare cases, some children with ASDs display remarkable abilities, such as drawing detailed, realistic pictures at a young age or playing an instrument without training. Some can memorize difficult lists of items, such as statistics or names (this is called islets of intelligence or savant skills).

Many children diagnosed with an ASD have a co-occurring disorder, and some level of mental retardation. But those with Asperger’s disorder typically have normal intellectual abilities. Approximately 75 percent of children with autism have below average intelligence. A child’s areas of ability may vary, with some testing in the normal level and others in the lower range, while a small percentage of children have demonstrated higher levels in specific areas, such as math.

**How It Is Diagnosed**
To date, no medical tests exist that detect autism. But scientists are hopeful that advanced imaging techniques and differences in blood levels of proteins in autistic versus normal children may have implications for diagnosis. Already, improved diagnostic procedures have allowed clinicians to diagnose children at a younger age.

Signs may be present since birth, or may occur after months of normal development. However, no two children with the disorder behave the same way. Children as young as 18 months may be diagnosed, but have different clinical features than an older child with autism. Between 18 months and 36 months, signs may be:

- Limited pretend play
- Lack of pointing to demonstrate interest
- Reduced gaze following
- Less frequent demonstration of repetitive, stereotypic behaviors

In children with autism between 2 years and 3 years of age, the following features may be observed:

- Communication difficulties
- Socialization deficits with caregivers
- Perceptual sensitivity
- Other difficult behaviors

Formal diagnosis involves parental input and structured and systematic screening instruments, such as the Modified Checklist for Autism in Toddlers (M-CHAT) and the Autism Behavioral Checklist (ABC) for older children. The Childhood Autism Rating Scale (CARS) and the Autism Diagnostic Inventory-Revised (ADI-R) are used, as well.

**What Causes It**
Some combination of genetic, biological, environmental or other factors are believed to contribute to autism. Researchers are exploring several genes, which are believed to contribute to the disorder, and several brain regions that have shown abnormalities. Abnormal brain development during the first months of life is being studied to determine if structural abnormalities, such as in the mirror neuron systems, may be caused by genetic and/or environmental factors. Researchers are also exploring the effects of genetic imprinting in which a gene’s expression is determined by which parent donates the gene copy. Certain neurotransmitters, such as serotonin, dopamine, and epinephrine, may also function abnormally. In some cases, scientists are exploring the possibility that a faulty immune response to a virus, elevated concentrations of proteins at birth in the blood, dysregulation of specific neuropeptides, or a major stress during pregnancy may lead to the disorder.

**Treatments**
There is no one treatment for the ASDs; however, it is widely accepted that the earliest interventions allow the best outcomes. Treatments generally address both cognitive and behavioral functioning. They may include a combination of medications (for challenging behaviors), behavior therapy, psychoeducation, family support groups, educational interventions, speech and language therapy, occupational therapy, and specialized training to develop and improve acquisition of necessary skills.

Research has found that a newer class of atypical antipsychotic medications may better treat the serious behavioral disturbances in children with autism who are between 5 and 17 years old. Applied behavior analysis may be an effective adjunctive treatment in reinforcing desirable and reducing undesirable behaviors. Other work focuses on improving social communication in children with autism. Some have found that structured multidisciplinary behavior programs are more successful. Parental involvement, a predictable schedule, regular behavior reinforcement, and active engagement of attention in highly structured activities to enhance a strength or ability may all contribute to creating an effective treatment program.