

# Autism spectrum disorder

## An update for GPs

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Autism spectrum disorder (ASD) can be associated with comorbid mental health problems such as anxiety, attention deficit hyperactivity disorder and depression. GPs have key roles in recognising early signs of ASD and referring for specialist assessment, providing timely support to the person with ASD and their family, and in assisting with co-ordinating therapists and specialist support.

In Australia, about one in 100 children are born with an autism spectrum disorder (ASD).<sup>1</sup> This diagnosis is made when the child has difficulty understanding, learning and using language and relating socially to others and also has repetitive play, interests and behaviour. ASD emerges in early infancy, and the diagnosis can be reliably made from about 2 years of age.

The terms 'autistic disorder' (also known as 'autism') and 'Asperger's syndrome' (also known as 'Asperger's disorder') have been used in the past. In 2013, the American Psychiatric Association revised the diagnostic criteria, and the new term 'autism spectrum disorder' has now replaced these terms.<sup>2</sup>

GPs should be knowledgeable about the early signs of ASD, understand the importance of early intervention and be able to help parents contact early childhood intervention services.

MedicineToday 2017; 18(5): 42-48

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### KEY POINTS

- About one in 100 children in Australia are born with autism spectrum disorder (ASD).
- Signs of communication, social and behavioural disturbance at 12 to 24 months of age can be red flags for ASD.
- ASD is a lifelong condition that can be associated with the emergence of comorbid mental health problems such as anxiety, attention deficit hyperactivity disorder and depression.
- GPs have a key role in recognising early signs of ASD and referring these children for specialist assessment.
- GPs also have the important roles of reviewing specialist-prescribed medication and supporting highly stressed families.
- Deterioration in behaviour might indicate acute illness in a person with ASD. Medical review is critical if there is a sudden change in behaviour as this may be due to a simple medical problem such as an ear infection.

### Diagnosis of ASD

Parents who are worried about their child's development and behaviour often seek help from an early childhood professional. A thorough and detailed assessment provides information about the child's behaviour and development. Having a diagnosis of ASD is important, helping to:

- create a pathway for help and treatment
- target areas of need as well as strengths to build on
- access ASD-specific disability services and Medicare funding.

Diagnosis of ASD relies upon matching the child's behaviour and development with diagnostic criteria. The diagnosis is made

by a multidisciplinary diagnostic team according to specific criteria. The most recent criteria are those in the *Diagnostic and Statistical Manual of Mental Disorders*, 5th ed (*DSM-5*) of the American Psychiatric Association.<sup>2</sup> *DSM-5* guides the team in diagnosing ASD according to a specific number of symptoms that must be both present in early childhood and impairing everyday functioning. These symptoms are listed in Box 1.

*DSM-5* has three levels of severity of ASD, and emphasises that these levels should not be used to assess eligibility for services. The levels are:

- requiring 'very substantial support'
- requiring 'substantial support'
- requiring 'support'.

In Australia, ASD assessment guidelines have been developed in the past that advocate a multidisciplinary approach to assessment using *DSM-5* criteria. The Co-operative Research Centre for Living with Autism (Autism CRC) is undertaking a project to develop a national guideline for ASD diagnosis in this country. The goal is that this national guideline will define a diagnostic process that is rigorous, accessible, client-centred, clinically acceptable, effective, efficient and equitable for individuals being assessed for autism.<sup>3</sup>

A multidisciplinary assessment team is usually comprised of a paediatrician or child psychiatrist, speech pathologist, occupational therapist, psychologist and special educator. The team is not necessarily co-located for a single assessment; for example, the speech, language and cognitive assessments may be performed and reports written for the family to take to the appointment with the child psychiatrist or paediatrician, who will then make the diagnosis after gathering all the assessment information. Assessment should include:

- medical assessment, including tests for known causes of developmental delay and also hearing, vision and blood tests
- an interview to find out about the child's early developmental and

family history

- observation of the child's behaviour and interactions (e.g. using the Autism Diagnostic Observation Schedule)
- developmental/cognitive assessment using appropriate standardised assessments
- language assessment (expressive, receptive and pragmatic language)
- assessment of emotions and behaviour, including parent- or teacher-completed checklists
- assessment of sensory problems, adaptive functioning, motor planning and co-ordination
- observation and reports from parents/caregivers, teachers and others who know the child well, to give a broad picture of each child.

Children with ASD present differently depending on their current symptoms, their cognitive ability and their educational and life experiences. IQ scores of children with ASD typically show a scattered pattern of performance, with deficits in verbal sequencing and abstraction skills, but with higher success in skills requiring rote memory, immediate memory or physical manipulation and visual-spatial skills (such as block design and object assembly). The IQ profiles of children with ASD who have better language skills and no history of delayed language often show strengths in verbal IQ and poorer nonverbal IQ (such as puzzles, sequencing and block design). The high-performing skills on a child's IQ test may be the basis of so-called 'islets of ability'. Some children with ASD show unusual abilities such as profound musical skills or exceptional cognitive skills – 'savant skills'.

Research has shown that most people diagnosed with ASD in early childhood continue to have ASD symptoms in later life.<sup>4-6</sup>

### Comorbidity

Common comorbid conditions in children with ASD include:

- developmental delay/intellectual disability

## 1. SYMPTOMS OF AUTISM SPECTRUM DISORDER<sup>2</sup>

According to the *DSM-5* diagnostic criteria for autism spectrum disorder, to be diagnosed with the condition children must have the following symptoms in early childhood and these symptoms must cause impairment of everyday functioning.

### A. Persistent deficits in social communication and social interaction with:

- deficits in social-emotional reciprocity
- deficits in nonverbal communicative behaviours used for social interaction
- deficits in developing and maintaining relationships appropriate to developmental level (beyond those with caregivers)

### B. Restricted, repetitive patterns of behaviour, interests or activities with at least two of:

- stereotyped or repetitive speech, motor movements
- excessive adherence to routines, ritualised patterns of verbal or nonverbal behaviour, or excessive resistance to change
- highly restricted, fixated interests that are abnormal in intensity
- hyper- or hyporeactivity to sensory input or unusual interest in sensory aspects of environment (noise, pain, vision, touch, taste)

Abbreviation: *DSM-5* = *Diagnostic and Statistical Manual of Mental Disorders*, 5th ed.

- anxiety and mood disorders
- communication disorders
- attention deficit disorders
- epilepsy.

Comorbid conditions may be related (e.g. there is an increasing likelihood of the onset of epilepsy in children with ASD) or they may be independent of each other (e.g. the child has diabetes and ASD).<sup>7</sup>

### Early signs of ASD

Signs of ASD may be apparent in infancy but are often more obvious after the age of 2 years. Most parents of children with ASD notice differences in their child's

## 2. RED FLAGS FOR AUTISM SPECTRUM DISORDER<sup>8</sup>

- Does not babble or coo by age 12 months
- Does not gesture (point, wave, grasp) by age 12 months
- Does not say single words by age 16 months
- Does not say two-word phrases on his or her own by age 24 months
- Has any loss of any language or social skill at any age

development and behaviour very early, sometimes before the child has turned 2 years of age. The five behaviours that are 'red flags' for autism are listed in Box 2.<sup>8</sup> The presence of any of these red flags does not mean the child definitely has ASD, but a child showing these behaviours should be assessed by professionals knowledgeable about ASD. The red flags are increasingly being recognised by GPs, maternal and child health nurses, early childhood educators and allied health clinicians.

Although it is known that the symptoms of ASD begin during early childhood, there is limited evidence about when symptoms actually start and their potential severity.<sup>9</sup> Behaviours that are early indicators of ASD include those listed in Box 3.<sup>10-13</sup>

## Regression in ASD

Loss of previously acquired skills, or regression, is reported in 20 to 33% of children with ASD and can include loss of words, vocalisations, nonverbal communication, social interaction skills, imitation or pretend play. The common time for loss of skills is reported as about 18 to 21 months.<sup>14</sup>

The pattern of symptoms in regression has led to suspicions that postnatal environmental factors such as immunisation with the measles-mumps-rubella (MMR) vaccine trigger autism. Although reports of a possible link between vaccination and autism began in the 1980s, no causal link has been confirmed (see later discussion of ASD and immunisation).<sup>15-17</sup>

## Causes of ASD

ASD has no single known cause. Given its complexity and the fact that symptoms and severity vary, there are probably many causes, including genetic and environmental risk factors.

## Genes and environment

Theories about what might cause ASD have changed over the past 60 years. In some families, there appears to be a pattern of ASD or other disabilities. 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.<sup>18</sup>

Evidence supporting a significant genetic contribution to ASD has been increasing over the past few decades, but what causes or increases the risk for ASD is not yet understood.<sup>19</sup> Studies have shown that among identical twins, if one child has ASD, then the other will be affected about 98% of the time; and in nonidentical twins, if one child has ASD, then the other is affected about 53% of the time.<sup>20</sup>

The patterns of genetic inheritance are complex, with the involvement of multiple genes rather than a simple dominant, recessive or X-linked gene.<sup>19</sup> Several chromosome regions are likely to contain risk genes for ASD, but no gene has been unequivocally identified to date.<sup>21</sup>

Research has begun to show that environmental factors may also involve some genetic susceptibility. A recent study has shown that at an individual level, the risk of autism increases according to how close a person is genetically to relatives with autism.<sup>22</sup>

## Other possible causes

About 10% of people with ASD have known potentially causative medical conditions, including Fragile X syndrome, tuberous sclerosis, congenital rubella syndrome and untreated phenylketonuria. A small proportion of children who are born prematurely or with low birthweight are at greater risk of ASD, and advanced paternal and maternal age, growth restriction

## 3. EARLY INDICATORS OF AUTISM SPECTRUM DISORDER<sup>10-13</sup>

- Aloof, in his/her own world
- Limited or unusual eye contact
- Limited body language, facial expression or social smile
- Inconsistent response to name
- Not pointing to share interest
- Poor imitation (e.g. peek-a-boo, waving bye-bye)
- Resists being cuddled, touched or held
- Repeated hand, finger or body movements
- Limited object exploration and play with toys
- Arranges objects in a strict order or has specific routines
- Upset over small changes and difficulties with transitions
- Unusual or repetitive preoccupations
- Likes to play with or hold unusual objects
- Unusual sensory interest and response
- Limited infant babble and vocalisation
- Delayed onset of speech
- Poor understanding of speech, gestures and facial expression
- Use of other's body as a tool
- Lack of social imitative/pretend play
- Loss of previously acquired words

and newborn hypoxia are also associated with an increased risk of ASD.<sup>23-25</sup>

## ASD and immunisation – no link

Over the past decade there has been considerable discussion, publicity and research regarding whether there is a link between autism and immunisation. As mentioned earlier, comprehensive studies have provided no evidence to support a link between MMR vaccination and ASD;<sup>15-17</sup> previous studies suggesting a causal link were found to be seriously flawed. There is also no evidence to suggest that any other childhood vaccine may increase the risk of ASD or to support an association

between vaccine preservatives such as thimerosal (which contains ethylmercury) and ASD.<sup>26</sup>

### **Risk of ASD if relatives affected**

In the general population worldwide, ASD affects about one in 100 children.<sup>27</sup> As previously mentioned, a recent study provided measures of individual risk for children who have a relative with ASD: children are 10 times more likely to develop ASD if they have a sibling with ASD, three times more likely if they have a half-brother or sister with ASD, and two times more likely if they have a cousin with ASD.<sup>22</sup> There are no differences in relative risk between genders.

### **Increase in rate of ASD**

There has been much discussion as to why the prevalence of autism has been steadily increasing. One reason is the change in diagnostic criteria in 1994. At that time, the diagnostic criteria for autism expanded to include children who were not previously considered to be 'on the spectrum.'

Studies have shown that, despite this change in diagnostic criteria, the prevalence of diagnosed cases of ASD is now much higher than expected. Many researchers believe the increase in the number of cases of autism worldwide may also be due to a combination of genetic and environmental factors described above.

### **Changes in ASD over time**

In people with ASD, there is generally a pattern of improvement from childhood to adolescence to adulthood, with symptoms usually decreasing over time.<sup>28</sup>

### **The preschool years**

A young child with ASD is often disinterested in others, does not understand the feelings of other people, their speech may be absent or delayed and they may be upset by even small changes and have a range of sensory sensitivities. Special interests and repetitive body movements may become more noticeable after 3 years of age.

Many parents with a child with ASD

find the child's preschool years the most difficult to manage but, with early intervention, education and support, improvement can be expected. Early intervention that improves learning abilities can lead to better social and language skills in adolescence and early adulthood.<sup>2</sup> For example, if a preschool-aged child is able to develop skills such as functional play and is responsive to others, can engage in joint attention and make social requests, they are more likely to have better language skills in the future.<sup>28</sup>

### **The primary school years**

Some parents report that the primary school years are more settled than the preschool years for their child with ASD and the whole family, particularly when the transition to school has been carefully planned and there is ongoing support from the school. With education and understanding, primary school-aged children may become more socially responsive and communication skills can increase.

Other parents, however, find that their child with ASD develops behavioural difficulties and anxiety from coping with change and social demands once they are out and about in the social world of school and peers. Preoccupations or special interests may also increase at this time. Helping to build stronger social skills during middle childhood has been shown to lead to improvements during adolescence.<sup>29</sup> Writing social stories together with the child with ASD that tell him/her how to behave and what to say in social settings, joining social skills training groups where there are opportunities to role play and practise social interaction skills, and having opportunities to mix with peers in supervised, structured settings are all helpful for children with ASD.

### **Adolescence**

Young people with ASD experience the same changes and growth in body and mind as other adolescents but their ASD continues to affect the core areas of social interaction, communication and

behaviour. GPs can play an important role in helping the adolescent with ASD and their family to prepare for the changes in the young person over the next few years.

Some parents have described more social interaction, less repetitive behaviours, better daily living skills and more emotional responsiveness in their teenage sons and daughters with ASD. High-functioning adolescents with ASD (normal IQ range) have been reported to show more improvement than adolescents with ASD and intellectual disability.<sup>29</sup> For other parents, adolescence in their child with ASD can bring an increase in anxiety, tension, mood disturbance and social withdrawal, with a focus on preoccupations such as electronic games. This may be due to a combination of the development of some degree of insight as well as hormonal and developmental changes.

For most adolescents, the bodily changes that they experience at this time have a significant effect on how they feel about themselves. As most young people with ASD do not like change, these physical changes can be overwhelming. Preparing adolescents for the changes that will occur can minimise confusion and fears about their changing bodies. Ideally, education about puberty needs to start well before it is actually occurring to be most beneficial to each young person.

Adolescents with ASD are also likely to need to be taught about growth and development, personal hygiene and sex education, in a direct, simple and clear manner at their level of comprehension. As young people with ASD usually have better visual skills than language skills, it makes sense that teaching around the issues of puberty and sexuality will be more easily understood if pictures and visual supports are used; this is so even for the higher functioning adolescents. Opportunities for social involvement with peers leads to more social awareness and better daily living skills in adolescents with ASD. Focusing intervention programs in the individual's area of social skills is important.<sup>29</sup>

### Television, video games and social media

Parents may communicate that they are worried about their adolescent son or daughter with ASD, saying, for example, 'He is spending hours alone in the bedroom with the computer. Do we tell him to come out and be with the family or leave him alone?' Many parents face this dilemma with their teenage sons and daughters with ASD. Are the adolescents avoiding social interaction or making friends and learning social skills online in a nonthreatening way?

Screen-based media such as television, video games, computer games and electronic social media (including email, text messages and online social networking sites like Facebook and video-sharing sites like YouTube) are an increasingly popular tool for entertainment and social connection among typically developing children and adolescents. Communicating online through email, instant messaging and text messaging can offer opportunities for social interaction in a format that does not require attention to nonverbal cues such as gestures, facial expressions or voice nuances. Computer technology provides a more controlled and predictable environment than face-to-face interaction, and this can be particularly desirable for adolescents with ASD who want to be in touch with friends but do not like to be physically face to face with them.

Recent research, however, has found that preoccupation with media appears to be a clinically significant problem. Adolescents with ASD were reported by parents to spend 62% more time watching television and playing video games than all nonscreen-daily activities combined.<sup>30</sup> In contrast, children with ASD also spent little time using social media or socially interactive video games.<sup>30</sup>

Two useful take-home messages regarding screen-based media are:

- care must be taken to develop strategies for building generalisation from solitary screen media formats to real-world social situations

- communicating online can be helpful for adolescents with ASD who want to interact with peers but find it difficult to manage face to face; however, time limits should be set, and a range of opportunities for 'offline' social interaction also offered.

### Adulthood

Although the outcome for adults with ASD has improved over recent years, many remain dependent on others for support. Those with an intellectual disability may have more ASD symptoms and behavioural difficulties than those without intellectual disability.<sup>31</sup> Some adults achieve relatively high levels of independence but for most the challenges continue, including living alone, having close friends and being in permanent employment. Appropriate vocational training and supported work, recreation and accommodation, and the development of wider social support networks are ongoing needs of adults with ASD. Recognition, monitoring and treatment of physical and mental health problems are also necessary.

The GP who has developed a relationship, sometimes over many years, with the person with ASD and their family is ideally placed to assist the transition from paediatric to adult services. To ensure the transition is as smooth as possible it is essential that not only the medical history, including general health, mental health and well-being, of the person with ASD is passed on to adult service providers but also information about recent successful treatment and management strategies.

### Treatment options for children with ASD

Several interventions are available to help a child with ASD but there is no specific treatment that can cure ASD.<sup>32</sup> The goal of intervention is to maximise the child's ability and skills by supporting their development and learning (Figure).

A diagnosis of ASD brings a multitude



Figure. Educational intervention programs for children with ASD involve parents and professionals working together on communication, social skills and behaviour.

of questions about what to do next. Parents need to make important decisions about their child's education and treatment. Treatment should begin as early as possible and be tailored to the child's profile of symptoms, strengths and needs. A variety of evidence-based interventions are more likely to promote development, improve behaviour and reduce the stress experienced by the child and family. Some common treatment approaches are outlined below; more information can be found on the Raising Children Network website ([www.raisingchildren.net.au/articles/autism\\_spectrum\\_disorder\\_intervention\\_types.html](http://www.raisingchildren.net.au/articles/autism_spectrum_disorder_intervention_types.html)), supported by the Australian Federal Government.

### Educational interventions

Children with ASD often respond well to highly structured educational programs that are based on understanding the culture of ASD, developing an individual person- and family-centred plan for each student, structuring the physical environment to enhance learning, using visual supports to make the sequence of daily activities predictable and understandable, and using visual supports to make individual tasks understandable. An example of such a

program is the TEACCH (Treatment and Education of Autistic and Related Communication-Handicapped Children) program.<sup>33</sup> Successful programs include parents and professionals working together to improve social skills, communication and behaviour in daily activities.

### Behaviour-based interventions

Preschool children with ASD who receive individualised behavioural interventions can make good progress. Intensive early behavioural interventions that target a range of essential skills that define or are associated with ASD (e.g. communication, social and pre-academic/academic skills) can be helpful. These interventions are also described as applied behaviour analysis, early intensive behavioural interventions or behavioural inclusive programs.<sup>34,35</sup>

### Therapy-based interventions

A therapy-based approach to intervention for ASD is the use of specific therapies to target specific difficulties (social, behavioural and/or language). Some programs focus on reducing problem behaviours and teaching new skills, and others focus on teaching children how to act in social situations or how to communicate better with others (e.g. the Hanen Program [language communication] and the Picture Exchange Communication Program [visual communication]).<sup>36,37</sup>

### Family-based interventions

There is no doubt that the family of the child with ASD needs help and support. Stressors can be present whatever the severity level of the child's ASD symptoms. It should be remembered that parents of children with high functioning ASD might also have high levels of stress.

Treatment therefore should not focus exclusively on the child with ASD. Parents need to learn effective strategies for coping with their own distress. This is particularly important if a parent also has the condition. Parents and other family members can learn how ASD affects the child and how to play and interact with them

in ways that promote social interaction skills, as well as how to manage problem behaviours and how to teach daily living skills and communication. Examples of programs that can improve child outcomes and reduce family stress are the Triple P Positive Parenting Program and Preschoolers with Autism.<sup>38,39</sup>

### Medical interventions

Although there are no evidence-based pharmacological treatments for ASD, some drugs can improve certain symptoms of emotional and behavioural difficulties associated with ASD. Neuroleptics (e.g. risperidone, aripiprazole) can reduce disruptive, irritable and aggressive behaviours but problematic side effects, particularly weight gain and metabolic syndrome, are common. Selective serotonin reuptake inhibitors (e.g. fluoxetine, sertraline) and tricyclic antidepressants (e.g. imipramine, clomipramine) can reduce comorbid symptoms of anxiety, obsessive-compulsive disorder and depression. Attention deficit hyperactivity syndrome is often associated with ASD (30 to 50% of cases) and can be treated with stimulant medication, although side effects are common.

Parents and professionals need to make informed decisions about treatment options for children. However, it can be difficult to work out whether a treatment being considered for a particular child is known to be effective.

Parents should be encouraged to ask questions and think critically about treatments for their child with ASD.<sup>40</sup> For example:

- Will the treatment result in harm to my child (physical or psychological)?
- Is the treatment developmentally appropriate for my child?
- How might failure of the treatment affect my child and family?
- Has the treatment been validated scientifically?
- Will the treatment be integrated into my child's current program or will it be extra time?
- What are the costs?

Particular points to remember to talk about with families include:

- beware of treatments that promise 'cure' and are said to work for all children with ASD
- for any treatment, baseline and follow-up evaluation of key symptoms using a behavioural checklist are necessary to demonstrate benefit
- regular health and dental checks are important. Current sleep patterns, diet and level of physical activity should be discussed.

### Conclusion

Many families acknowledge that their GP is the first and most important contact for them and their child with ASD. GPs can provide a crucial role in early detection and ongoing review and support for individuals with ASD and their families. Over time, they get to know the family's strengths and weaknesses and how best to support the various family members. Importantly, GPs are in a position to provide timely support, as and when needed, to the person with ASD and their family. They are also available to assist the family in the important task of co-ordinating therapists and specialist support. **MT**

### References

A list of references is included in the website version of this article ([www.medicinetoday.com.au](http://www.medicinetoday.com.au)).

COMPETING INTERESTS: None.



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