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AUTISM

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Abstract

Autism spectrum disorder (ASD) is a complex, lifelong neurodevelopmental condition that is marked by deficits in social communication and interaction and repetitive or restrictive patterns of behavior, interests, or activities. These symptoms can create challenges for individuals on the autism spectrum and their parents during the transition to adulthood, which may interfere with their ability to access and receive adequate and appropriate health care. Awareness of how the challenges associated with ASD may translate to health care barriers can help primary care providers address the complex needs of individuals who are on the autism spectrum and mitigate the risks of additional health disparities. This chapter starts with a case presentation to illustrate key considerations for serving a patient population with ASD and the differences between a medical versus social model of disability, then provides an overview of ASD and its common co-morbidities and risk factors, discussion about special issues that arise during the transition to adulthood, common interventions for individuals on the autism spectrum, as well as practical tips to facilitate healthcare.

Keywords: Autism, Adults with Autism, Autism in Primary Care, Transition to Adulthood

Allen is a 21-year-old male with autism spectrum disorder (ASD) and mild intellectual disability who presents to establish care. He is accompanied by his mother who says he refused to return to his previous Internal Medicine physician because the physician “did not know what to do with him.” One year ago, his pediatrician had suggested that they find an adult doctor but they have had difficulty finding the right physician. Allen graduated high school with a diploma and spent some time in a vocational training program. After completing that, he struggled to find work and spent about one year at home with no regular daily activities. He recently obtained some support through his local Board of Developmental Disabilities and he is now working part-time at a local grocery store bagging groceries and retrieving shopping carts with a job coach for support. They feel he is capable of more than this but have not been able to find the right fit for him.

Allen appears well-groomed, quiet, and avoids eye contact. He answers questions with short responses and at times takes longer than expected to answer. He is unable to answer some of the questions about his medical history. His mother at times needs to reword the questions asked so that he can understand them. His mother reports he had ADHD and was on a stimulant through high school, but he has not taken it for several years. He is also on an atypical antipsychotic which was started eight years ago due to explosive outbursts. He has not had any outbursts for years and they are not sure if he should continue this medication or not. They also wonder if restarting his stimulant would help him focus at work. He exhibits some intermittent rocking in his chair and several episodes of hand-flapping that become more prominent as the visit progresses.

Exam is only remarkable for being overweight, ticklish during the abdominal exam, and refusal of the genital exam.

Allen reports that when he is not at work he spends most of his day playing video games or watching videos online. His mother expresses concern about his weight, which has been steadily increasing since he graduated from high school. Additionally, he resists brushing his teeth and bathing himself because he does not like how the toothpaste and soap feel. She also notes that he is struggling to develop relationships with friends and has seemed more withdrawn recently. When asked about these things, he is reluctant to discuss it.

CASE DISCUSSION

This case illustrates some of the challenges that both individuals on the autism spectrum and their parents face when they reach adulthood. Many people with ASD struggle to maintain close relationships with others once they leave the structured environment of high school. Several studies indicate that youth with ASD tend to be “disconnected” for up to five years after aging out of school, meaning that they are not in any employment or post-secondary education setting (Shattuck et al., 2015). Additionally, parents of young adults on the autism spectrum struggle to find the balance of allowing autonomy and independence while ensuring safety and support for their children.

In Allen’s case, he is struggling to express himself and communicate with his physician. This can occur due to several causes, including anxiety, challenges with communicating feelings and needs, or sensory processing difficulties that may inhibit him from performing at his highest level of ability. His physician should explore how he best

communicates and seek accommodations to help him remain engaged in the encounter. The provider should try to use precise, literal language to help improve the effectiveness of his or her communication. Encouraging him to come prepared with questions that are pre-planned or written down may be beneficial. Additionally, Allen is demonstrating challenges that could benefit from services such as occupational therapy (OT) to improve his self-care skills and address possible sensory processing challenges associated with bathing and brushing his teeth. This would help improve his level of independence as well as functional and meaningful participation in other activities of interest.

Since Allen is on the autism spectrum and has an intellectual disability, you should consider referring him for genetic testing because the genes which have been linked to autism can also be associated with cancers, leading to a need to adjust the cancer screening timeline. Genetics programs at major academic centers will often have a cancer-screening clinic for individuals who are at risk for early cancers.

Allen's mother coached and supported him through this encounter, which allowed Allen to stay more involved in the discussion. However, many parents or caregivers struggle to find the right balance in supporting independence while also ensuring essential information is conveyed. Providers may need to coach parents to allow the individual to interact with the provider at their highest potential. Parents and caregivers can perform important roles in helping patients learn their medical needs and learn to self-advocate. Depending on patient preference, effort should be made to allow the patient some time with the physician without a parent or caregiver present to allow development of comfort with the medical provider as well as allow discussion of topics that may be difficult to discuss with parents present.

Several important medical and social issues were raised in this case. Obesity is common in adults with ASD. His “disconnectedness” over the past several years may be contributing to this, as he has limited opportunity to get out of the home, be active, interact with others, and develop friendships. Assisting Allen and his parents in identifying opportunities for work that fit his strengths, interests, and needs will be important for him to maintain a healthy lifestyle. While helping patients in this dilemma is beyond the purview of a typical primary care office, making recommendations to parents to connect with the Department of Vocational Rehabilitation, a local Family Resource Center, or the public Department of Developmental Services in the area is a good place to help them get started.

Finally, many individuals on the autism spectrum are treated with medication for behavioral issues. Commonly used medications include selective serotonin reuptake inhibitors (SSRIs), antipsychotics, stimulants, as well as antiepileptic medications. Many of these medications have significant adverse effects and need monitoring with labs or other clinical assessments. Additionally, polypharmacy concerns are common in patients on multiple psychotropic medications. In this case, the provider should consider a trial discontinuation of the atypical antipsychotic, as the risks associated with antipsychotics may outweigh the benefit in this patient who has not had an aggressive outburst in many years. In many cases, primary care providers may not feel comfortable managing these medications, and patients should be referred to a psychiatric or neurologist who has more experience managing these medications in with people on the autism spectrum.

Medical model versus social model of disability

Of relevance to this case study and discussion is the concept of the medical model versus the social model of disability. For several decades, approaches and interventions for individuals on the autism spectrum have largely focused on the individual, their impairment, and remediation of skills so that individuals can progress along the typical developmental pathway of their peers. The medical model has defined how we see and describe individuals on the autism spectrum, the interventions that have been developed over the past several decades, and the treatments that we often refer individuals and families to. While it is known that individuals on the autism spectrum experience significant challenges in areas such as social and communication skills and sensory processing, and various interventions have proven to be effective in improving these areas, we should also have an understanding of ASD through the lens of the social model. The social model views disability as a result of societal and environmental barriers. As physicians, we should consider the individual within their context, and the social and environmental factors that may be influencing our interactions with individuals and exacerbating their symptoms during office visits or in their day-to-day life. Examples of this include our own personal biases and assumptions, as well environmental factors, such as lights or sounds in the waiting room. Many of the tips provided in this chapter focus on low cost accommodations that could be implemented in practice. These accommodations can help create a more supportive environment and increase the chances of a successful checkup or office visit for those on the autism spectrum.

While it is important to understand the individual challenges experienced by those on the autism spectrum and the impact of social and environmental factors, it is also important to acknowledge the individual strengths of our patients. Examples of strengths

unique to individuals with ASD include detailed thinking, good long-term memory, and the ability to analyze information (1). Identifying and focusing on the strengths of your patients with ASD can assist individuals in seeing their own strengths. While this can positively affect the attitudes and beliefs of the individuals and parents, it can also help providers identify and make proper referrals to services and community programs, and can assist individuals and families realize the different opportunities one could pursue in adulthood with the proper supports in place.

The following sections provide information on the phenomenology and etiology of ASD, comorbidities and risk factors associated with ASD, and special issues arising during the transition to adulthood that may be important for primary care providers to be aware of, as well as brief descriptions of the interventions and treatments that individuals on the autism spectrum may receive or benefit from and practical tips for facilitating health care.

BACKGROUND

Definition

Autism spectrum disorder (ASD) is a complex, lifelong neurodevelopmental condition that is marked by deficits in social communication and interaction and repetitive or restrictive patterns of behavior, interests, or activities (2). Signs and symptoms are present in early childhood, but may not become obvious until later childhood or adulthood, when demands increase (2). Individuals on the autism spectrum may also experience a lack of coordination, motor planning, and atypical sensory processing, such as oversensitivity to auditory, tactile, and visual input (3, 4). Furthermore, an intellectual disability may or may not be present (5). Symptoms and behaviors associated with autism

often result in decreased social participation, occupational, and other areas of functional participation and may change over time with development and life stages (2, 6, 7)

Prevalence

Over the past several years, the prevalence of ASD has increased 123% from 2002 and 2008 (5). The reasons for the increasing prevalence of ASD remains unclear, however, it is suspected that it is related to factors such as increased awareness and diagnostic practices (8, 9). The current estimated prevalence of ASD in the United States is 14.7 per 1,000 (one in 68) children aged 8 years (5). In addition, it has been found that prevalence does not change with age (10). While ASD is reported to occur in all racial/ethnic and socioeconomic groups, prevalence estimates vary between these groups, as there are reported gender (11, 12), ethnic, and racial disparities in the identification of ASD (13, 14).

Etiology and Risk Factors

The etiology of ASD is not fully understood, however, several studies have identified various risk factors associated with ASD. Genetic factors have long been thought to influence autism and are one of the most extensively studied factors in epidemiologic research. Studies have found a 40 to 90 percent heritability rate (15, 16) and associations with fragile X syndrome, 15q11-13 duplications, genetic variants, and de novo mutations (17, 18). Over 100 mutated genes have been found to be associated with ASD (19). Gene mutations in ASD are believed to be a result of spontaneous mutations, suggesting gene-gene interaction (20), gene-environment (21), and epigenetic programming early in life (22-25) as well as windows of vulnerability that may influence ASD (26) during fetal development and in early childhood. While studies indicate there is a neurogenetic

component to ASD, some studies suggest there are associations between ASD and prenatal exposures and perinatal factors (27-32). However, it should be noted that there are limitations associated with these studies.

Associated Morbidity

Autism spectrum disorders have been commonly researched within the disciplines of psychiatry and neurology. However, evidence has shown that individuals on the autism spectrum experience high rates of co-occurring mental and physical conditions, shifting the focus from solely neurodevelopmental and behavioral to a more complex process. Research indicates that specific medical conditions are more prevalent in individuals with autism compared to the neurotypical population. Medical conditions that are reported to occur at higher rates in people on the autism spectrum include: eczema, allergies, asthma, ear and respiratory infections, gastrointestinal problems, severe headaches and migraines, sleep disorders, and epilepsy (33). People on the autism spectrum are also at heightened risk for chronic health conditions in adulthood, such as diabetes, coronary heart disease, cancer (34), and mental health conditions (33, 35, 36). These co-occurring conditions have been found to negatively impact functional ability of individuals on the autism spectrum within the areas of behavior, communication, cognition, and sensory processing.

Genetics and Cancer Screening

Recent studies have suggested that ASD has a strong genetic component with potential links to cancer (37-40). Findings have indicated associations between ASD and up regulation of the PI3k (phosphatidylinositol 3-kinase) – Akt-mTOR (mammalian target of rapamycin) growth-signaling pathway (41-45), which has been associated with the

development of cancers (46, 47). Individuals with autism have been found to have similar mutations in the gene, PTEN, as seen in various forms of cancer (39). PTEN is a tumor suppressor gene that helps prevent cells from becoming cancerous and is a negative regulator of PI3K-Akt-mTOR signaling. Mutations in PTEN have been associated with cognitive impairments and abnormalities in brain structure and various forms of cancer, including cancers of the breasts, kidney, prostate, and brain. In addition, the neurofibromatosis gene NF1, which is also a tumor suppressor and negative regulator of the PI3K-Akt-mTOR pathway, has been associated with ASD (48). Because recent evidence suggests individuals with ASD are at heightened risk for cancer, a referral for genetic testing and cancer screening is recommended (see **Box 1**).

Box 1: Genetics and Cancer Screening

- The American Academy of Neurology and the Child Neurology Society recommend referring individuals with ASD for high-resolution chromosome studies (karyotype) and DNA analysis for Fragile X, particularly if:
 - intellectual disability is present (or cannot be excluded)
 - there is a family history of Fragile X or undiagnosed intellectual disability
 - dysmorphic features are present.

Note, however, there is little likelihood of positive karyotype or Fragile X testing in the presence of autism without intellectual disability.

- Genetic counseling for individuals with ASD (and their families) should always accompany genetic evaluation.
- Routinely include age-appropriate cancer screening procedures during health maintenance visits.

Seizure Disorder

Individuals on the autism spectrum are reported to experience higher rates of epilepsy than the general population with a prevalence rate of 12.5% in children with ASD, which increases to 26% by adolescence (49, 50). Seizure disorder has been associated with increased age, lower intellectual functioning, and decreased adaptive behavior. Epilepsy can be easily misdiagnosed in individuals with intellectual disabilities as a result of misinterpretation of behavioral, physiological, and psychological events (51).

Undiagnosed or misdiagnosis can potentially have fatal implications. Therefore, further evaluation, such as EEG, and/or referral to a specialist should be considered when patients present with changes in behavior that could be related to seizures (52).

Gastrointestinal Disorder

Individuals on the autism spectrum are reported to experience higher rates of gastrointestinal problems, including diarrhea, constipation, vomiting, and abdominal pain. These symptoms can have negative implications on behavior. Evaluation and management of gastrointestinal problems in individuals on the autism spectrum is not yet fully understood (53), however, it is recommended that individuals should receive the same thoroughness and standard of care as patients without ASD. Furthermore, gastrointestinal workup should be considered with change in behavior.

Sleep Disturbances

Sleep disturbances are commonly reported in individuals on the autism spectrum across the lifespan (54-57). Sleep disturbances can negatively impact daily functioning and quality of life (58, 59). Sleep problems may be a result of obstructive sleep apnea and

gastrointestinal reflux, and have been associated with emotional and behavioral problems as well as psychiatric conditions (60). Melatonin and other behavioral interventions have been found to be effective in improving sleep (54, 61).

Mental Health Conditions

Individuals on the autism spectrum are reported to experience high rates of mental health conditions (33, 35, 36), with anxiety and depression being the most commonly reported co-occurring conditions. In addition, reports suggest around 30% of individuals on the autism spectrum meet the criteria for attention deficit hyperactivity disorder (ADHD) (62). While anxiety is reported to occur in children with ASD, studies have indicated that anxiety often increases in adolescence and adulthood. Assessment and diagnosis of anxiety and depression can be challenging as individuals may have difficulties with communicating feelings and symptoms. While various interventions including using components of cognitive behavioral therapy (CBT) have been proven to be effective in improving anxiety symptoms in ASD (63, 64), there is often a lack of mental health providers trained to serve adults with ASD. Effort should be made to identify mental health providers with experience treating those with ASD, if possible.

Special Issues that Arise in the Transition to Adulthood

It is estimated that approximately 500, 000 individuals on the autism spectrum will transition into young adulthood each year in the United States. Youth on the autism spectrum are especially vulnerable during the transition to adulthood due to the inherent characteristics of ASD, such as challenges with communication and social interaction, (2), co-morbid physical and mental health problems (36), and societal biases and discrimination (65). These pervasive challenges often result in complex service needs that

cut across sectors and require high levels of care coordination, further complicating this transitional period (66-69).

Based on Part B of the Individuals Disability Education Act (IDEA), children and youth are eligible to receive special education related services from 3 to 22 years of age (70). The IDEA ensures that while children are in school and of eligible age (3-22 years of age), they are entitled to services that will help them function within their current educational setting and prepare them for adulthood within the areas of education, employment, and independent living (70). However, upon reaching their 22nd birthday, individuals essentially experience a “services cliff” where they go from receiving several hours of services to no services, despite the need for continued supports and services to assist them during and after the transition to community-based settings.

Although this is a time of much needed support, the gap between service needs and receipt increases as many individuals on the spectrum exit the special education system and attempt to access adult systems of care. Evidence has shown less optimal outcomes for young adults on the autism spectrum with high rates of disconnectedness upon leaving high school (71, 72). It is reported that one-third of young adults are disconnected after high school (never had a job or continued education after high school) and approximately 26% receive no services that would help them become employed, continue their education, or live more independently (72). In addition, only 36% ever attend postsecondary education and 58% work for pay outside of the home between high school and their early 20s (72).

Evidence suggest that many individuals on the autism spectrum continue to lack skills, such as self-care and daily living skills that are foundational and necessary for

achieving functional and meaningful participation in adulthood (73-75). In addition, marked social deficits may become increasingly problematic in adolescence when social expectation demands increase and social network heightens (76). Symptoms of autism do not disappear when an individual becomes an adult (77) and many could benefit from continued support and services throughout life (75, 78). Educating and assisting individuals on the autism spectrum and families connect to services within their community, such as the Department of Vocational Rehabilitation, Department of Developmental Services, and community centers can help reduce disconnectedness and improve outcomes in adulthood for those on the autism spectrum.

Interventions and Treatment

There is a wide range of severity of symptoms in autism. Families may pursue treatments including behavioral, psychological, educational, and alternative treatments.

Interventions are generally targeted at improving social communication and interaction, increasing and maintaining adaptive behaviors, functional skills, and increasing meaningful participation. Below are common interventions provided to individuals on the autism spectrum.

Applied Behavioral Analysis

Applied behavioral analysis (ABA) is an evidence-based intervention for children on the autism spectrum that uses principles of learning theory to try to bring about meaningful and positive change in behavior. The goal of ABA is to increase and maintain functional and adaptive behaviors, decrease maladaptive behaviors, teach new skills, and generalize skills to other environments. Functional behavioral assessments include identifying antecedents, behaviors, and consequences of behavior and developing individualized

treatment plans that will increase the frequency of a targeted behavior and adaptive behavior. It is important to note that although ABA is commonly used in children on the autism spectrum, autistic rights advocates have raised significant concerns about ABA (Jones, 2014) and there is very limited evidence to support this intervention for adults on the autism spectrum.

Cognitive Behavioral Therapy

Cognitive behavioral therapy (CBT) is used to help individuals on the autism spectrum improve behaviors and self-regulation. Cognitive behavioral therapy is an approach that aims to change perceptions of thoughts. It is an approach that has been proven to help reduce anxiety and depressive symptoms. While CBT can help reduce symptoms and challenging behaviors, such as obsessive thoughts, it teaches individuals how to cope, manage, and reduce unwanted feelings.

Speech and Language Therapy

Speech and language therapy aims to improve social communication and interaction, self-advocacy, and other language impairments in individuals on the autism spectrum.

Intervention includes a variety of modalities to help support and improve social interaction and verbal and nonverbal communication, including activity schedules/visual supports and/or augmentative and alternative communication (AAC). Augmentative and alternative communication includes supplementing or replacing natural speech with aided or unaided symbols. Examples of these devices, include, but are not limited to Picture Exchange Communication System (PECS), speech generative devices, and manual signs or gestures. These approaches have been proven to be effective in improving

communication skills, social skills and interactions, and self-advocacy and self-determination in individuals on the autism spectrum.

Occupational Therapy

Occupational therapy (OT) is a client-centered profession that assists individuals to achieve the highest degree of independence. Occupational therapy aims to improve performance and participation in daily occupations, such as self-care routines, leisure activities, and school or work-related tasks. Occupational therapy works on developing and maintaining individual skills and modifying the environment to create a person-environment fit. Occupational therapy also uses sensory integration (SI) alone or as part of therapy. The goal of SI is to remediate processing and integration of sensory information to allow the individual to adapt and interact with their environment.

Practical Tips to Facilitate Healthcare

Limited communication and social interactions as well as sensory processing challenges experienced by individuals on the autism spectrum can make it challenging for medical providers to identify health complications in individuals on the autism spectrum. Adults on the autism spectrum report greater unmet healthcare needs, lower use of preventive services, and greater use of the emergency department than adults without ASD (79), placing them at risk for less optimal health outcomes. A recent qualitative study indicated that poor provider and patient level interactions contribute to negative healthcare experiences . Individuals on the autism spectrum have a significant need for services and supports to help increase quality of life and function and to treat co-occurring medical conditions. Timely, accurate information with care coordination can help improve outcomes in adulthood.

Below are a list of practical tips from the Academic Autistic Spectrum Partnership in Research and Education (AASPIRE) for healthcare providers when managing and providing care of individuals with ASD (see **Box 2 through 5**). The complete list of helpful tips can be found on their website at: www.autismandhealth.org.

Communication and Interaction

Individuals on the autism spectrum are reported to have various strengths and challenges in verbal and non-verbal communication, receptive and expressive skills, and ability to process information. In addition, individuals on the autism spectrum commonly take language literally and require information to be provided to them in a way that is precise, concrete, and specific. Understanding a patient's communication needs is very important to providing quality care.

Box 2: Tips on Communication and Interaction

- Do not assume that a patient cannot understand healthcare information or communicate when he/she does not speak fluently. In addition, do not assume that a patient who speaks fluently does not have significant communication challenges.
- Obtain individualized information on communication needs and preferences.
- Be precise, concrete, and specific.
- Do not assume a patient is distracted or inattentive because he/she is fidgeting, making repetitive movements, or avoiding eye contact.
- Give adequate time for individuals to process information they need to see, hear, or feel before they respond.

Sensory Challenges

Individuals on the autism spectrum commonly have atypical sensory processing.

Individuals may be hyper-responsive or hypo-responsive to sounds, lights, smells, touch, or taste. As a result, some environments can be over stimulating for some individuals.

Environments that are not sensitive to their sensory need can have a negative impact on their healthcare experience and social interactions. In addition, individuals may have difficulties with body awareness, making it difficult for them to discriminate between different tactile inputs and location of symptoms. Therefore understanding these sensory challenges and creating a sensory friendly environment can create more positive experiences for the patient on the spectrum.

Box 3: Tips on Sensory Challenges

- Use natural light or make the lighting dim.
- See the patient in a quiet room.
- Avoid unnecessarily touching the patient and warn him/her if you will be use touch for a physical examination.
- Suggest that the patient bring manipulatives or other physical supports to help reduce or increase sensory stimuli.

Planning and Organizing

Some individuals on the autism spectrum experience difficulties with executive functioning within the areas of planning, organizing, and sequencing information.

Individuals on the autism spectrum also commonly have difficulties adapting to new environments and situations, creating a need for routine and consistency. Below are tips

on the types of supports that can assist individuals in making decisions, following through with information, and decreasing the stress of attending a healthcare appointment.

Box 4: Tips on Planning and Organizing

- Identify patient needs and necessary accommodations prior to the visit by having patients complete a pre-visit assessment or complete a Personalized Accommodations Report by going to www.autismhealth.org/AHAT.
- Let the patient and/or his/her supporter know what will occur at the appointment.
- Provide visual supports to help the patient through the healthcare routine.
- Write up step-by-step instructions.
- Have staff assist the patient in scheduling follow-up visits, referrals, or tests.
- Contact and follow-up with the patient and/or supporter after the visit.

Exams and Procedures

Tolerating examinations, tests, and procedures may be challenging for individuals on the autism spectrum due to reasons mentioned above. Below are tips to help people on the autism spectrum in better tolerating these medical procedures (see **Box 5**).

Box 5: Tips on Exams and Procedures

- Explain to the patient what is going to be done before doing it.
- Slowly expose individuals to different equipment and perform a “trial run” if possible.
- Give patients extra time to process information he/she sees, hears, or feels before they respond.

- Order blood tests only when absolutely necessary.
- Use a numbing spray, cream, or provide the patient with anti-anxiety medication, if necessary, before a blood draw.

SUMMARY

Having an understanding of the challenges that individuals on the autism spectrum experience, and the how social and environmental factors can allow for better provider-patient interactions, successful checkups, and can assist providers in making proper referrals to services and community resources. Utilizing the tips discussed above and creating a supportive environment can help improve your practice and delivery of care to adults on the autism spectrum and their families.

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Autism Spectrum Disorders (ASD) Condition Fact Sheet

Definition	<p>Autism spectrum disorders (ASD) is a lifelong neurodevelopmental condition characterized by:</p> <ul style="list-style-type: none"> ○ Deficits in social communication and interaction ○ Repetitive or restrictive patterns of behavior, interests, or activities. <ul style="list-style-type: none"> ● Additional deficits include lack of coordination, motor planning, and abnormalities in sensory processing. ● Individuals may or may not have co-occurring intellectual deficits. 		
Epidemiology	<ul style="list-style-type: none"> ● In the United States, 14.7 per 1,000 (one in 68) children aged 8 years have an ASD. ● ASD is five times more common in males (one in 42) than females. ● Prevalence of ASD in white non-Hispanic children is 15.7 per 1000, 12.1 per 1000 black non-Hispanic children, and 10.8 per 1000 in Hispanic children. ● Identical twins are at increased risk for ASD and will occur 36-95% of the time and 0-31% of the time in non-identical twins. ● Parents with one child with autism have a 2-18% chance of having a second child with an ASD. 		
Special Considerations	<p>Individuals on the autism spectrum disorder have high rates of co-morbid physical and mental health conditions, including: (80, 81) (80, 81) (80, 81) (81, 82) (81, 82) (34, 37) (34, 37)</p> <table border="0" style="width: 100%;"> <tr> <td style="vertical-align: top;"> <ul style="list-style-type: none"> ● Eczema ● Allergies ● Asthma ● Ear and respiratory infections ● Gastrointestinal problems </td> <td style="vertical-align: top;"> <ul style="list-style-type: none"> ● Severe headaches and migraines ● Sleep disorders ● Epilepsy ● ADHD ● Anxiety and depression </td> </tr> </table> <p>Individuals are at heightened risk for chronic conditions, including:</p> <ul style="list-style-type: none"> ● Diabetes ● Coronary heart disease ● Cancer 	<ul style="list-style-type: none"> ● Eczema ● Allergies ● Asthma ● Ear and respiratory infections ● Gastrointestinal problems 	<ul style="list-style-type: none"> ● Severe headaches and migraines ● Sleep disorders ● Epilepsy ● ADHD ● Anxiety and depression
<ul style="list-style-type: none"> ● Eczema ● Allergies ● Asthma ● Ear and respiratory infections ● Gastrointestinal problems 	<ul style="list-style-type: none"> ● Severe headaches and migraines ● Sleep disorders ● Epilepsy ● ADHD ● Anxiety and depression 		
Recommended Screening	<p>All individuals with a diagnosis of an autism spectrum disorder should have genetic screening, particularly:</p> <ul style="list-style-type: none"> ● Females ● Co-existing intellectual disability ● Known sibling with an autism spectrum disorder 		