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Evaluation and Management of Attention-Deficit/ Hyperactivity Disorder

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Attention-Deficit/Hyperactivity Disorder (ADHD) is the most common neurobehavioral disorder of childhood with an estimated prevalence of 7.2% worldwide[1] and 13% in Iowa.[2] ADHD is diagnosed clinically based on the presence of a persistent pattern of inattention and/or hyperactivity/impulsivity presenting before 12 years of age with symptoms in two or more settings for at least six months that is inconsistent with developmental level and interferes with social, academic, or occupational functioning, and symptoms are not better explained by a mental health disorder (mood disorder, anxiety disorder, personality disorder, or substance intoxication). The American Academy of Pediatrics (AAP) revised the clinical practice guidelines[3] with key points summarized below.

Evaluation

- Primary Care Clinicians (PCCs) should evaluate for ADHD in any child or adolescent (4 years to 18th birthday) who presents with behavior problems and symptoms of inattention, hyperactivity, or impulsivity.
- Diagnosis should involve thorough history using **DSM-5 criteria**, information gathering from multiple sources (parents, teachers/ daycare, or other clinicians) and observation of child's behavior.
- DSM-based ADHD rating scales are not diagnostic, but should be used to support the evaluation.
- Two-thirds of children with ADHD have a coexisting emotional, behavioral, learning,

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or mental health condition. Children, especially adolescents, should be screened for coexisting conditions (anxiety, depression, learning difficulties, ODD, conduct disorder, substance abuse, and sleep difficulties). This information can impact management of ADHD.

Screening tools

Collect from observers in at least two settings (parents and school teachers).

- Preschool age – ADHD Rating Scale IV Preschool Version and/or Conners Comprehensive Behavior Rating Scale
- School age – Vanderbilt Assessment Scale

When appropriately scored, interpreted, and documented, these can be billed with code 96127.

Special considerations

For preschoolers with concern for ADHD, evidence-based Parent Training in Behavior Management (PTBM) is recommended before giving a diagnosis. Parent Child Interaction Therapy (PCIT) and Positive Parenting Programs (Triple P) are examples of PTBM. Play therapy is not effective and has not shown improvement in behavior management due to lack of a parent training component.

For adolescents, information from at least two teachers should be obtained. Adolescents should be actively involved in their evaluation.

Psychology testing is not necessary for diagnosis, but is recommended for evaluation of learning or cognitive concerns identified during assessment.

Management

ADHD is a chronic disorder and PCCs should follow principles of the Chronic Care Model and medical home.

Behavioral therapy

- For preschoolers with ADHD, PCCs should prescribe PTBM and/or behavioral classroom interventions as first-line treatment.
- Behavioral parent and classroom training should prevent and respond to behaviors targeting interrupting, aggression, task completion, and compliance with directions.
- Therapy in adolescents should target skill development and improving executive function skills.

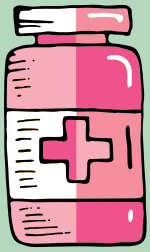
School supports

- Children and adolescents with ADHD may be eligible for services at school as part of the 504 Rehabilitation Act plan (504 plan) or an Individualized Education Plan (IEP) under the Individuals with Disabilities Education Act (IDEA).
- Strong family and school partnership is recommended.
- PCCs should advocate for behavioral support in school even if the child's/adolescent's ADHD symptoms are well managed on medication.
- In Iowa, the **Family & Educator Partnership (FEP)** provides an opportunity for parents and educators to build partnerships to improve educational programs for children with special needs and has a designated Family & Educator Coordinator for each Area Education Agency.

Medications

- The goal of medication is to reduce impairment in daily life due to ADHD symptoms.
- Cardiovascular screening should be done prior to starting medications. If the screening is negative, an EKG is not necessary prior to starting stimulants.
- For school-aged children, the PCC should prescribe FDA-approved medications for ADHD with PTBM, and/or classroom interventions and behavioral supports.
- For preschoolers, methylphenidate, although not FDA approved, may be considered when behavioral interventions alone are not sufficient.
- There is strong evidence for stimulants, but not as strong for atomoxetine, extended-release guanfacine, and extended-release clonidine.
- Choice of medication is dependent on efficacy of agent, desired duration of coverage, whether a child can swallow pills or capsules, out-of-pocket costs, and insurance coverage.
- Generally, methylphenidate or amphetamine groups of drugs are recommended as first-line agents and are FDA approved for children ≥6 years. Both groups of drugs have similar desired and adverse effects.

Management of Common Side Effects of Stimulant Medication



Appetite suppression – Heavy, high-calorie meals before taking medication and in the evening. Give daily bedtime snack. Monitor growth at every visit. If the child falls below two growth curves, discontinue medication.

Sleep difficulties – Strong emphasis on good sleep hygiene. No screen time one hour before bedtime. Melatonin OTC can be trialed 1-5 mg. If not effective, can trial clonidine or trazodone at bedtime.

Irritability/mood changes – Discontinue medication and trial a different medication from same or different group. The first medication can be trialed again when the child is older.

Rebound hyperactivity/irritability in evening – Consider small dose of short-acting stimulant to be given no later than 4 p.m. Dosing later may interfere with sleep onset and appetite at dinner time. Consider using a non-stimulant in the evening if ADHD is impairing evening routines.

- If other family members have tolerated a medication from a specific group, it can be trialed first.
- Short-acting medications generally last for four hours and extended-release preparations avoid the need for school-based administration of medication, with fewer daily doses and improved compliance.
- Stimulant medications are fast acting, so efficacy can be determined and the dose adjusted weekly until optimum drug/dose is achieved.
- ADHD rating scales should be completed regularly by parents and teachers to guide medication management and dose adjustment.
- A child may need trial of two or more medications before a good fit is found. Parental counseling is important at the onset of a medication trial.
- Non-stimulant medications can be used as an adjunct if appropriate symptom control is not achieved on stimulants alone, significant side effects are noted on stimulant medication, there is concern for diversion/abuse, or caregiver preference.
- A follow-up visit is recommended four weeks after starting the medication and monthly until optimum response is obtained. After that, visits should occur every three months in the first year of treatment. Subsequently, if symptom control is stable, face-to-face visits are recommended quarterly or at least every six months for medication management.
- Additional medication management may be needed for coexisting sleep difficulties, or mental health conditions. More specific algorithms on medication management can be found in **Guideline for the Assessment and Treatment of Children and Adolescents with Complex Attention-Deficit/Hyperactivity Disorder**.[4]
- Pharmacogenetic testing is not recommended at this time due to lack of evidence about utility.

Evaluation and Management of Autism Spectrum Disorders

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Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder with deficits in social-emotional communication/interaction and restricted, repetitive patterns of behavior. In the U.S., prevalence is estimated to be 1:54 children (1.85%)[5] with predominance in boys (4.3:1). **DSM-5 criteria** for diagnosis of ASD stipulate an individual must demonstrate deficits in all three areas of social-emotional communication/interactions (social-emotional reciprocity; nonverbal communicative behaviors during social interactions; and developing, maintaining, and understanding relationships) and have two of the four symptoms of restricted, repetitive patterns of behavior:

- Stereotyped or repetitive motor movements, use of objects, or speech;
- Insistence of sameness or inflexible adherence of routines;
- Highly restricted, fixated interests that are abnormal in intensity or focus;

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- Hypo-reactivity or hyperreactivity to sensory input or unusual interests in sensory aspects of the environment.

In addition, these symptoms are not otherwise explained by developmental delays or underlying mental health conditions, such as anxiety disorders, ADHD, and seizure disorders. Approximately 30% of children with ASD will also have intellectual disability. Psychiatric conditions (ADHD, anxiety disorders, mood disorders, OCD, or others) have been identified in 70-90% of children and youth with ASD. The AAP recently published updated guidelines[6] on evaluation and management of ASD discussed in this article.

Red flags and screening

Developmental surveillance should be done at all visits by screening for parental concerns about child development or learning. Red flags prompting further screening are:

EARLY SYMPTOMS OF ASD

	SYMPTOM
By 12 months	Does not respond to name.
By 14 months	Does not point at objects to show interest.
By 18 months	Does not pretend play.
General	Avoids eye contact and may want to be alone. Has trouble understanding other people's feelings or talking about their own feelings. Has delayed speech and language skills. Repeats words or phrases over and over (echolalia). Gives unrelated answers to questions. Gets upset by minor changes. Has obsessive interests. Makes repetitive movements like flapping hands, rocking, or spinning in circles. Has unusual reactions to the way things sound, smell, taste, look, or feel.

AAP recommends screening for autism for all children at 18 and 24 months.

Screening tools

- Ages 16-30 months: **M-CHAT-R/F™**
- Ages 4 and up: Social Communication Questionnaire (SCQ)

Autism screening tools can be billed with code 96110 with an E/M code.

Referral and resources

- Formal hearing and vision should be tested in the primary care setting to rule out impairments affecting social communication.
- Children < 3 years should be referred to early intervention services also known as Early ACCESS.
- Children > 3 years should be referred to their regional Area Education Agency (AEA) to determine services in the school setting. Children with ASD are eligible to participate in special education preschool, even if they are not toilet trained.
- Children with concerns for developmental delay in speech or fine motor/gross motor skills should be referred for private therapy (speech therapy, occupational, and/or physical therapy) without waiting for a diagnostic evaluation for autism.
- Lastly, children should be referred for diagnostic assessment with a qualified health care professional and further recommendations.

Diagnosis

A comprehensive evaluation by a trained specialist is needed, but a primary care clinician (PCC) trained and comfortable with applying **DSM-5 criteria** can make the initial clinical diagnosis. Diagnosis involves observation of symptoms with detailed developmental history, and use of validated, structured observation tools such as Autism Diagnostic Observation Schedule, 2nd Edition (ADOS-2) or Childhood Autism Rating Scale, 2nd Edition (CARS-2). Additional developmental/cognitive testing, speech and language evaluation, and an occupational therapy evaluation may be completed to determine additional services. It is important to keep in mind that most Applied Behavior Analysis (ABA) therapy providers in Iowa ask for a standardized test score (e.g., ADOS or CARS-2-ST) to enroll in therapy.

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Medications for Management of ADHD*

Medication	Brand Names	Duration	Dosage Forms	Additional Considerations
Methylphenidate – Immediate release	Focalin Methylin Ritalin	~4 hours	Tablet, liquid	Common side effects for all stimulants: • Appetite suppression • Trouble sleeping • Stomachache • Headache • Mood changes, irritability • Increased tics • Slowing of growth
Amphetamine – Immediate release	Adderall Evekeo Procentra Zenzedi	~4-6 hours	Tablet, capsule, liquid	
Methylphenidate – Extended release	Focalin XR Metadate CD Ritalin LA Quillichew ER Quillivant XR	~8-10 hours	Tablet, capsule, chewable tablet, liquid	Preparations differ in terms of immediate release:extended release component (30:70, 40:60, 50:50). All capsules can be opened and sprinkled on spoonful of food for intake. Concerta must be swallowed whole. Request "authorized generic." ODTs should not be chewed. Jornay PM is taken the night before. May interfere with sleep.
	Aptensio XR Concerta Cotempla XR – ODT Daytrana (patch)	~10-12 hours		
	Adhansia XR Jornay PM	+12 hours		
Amphetamine – Extended release	Adderall XR Adzenys XR – ODT Dexedrine	~8-10 hours	Tablet, capsule, chewable tablet, liquid	
	Dyanavel XR Mydayis Vyvanse	~10-16 hours		
Non-stimulants	Strattera (Atomoxetine)	~24 hours	Capsule	Must be swallowed whole. Cannot be opened and sprinkled.
α_2 agonists	Kapvay (Clonidine ER) Intuniv (Guanfacine ER)	~12-24 hours	Tablet	Extended release tablets must be swallowed whole. Cannot be crushed or chewed. Common side effects: fatigue, drowsiness, hypotension. Do not stop abruptly.

Adapted from **https://chadd.org/wp-content/uploads/2019/07/Medication-Chart-July-2019.pdf**

*FDA-approved medications only. Please refer to **http://www.adhdmedicationguide.com/** for the most up-to-date, detailed medication guide.

Family Resources

CDC Learn the Signs – **https://www.cdc.gov/ncbddd/actearly/index.html**

Child Mind Institute – **https://childmind.org/topics/disorders/autism-spectrum-disorder/**

Autism Speaks Toolkits – **https://www.autismspeaks.org/autism-speaks-tool-kits**

Autism Navigator – **https://autismnavigator.com/**

ASD Resources

Early ACCESS Referral – call: 1-888-IAKIDS1(1-888-425-4371) or visit: **www.iafamilysupportnetwork.org**

Iowa Regional Autism Assistance Program – **https://chsciowa.org/regional-autism-assistance-program.asp**

CDC Autism Training Modules – **https://www.cdc.gov/ncbddd/actearly/autism/case-modules/index.html**

CDC DSM-5 Criteria for ASD - **https://www.cdc.gov/ncbddd/autism/hcp-dsm.html**

ADHD Resources

Riddle MA. Pediatric Psychopharmacology for Primary Care (2nd Ed.) 2019. American Academy of Pediatrics.

Medication Chart with Detailed Dosing Guide – **www.adhdmedicationguide.com**

ADHD Medication Chart – **https://chadd.org/wp-content/uploads/2019/07/Medication-Chart-July-2019.pdf**

National Center for ADHD – Extensive resources for parents, educators, and professionals at: **www.chadd.org**

AAP ADHD Guideline – Clinical Practice Guideline for the Diagnosis, Evaluation, and Treatment of Attention-Deficit/Hyperactivity Disorder in Children and Adolescents. *Pediatrics*. October 2019. 144 (4) e20192528. **https://pediatrics.aappublications.org/content/144/4/e20192528**

ADHD Toolkit – **https://www.aap.org/en-us/pubserv/adhd2/Pages/kit/data/introframe.html**

Understood.org – **https://www.understood.org/**

CDC DSM-5 Criteria for ADHD – **https://www.cdc.gov/ncbddd/adhd/diagnosis.html**

American Psychiatric Association. (2013). Diagnostic and Statistical Manual of Mental Disorders (5th ed.). Washington, DC.

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3. Wolraich ML, et al. Clinical Practice Guideline for the Diagnosis, Evaluation, and Treatment of Attention-Deficit/Hyperactivity Disorder in *Children and Adolescents. Pediatrics*, 2019. 144(4): p. e20192528.

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6. Hyman SL, Levy SE, and Myers SM. Identification, Evaluation, and Management of Children With Autism Spectrum Disorder. *Pediatrics*, 2020. 145(1): p.e20193447.

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Interventions

The goals of management are to: 1. minimize core deficits (social communication and restricted, repetitive patterns of behavior), 2. maximize functional independence by facilitating learning and daily living skills, and 3. eliminate or minimize problem behaviors that interfere with functioning.

Therapy

- Speech and language therapy to address language impairments, occupational therapy for fine motor delay and activities of daily living, and/or physical therapy for gross motor or coordination difficulties are recommended.
- Behavior therapy interventions grounded in principles of ABA have demonstrated the most effectiveness in improving communication and social engagement and minimizing behaviors (e.g., aggression).
- Parental participation and hands-on training is strongly recommended for implementation of strategies at home and successful skill development.
- Iowa's **Regional Autism Assistance Program** has family navigators who can help families identify and connect to local resources for their child with suspected or confirmed autism. Referral can be made by a physician. Services are free.

School interventions

- Children and adolescents with autism may be eligible for school services as part of the 504 Rehabilitation Act plan (504 plan) or an Individualized Education Plan (IEP) under the Individuals with Disabilities Education Act (IDEA), based on functional impairment.
- Classroom-based models using principles of ABA in an inclusive general education setting are most helpful in learning new skills and social interactions.
- In Iowa, a formal diagnosis of autism is not necessary to start services in school.
- In Iowa, the **Family & Educator Partnership** provides an opportunity for parents and educators to build partnerships to improve educational programs for children with special needs and has a designated Family & Educator Coordinator for each AEA.
- Each AEA has a trained challenging behavior team that can provide consultative services to teachers to improve behavior supports for children with autism.

Medical management of co-occurring conditions

Children with ASD have higher prevalence of GI symptoms, constipation, selective eating, obesity, sleep problems, developmental delays, motor coordination disorders, and behavioral or psychiatric conditions. These should be managed individually with appropriate therapeutic or medical interventions in the primary care office, or in conjunction with a specialist. Self-injury or aggression, if present, may require a combination of intensive behavior intervention and psychopharmacologic agents.

Families should be asked about complementary, integrative, or alternative therapies used at each visit. In studies, dietary elimination of gluten- and casein-containing foods have not demonstrated improvement in core features of autism. Cannabidiol (medical marijuana) is approved for use for management of irritability and aggression in children with autism in Iowa; there is lack of evidence to recommend its widespread use at this time.

Partnering with families and transition to adulthood

It is important for the PCC to provide a medical home model with family-centered care for children with ASD. Families of children with autism are under chronic stress and will need additional support throughout various transitions during childhood and adulthood. Autism Speaks has developed several **toolkits** for parents and professionals on commonly identified issues. For transition to adulthood **Got Transition®** has a wealth of information for families and health care providers related to health care, education, employment, guardianship and decision making, SSI benefits, and others.

Please note: article references are on page 6.

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What's in this issue

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