ADHD in Children and Adolescents

Purpose

To aid primary care physicians with the diagnosis and management of children and adolescents with attention deficit/hyperactivity disorder (ADHD).

Key Points

- In a child between 4 and 18 years who presents with inattention, hyperactivity, impulsivity, academic underachievement, or behavior problems, clinicians should initiate an evaluation for ADHD.
- The diagnosis of ADHD requires that a child meet DSM-5 criteria.
- It is important to obtain information not only from the child/adolescent but also from individuals the child/adolescent spends a significant amount of time with including the parents, caregivers, day care teachers and school professionals.
- Coordination between child, parent, school and health care professionals is essential to achieve the best outcomes for the child.

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Screen for ADHD
- Can't sit still /hyperactive
- Lack of attention/does not listen
- Impulsive: acts without thinking
- Behavior problem
- Academic problem

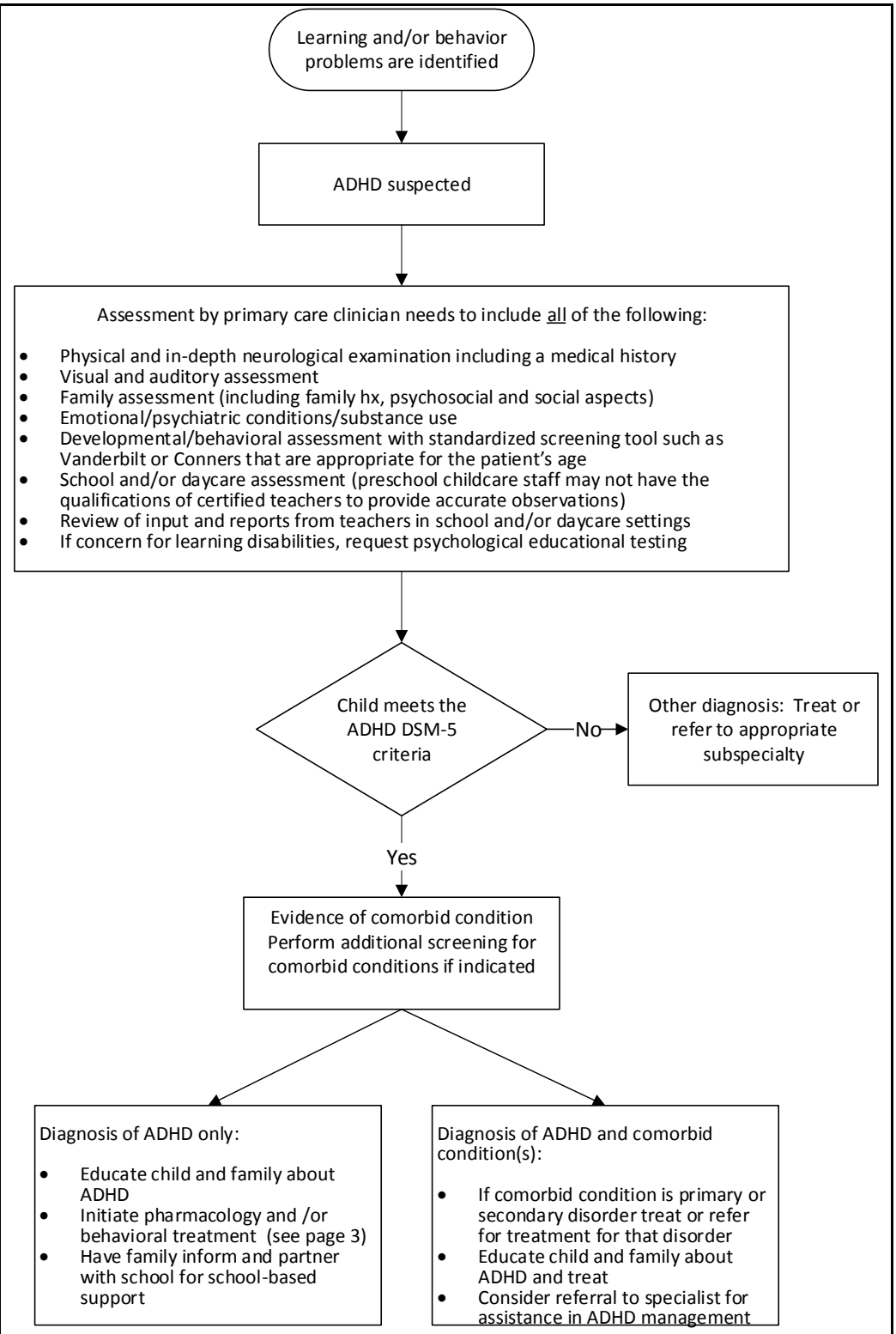
Required for ADHD

Behavioral Symptoms:
- Onset before age 12
- Duration of at least 6 months
- Typically occurs in more than one setting (i.e. home/day care/school); on occasion may cause more severe impairment in only one setting
- Results in functional impairment (school/social)

Conditions That May Be Confused With ADHD or Are Comorbid Condition(s)
- Anxiety Disorders
- Bipolar Disorder
- Learning/Language Disorders
- Fetal Alcohol Syndrome
- Major Depressive Disorder
- Oppositional Defiant Disorder
- Post traumatic Stress Disorder (PTSD)
- Reactive Attachment Disorder (RAD)
- Autism Spectrum Disorder/Sleep Disorder
- Tic Disorder
- Substance Use Disorder

Family Assessment
- Chaotic, unstructured home environment
- Family hx of ADHD or psychiatric/psychological problems
- Family stress (i.e. financial/divorce/ death of loved one)
- Parenting Style (inappropriate, punitive, inconsistent)
- Life transitions (i.e. moving/change schools, death or loss)
- Cultural factors
- History substance abuse/mental illness
- Abuse/neglect

When to Consider Specialist Referral
- Treatment is not successful
- Multiple or significant comorbid conditions
- Primary care clinician not comfortable with diagnosing and management



Guidelines are intended to be flexible. They serve as reference points or recommendations, not rigid criteria. Guidelines should be followed in most cases, but there is an understanding that, depending on the patient, the setting, the circumstances, or other factors, care can and should be tailored to fit individual needs.

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Parent/Family Strategies
(improvement of family functioning)
- Support groups for ADHD
- Parental skill training, first line intervention for preschool children
- Advocacy groups

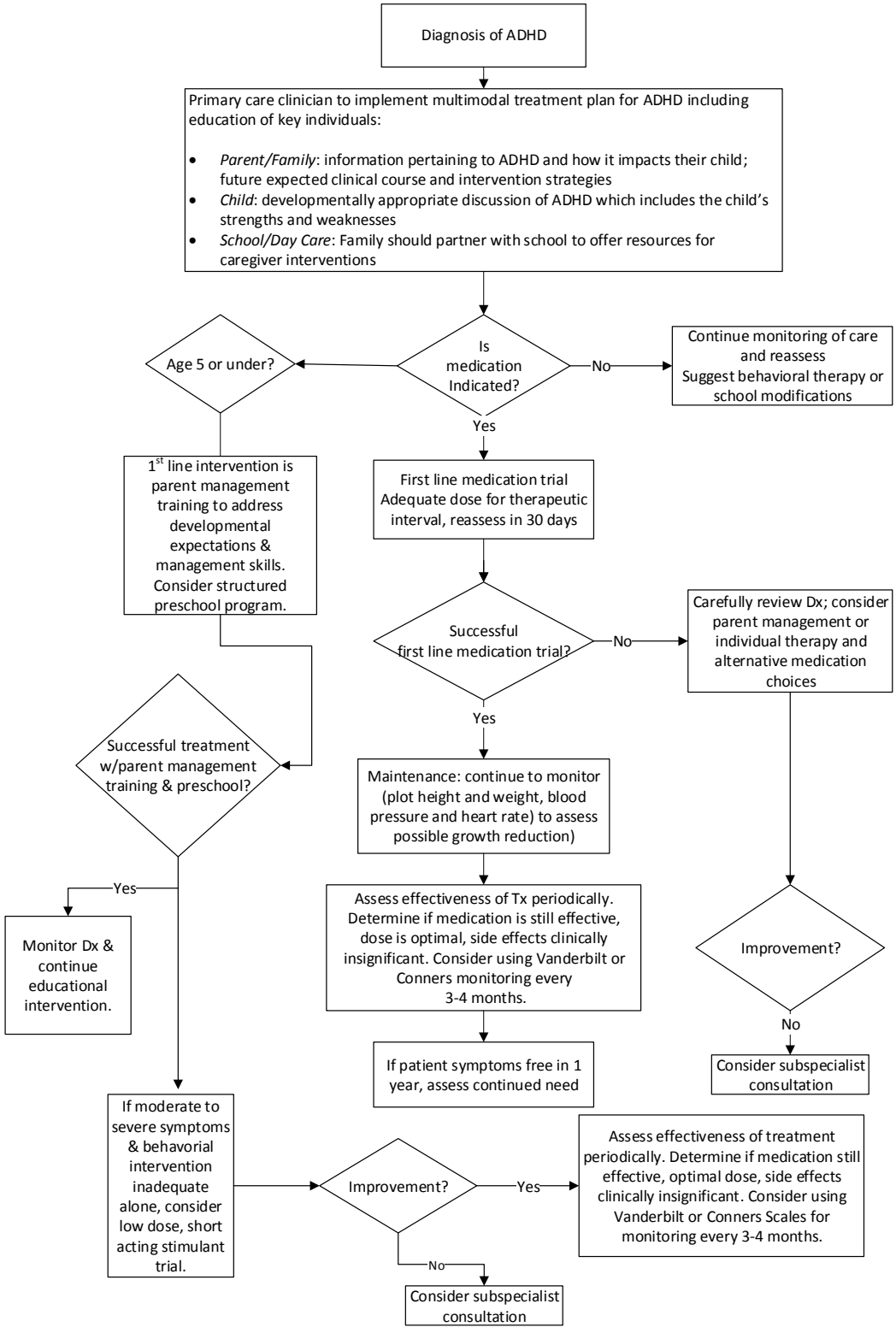
Child (behavioral interventions)
- Training for social skills
- Strategies for effective problem solving
- Training in study skills and organizational management
- Referral to specialist if needed to assist with comorbid conditions

School (academic interventions)
- Behavior modification
- Classroom modifications
- Structured learning environment
- Additional support as needed (tutor, resource room, equipment)
- Possible need for 504 Plan or IEP to optimize and facilitate school's response

First Line Medication
- Stimulants are first line of treatment and have proven to benefit most people
- Contradictions: psychosis, certain cardiovascular conditions
- Safe and effective in managing ADHD in presence of tic disorders
- Preschool children (ages 4-5 years) should be given a lower dose and increased in smaller increments since they may have more side effects.

Second Line Therapy/Alternate Medication Trial(s)
- Consider when stimulant trial is unsuccessful or if associated comorbidity
- Second line therapy commonly includes atomoxetine, short and long acting guanfacine, clonidine, bupropion
- In some cases guanfacine or clonidine can be considered as adjunctive treatment along with stimulant medication and atomoxetine

Treatment



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Medications

Methylphenidate type products (Schedule II drugs)						
Generic Availability	**Generic Name**	**Brand**	**Strengths**	**Form**	**Max Dose**	**Notes**
Generic available	methylphenidate HCl	Concerta	18mg, 27mg, 36mg, 54mg	Extended release tablet	Children: 54mg/day Adolescents: 72mg/day	Given once daily in the AM. Use osmotic pressure to deliver methylphenidate at a controlled rate resulting in duration action of approximately 10-12 hours. Must be swallowed whole, do not crush.
No generic available	methylphenidate transdermal system	Daytrana	10mg/9hr, 15mg/9hr, 20mg/9hr, 30mg/9hr	Transdermal patch	30mg/day	Apply to hip 2 hrs before desired effect; drug effects may persist 2-3 hours after patch removal; rotate sites; do not alter/cut patch. Total wear time should not exceed 9 hours. Total duration of action of 10-12 hrs.
Generic available	dexmethylphenidate HCl	Focalin	2.5mg, 5mg, 10mg	Tablet	20mg/day in divided doses	Give in the AM and then again no sooner than 4 hours later. dosed twice a day. Duration of action of approximately 5-6 hours.
Generic available for 15mg, 30mg and 40mg	dexmethylphenidate HCl	Focalin XR	5mg, 10mg, 15mg, 20mg, 25mg, 30mg, 35mg, 40mg	Extended release capsule	40mg/day	Capsules can be opened and sprinkled on applesauce immediately before administering the medication. Duration of action of approximately 10-12 hours.
Generic available	methylphenidate HCl	Metadate CD	10mg, 20mg, 30mg, 40mg, 50mg, 60mg	Extended release capsule	60mg/day	Given once daily in the AM. Capsules can be opened and sprinkled on applesauce immediately before administering the medication. Duration of action of 8-12 hours.
Generic available	methylphenidate HCl	Metadate ER	20mg	Extended release tablet	60 mg/day	When transitioning from immediate release to extended release methylphenidate, combine total daily dose of the immediate release form into one dose of the extended release form to be given once in the morning. Duration of action of about 8 hours.
Generic available – for liquid only	methylphenidate HCl	Methylin	2.5mg, 5mg, 10mg chewable tablets; 5mg/5ml, 10mg/5ml oral solution	Chewable tablets or oral solution	60mg/day in divided doses	Give 30-45 minutes before breakfast and lunch. Some patients may benefit from a third dose given in the afternoon. Duration of action of 3-5 hours.
No generic available	methylphenidate HCl	Methylphendiate ER 10mg (Only one mfg therefore classified as brand)	10mg	Extended release tablet	60mg/day	When transitioning from immediate release to extended release methylphenidate, combine total daily dose of the immediate release form into one dose of the extended release form to be given once in the morning. Duration of action of about 8 hours.
No generic available	methylphenidate HCl	Quillivant XR	25mg/5mL	Reconstituted suspension	60mg/day	Given once daily in the morning without regard to food. Shake vigorously for at least 10 seconds before pouring. Store at room temperature. Good for up to 4 months after reconstituted. Duration of action up to 12 hours.
Generic available	methylphenidate HCl	Ritalin*	5mg, 10mg, 20mg	Scored tablet	60mg/day in divided doses	Give 30-45 minutes before breakfast and lunch. Some patients may benefit from a third dose given in the afternoon. Duration of action of 3-5 hours.
Generic available – excluding 10mg	methylphenidate HCl	Ritalin LA*	10mg, 20mg, 30mg, 40mg	Extended release capsule	60mg/day	Capsules can be opened and sprinkled on applesauce immediately before administering the medication. Duration of action of 8-12 hours.
Generic available	methylphenidate HCl	Ritalin SR*	20mg	Sustained release tablet	60mg/day	May use Ritalin SR when the 8 hour dosage corresponds to total prescribed immediate release dosage. Will eliminate need for midday dose. Approximate duration of action 3-8 hours.

*With both short-term and suspended, there may be variation in response in short and extended. Titrate dosing on individual basis.

- Individualize and use lowest effective dose. Re-evaluate periodically; improvement may be sustained when the drug is either temporarily or permanently discontinued.
- See product monograph or contact the company for more information. If paradoxical aggravation of symptoms or other adverse effects occur the dose should be reduced or discontinued.
- Concerta, Daytrana, Focalin, Ritalin (although Ritalin is not approved for 3-5 ages, the Preschool ADHD Treatment 2006 Study showed that low doses of Ritalin medication are effective and safe) Methylin, and Metadate CD are not recommended for children under 6 years of age. Not all medications are covered by all insurance plans. Please contact individual health plans for details on drug coverage.

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Amphetamine type products (Schedule II drugs)						
Generic Availability	**Generic Name**	**Brand**	**Strengths**	**Form**	**Max Dose**	**Notes**
Generic available	dextroamphetamine + amphetamine	Adderall	5mg, 7.5mg, 10mg, 12.5mg, 15mg, 20mg, 30mg	Double scored immediate release tablet	40mg/day in divided doses	Give first dose on awakening: if needed, may give one or two additional doses at 4-6 hr intervals. Avoid late evening dose due to possibility of insomnia. Duration of action is approximately 4-6 hours.
Generic available	dextroamphetamine + amphetamine	Adderall XR	5mg, 10mg, 15mg, 20mg, 25mg, 30mg	Extended release capsule	Children: 30mg/day	Capsules can be opened and sprinkled on applesauce immediately before administering the medication. Duration of action is approximately 8-10 hours.
Generic available	dextroamphetamine sulfate	Dexedrine Spansule	5mg, 10mg 15mg	Extended release capsule	40mg/day	Given once daily in the AM. Duration of action of about 6-8 hours. Sprinkling is not recommended by the manufacturer.
Generic available for 5mg, 10 mg only	dextroamphetamine sulfate	Zenzedi (Formerly known as DextroStat or Dexedrine IR)	2.5mg, 5mg, 7.5mg, 10mg	Immediate release tablet	40mg/day	Given once in the AM and then every 4-6 hours. May switch patients to once daily dose of Dexedrine Spansules once titrated. Avoid late evening doses due to the possibility of insomnia. Duration of action of about 4-6 hours.
Generic available	dextroamphetamine sulfate	Procentra	5mg/5mL	Oral solution	40mg/day	Given once in the AM and then every 4-6 hours. May switch patients to once daily dose of Dexedrine Spansules once titrated. Avoid late evening doses due to the possibility of insomnia. Duration of action about 4-6 hours.
No generic available	lisdexamfetamine	Vyvanse	20mg, 30mg, 40mg, 50mg, 60mg, 70mg	Capsule	70mg/day	Given once daily in the AM. May be taken whole or contents dissolved in glass of water. Duration of action of about 10-12 hours.

Non-stimulant products (Non-controlled drugs)						
Generic Availability	**Generic Name**	**Brand**	**Strengths**	**Form**	**Max Dose**	**Notes**
Generic available	clonidine	Catapres	0.1mg, 0.2mg, 0.3mg	Immediate release tablet	<=45kg =0.3mg and >45 kg =0.4mg	Starting dose is .025 -.05 mg/day in evening. Increase by similar dose every 3-7 days, adding to morning, mid-day, possibly afternoon, and again evening doses in sequence. Heart rate and blood pressure should be monitored. Do not substitute extended-release tablet for immediate-releaser clonidine on a mg/mg basis, because of differing pharmacokinetic profiles.
No generic available	guanfacine	Intuniv	1mg, 2mg, 3mg, 4mg	Extended release tablet	4mg/day	Given once daily at the same time each day. Monitor blood pressure. Duration of action of about 10-12 hours.
Generic available	clonidine	Kapvay	0.1mg	Extended release tablet	0.4mg/day	Given once daily at bedtime; doses exceeding 0.1mg/day should be divided into two does taken in the morning and at bedtime. Clonidine is considered to be a second line agent due to potential cardiac effects. Monitor blood pressure. Duration of action of about 10-12 hours.
No generic available	atomoxetine HCl	Strattera	10mg, 18mg, 25mg, 40mg, 60mg, 80mg, 100mg	Immediate release capsule	100mg/day or 1.4mg/kg/day, whichever is less	Contraindicated in patients taking MAOIs or diagnosed with narrow angle glaucoma. Do not break capsules. This medication should be discontinued if jaundice or liver toxicity occurs. Duration of action about 10-12 hours.
Generic available	guanfacine	Tenex	1mg, 2mg	Immediate release tablet	4mg/day	Usually taken 1-2 times/day with or without food. Give at a regular time to keep a steady level in the bloodstream. Last dose may be given at bedtime to avoid being too tired during the day. Do not substitute extended-release tablet for immediate-release guanfacine on a mg/mg basis because of differing pharmacokinetic profiles. Heart rate & blood pressure should be monitored.

- Individualize and use lowest effective dose. Re-evaluate periodically; improvement may be sustained when the drug is either temporarily or permanently discontinued.
- See product monograph or contact the company for more information. If paradoxical aggravation of symptoms or other adverse effects occur the dose should be reduced or discontinued.
- Adderall, Dexedine, and Dextrostat are not recommended for children under 3 years of age. Vyvanse is not recommended for children under 6 years of age. Not all medications are covered by all insurance plans. Please contact individual health plans for details on drug coverage.

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DSM 5 Criteria

A. Either (I) or (II):

(I) Six or more symptoms of **inattention** for children up to age 16, or five or more for adolescents 17 and older and adults; symptoms of inattention have been present for at least 6 months, and they are inappropriate for developmental level.

Inattention:

1. Often fails to give close attention to details or makes careless mistakes in schoolwork, work, or other activities (e.g., overlooks or misses details, work is inaccurate)
2. Often has difficulty sustaining attention in tasks or play activities (e.g., has difficulty remaining focused during lectures, conversations, or lengthy reading)
3. Often does not seem to listen when addressed directly (e.g., mind seems elsewhere, even in the absence of any obvious distraction)
4. Often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (not due to oppositional behavior or failure to understand instructions.) (e.g., starts tasks but quickly loses focus and is easily sidetracked)
5. Often has difficulty organizing tasks and activities (e.g., difficulty managing sequential tasks; difficulty keeping materials and belongings in order; messy, disorganized work; has poor time management; fails to meet deadlines)
6. Often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (e.g., schoolwork or homework; for older adolescents and adults, preparing reports, completing forms, reviewing lengthy papers)
7. Often loses things necessary for tasks or activities (e.g., school materials, pencils, books, or tools, wallets, keys, paperwork, eyeglasses and mobile telephones)
8. Is often easily distracted by extraneous stimuli (e.g., for older adolescents and adults may include unrelated thoughts)
9. Is often forgetful in daily activities (e.g., doing chores, running errands; for older adolescents and adults, returning calls, paying bills, keeping appointments)

(II) Six or more symptoms of **hyperactivity-impulsivity** for children up to age 16, or five or more for adolescents 17 and older and adults; symptoms of hyperactivity-impulsivity have been present for at least 6 months to an extent that is disruptive and inappropriate for the person's developmental level**.**

Hyperactivity: (excessive movement and restlessness)

1. Often fidgets with hands or feet or squirms in seat
2. Often leaves seat in classroom or in other situations in which remaining seated is expected (e.g., leaves his or her place in the classroom, in the office or other workplace, or in other situations that require remaining in place)
3. Often runs about or climbs excessively in situations in which it is inappropriate (e.g., in adolescents or adults, may be limited to subjective feelings of restlessness)
4. Often has difficulty playing or engaging in leisure activities quietly
5. Is often "on the go" or often acts as if "driven by a motor" (e.g., is unable to be or uncomfortable being still for extended time, as in restaurants, meetings; may be experienced by others as being restless or difficult to keep up with)
6. Often talks excessively

Impulsivity: (acting without thinking)

1. Often blurts out answers before questions have been completed (e.g., completes people's sentences; cannot wait for turn in conversation)
2. Often has difficulty awaiting turn (e.g., while waiting in line)
3. Often interrupts or intrudes on others (e.g., butts into conversations or games, or activities; may start using other people's things without asking or receiving permission; for adolescents and adults, may intrude into or take over what others are doing)

In addition, the following conditions must be met:

B. Several hyperactive impulsive or inattentive symptoms were present before age 12 years.

C. Several symptoms are present in two or more settings, (e.g., at home, school or work; with friends or relatives; in other activities).

D. There is clear evidence that the symptoms interfere with, or reduce the quality of social, school, or work functioning.

E. The symptoms do not occur exclusively during the course of schizophrenia or other psychotic disorder and are not better accounted for by another mental disorder (e.g. mood disorder, anxiety disorder, dissociative disorder, or a personality disorder.

Resources for Physicians

National Initiative for Children's Healthcare Quality (NICHQ)
Caring for Children with ADHD: A Resource Toolkit for Clinicians: ADHD toolkit for providers developed by the American Academy of Pediatrics and National Initiative for Children's Healthcare Quality. Summary of Contents: Initial Evaluation Forms, Vanderbilt Assessment Scale (Initial Parent/Teacher and Follow-up Parent/Teacher), Scoring Instructions, ADHD Management Plans, Daily Home Report Card, Parent Informational Resources

- 1st edition of the toolkit - available for downloading in English only
- 2nd edition of the toolkit - can be purchased from the AAP Bookstore

American Academy of Pediatrics

CAPPC NY
Extends child psychiatric expertise to educate and provide consultation support to pediatric prescribers across New York state.

Centers for Disease Control and Prevention
https://www.cdc.gov/ncbddd/adhd/

Children and Adults with Attention Deficit/Hyperactivity Disorder (CHADD)
Provides education, advocacy and support for individuals with ADHD.

Conners 3rd Edition Rating Scales
http://www.pearsonclinical.com/psychology/products/100000523/conners-3rd-edition-conners-3.html?origsearchtext=100000523

Learning Disabilities Association of America (LDA)
Provides professionals, parents and teachers with information on learning disabilities, practical solutions, and a network of resources.

NASP
National Association of School Psychologists

National Institute of Mental Health (NIMH)

NYS Office of Mental Health

US Food and Drug Administration (FDA)
Medication guides.

Vanderbilt Assessment
http://www.nichq.org/childrens-health/adhd/resources/vanderbilt-assessment-scales

Resources for Patients

Centers for Disease Control and Prevention
Is It ADHD? – Symptom Checklist - Print symptoms checklist to complete later
Is It ADHD? – Symptom Checklist - Print symptoms checklist to complete later (Spanish version)
Learn the Signs, Act Early - Print form in English and Spanish

Learning Disabilities Association of America (LDA)
Provides professionals, parents and teachers with information on learning disabilities, practical solutions, and a network of resources.

National Center for Learning Disability
Connects parents with essential resources, provides educators with evidence-based tools and engages advocates in public policy initiatives to improve the lives of children and adults with learning disabilities.

ParentsMedGuide.org
ADHD medication guide for parents. Resources developed by the American Psychiatric Association and the American Academy of Child and Adolescent Psychiatry.

Vanderbilt Diagnostic Teacher Rating Scale
A rating scale with two components: symptom assessment and impairment of performance in school, to screen for symptoms of ADHD.

Measures Commonly Used by National Organizations (for purpose for maintenance treatment)
• ADHD Initiation Phase: percentage of members 6 to 12 years of age with an ambulatory prescription dispensed for ADHD medication who had one follow-up visit with a practitioner with prescribing authority during the 30-day initiation phase. *(HEDIS, MU2)*
• ADHD Continuation and Maintenance Phase: percentage of members 6 to 12 years of age with an ambulatory prescription dispensed for ADHD medication who remained on the medication for at least 210 days and who, in addition to the visit in the initiation phase, had at least two follow-up visits with a practitioner within 270 days (9 months) after the initiation phase ended. *(HEDIS, MU2)*

High Risk Populations/Disparities
• All practitioners need to be aware that there are racial and ethnic disparities in the diagnosis and treatment of ADHD, even though prevalence likely does not differ (e.g. Children from racial and ethnic minorities may be less likely to be diagnosed and treated for ADHD).
• In a national survey, reported rates of identified ADHD and the use of any prescription medication were lower in Hispanic and African-American children, compared to white children. In another study, prevalence did not differ in different groups, but medication use was lower in non-Whites. "Attitudes and perceptions about mental health care, language barriers, parental knowledge about ADHD, and access to and cost of treatment are among the cultural disparities that result in a considerable level of unmet need." 1

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