

Attention-Deficit Hyperactivity Disorder

ADHD Guideline Team

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These guidelines should not be construed as including all proper methods of care or excluding other acceptable methods of care reasonably directed to obtaining the same results. The ultimate judgment regarding any specific clinical procedure or treatment must be made by the physician in light of the circumstances presented by the patient.

Patient population. Children age 6 to 18 years. Children 3 -5 years and adults may be treated for ADHD, as discussed (see Special Populations).

- Objectives.**
1. Recognize and treat ADHD early in the primary care setting.
 2. Identify appropriate treatment options and drug side effects.
 3. Identify common co-morbidities and indications for referral.
 4. Identify appropriate support resources for patients and their families.

Key Points

Epidemiology

Common. ADHD is the most common behavioral disorder in school-age children. Studies demonstrate a U.S. community prevalence of 8-12%. It is more common in boys.

Primary care provider. Most children with ADHD will receive most or all of their care through primary care physicians.

Diagnosis

Types. Diagnosis is based on the DSM-IV criteria (see Tables 3 & 4). The three main types are primary hyperactive, primary inattentive, and mixed.

Multiple sources. No specific test can make the diagnosis. Input from both parents and teachers is required. Some psychological rating tools are useful (e.g., Vanderbilt, Connors; see Figure 1, Tables 1 & 2, and Appendix A1). Formal neuropsychiatric testing may be useful in certain situations.

Confused and associated conditions. Diagnosis is complicated by overlapping symptoms or co-occurrence of other disorders (e.g., anxiety disorders, bipolar disorder, fetal alcohol syndrome, major depressive disorders, learning disorders, oppositional defiant disorder, post traumatic stress disorder, reactive attachment disorder; see Appendices B1 & B2).

Treatment

Drug treatment

- Stimulants are the first line treatment and have proven benefit to most people. If one class of stimulant fails or has unacceptable side effects then another should be tried (see Tables 5-7).
- Atomoxetine (Strattera®) is a secondary choice. (One reported side effect is suicidal thinking.)
- Other medications may be used alone or in combination depending upon the ADHD type or comorbidity profile: e.g., Alpha-II agonists (clonidine, guanfacine) with hyperactivity or impulsivity; bupropion (over age 8) with co-morbid depression; risperidone (atypical antipsychotic) for aggression (see Table 8).
- Tricyclic antidepressants may rarely be used to treat ADHD; SSRIs may be useful for depressive disorders. (There is a reported increase of suicidal ideation for SSRIs but SSRIs are not used to treat ADHD.)

Non-pharmacologic treatments

- Parental interventions: education and support, parent training class, family therapy (see Table 9 and Appendix A2)
- Behavioral interventions: routines and clear limits; positively reinforce target behaviors
- School interventions: consider evaluation for intelligence testing (IQ) and to rule out learning disorders. Affected children may qualify for special education services and an individualized education plan (IEP) (see Appendices A3 & A4).

Special Populations or Circumstances

Special considerations apply to: 3 to 5 year olds, adolescents, head-injured patients, mentally retarded/autistic patients, fetal alcohol syndrome, substance-abusing patients (see Appendix B3).

Controversial Areas

Common myths. Several common beliefs related to ADHD are untrue, e.g., that it is not a real disorder, it is an over-diagnosed disorder, children with ADHD are over-medicated.

Diets. Although a few studies suggest dietary modification may have promise (e.g., individually tailored hypoallergenic diets, essential fatty acids, flax seed), studies have shown the Feingold diet and modifying sugar consumption have no effect.

Complementary Alternative Medicine. Use is controversial, but common (see Appendix B4).

* Levels of evidence reflect the best available literature in support of an intervention or test:

A=randomized controlled trials; B=controlled trials, no randomization; C=observational trials; D=opinion of expert panel.

Figure 1. Diagnosis and Evaluation of the Child with Attention-Deficit/Hyperactivity Disorder

(Based on American Academy of Pediatrics, 5/00)

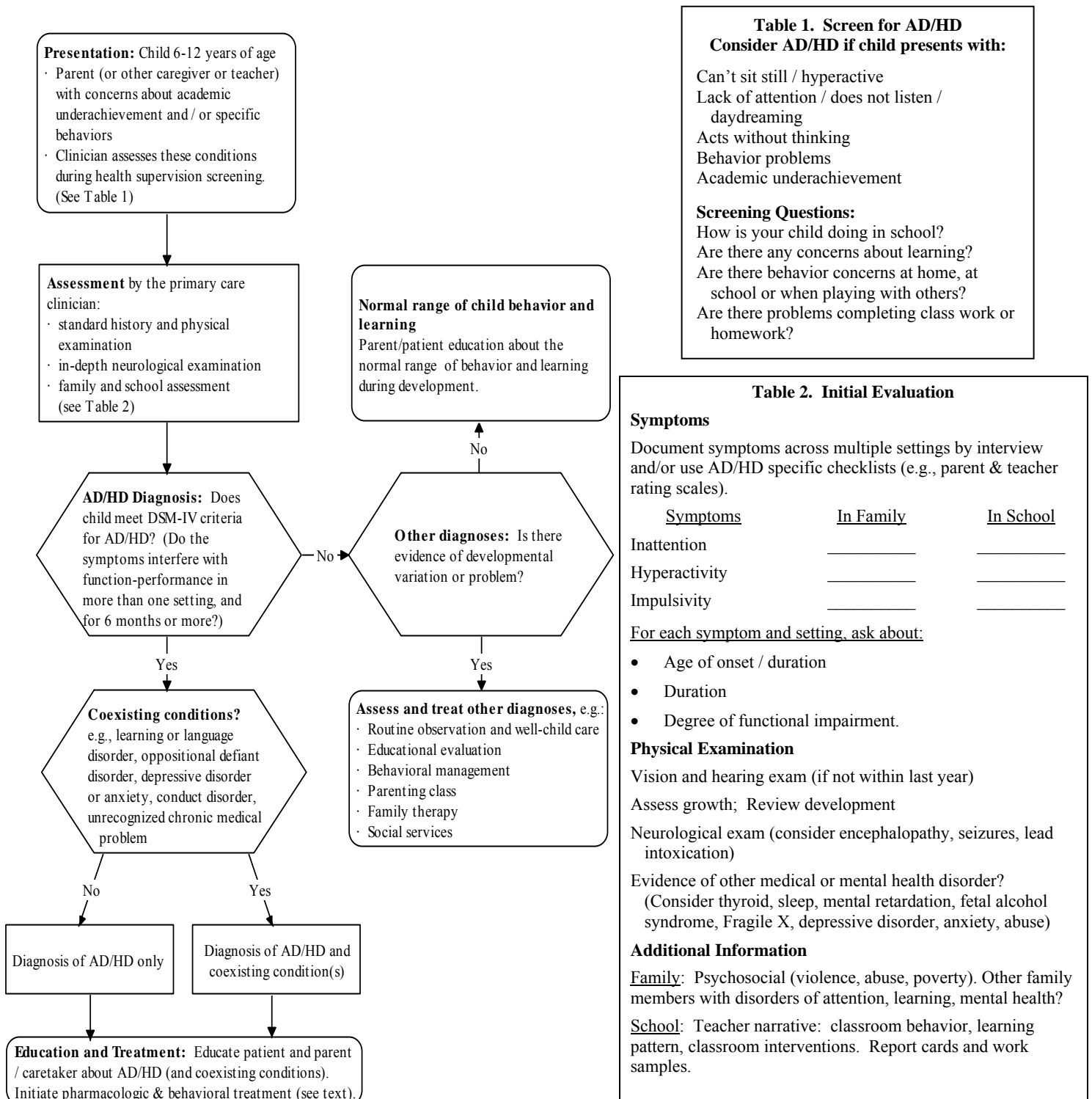


Table 1. Screen for AD/HD
Consider AD/HD if child presents with:

- Can't sit still / hyperactive
- Lack of attention / does not listen / daydreaming
- Acts without thinking
- Behavior problems
- Academic underachievement

Screening Questions:

- How is your child doing in school?
- Are there any concerns about learning?
- Are there behavior concerns at home, at school or when playing with others?
- Are there problems completing class work or homework?

Table 2. Initial Evaluation

Symptoms

Document symptoms across multiple settings by interview and/or use AD/HD specific checklists (e.g., parent & teacher rating scales).

Symptoms	In Family	In School
Inattention	_____	_____
Hyperactivity	_____	_____
Impulsivity	_____	_____

For each symptom and setting, ask about:

- Age of onset / duration
- Duration
- Degree of functional impairment.

Physical Examination

Vision and hearing exam (if not within last year)

Assess growth; Review development

Neurological exam (consider encephalopathy, seizures, lead intoxication)

Evidence of other medical or mental health disorder?
(Consider thyroid, sleep, mental retardation, fetal alcohol syndrome, Fragile X, depressive disorder, anxiety, abuse)

Additional Information

Family: Psychosocial (violence, abuse, poverty). Other family members with disorders of attention, learning, mental health?

School: Teacher narrative: classroom behavior, learning pattern, classroom interventions. Report cards and work samples.

Table 3. DSM-IV Diagnostic Criteria for ADHD

<p>A. Either 1 or 2</p> <p>1) Six (or more) of the following symptoms of inattention have persisted for at least 6 months to a degree that is maladaptive and inconsistent with developmental level:</p> <ul style="list-style-type: none"> a) Often fails to give close attention to details or makes careless mistakes in schoolwork, work, or other activities b) Often has difficulty sustaining attention in tasks or play activities c) Often does not seem to listen when spoken to directly d) 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) Often has difficulty organizing tasks and activities f) Often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (such as schoolwork or homework) g) Often loses things necessary for tasks or activities (e.g., toys, school assignments, pencils, books, or tools) h) Is often easily distracted by extraneous stimuli i) Is often forgetful in daily activities <p>2) Six (or more) of the following symptoms of hyperactivity-impulsivity have persisted for at least 6 months to a degree that is maladaptive and inconsistent with developmental level:</p> <p><i>Hyperactivity</i></p> <ul style="list-style-type: none"> a) Often fidgets with hands or feet or squirms in seat b) Often leaves seat in classroom or in other situations in which remaining seated is expected c) Often runs about or climbs excessively in situations in which it is inappropriate (in adolescents or adults, may be limited to subjective feelings of restlessness) d) Often has difficulty playing or engaging in leisure activities quietly e) Is often "on the go" or often acts as if "driven by a motor" f) Often talks excessively <p><i>Impulsivity</i></p> <ul style="list-style-type: none"> a) Often blurts out answers before questions have been completed b) Often has difficulty awaiting turn c) Often interrupts or intrudes on others (e.g., butts into conversations or games) <p>B. Some hyperactive-impulsive or inattentive symptoms that caused impairment were present before 7 years of age.</p> <p>C. Some impairment from the symptoms is present in 2 or more settings (e.g., at school [or work] or at home).</p> <p>D. There must be clear evidence of clinically significant impairment in social, academic, or occupational functioning.</p> <p>E. The symptoms do not occur exclusively during the course of a pervasive developmental disorder, schizophrenia, or other psychotic disorder and are not better accounted for by another mental disorder (e.g., mood disorder, anxiety disorder, dissociative disorder, or personality disorder).</p> <p>Code based on type (assuming criteria B–E are also met):</p> <p>314.01 Attention-Deficit Hyperactivity Disorder, Combined Type: if both criteria A1 and A2 are met for the past 6 months.</p> <p>314.00 Attention-Deficit Hyperactivity Disorder, Predominantly Inattentive Type: if criterion A1 is met but criterion A2 is not met for the past 6 months.</p> <p>314.01 Attention-Deficit Hyperactivity Disorder, Predominantly Hyperactive, Impulsive Type: if criterion A2 is met but criterion A1 is not met for the past 6 months.</p>
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Table 4. DSM-IV Criteria for ADHD Subtypes

Differentiating ADHD Subtypes:	Required Regardless of Subtype:
<p>Inattentive type (primarily): ADHD/I, meeting at least 6 of 9 inattention behaviors</p> <p>Hyperactive-impulsive type: ADHD/HI, meeting at least 6 of 9 hyperactive-impulsive behaviors</p> <p>Combined type: ADHD/C, meeting at least 6 of 9 behaviors in both the inattention and hyperactive-impulsive lists</p>	<p>Behavioral symptoms</p> <ul style="list-style-type: none"> • Onset before 7 years of age • Duration of at least 6 months • Occur in 2 or more settings (e.g., home, school) • Result in functional impairment (e.g., social, academic)

Table 5. First Line Drug Therapy for ADHD

Generic Name Brand Name, Dosage Strength	Onset of Action (min)	Duration of Effect on Behavior (hrs)	Usual Prescribing Schedule Starting dose – Maximum Recommended Dose	30-day Cost ¹		Drug Class Comments
				Generic	Brand	
Stimulants: Short-Acting (Immediate-Release)²						
Methylphenidate Ritalin® 5, 10, 20 mg Methylin® 5, 10, 20 mg	20 to 30 20 to 30	3 to 6 3 to 6	5-20 mg BID-TID. Increase dose by 5-10 mg/d weekly, max 60 mg/d.	\$18-47 \$18-47	\$33-100 \$18-56	<ul style="list-style-type: none"> ▪ Take with/after meals ± 30 minutes ▪ Methylin® also available as chewable tablets
Dexmethylphenidate Focalin® 2.5, 5, 10 mg	30	3 to 6	2.5-10 mg BID. Increase dose by 2.5-5 mg/d weekly, max 20 mg/d.	Generic not available	\$31-64	<ul style="list-style-type: none"> ▪ Take with/after meals ± 30 minutes ▪ Dose is 1/2 that of short-acting MPH (on a mg-to-mg basis)
Mixed Amphetamine Salts Adderall® 5, 7.5, 10, 12.5, 20, 30 mg	30	5 to 7	5-15 mg BID or 5-10 mg TID. (For patients 3 to 5 years old, begin with 2.5 mg daily). Increase dose by 2.5 mg/d (3 to 5 y/o) or 5 mg/d (6 to 12 y/o) weekly, max 40 mg/d.	\$60-90	\$113-170	<ul style="list-style-type: none"> ▪ Take with/after meals ± 30 minutes ▪ Not recommended if structural heart defects, or if a family history of sudden unexpected cardiovascular death
Dextroamphetamine Dexedrine® 5 mg DextroStat® 5, 10 mg	20 to 60 20 to 60	4 to 6 4 to 6	5-15 mg BID or 5-10 mg TID. (For patients 3 to 5 years old, begin with 2.5 mg daily). Increase dose by 2.5 mg/d (3 to 5 y/o) or 5 mg/d (6 to 12 y/o) weekly, max 40 mg/d.	\$15-27 \$15-27	\$25-75 \$14-41	<ul style="list-style-type: none"> ▪ Take with/after meals ± 30 minutes ▪ Not recommended if structural heart defects, or if a family history of sudden unexpected cardiovascular death
Stimulants: Intermediate-Acting (Sustained-/Extended-Release)²						
Methylphenidate Ritalin-SR® 20 mg Methylin® ER 20 mg Metadate® ER 20 mg	60 to 90 60 to 90 60 to 180	3 to 8 (highly variable)	20-40 mg daily or 40 mg in am, and 20 mg in early afternoon. Increase dose by 20 mg/d weekly, max 60 mg/d.	\$27-50 \$27-50 \$27-50	\$51-101 \$30-60 \$29-57	<ul style="list-style-type: none"> ▪ Take with/after meals ± 30 minutes ▪ Supplementation with short-acting MPH may still be necessary ▪ Do not crush/chew/divide
Dextroamphetamine Dexedrine Spansules® 5, 10, 15 mg	60 to 90	6 to 10 (highly variable)	5-30 mg daily or 5-15 mg BID. (For patients 3-5 years old, begin with 2.5 mg daily). Increase dose by 2.5 mg/d (3-5 years old) or 5 mg/d (6-12 years old) weekly, max 40 mg/d	\$18-57	\$30-95	<ul style="list-style-type: none"> ▪ Take with/after meals ± 30 minutes ▪ Not recommended if structural heart defects, or if a family history of sudden unexpected cardiovascular death ▪ Drug release is variable-supplementation with short-acting dextroamphetamine may still be necessary ▪ Capsule contents may be sprinkled on food

(Continued on next page)

Table 5. First Line Drug Therapy for ADHD, continued

Generic Name Brand Name, Dosage Strength	Onset of Action (min)	Duration of Effect on Behavior (hrs)	Usual Prescribing Schedule Starting dose – Maximum Recommended Dose		30-day Cost ¹		Drug Class Comments
					Generic	Brand	
Stimulants: Long-Acting (Once-Daily)²							
Methylphenidate Ritalin® LA, 10, 20, 30, 40 mg	1.8 hrs	7 to 9	20-60 mg. Increase dose by 10 mg/d weekly, max 60 mg/d.		Generic not available	\$73-159	<ul style="list-style-type: none"> ▪ Take with/after meals ± 30 minutes ▪ Do not crush/chew/divide ▪ Capsule contents may be sprinkled on applesauce³
Metadate® CD 10, 20, 30 mg	90	7 to 9	20-60 mg daily. Increase dose by 20 mg/d weekly, max 60 mg/d.		Generic not available	\$62-124	<ul style="list-style-type: none"> ▪ Do not crush/chew/divide ▪ Capsule contents may be sprinkled on food
Concerta® 18, 27, 36, 54 mg	30 to 60	8 to 12	18-72 mg daily. Increase dose by 18 mg/d at weekly intervals, max 54 mg/d.		Generic not available	\$86-181	<ul style="list-style-type: none"> ▪ Do not crush/chew/divide ▪ Tablet shell may appear in stool
Mixed Amphetamine Salts Adderall XR® 5, 10, 15, 20, 25, 30 mg	30	8 (approx)	10-30 mg daily. Increase dose by 5-10 mg/d weekly, max 30 mg/d.		Generic not available	All strengths: \$93	<ul style="list-style-type: none"> ▪ Take with/after meals ± 30 minutes ▪ Capsule contents may be sprinkled on applesauce² ▪ Not recommended if structural heart defects, or if a family history of sudden unexpected cardiovascular death
Non-Stimulants							
Atomoxetine (Strattera®) 10, 18, 25, 40, 60 mg	Slow onset	~ 24	≤70 kg 0.5 mg/kg/day; increase after a minimum of 3 days to 1.2 mg/kg/d, max 1.4 mg/kg/d or 100 mg, whichever is less	>70 kg 40 mg/day; increase after a minimum of 3 days to 80 mg/day, max 100 mg/d.	Generic not available	All strengths: \$93-186	<ul style="list-style-type: none"> ▪ When transitioning from stimulants to atomoxetine, cross-taper (i.e., decrease stimulant gradually while increasing dose of atomoxetine) ▪ Dosage adjustments are required for patients concurrently taking CYP2D6 inhibitors and those with hepatic insufficiency⁴ ▪ 1.6 to 1.8 mg/kg/d may be warranted in some pts. ▪ Not recommended for children <6 yrs old.

Note: Consider referral to child psychiatry for use in children <5 yrs old

¹ For brand drugs, Average Wholesale Price minus 10%. AWP from Amerisource Bergen Wholesale Catalog 4/13/05. For generic drugs, Maximum Allowable Cost plus \$3 from BCBS of Michigan MAC List, 1/31/05.

² Stimulants are not recommended for children < 3 years old

³ The applesauce should not be warm; mixture of drug and applesauce should be consumed immediately, and should not be stored for future use.

⁴ For patients concurrently taking CYP2D6 inhibitors (e.g., fluoxetine, citalopram, sertraline, paroxetine, bupropion) the dose should be increased only if symptoms fail to improve after 4 weeks and the initial dose is well-tolerated; for patients with moderate hepatic insufficiency (Child-Pugh Class B), initial and target doses should be reduced to 50% of the normal dose; for patients with severe hepatic insufficiency (Child-Pugh Class C), initial dose and target doses should be reduced to 25% of the normal dose..

Table 6. Adverse Effects of Stimulants and Non-Stimulants Used in Treatment of ADHD

Generic Name [Brand Name]	Drug Class Side Effects/Monitoring Parameters
Stimulants	
For all stimulants	
<u>Methylphenidate</u>	
Short-Acting (Immediate-Release) [Ritalin®, Methylin®] Intermediate-Acting (Sustained/Extended Release) [Ritalin-SR®, Methylin® ER, Metadate® ER] Long-Acting (Once-Daily) [Ritalin® LA, Metadate® CD, Concerta® ¹]	<ul style="list-style-type: none"> ▪ Anorexia, insomnia, abdominal pain/stomach upset, headaches, irritability, rebound, flattened affect, social withdrawal, weepiness, mood lability, tics, tremor, weight loss, reduced growth velocity. ▪ Monitor height, weight, blood pressure, and pulse
<u>Dexmethylphenidate</u>	
Short-Acting (Immediate-Release) [Focalin®]	<ul style="list-style-type: none"> ▪ Avoid decongestants ▪ Rare: visual hallucinations, seizures.
<u>Mixed Amphetamine Salts</u>	
Short-Acting (Immediate-Release) [Adderall®] Long-Acting (Once-Daily) [Adderall XR®]	<ul style="list-style-type: none"> ▪ Sudden death has been reported in association with amphetamine treatment at usual doses in children with structural cardiac abnormalities. Adderall should be avoided in these children
<u>Dextroamphetamine</u>	
Short-Acting (Immediate-Release) [Dexedrine®, DextroStat®] Intermediate-Acting (Sustained/Extended Release) [Dexedrine Spansules®]	<ul style="list-style-type: none"> ▪ Dextroamphetamine not recommended if structural heart defects, or if a family history of sudden unexpected cardiovascular death
Non-Stimulants	
Atomoxetine [Strattera®]	<ul style="list-style-type: none"> ▪ Liver injury. Discontinue in patients with elevated liver enzymes. ▪ Abdominal pain, decrease in appetite, vomiting, headaches, insomnia, somnolence, dizziness, irritability, increase in heart rate and blood pressure ▪ Monitor blood pressure and pulse ▪ Dosage adjustments are necessary for patients taking CYP450 2D6 inhibitors and poor metabolizers (PMs) of CYP2D6. (PMs can be identified by testing.) ▪ Increase in suicidal ideation (↑0.4% FDA review 9.05).

¹Theoretical potential for GI obstruction with Concerta® (tablet is non-deformable); do not use in patients with severe GI narrowing.

Table 7. Guidelines for Switching Stimulant Medications

(Adopted from Pediatrics in Review, 22[6], 2001)

Short-Acting to Intermediate-Acting		Short-/Intermediate-Acting to Long-Acting		Other Equivalents	
Dextroamphetamine 5 mg bid 10 mg bid	Dexedrine Spansule ® 10 mg daily 15 mg plus 5 mg tab or 20 mg daily	Methylphenidate 10 mg bid, or 20 mg SR 15 mg bid 20 mg bid, or 40 mg SR	Ritalin LA® 20 mg daily 30 mg daily 40 mg daily	Methylphenidate 5 mg bid 10 mg bid 15 mg bid	Adderall ® 2.5 mg bid 5 mg bid 7.5 mg bid
Methylphenidate 5 mg bid 10 mg bid 15 mg bid	Ritalin SR®* 20 mg daily 20 mg + 10 mg tablet daily 40 mg daily	Methylphenidate 5 mg bid or tid, or 20 mg SR 10 mg bid or tid, or 40 mg SR 15 mg bid or tid, or 60 mg SR	Concerta™ 18 mg daily 36 mg daily 54 mg daily	Ritalin SR® 20 mg daily 40 mg daily 60 mg daily	Adderall ® 5 mg bid 10 mg bid 15 mg bid

*Supplementation with a small dose of IR MPH may still be necessary throughout the day due to variability in drug release

Table 8. Second Line Drugs for Treatment of ADHD

(Adapted from Miller KJ, Castellanos FX. Attention deficit / hyperactivity disorders. Pediatrics in Review; 1998, 19(11):373-384)

Medication	Indications	Dose Schedule	Range	Cost*	Drug Class Side effects / Comments
Antidepressants					
Bupropion Wellbutrin ® 75, 100 mg Wellbutrin SR ® 100, 150 mg (twice-daily formulation) Wellbutrin XL® 150, 300 mg (once-daily formulation)	ADHD with intolerance to stimulants (esp. due to decreased appetite) ADHD with depression, aggression, irritability Smoking cessation In consultation with a child psychiatrist, may be used for: Mood lability Aggression, Depression	<u>Children 8-12 years:</u> Initial: 75mg/day Increase: every 1-2 weeks: 75-100mg/d, then 75 mg BID, then 75+100mg daily, then 100mg BID, then 75+150mg daily or for children >20kg: 1 mg/kg/d, then 3 mg/kg/d at week 1, then 6 mg/kg/d or 300 mg (whichever is less) at week 3 <u>Adolescents:</u> Initial (immediate-release): 100 mg BID Initial (sustained-release): 1.5 – 2 mg/kg/d or 100 – 150 mg in morning Increase: 50-100 mg or 0.5 mg/kg to 1 mg/kg every 1 to 2 weeks <u>Frequency</u> (children and adolescents) IR: usually BID, sometimes TID SR: BID. May begin with once daily and titrate to BID XL: daily. Begin with IR or SR, change to XL after determining optimal dose Must be taken daily	75 to 300 mg/d	\$12-38 generic \$35-141 brand \$41-84 generic \$56-122 brand NA generic \$87-114 brand	<ul style="list-style-type: none"> ▪ Black Box Warning: Risks for changes in behavior, hostility, agitation, depressed mood, suicidal ideation, and attempted and completed suicide. ▪ Agitation, dry mouth, insomnia, headaches, nausea, constipation, tremor ▪ Lowers seizure threshold ▪ Contraindicated in patients who have Bulimia or anorexia Nervosa ▪ Avoid bedtime administration ▪ May be used in combination with stimulants for poorly responsive cases ▪ SR tablets may be split, but not crushed/chewed; tablets should be used soon after spitting to avoid chemical degradation ▪ Taper over 1 to 2 weeks ▪ Efficacy of XR product has not been evaluated in ADHD ▪ Take care not to give >150mg within an 8 hour interval. Patients should be advised not to double doses if they miss a dose. ▪ Consider referral to child psychiatry for use in children <8 yrs old
Imipramine Tofranil ® or generic 10, 25, 50 mg tablets	ADHD + tics ADHD + Enuresis Enuresis ADHD + depression or anxiety	Initial: 10 to 25 mg or 0.5 mg/kg bedtime Increase: 10 to 25 mg every 5-7 days up to 3 mg/kg per day Frequency: 2 to 3 doses/day Must be taken daily. Stop slowly	25 to 100 mg/d 1 to 3 mg/kg per day Monitor blood levels	\$14 -31 generic \$71-243 brand	<ul style="list-style-type: none"> ▪ Constipation, fatigue, stomach upset, dry mouth, blurry vision, dizziness, tachycardia ▪ May affect cardiac conduction rate – contraindicated in children with cardiovascular disease or cardiac arrhythmias ▪ Increased levels with methylphenidate ▪ Monitor blood pressure and heart rate ▪ Obtain ECG at baseline and with dose changes ▪ Consider referral to child psychiatry for use in children <5 yrs old
(Continued on next page)					

Table 8. Second Line Drugs for Treatment of ADHD, continued

Medication	Indications	Dose Schedule	Range	Cost*	Drug Class Side effects / Comments
Antidepressants (continued)					
Nortriptyline Pamelor ® or generic 10, 25, 50 75 mg tablets; 10mg/5 mL liquid	ADHD + tics ADHD + depression or anxiety	Initial: 10 to 25 mg at bedtime Increase: Up to 2 mg/kg per day Frequency: Once or twice a day	1.0 to 2.0 mg/kg per day Monitor blood levels	\$6-7 generic \$76-304 brand	<ul style="list-style-type: none"> ▪ Dry mouth, constipation, weight gain ▪ Use with caution in children with cardiovascular disease or cardiac arrhythmias ▪ Monitor blood pressure and heart rate ▪ ECG baseline and with dose changes ▪ Helpful for headache and pain treatment ▪ Consider referral to child psychiatry for use in children <8 yrs old
Antihypertensives					
Clonidine Catapres ® or generic 0.1, 0.2, 0.3 mg tablets Available as a patch	ADHD + tics ADHD + Post traumatic stress disorder (PTSD) PTSD Insomnia, Oppositionality Hyperarousal, Aggression	Initial: 0.05 mg HS Increase: 0.05 mg every 3 to 7 days Frequency: 3 to 4 doses/day for ADHD , but may be given just at HS for PTSD, insomnia Must be taken daily, caution parents not to give prn if using for insomnia Maximum effect may take several weeks Start and stop slowly	0.05-0.2 mg/d	\$7-8 generic \$27-81 brand	<ul style="list-style-type: none"> ▪ Sedation (50%), dizziness, anorexia, orthostatic hypotension, depression, nightmares, enuresis ▪ Sedation tends to decrease over time ▪ Rebound hypertension and/or rebound insomnia if stopped abruptly ▪ Monitor blood pressure: baseline, after dose adjustment, and at follow up. ▪ Baseline EKG advisable ▪ 4 cases of sudden death have been reported with combination treatment of Clonidine + methylphenidate ▪ Taper over at least 1-2 weeks to discontinue ▪ Consider referral to child psychiatry for use in children <5 yrs old
Guanfacine Tenex ® or generic 1,2 mg tablets (limited data available)	ADHD + tics ADHD + PTSD PTSD Insomnia, Oppositionality Hyperarousal, Aggression	Initial: 0.5 mg HS Increase: 0.5 mg/week Give as one to two doses/day Takes several days to weeks to take effect	0.5 to 3 mg/d	\$11-27 generic \$76-226 brand	<ul style="list-style-type: none"> ▪ Sedation (less than Clonidine), dizziness, nausea, orthostatic hypotension, insomnia, agitation, headaches, stomach aches, enuresis ▪ Monitor blood pressure: baseline, after dose adjustment, and at follow-up ▪ Baseline EKG is advisable ▪ Consider referral to child psychiatry for use in children <5 yrs old
(Continued on next page)					

Table 8. Second Line Drugs for Treatment of ADHD, continued

Medication	Indications	Dose Schedule	Range	Cost*	Drug Class Side effects / Comments
Drugs Sometimes Used to Augment Treatment of ADHD (e.g., Antipsychotic Medications, Trazodone)					
Risperidone Risperdal ® or generic 0.25, 0.5, 1, 2, 3, 4 mg tablets Available as orally disintegrating tablets (Risperdal M-tab - no generic) in 0.5, 1, and 2 mg Available as a liquid 1 mg/cc	ADHD + tics ADHD + aggression ADHD + mood swings ADHD + severe insomnia, aggression, and/or hyperactivity	Initial: 0.5 mg HS Increase: 0.5 mg BID after 3 to 7 days and then by 0.5 mg/day up to 1 mg BID Frequency: 1 - 2 doses/day for aggression/severe mood swings, but may be given just at HS. Must be taken daily. Maximum effect may take 1 -2 weeks Start and stop slowly	0.5 to 2 mg/d	no generic \$99-165 brand	<ul style="list-style-type: none"> ▪ Sedation, orthostatic hypotension, orthostatic tachycardia, dizziness, increased appetite, metabolic syndrome (hyperglycemia, insulin resistance, hypercholesterolemia, hypertriglyceridemia), akathisia, dystonic reaction, tardive dyskinesia, extrapyramidal symptoms, neuroleptic malignant syndrome, hyperprolactinemia, ▪ Sedation tends to decrease over time ▪ Monitor weight, glucose, cholesterol, triglycerides, and liver function studies at least yearly. ▪ Baseline liver function panel advisable ▪ Consider referral to child psychiatry, especially if more than 1-2 months treatment is required, and/or in children < 5 yrs old. ▪ Fluoxetine, paroxetine (other CYP2D6 inhibitors) may increase serum levels of risperidone ▪ QT prolongation has been reported
Trazodone Desyrel ® or generic 50, 100 mg tablets	ADHD + insomnia ADHD + Hyperactivity and/or Aggression	Initial: 25 mg q HS Increase: 25 mg/week up to 200 mg per day. Give as one to three doses/day Takes several days to weeks to take effect	25 to 200 mg/d	\$5-9 generic \$59-205 brand	<ul style="list-style-type: none"> ▪ Sedation, dizziness, orthostatic hypotension. ▪ Monitor blood pressure and heart rate: baseline, after dose adjustment, and at follow-up. ▪ Consider referral to child psychiatry for use in children <5 yrs old. ▪ Fluoxetine, sertraline (other CYP3A4 inhibitors) may increase serum levels of trazodone

For brand drugs, Average Wholesale Price minus 10%. AWP from Amerisource Bergen Wholesale Catalog 4/13/05. For generic drugs, Maximum Allowable Cost plus \$3 from BCBS of Michigan MAC List, 1/31/05.

Table 9. Types of Intervention for ADHD

Pharmacotherapy	See above.
Psychoeducation and Support	Have printed materials handy to distribute to patients, families, and schools regarding diagnosis, medications, and treatment/support services. Be prepared to give lecture presentations to schools and community agencies. (See internet sources for handouts in text section on “Behavioral management.”)
Parent Skills Training	Such training may occur in formal groups and classes, through reading books and through individual counseling.
Family Therapy	This may be particularly useful for families with very severely disruptive children and families with adults who suffer from ADHD.
ADHD Support Groups	These groups may be available in your local area through CHADD (Children and Adults with Attention Deficit Disorder) or other groups. Support groups allow parents to connect and share with other parents who have similar concerns about their children. Often, ADHD support groups sponsor lectures and reading materials along with the group meetings.
Advocacy Groups	These groups help parents learn about the legal rights their children have with regard to educational settings and special education services. One such group is PACER (Parent Advocacy for Children’s Educational Rights).
Social Skills Training	This training often uses role-play, modeling and group feedback to teach children practical interpersonal skills in a safe-setting. Such skills include: maintaining eye contact, strategies for initiating and maintaining conversations, remembering to share and cooperate, how to read facial expressions and judge an appropriate response.
Cognitive Behavioral Therapy	This work often focuses on becoming more reflective, learning to stop and think before acting or speaking and learning to improve problem solving skills.
School Consultations/ Interventions	This includes composing letters with diagnoses, medications, and recommendation; obtaining baseline and follow-up information about school performance and response to treatment, attendance at IEP meetings.
Alternative/Complementary Treatments	See below.

Clinical Background

Clinical Problem and Current Dilemma

Prevalence and Impact

Attention deficit hyperactivity disorder (ADHD) is the most commonly diagnosed behavioral disorder of childhood. Community based surveys show a prevalence of approximately 10%. School and office based surveys are somewhat lower [C]. It is more commonly diagnosed among boys. In girls the inattentive type is more common. The core symptoms include developmentally inappropriate levels of attention, concentration, activity, distractibility, and impulsivity that persist over a period of at least six months. Children with ADHD usually have functional impairment across multiple settings including home, school, and peer relationships. These children experience long-term adverse effects on academic performance, vocational success, and social-emotional development [B]. They experience peer rejection, engage in disruptive behavior and

are frustrated learners. They have higher injury rates. Untreated, they have higher rates of MVA, substance abuse, school drop out [B]. Some of these children may qualify for special education services under the OHI (otherwise health impaired) classification or Section 504 of the Rehabilitation Act. All children benefit from teacher awareness and educational support [D].

International statistics are difficult to compare due to varying clinical definitions of the disorder, use of different assessment tools and differing cultural definitions of acceptable childhood behavior. Prevalence rates in studies from Canada (9% for boys, 3.3% for girls), China (3%), Puerto Rico (9.5% - 16.2%), Israel (5%) and Spain (16%) demonstrate marked variability. Ethnic comparisons in the U.S. demonstrate higher prevalence in African-American children compared to White or Hispanic children. Lower rates are observed in Asian-American children [C].

Primary Care Role

Most patients will present to their primary care provider, generally with concerns about school performance and/or behavioral problems. Depending upon the presentation and potential co-morbidities, the primary care provider may be able to establish the diagnosis, institute appropriate therapy and follow up. Screening questions are useful in identifying potential patients with this disorder. The most common therapy is stimulant medication. These schedule II medications must be prescribed monthly. This is most conveniently done by the primary provider. The provider will need to arrange for consultation in more complex diagnostic or management situations. Lack of insurance coverage is a barrier to specialty care. There are no documented strategies for the prevention of ADHD. Currently there is no cure. This chronic condition persists into adulthood in about one-third of individuals.

Diagnostic Concerns

ADHD is both under- and over-diagnosed. The high prevalence of co-morbidities is often confusing. Diagnosis requires more extensive evaluation than is usually possible in a 15 minute office visit. It requires observational information from classroom teacher and parents. ADHD is a behaviorally based diagnosis currently without clinically useful biologic measurements.

Although there is no diagnostic test for ADHD, the 1998 National Institutes of Health Consensus Statement on ADHD concluded: "there is evidence supporting the validity of the disorder." In their 1998 study published in JAMA, Goldman et al. state "ADHD is one of the best researched disorders in medicine and overall data on its validity are far more compelling than those for most mental disorders and even for many medical conditions."

Treatment Concerns

Concern has been expressed by some that providers are too quick to label patients with ADHD and prescribe medication. There are accepted standards for diagnosis and treatment. Long term use of stimulant therapy has not demonstrated any obvious ill effects, through observational data [C]. There are no formal long term studies. Delayed growth may be a concern through mid-adolescence but normalizes by late adolescence. This appears to be an effect of the ADHD and not its treatment; however, the MTA study reported decreased growth with continuous stimulant treatment [A]. "Drug holidays" can be used, but the benefits of this strategy in mitigating growth delays has not been demonstrated in a controlled setting. Failure to treat could result in sub-optimal learning with long-term adverse developmental and physical outcomes. Drug diversion of stimulant medication is a small problem but one the provider must be alert for. This is a chronic condition of childhood for which medication therapy has been shown to be the most effective [A].

Rationale for Recommendations

Etiology & Natural History

While the etiology of ADHD is unknown, converging evidence supports a neurological basis for the disorder. ADHD is characterized by disturbances of executive functioning (e.g., deficits in working memory, inability to plan/organize/integrate). At least three brain regions have been implicated in the disorder. MRI studies have correlated severity of ADHD symptoms with smaller frontal and temporal gray matter, caudate, and cerebellar volumes [B]. More than 20 genetic studies support the tendency for inheritability of ADHD. Specifically, genetic studies have shown increased prevalence of ADHD in children of affected persons.

ADHD is a chronic condition that may persist into adulthood. Symptoms tend to improve with age, although this may be due in part to improved coping skills. Synaptogenesis and myelination continue into adolescence and young adulthood (especially in the frontal lobes), which may also explain improvement of symptoms with age.

Diagnosis

Any child 6-12 years old who presents to their primary care provider with inattention, hyperactivity, impulsivity, academic underachievement, or behavior problems should prompt an evaluation for ADHD. The diagnosis is made using the criteria from the Diagnostic and Statistical Manual of Mental Disorders, fourth edition (DSM-IV), see Tables 3 and 4.

Evaluation (Figure 1 and Tables 1 and 2). The following information must be obtained from both family and educational settings to derive the diagnosis of ADHD: presence and duration of core symptoms (Tables 3 and 4); degree of functional impairment; and any associated conditions. The process of evaluation usually requires multiple visits.

Review the child's growth, development, and the social and medical history for the family.

Perform a complete physical exam to detect alternate diagnoses or comorbidities. Screen for other medical problems. Screen for sensory impairments. Usually the physical exam is normal. The child's attention span, amount of fidgeting, and parental interactions can all be observed over several visits. Absence of hyperactivity in the office does not rule out the diagnosis.

No specific diagnostic test (e.g., blood or neurologic) is necessary or sufficient to establish the diagnosis of ADHD. Blood lead levels, thyroid function tests, brain imaging or electroencephalogram have no discriminative ability in

establishing the diagnosis of ADHD. The use of standardized rating scales for parent- and teacher-report are strongly recommended. A variety of rating scales are available, some are free of charge; however, many are copyrighted and must be purchased, e.g., Child Behavior Checklist, Conners Rating Scales (see Appendix A1).

Commonly confused and associated conditions. ADHD is a common disorder of childhood. In addition, symptoms of ADHD are non-specific and occur in a wide variety of developmental, psychiatric, and medical disorders. Concerns about under- or over- diagnosis of ADHD may relate in part to the presence of conditions that are commonly confused with ADHD, e.g., developmental disorders (learning disorders/disabilities, mental retardation, autistic spectrum disorders), psychiatric disorders (oppositional defiant disorder, anxiety disorders, depressive disorders), environmental factors (stress, child neglect/abuse, toxins), and medical disorders (post-traumatic encephalopathy, post-infectious encephalopathy, chronic illness, seizures, sleep disorders, sensory disorders, drug-induced changes). Specific diagnostic criteria have been developed and published for ADHD (see the Diagnostic and Statistical Manual of Mental Disorders, fourth edition DSM-IV, some relevant definitions are reproduced in Appendix B1). However, ADHD can be very difficult to distinguish from some other childhood disorders. If a child displays symptoms atypical for uncomplicated ADHD, or if the child does not respond to treatment as expected, the primary care physician should strongly consider consultation with an appropriate specialist in ADHD.

ADHD may co-occur with other disorders. According to the MTA study (1999), two-thirds of children with ADHD have at least one other co-morbid disorder. Learning disabilities, depressive disorders, anxiety disorders, and tic disorders are more prevalent in patients diagnosed with ADHD. When co-morbid conditions exist, academic and behavioral problems may be more complex and difficult to treat. One reason for (apparent) treatment failure is unrecognized co-morbidity. Conversely, patients with untreated (or inadequately treated) ADHD are at higher risk for psychiatric and behavioral comorbidity. See Appendix B2 for selected psychiatric disorders that may be confused with or co-occur with ADHD and suggestions for distinguishing between disorders.

Treatment

The goal of treatment is to improve symptoms and maintain school performance, social interaction, self-worth/self-esteem, and a chance for successful learning. Treatment may be considered successful when it improves school performance and relationships, decreases struggles, relieves frustration and anger and improves the poor self-image that these children have developed.

Combine pharmacologic and behavioral treatment. A treatment plan for ADHD should include both

pharmacologic and behavioral components. Pharmacologic treatment improves core symptoms [A]. Behavioral management techniques help normalize behavior, which is particularly important for times when medications (stimulants) are not active (later in the day). Behavioral management can help the 5–20% of children who do not respond to psychostimulants and may allow for lower medication doses in those patients who are on stimulants. Also, parents and teachers report better satisfaction with treatments that include behavioral components.

Although several studies comparing pharmacologic and behavioral treatment found pharmacologic treatment alone to be sufficient, these studies typically focused on short term outcomes. A longer term study (e.g., 24 months) found that over time, the effects of medication alone decreased by 50%. This decrease may result in part from less frequent contact and support. Over the longer term the effects of combined therapy remained more consistent.

Pharmacologic treatment. The treating physician must decide the strategy of pharmacologic treatment based on the circumstances of the individual patient. Typically, the first line agents are psychostimulants (methylphenidate, dextroamphetamines, and mixed amphetamine salts). Atomoxetine is the only non-stimulant medication approved by the FDA for treatment of ADHD. Other non-stimulant medications used for ADHD are some antidepressants (bupropion, tricyclics, trazodone), some antihypertensives (clonidine, tenex), and occasionally atypical antipsychotics (e.g., risperidone) or mood stabilizers (e.g., valproic acid). These are not approved by the FDA for treatment of ADHD, but controlled studies have shown them to be useful when stimulants are ineffective or comorbidities are present; therefore, they may be appropriately prescribed “off label”. Tables 5 – 8 provide an overview of dosing, cost, side effects and other information for first line and second line agents, respectively.

Stimulants. Psychostimulants are the best researched [A], safest and the most effective medication for this purpose. Stimulants improve the core symptoms of inattention, impulsively and hyperactivity. They also improve the child’s ability to follow rules, decrease emotional over-reactivity and improve relationship with peers and family members, thereby improving social interactions and self esteem. The short-term benefits are obvious; but long-term outcomes in educational and occupational achievement and behavior have not been studied. Long-term outcomes on academic performance have not been demonstrated. Decreased risk of substance abuse has been seen in patients with ADHD who are treated with stimulants versus those not treated with stimulants.

The mechanism of action of stimulants is not fully known, but is predominantly attributed to binding of the Dopamine transporter and subsequent inhibition of dopamine reuptake resulting in increased levels of extracellular dopamine. Four types of stimulants are used:

- methylphenidate – Ritalin, Methylin, Methylin ER, Ritalin SR and LA, Metadate ER and CD, Concerta.
- dexamethylphenidate – Focalin (d-threo methylphenidate enantiomer)
- dextroamphetamines – Dexedrine, Dextrostat and Dexedrine spansules
- mixed amphetamine salts – Adderall and Adderall XR

A fifth type, Pemoline (Cylert) is also available but is not recommended as it has been associated with life-threatening hepatic failure.

Methylphenidate (MPH) has been used and studied the most and is the first choice [A] for beginning medical treatment. Mixed amphetamine salts and dextroamphetamine have demonstrated equivalent efficacy to MPH and are usually considered as alternative first-line agents in those patients who fail to respond to MPH. Dexamethylphenidate is composed of the d-threo enantiomer of MPH. Data do not demonstrate that dexamethylphenidate has advantages of efficacy or safety over MPH or other stimulants.

Dosing and formulations. Stimulants are available in several short-, intermediate-, and long-acting forms. There is a wide variation in individual responses. Unlike most pediatric medications, the dosage of stimulants is not weight dependent. Suboptimal doses of stimulant medication may result in inconsistent or incomplete coverage through the day. A therapeutic failure may not be from the failure of the drug itself, but rather from suboptimal dosage.

The intermediate-acting forms of MPH (Ritalin-SR®, Methylin® ER, Metadate® ER) are formulated in a wax matrix core, which may result in unpredictable release of active MPH. Therefore, the durations of action of these formulations are highly variable. This often necessitates supplementation with a short-acting (immediate-release) product for a consistent effect throughout the day. All three formulations are considered therapeutically interchangeable.

The Dexedrine spansule® delivers the initial dose immediately and the remaining medication is released slowly over time so that the therapeutic levels last from 6 to 8 hours.

Ritalin® LA, Metadate® CD and Adderall® XR have a bead delivery system. A proportion of the beads are released initially to provide immediate coverage and a second quota is released approximately four hours later. Concerta® has 3 layers. The central core which is surrounded by a semi-permeable membrane which is then surrounded by an immediate release coating. When the tablet reaches the GI tract, the outer layer dissolves providing the initial dose of MPH. Water then permeates through the semi-permeable membrane (which is the second layer) into the central core of the tablet and helps with release of the rest of the drug.

Supplementation with a single small dose of a short-acting (immediate-release) product may still be needed, even with these long-acting products, either in the morning (Concerta®) or in the evening (Ritalin® LA, Metadate® CD), depending on the choice of long-acting formulation.

Starting stimulant therapy. Since dosage is not based upon the patient's weight, titration is necessary to establish the optimal dose. Titration is easiest with the short acting forms. Start with the lowest dose of a short acting stimulant. Increase the dose on a weekly interval until the desired change in behavior is achieved or the patient develops undesirable side effects. A trial may be started with one dose in the morning. The need for additional doses in the afternoon and evening can be determined depending upon response to treatment and the child's schedule and behavior. Dosages and schedules must be individualized depending on target goals.

Target goals have to be defined for each child, accounting for the child's age, school and home environment. Educational and athletic expectation, after school activities, and cultural factors that affect his health care also need to be considered. Goals should be realistic and achievable.

Studies have shown that 70–75% of patients respond to the first stimulant medication. This number increases to 90–95% when a second stimulant is tried. If the patient does not respond to one stimulant, try a different stimulant. For example, Adderall is a mixed salt with fewer adrenergic side effects than methylphenidate. (Adderall should not be used in patients with a heart defect or a family history of sudden unexpected cardiovascular death.) Management of these medications is complex and failures are often due to improper doses rather than ineffectiveness of the medication.

It may take one to three months to establish the best dose and form of medication for any given patient. During the process of titration, the patient will need frequent follow-up, some of which may be accomplished by phone. The timing and dose of medication are best determined using feedback from patient as well as their parents and teachers who should be advised to screen for side effects and the duration of effectiveness of the medication. Short rating scales may be helpful (Appendix A1).

Maintaining stimulant therapy. When the appropriate dosage has been established, the patient can be switched to a longer acting psychostimulant. The availability of long acting medications has improved compliance. Table 7 has helpful suggestions for the conversion from short-acting to intermediate- and long- acting stimulants.

ADHD is a full time disease. A second dose of a short acting medication given in the afternoon or evening will benefit children that are having difficulty completing their homework. This also helps those children having difficulties in relationships with peers and family members.

For the majority of patients, it is important to continue the medication on weekends and holidays. This also gives the parents an opportunity to observe the effects of the medication and improves the child's interactions with family members.

Side effects of stimulants. Side effects are mostly due to adrenergic activity and are dose dependent. Most side effects can be managed by changing the form of the stimulant or adjusting the dose and timing.

A common side effect of stimulants is appetite suppression, which may result in transient weight loss. Administering the stimulant with or after meals may minimize this side effect. With the exception of a few formulations whose absorption is affected by food, most of the stimulants can be taken without regard to food (see table 5). Difficulty in initiation of sleep may be associated with increased hyperactivity and irritability as the effect of medication wears off. In some children a small dose of a short acting stimulant may help alleviate this symptom. In others addition of a second line agent may become necessary to overcome sleep difficulties. Depression is uncommon but may appear after several months of treatment. The patient may develop sadness, apathy, and loss of interest in activities and suicidal tendencies. Symptoms disappear after discontinuing the medication. Social withdrawal: "Zombie like behavior" may be due to excessive dosage of medication.

Before starting the medication it is important to obtain a history of the patients eating and sleeping patterns, family history of tics and Tourettes disorder, and assess any signs of depression and social withdrawal. Tics may appear in some patients when they are on stimulant medication, and disappear with discontinuation of medication. Rare patients may appear to develop Tourettes disorder when on stimulants; however, in actuality 50% of the patients with Tourettes Disorder also have ADHD which may present 2 to 3 years before the tics appear. It is believed that stimulants do not cause Tourettes (an inherited disorder), it simply unmask the condition. This usually occurs in elementary school age or adolescence.

Concerns have been raised about possible growth suppression in patients with ADHD (with and without stimulant treatment). Recent analysis of the MTA study of patients who have been on medication for 24 months revealed a significant growth suppression in patients on continuous medication compared to a smaller growth suppression in patients not on continuous medication. However 24 month follow up is not sufficient to determine whether this growth suppression is temporary or permanent. Longer follow up is required to address the effect of medication on growth.

Elevated heart rate and blood pressure have been observed in children undergoing therapy with stimulants. These effects are generally considered clinically insignificant and dose related.

Long-term management of stimulants. Once the dosage is established, follow up visits should occur every 4 to 6 months. Laboratory tests are not indicated for follow-up of patients treated only with a stimulant other than pemoline. However, patients on multiple psychotropic medications should have periodic laboratory monitoring of their liver function. Laboratory tests may be indicated for other medications that the patient may be taking (e.g., blood levels for depakote, glucose for risperdal, etc.)

At each visit, the physician should check height, weight, the dosage and timing of medications. The physician should talk to older children alone to obtain more reliable report from their point of view to address relationship issues (problems with peers and/or family), and to screen for comorbid problems (e.g., depression, substance abuse, sexual activity). Duration of treatment is individualized. Ambivalence about medication is common and can cause poor compliance even when benefits are obvious. Parents and children often discontinue medication without consulting the physician. To prevent this, trial periods off medication should be discussed. Off medication trials should not be given at the beginning of the school year or when there are other changes imminent in the child's life e.g., change in school, divorce or remarriage of parents. Termination of medication can be planned if missed dosages do not result in behavior problems. If there is no problem noted in behavior as well as academic performance for 2 weeks, a longer period can be tried with close monitoring.

Consistency with counseling is important. Counseling will need to be increased during adolescence. Adolescents prefer their impulsive behavior and consider alteration of their behavior by medication as a negative. The result is an increase in risk taking behaviors like alcohol and substance abuse, driving accidents, pregnancies and school dropouts.

Patients who are not on medication can be followed up one or two times a year especially around critical times in their life, e.g., changes in school.

Atomoxetine (Strattera®). Atomoxetine is the only non-stimulant drug approved by the FDA for treatment of ADHD. Studies with placebo have shown that the efficacy of atomoxetine is comparable to that of stimulants. Atomoxetine is believed to work by increasing the norepinephrine levels by inhibiting norepinephrine reuptake at neuronal synapses.

Atomoxetine can be given once a day and works for 24 hours. A single dose administered in the morning will carry over to the next morning and will improve the morning symptoms, e.g., excessive arguing and not being able to get out of bed to be on time for school. The maximum dosage has been set at 1.4 mg/kg/day. However, some children may need to go up to 1.6 to 1.8 mg/kg/day.

A disadvantage of atomoxetine is that in some cases the patient has to be on the medication for 4 to 5 weeks to reach the full therapeutic effect. Some physicians may want to use a short acting stimulant for initial management, followed by changing over to atomoxetine while cross tapering the stimulant medication.

Side effects may include an increase in suicidal thinking, tiredness, sleepiness, nausea, and rarely liver damage. The FDA recommends that children and adolescents being treated with atomoxetine should be closely monitored for clinical worsening, as well as agitation, irritability, suicidal thinking or behaviors, and unusual changes in behavior, especially during the initial few months of therapy or when the dose is changed. Nausea can be a significant problem if dose is increased too rapidly. These side effects can be avoided by giving the medication in the evening or by twice a day dosing.

Although not observed in clinical trials with Strattera, post-marketing cases of hepatotoxicity (elevation in liver function tests > 10x UNL) have been rarely reported. LFT's should be obtained at the first symptom/sign of liver dysfunction. Strattera should be discontinued in patients with clinical (e.g., jaundice, RUQ tenderness) or laboratory evidence of liver injury, and should not be restarted.

Tricyclic antidepressants (TCAs). TCAs are used as 2nd or 3rd line drugs when stimulants are ineffective or comorbidities are present. They may be used in conjunction with the stimulants or alone. TCAs that have been used more commonly for treatment of ADHD are Imipramine, Desipramine and Nortriptyline. TCAs have been shown to be effective in 60 to 70% of patients. Hyperactivity, impulsivity, anxiety and moodiness can decrease in several days but full response may take several weeks. TCAs are contraindicated in patients with a history of cardiac disease and arrhythmia or a family history of sudden death.

Bupropion. Bupropion is an antidepressant with dopaminergic activity similar to stimulants. A few placebo-controlled trials with small numbers of patients (largely, adolescents with comorbid disorders, such as nicotine dependence or substance abuse) demonstrated that bupropion improves hyperactivity and aggressive behavior. Bupropion decreases seizure threshold and should not be prescribed in patients with pre-existing seizure disorder. It should also be avoided in patients with Bulimia or Anorexia Nervosa.

Antihypertensives. The alpha-2 adrenergic agonists, clonidine (Catapres®) and guanfacine (Tenex®) may also be beneficial as alternatives or adjuncts to stimulants, but they have been studied in very few clinical trials as compared to stimulants. Clonidine has been reported to be effective in 50% of patients [B], especially those who are over aroused, easily frustrated, very hyperactive, impulsive, or aggressive. Potential advantages of guanfacine over clonidine include greater selectivity for the alpha-2

receptor, a longer half-life (and, thus duration of action), and fewer sedative and hypotensive effects. Clonidine and guanfacine are not as effective as stimulants in increasing attention. They are especially useful in combination with stimulants for patients who have ADHD related sleep problems, aggression and excessive hyperactivity. A bedtime dose of clonidine may benefit those children who respond well to stimulant medications but who develop insomnia. These agents are also valuable as monotherapy or in combination with stimulants for children with tics or Tourettes disorder.

Behavioral management. Behavioral components should be part of the treatment plan for ADHD because: parents and teachers report better treatment satisfaction if behavioral components are included; 5-20% of children do not respond to psychostimulant medications; and medication does not completely normalize behavior.

Parents, teachers and the child need adequate education about ADHD to understand the medical basis of this condition, and how the diagnosis explains much of the child's behavioral difficulties and needs. This education will help them view behavioral interventions as step-wise approaches to building skills that will help their child function better at school and at home. In addition, behavioral intervention facilitates parents and children working together with educators and doctors for long-term treatment success.

Behavioral targets for intervention depend on the child's age and needs. Parents and teachers should expect that new intervention and training needs will emerge with increasing age and educational level. Social skills, developing methods for self-monitoring and learning how to keep track of time should be included. In general, interventions should target behaviors one-at-a-time with a positive, team-work approach. Recommendations for behavioral management are available through the following and other sources:

- CHADD (Children and Adults with Attention Deficit Disorder) Fact Sheets www.chadd.org
- NICHQ ADHD Tool Kit www.aap.org/moc/index.cfm (\$35-\$40 per tool kit ordered)
- AAP Parent Pages www.aap.org/policy/adhd.pdf
- Medical Library www.medem.com
- AACAP www.aacap.org
- NIMH: Attention Deficit Hyperactivity Disorder www.nimh.nih.gov/healthinformation/adhdmnu.cfm

Many sites provide helpful handouts for parents and teachers. See Appendix A2 for a brief review of tips for home and school.

Behavioral treatment programs include parent training, peer social skills training, family counseling and classroom interventions (see Table 9). Each of these has shown some benefit for children with ADHD. Providers of such training can include mental health professionals, school personnel and primary care providers. Psychological interventions,

including cognitive-behavioral therapy have not been widely thought efficacious for ADHD. [B]

Parents and teachers often work with a behavioral consultant or psychologist to identify methods to obtain behavioral improvements. The intent of behavioral interventions is to shape and reinforce desired behaviors while diminishing undesirable behaviors. Studies suggest that behavioral treatment provides benefit as long as the treatments are maintained.

As with medication choices, it is important to recognize if other conditions are co-morbid with ADHD when educating parents and teachers about a child's condition(s). If co-morbid conditions are found, work with a psychologist and/or child psychiatrist might be especially helpful for the family.

Two Federal laws, Section 504 of the Rehabilitation Act of 1973 and IDEA safeguard the rights of individuals with disabilities, including ADHD, to a free and appropriate education. Both laws provide an opportunity for accommodations within the school setting if the medical condition is found to be severe enough to affect learning. Parents can request an assessment of their child by the school district but should do so in writing. The extent of the evaluation, accommodations and safeguards vary by law. See Appendix A3 for further information about these laws and Appendix A4 for a list of special education terms.

It is also important to recognize that children with ADHD have problems with executive functioning that are not currently recognized under traditional special education rules. Problems with executive functioning include inconsistent performance, poor organizational skills, trouble knowing how to break down tasks and poor sense of time. Such areas should be included as goals in the IEP.

Special Populations

Primary care physicians may desire specialist consultation assisting in the diagnosis and treatment of ADHD in the following populations:

- Preschool age (3 to 5 year)
- Head-injured patients
- Mentally retarded and/or patients with autistic-spectrum disorders
- Fetal Alcohol Syndrome (FAS) and Alcohol-Related Neurobehavioral Disorder
- Substance-abusing patients
- Adolescent and adult patients (13 years +)

Additional information about each of these populations is presented in Appendix B3.

Teens with ADHD present a special challenge. During these years, academic and organizational demands increase. Adolescents also face challenges related to normal development: discovering their identity, establishing independence, dealing with peer pressure, exposure to

drugs and alcohol, learning to drive, and, emerging sexuality.

Many adults with ADHD were never diagnosed as children. Adults with ADHD may be easily distracted, have difficulty sustaining attention and concentrating, are often impulsive and impatient, and may have mood swings and/or low frustration tolerance. They may be disorganized and have difficulty planning ahead. Although frank hyperactivity is much less common in adults, they may be fidgety and/or feel internally restless. Adults may experience career difficulties. They may lose jobs due to poor performance (lack of attention, poor task completion, disorganization) or interpersonal problems.

Controversial Areas

Common Myths

Some of the common myths about ADHD are listed below along with explanations regarding them.

- ADHD is not a real disorder. The U.S. Surgeon General's Report of 2001 reflects the general consensus that ADHD is a medical disorder with lifelong consequences.
- ADHD is a disorder of childhood. Long term studies suggest that 70-80% of children with ADHD have significant symptoms into adolescence and as adults.
- ADHD is over-diagnosed. Current prevalence rates likely reflect changes in the last decades: addition of inattentive ADHD criteria to the DSM-IV, changes in special education legislation and improved recognition by providers.
- Children with ADHD are over-medicated. A relatively low rate of stimulant use is reported in school age children.
- Poor parenting causes ADHD. Evidence from twin studies suggests that genetics accounts for about 80% of the variance for children with ADHD who share the same environment.
- Minority children are over-diagnosed with ADHD and are over-medicated. In fact, African American children are unfortunately less likely to receive appropriate access to mental health services and are 2-2.5 times less likely to be medicated for their ADHD.
- Girls have lower rates and less severe ADHD than boys. In fact, girls are less likely to be recognized due to lower rates of externalizing behaviors. They have, however, higher rates of internalizing behaviors with more mood and anxiety disorders and problems with social functioning.

Diet and Dyes

The Feingold Diet (Kaiser-Permanente diet) requires children to eliminate all foods containing artificial colors, flavors and salicylates. This eliminates nearly all processed foods. Rigorous dietary studies have failed to duplicate Dr. Feingold's clinical observations.

Increased consumption of refined sugars is postulated as contributing to hyperactivity. Studies have found most behavioral effects of sugar to last from 30 to 90 minutes. Controlled diets in a laboratory setting did not find any differences in the completion of various tasks [B]. Younger children may be more sensitive to sugar. Children presently consume 40 to 50 teaspoons of sugar a day.

Specifically designed hypoallergenic diets that are individually tailored have demonstrated that food sensitivities or allergies can be involved in provoking behavior problems. The behavioral contribution of food hypersensitivity can be evaluated through an elimination diet of dairy, wheat and citrus. A symptom diary is maintained and foods re-introduced one at a time four weeks later. Compliance with these strict diets is an issue.

Essential omega-6 and omega-3 fatty acids must be obtained from the diet to form long chain fatty acids known as eicosanoids. Recent studies have found children with ADHD to have altered fatty acid metabolism with lower levels of these essential fatty acids. Increasing essential fatty acids such as omega-3 has been recommended by eating at least a 2 ounce serving of cold water fish three times a week. One study demonstrated that children supplemented with specific fatty acids demonstrated improvement in their behavior. Further research is needed. Daily flax seed oil (1/2 tbs) or ground up flax seed (1 tbs) is a source of essential fatty acids.

Complimentary / Alternative Medicine (CAM)

The use of CAM for ADHD is controversial yet commonly reported by adults and children. Its use may be enhanced by continued debate (in the lay press) about the safety of stimulant medication. Unfortunately, studies suggest that less than 40% of parents of CAM users discuss it with their child's doctor. The primary care provider should be aware of CAM and inquire about CAM use as a primary or secondary therapy.

Appendix B4 lists common CAM therapies used by families for ADHD and related problems. A small, non-randomized, single-blinded study demonstrated possible efficacy at 10 days and 2 months of a homeopathic treatment program, primarily with *Verum*. *Stramonium*, *Cina*, and *Hyoscyamus* were also among the 8 different remedies found to be potentially useful. Chamomile or lavender teas or baths have not been studied but are used.

Supplements vary in purity and potency. Contamination with heavy metals has been reported as well as a 10 – 1000 fold variability in potency by lot.

Mind-body techniques include diaphragmatic breathing, progressive relaxation, journaling or meditation. They are used as an alternate energy outlet and are thought to help with focus and attention.

Strategy for Literature Search

The literature search for this guideline was conducted prospectively using the major keywords of: attention deficit disorder with hyperactivity, human children age 3-18, English language, and published 1/1/99-9/30/02 on Medline. Additional key words included: clinical protocols, physician practice patterns, algorithms, consensus development conferences, practice guidelines, guidelines, outcomes and process assessment (health care); clinical trials, controlled clinical trials, multicenter studies, randomized controlled trials, cohort studies, metaanalysis or meta-analysis; costs and cost analysis; diagnosis, diagnostic use, sensitivity and specificity, false negative reactions, false positive reactions, likelihood functions, sensitivity, specificity; therapy, drug therapy, diet therapy, therapeutic use, rehabilitation.

The search was conducted in components each keyed to a specific causal link in a formal problem structure (available upon request). The search was supplemented with very recent clinical trials known to expert members of the panel. Negative trials were specifically sought. The search was a single cycle. Conclusions were based on prospective randomized clinical trials if available, to the exclusion of other data; if randomized controlled trials were not available, observational studies were admitted to consideration. If no such data were available for a given link in the problem formulation, expert opinion was used to estimate effect size.

Related National Guidelines

The UMHS Clinical Guideline on ADHD is consistent with the American Academy of Pediatrics Committee on Quality Improvement, Subcommittee on Attention-Deficit/Hyperactivity Disorder "Clinical Practice Guideline: Diagnosis and Evaluation of the Child With Attention-Deficit/Hyperactivity Disorder," 2000.

Disclosures

The University of Michigan Health System endorses the Guidelines of the Association of American Medical Colleges and the Standards of the Accreditation Council for Continuing Medical Education that the individuals who present educational activities disclose personal financial relationships with commercial companies whose products or services are discussed. No member of the guideline team (Drs. O'Brien, Felt, Harrison, Kochhar, and Riolo) nor the consultant (Dr. Shehab) has such a relationship.

Annotated References

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The second of a two clinical guideline from the American Academy of Pediatrics provides evidence-based recommendations for the treatment of children diagnosed ADHD.

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This 354 page paperback book is written for parents of children with ADHD. It uses common scenarios to answer diagnostic, management, and developmental questions. It includes practical suggestions and lists many resources for parents.

**University of Michigan Health System
Guidelines for Clinical Care**

Attention-Deficit Hyperactivity Disorder

APPENDICES

Appendix A Management Tools

- A1 Behavioral Rating Scales
- A2 Tips for Parents of Children with ADHD
- A3 ADHD and Educational Rights
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Appendix A1. Behavioral Rating Scales

Tool	Psychometrics	Company	Cost	Comments
ADHD Specific				
Connor Rating Scales (CRS)	Good	Multi-Health Systems, Inc.	Kit	Normed by age and gender, 3-17 years. Available in English, Spanish, French (Canadian)
Parent			\$118-193	
Long form (#80)	Sensitivity and specificity	https://www.mhs.com/ecom/	\$27-29/25	Long form: 18 scales including anxiety, mood, psychosomatic. Helpful for evaluation. Administration 15-20 minutes.
Short form (#27)				
Teacher				Behavior is rated from 0 to 3 based on frequency with which the child displays that particular behavior.
Long form (#59)				
Short form (#28)				
Self-Report (12-17 yrs)				Separate tests are given for both parents and teachers and the results are then combined to yield a diagnosis.
Long form (#87)				
Short form (#27)				
ACTers (ADD-H)	Good	Hawthorne Educational Systems, Inc.	Kits	Standardized K-8 grade.
Comprehensive			\$47-51	Not age normed.
Teacher's Rating Scale				
Parent			Forms	
Teacher		www.hes-inc.com/	\$32/50	
Self-report				
Child Behavior Checklist (CBCL)	Good	Achenbach System of Empirically Based Assessment	Available in many forms so costs vary; however, will cost ≥ \$50.	112 items. 3-point Likert scale: 0 = Not True; 1 = Somewhat or Sometimes True; 2 = Very True or Often True. Available in Spanish.
Parent Report (6-18 years)	Demonstrated reliability and validity.	1 South Prospect St. Burlington, VT 05401-3456		Can be scored with hand-scored profiles and templates or with computer programs.
Teacher Report Form (6-18 years)	Non-Specific to ADHD, but allows assessment of co-morbid problems.	www.aseba.org		Eight behavioral domains: Withdrawn, Somatic Complaints, Anxious/Depressed, Social Problems, Thought Problems, Attention Problems, Delinquent Behavior, and Aggressive Behavior.
Preschool Form (1 - 5 years)		Phone: 802-656-2602		
Youth Self Report (YSR; 11-18 years)	Widely used.	E-mail: mail@aseba.org		Normative data from large, representative US sample (N=1,753, 6-18 years, 40 states, all race & income). Normed by gender and age (4-11 and 12-18 years).
NICHQ Vanderbilt Assessment Scale	Good sensitivity and specificity	American Academy of Pediatrics – National Initiative for Children's Healthcare Quality (NICHQ)	Free	Scales are part of an ADHD Tool Kit developed by the AAP for primary care providers for children.
Parent Informant		http://www.nichq.org/initiatives/		
Teacher Informant				Separate forms for evaluation and follow-up.
ADDES-2 (Attention Deficit Disorders Evaluation Scale)	Good sensitivity and specificity	Hawthorne Educational Systems, Inc.	Kits	ADDES-2: 4.5-18 y
Parent (#46)			\$220	ADDES-S: 11.5-18 y
Teacher (#60)		www.hes-inc.com/	Forms	Normed age and gender.
ADDES-S			\$33/50	Good for evaluation.
Secondary Age Student				Administration 15 minutes.
Parent (#46)				Requires manual to score.
Teacher (#60)				

Note: Standardized rating scales provide useful information and behavioral descriptions but are not diagnostic. Comparison of parent and teacher report using rating scales can reveal discrepancies which may have clinical importance. For example, if a child has more difficulties in a particular caretaker, situation, or environment, this may suggest intervention strategies or may lead to concerns regarding co-morbidity.

Appendix A2. Tips for Parents of Children with ADHD

<p>General</p> <ul style="list-style-type: none">• Schedule one on one time with your child every day to let her/him know how important s/he is to you. Even 10 to 15 minutes regularly, will make a difference.• Educators and other “teachers” will change. As the parent, you will not. You are his best and most important teacher.• Be aware of and notice your child’s strength areas and look for opportunities to praise him.• Be aware that children with ADHD benefit from more frequent feedback• Remain calm and in control• Model the behavior you would like to see from your child• Use schedules and routines• Post lists and reminders for the routines in places they will be seen• Discuss the behavioral goals with your child• Discuss the behavioral target(s), expectations and the feedback with your child’s other caretakers so she gets a consistent message.• Give directions one at a time• Track your child’s response• Provide feedback constructively and immediately• Target one to three behaviors at a time for shaping• Use desired activities (TV, video games) as privileges/rewards for success on behavioral targets.• All day is a long time for your child and you to work on behavioral goals. Therefore, consider focusing on the behavior(s) for close tracking and feedback for an hour a day or around a regular routine.• Assure regular mealtimes and good rest for your child and you. <p>Younger Children</p> <ul style="list-style-type: none">• Routines are very important• Post pictures for the order of routines you’d like her to learn (e.g., the steps to get ready for bed)• Balance higher energy and quieter activities through the day.• Choose your battles – ignore minor misbehaviors• Give choices but limit the number• Avoid high-risk situations and times of day (shopping mall, grocery shopping on the way home)• Review the “rules” (hands to self, inside voices) immediately before venturing into a community setting.• Consider taking “practice trips” that will allow you to implement a consequence (leaving if the rules are not followed) without disturbing your planned and needed shopping trip.	<p>School-age Child at Home</p> <ul style="list-style-type: none">• Invite peers one at a time to reduce stimulation, encourage friendship and allow you to provide feedback about what went well.• Include homework time as a part of the family routine• Organize a non-distracting place for homework• Check your child’s backpack everyday and help her organize the homework into doable chunks• Suggest brief breaks between the ‘chunks’ of homework• Use the activities your child enjoys as incentives for getting work done (homework and chores)• Help your child use a system (e.g. labeled folders for each subject) to get the homework back to school.• Many children benefit from work with a tutor, and a high school or college-age student might be a less-costly choice.• Use repetition (going over the spelling list, math facts)• Be aware of those long-term assignments. Post the information. Discuss a timeline and stick to it.• Communicate with your child’s teacher about homework, grades, and behavior.• If your child is struggling, consider requesting evaluation for Section 504 or IDEA, especially if there is concern about possible learning disability. <p>Child at School</p> <ul style="list-style-type: none">• An orderly and predictable classroom setting.• Consistent rules and expectations.• Regular breaks• Quiet work areas• Seating near where the teacher does the teaching• Include a curriculum about time management and study skills• Assess student’s abilities to get homework assignments written down and remember to take needed items home. Consider targeting and shaping these skills• Teach self-monitoring and self-reinforcement skills• Establish a system of daily communication (school-home note card) about progress on targeted behaviors and learning areas as well as a double-check on homework.• Link school performance with home rewards that you and your child define before-hand
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Appendix A3. ADHD and Educational Rights

Section 504

Section 504 of the National Rehabilitation Act of 1973, is a civil rights law with the intent to protect the rights of individuals with disabilities. Section 504 is not within Special Education designation but generally provides “reasonable” accommodations and services such as reduced assignments, adjusting testing conditions, and meeting transportation needs.

IDEA

The Individuals with Disabilities Education Act (IDEA) (originally Public Law 94-142 amended in 1997 – Public Law 105-17), provides children with disabilities (including significant ADHD) legal safeguards. In most cases, the assistance provided and the legal safeguards from IDEA are greater than Section 504.

- The parent must submit a written request for the evaluation.
- The evaluation is multidisciplinary in nature.
- Children with ADHD may be eligible for Special Education categorization under the Otherwise Health Impaired (OHI) category if they also have:
 - limited alertness to academic tasks, due to heightened alertness to environmental stimuli;
 - chronic problems or if acute, the problems have substantial impact;
 - adversely affected educational performance; and
 - the need for special education services to address the problems.
- At this time, the parent, (the child if older), school psychologist, teacher and other evaluators determine the child’s eligibility for special education categorization, document the child’s specific needs, target specific outcomes and determine the needed interventions.
- The results of the psychoeducational evaluation are shared with the parent at an Individualized Education Plan Committee (IEPC) meeting.
- If a learning disability is determined the child may be eligible for services for both the ADHD and LD.

Individualized Education Plan (IEP)

An IEP is a written agreement between the parents and the school about what the child needs and what will be done to address those needs. An IEP is a legal document under IDEA that must be drawn up by the educational team for the exceptional child and must be signed by the student’s parents before implementation.

Appendix A4. Special Education and Evaluation Terms

Special Education Terms		Intelligence Tests	
IEP	Individualized Education Plan	WISC	Wechsler Intelligence Scale for Children
IEPC	Individualized Education Plan Committee	K-ABC	Kaufman Assessment Battery for Children
BIP	Behavioral Intervention Plan	SB-4	Stanford-Binet Fourth Edition
SST	Student Study Team	WJ-R	Woodcock Johnson Psychoeducational Battery, Tests of Cognitive Ability
OHI	Otherwise Health Impaired		
SLD	Specific Learning Disability	Achievement Tests	
EI	Emotionally Impaired	WJ-R	Woodcock Johnson Psychoeducational Battery, Tests of Achievement
Section 504	National Rehabilitation Act (1973)	PIAT-R	Peabody Individual Achievement Test
IDEA	Individuals with Disabilities Act (1997)	WRAT-R	Wide Range Achievement Test
		WIAT	Weschler Individual Achievement Test

Appendix B1. Definitions of Selected Psychiatric Disorders: DSM IV Diagnostic Criteria

Anxiety Disorders

Generalized Anxiety Disorder (GAD) (300.02)

- A. Excessive anxiety and worry, occurring more days than not for at least 6 months, about a number of events or activities (such as work or school performance).
- B. The person finds it difficult to control the worry.

- C. The anxiety and worry are associated with three (or more) of the following six symptoms (with at least some symptoms present for more days than not for the past 6 months). Note: Only one item is required in children.
- (1) restlessness or feeling keyed up or on edge
 - (2) being easily fatigued
 - (3) difficulty concentrating or mind going blank
 - (4) irritability
 - (5) muscle tension
 - (6) sleep disturbance (difficulty falling or staying asleep, or restless unsatisfying sleep)
- D. Anxiety cannot be explained by a Mood Disorder, Pervasive Developmental Disorder, Psychotic Disorder, or another Anxiety Disorder (e.g., PTSD).
- E. Symptoms cause clinically significant distress or impairment in functioning.
- F. Not due to the direct physiological effects of a substance of abuse, prescribed medication, or general medical condition.

Panic Attacks

- A. Discrete period of intense fear or discomfort, in which four (or more) of the following symptoms developed abruptly and reached a peak within 10 minutes:
- (1) palpitations, pounding heart, or accelerated heart rate
 - (2) sweating
 - (3) trembling or shaking
 - (4) sensations of shortness of breath or smothering
 - (5) feeling of choking
 - (6) chest pain or discomfort
 - (7) nausea or abdominal distress
 - (8) feeling dizzy, unsteady, lightheaded, or faint
 - (9) derealization (feelings of unreality) or depersonalization (being detached from oneself)
 - (10) fear of losing control or going crazy
 - (11) fear of dying
 - (12) paresthesias (numbness or tingling sensations)
 - (13) chills or hot flushes

Obsessive-Compulsive Disorder (300.3)

- A. Either obsessions or compulsions:
- Obsessions as defined by (1), (2), (3), and (4):
- (1) recurrent and persistent thoughts, impulses, or images that are intrusive and cause marked anxiety or distress
 - (2) the thoughts, impulses, or images are not simply excessive worries about real-life problems
 - (3) the person attempts to ignore or suppress such thoughts, impulses, or images, or to neutralize them with some other thought or action
 - (4) the person recognizes that the obsessional thoughts, impulses, or images are a product of his or her own mind
- Compulsions as defined by (1) and (2):
- (1) repetitive behaviors (e.g., hand washing, ordering, checking) or mental acts (e.g., praying, counting, repeating words silently) that the person feels driven to perform in response to an obsession, or according to rules that must be applied rigidly
 - (2) the behaviors or mental acts are aimed at preventing or reducing distress or preventing some dreaded event or situation; however, these behaviors or mental acts either are not connected in a realistic way with what they are designed to neutralize or prevent or are clearly excessive
- B. At some point during the course of the disorder, the person has recognized that the obsessions or compulsions are excessive or unreasonable. Note: This does not apply to children.
- C. Symptoms cause marked distress, are time consuming (>1 hour per day), or interfere with functioning.
- D. Not restricted to Eating Disorder, Trichotillomania, Body Dysmorphic Disorder, or Substance Use Disorder.
- E. Not due to the direct physiological effects of a substance of abuse, a prescribed medication, or a general medical condition.

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Appendix B1. Definitions of Selected Psychiatric Disorders: DSM IV Diagnostic Criteria (Continued)

Separation Anxiety Disorder (309.21)

- A. Developmentally inappropriate and excessive anxiety concerning separation from home or from those to whom the individual is attached, as evidenced by three (or more) of the following:
- (1) recurrent excessive distress when separation from home or major attachment figures occurs or is anticipated
 - (2) persistent and excessive worry about losing, or about possible harm befalling, major attachment figures
 - (3) persistent and excessive worry that an untoward event will lead to separation from a major attachment figure (e.g., getting lost or being kidnapped)
 - (4) persistent reluctance or refusal to go to school or elsewhere because of fear of separation
 - (5) persistently and excessively fearful or reluctant to be alone or without major attachment figures at home or without significant adults in other settings
 - (6) persistent reluctance or refusal to go to sleep without being near a major attachment figure or to sleep away from home
 - (7) repeated nightmares involving the theme of separation
 - (8) repeated complaints of physical symptoms (such as headaches, stomachaches, nausea, or vomiting) when separation from major attachment figures occurs or is anticipated
- B. Duration of at least 4 weeks.
- C. Onset before 18 years.
- D. Causes distress or impairment in functioning.
- E. Not due to Pervasive Developmental Disorder or a Psychotic Disorder.

Anxiety Disorder Not Otherwise Specified (300.00)

This category includes disorders with prominent anxiety or phobic avoidance that do not meet criteria for any specific Anxiety Disorder, Adjustment Disorder With Anxiety, or Adjustment Disorder With Mixed Anxiety and Depressed Mood.

Bipolar Disorders

Bipolar Disorders

There are six separate criteria sets for Bipolar I Disorder: Single Manic Episode, Most Recent Episode Hypomanic, Most Recent Episode Manic, Most Recent Episode Mixed, Most Recent Episode Depressed, and Most Recent Episode Unspecified. Bipolar I Disorder, Single Manic Episode, is used to describe individuals who are having a first episode of mania. The remaining criteria sets are used to specify the nature of the current (or most recent) episode in individuals who have had recurrent mood episodes.

Manic Episode

- A. A distinct period of abnormally and persistently elevated, expansive, or irritable mood, lasting at least 1 week (or any duration if hospitalization is necessary).
- B. Persistence of three (or more) of:
- (1) inflated self-esteem or grandiosity
 - (2) decreased need for sleep
 - (3) more talkative than usual or pressure to keep talking
 - (4) flight of ideas or feeling that thoughts are racing
 - (5) distractibility (i.e., attention too easily drawn to unimportant or irrelevant external stimuli)
 - (6) increase in goal-directed activity or psychomotor agitation
 - (7) Involvement in activities with adverse consequences (e.g., over spending, sexual indiscretion)
- C. Cause impairment in functioning.
- D. Not due to substance of abuse, prescribed medication, or general medical condition.
- E. Mania caused by antidepressant treatment should not count toward diagnosis of Bipolar I Disorder.

Hypomanic Episode

- A. A distinct period of elevated, expansive, or irritable mood, lasting at least 4 days.
- B. Three (or more) of symptoms of mania (see above).
- C. Change in functioning that is uncharacteristic of the person and observable by others.
- E. Not severe enough to cause marked impairment in social or occupational functioning, or to necessitate hospitalization, and there are no psychotic features.
- F. Not due to substance of abuse, prescribed medication, or a general medical condition.

Mixed Episode

- A. The criteria are met both for a Manic Episode (see above) and for a Major Depressive Episode (see above) nearly every day during at least a 1-week period.
- B. Marked impairment in functioning. Needs hospitalization or has psychotic features.
- C. Not due to substance of abuse, prescribed medication, or general medical condition.

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Appendix B1. Definitions of Selected Psychiatric Disorders: DSM IV Diagnostic Criteria (Continued)

Bipolar I Disorder, Single Manic Episode (296.0x)

- A. Presence of only one Manic Episode (see above) and no past Major Depressive Episodes.
- B. The Manic Episode is not better accounted for by a Psychotic Disorder.

Major Depressive Disorder

Major Depressive Disorder, Single Episode (296.2x)

- A. Presence of a single Major Depressive Episode (see below).
- B. Not better accounted for by a Psychotic Disorder.
- C. There has never been a Manic Episode (see below).

Major Depressive Episode

- A. Five (or more) of the following symptoms have been present during the same 2-week period and represent a change from previous functioning; at least one of the symptoms is either (1) depressed mood or (2) loss of interest or pleasure:
 - (1) depressed mood most of the day, nearly every day, as indicated by either subjective or objective report. In children and adolescents, can be irritable mood.
 - (2) markedly diminished interest or pleasure in all, or almost all, activities most of the day, nearly every day (by subjective or objective report).
 - (3) significant weight loss when not dieting or weight gain. In children, failure to make expected weight gains.
 - (4) insomnia or hypersomnia nearly every day.
 - (5) psychomotor agitation or retardation nearly every day (observable by others, not merely subjective feelings of restlessness or being slowed down).
 - (6) fatigue or loss of energy nearly every day
 - (7) feelings of worthlessness or excessive/inappropriate guilt.
 - (8) diminished ability to think or concentrate, or indecisiveness, nearly every day (subjective/objective).
 - (9) recurrent thoughts of death, recurrent suicidal ideation, suicide attempt, or plan for committing suicide.
- B. Symptoms cause distress or impairment in functioning.
- C. Not due to a substance of abuse, prescribed medication, or a general medical condition.
- E. Not better accounted for by Bereavement.

Fetal Alcohol Syndrome (FAS)/Alcohol-Related Neurobehavioral Disorder (ARND)

The teratogenic effects of alcohol produce a range of outcomes extending from full FAS to a milder appearing disorder in which there are no characteristic facial features, but there are clinically significant learning and behavioral problems. Individuals with full FAS have a distinct pattern of facial abnormalities, growth deficiency and evidence of central nervous system dysfunction. In addition to mental retardation, individuals with FAS may have other neurological deficits such as poor motor skills and hand-eye coordination. They may also have a complex pattern of behavioral and learning problems, including difficulties with memory, attention and judgment. Individuals without full facial features of FAS, but who have clinically significant learning and behavioral problems are diagnosed with Alcohol-Related Neurobehavioral Disorder (ARND). ARND also referred to as Fetal Alcohol Effects (FAE) or partial FAS.

Fragile X Syndrome

Fragile X syndrome is the second most common 'chromosomal' cause of mental impairment after trisomy 21. It is characterized by moderate to severe mental retardation, macroorchidism, large ears, prominent jaw, and high-pitched jocular speech. Patients typically have flat feet and finger joint hypermobility. Mitral valve prolapse may be present. Many males have relative macrocephaly. Patients may also have tactile defensiveness. This condition accounts for about one-half of X-linked mental retardation. Frequency estimates vary from 0.5 per 1000 to 2.4:10,000 males.

Cognitive and behavioral profile: Hyperkinetic behavior and a problem with concentration are present in most affected males; therefore this condition can be easily confused with ADHD. Longitudinal observations indicate a deterioration of IQ with age; mental retardation may, for example, be moderate at age 12 and severe at age 25. Patients frequently may have autistic-like behavior and apparent speech and language deficits, making it easily confused with Autistic Disorder. Psychiatric comorbidity is high, with increased risk of ADHD, oppositional defiant disorder, enuresis, and encopresis. Fragile X syndrome may also be difficult to distinguish from Prader-Willi Syndrome; except patients with Fragile X Syndrome lack the neonatal hypotonia and infantile feeding problems followed by hyperphagia during toddlerhood seen in Prader-Willi.

Inheritance: Fragile X Syndrome is associated with mutations in the FMR1 gene. All mothers of males with the fragile X have been found to be carriers; the mutation must occur either at a low rate or only in males. Twenty percent of males who carry a fragile X chromosome are phenotypically normal; their daughters, to whom they transmit the fragile X chromosome, are likewise normal, but their grandsons are often affected. The brothers of the clinically normal, transmitting males have a low risk, while grandsons and great-grandsons have much higher risks.

Diagnosis: is made by immunofluorescence studies and is quite reliable. The most efficient and cost effective methodology for diagnosis is cytogenetic analysis, followed by molecular studies only when the fra(X) is seen or suspected.

Learning Disorders (LD)

Learning Disorder/Disability (LD) is a broad term that covers a pool of possible causes, symptoms, treatments, and outcomes. Learning Disabilities can be divided up into three broad categories:

- (1) Developmental speech and language disorders
- (2) Academic skills disorders
- (3) "Other" disorders- includes certain coordination disorders and learning handicaps not covered by the other terms.

Specific Learning Disability

A disorder occurring in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, which disorder may manifest itself in imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations. Such disorders include such conditions as perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia. This term does not include children who have learning problems which are primarily the result of visual, hearing, or motor disabilities, of mental retardation, of emotional disturbance, or of environmental, cultural, or economic disadvantage.

Dyslexia

Dyslexia includes a very broad range of learning disabilities which involve language processing deficits relating to: 1) attention, 2) language, 3) spatial orientation, poor reading and spelling skills, 4) memory, 5) fine motor control issues, and 6) sequencing or difficulty organizing information and instructions into an appropriate order.

Reading Disorder (315.00)

- A. Reading achievement, as measured by individually administered standardized tests of reading accuracy or comprehension, is substantially below that expected given the person's chronological age, measured intelligence, and age-appropriate education.
- B. Significantly interferes with academic achievement or activities of daily living that require reading skills.
- C. If a sensory deficit is present, the reading difficulties are in excess of those usually associated with it.

Mathematics Disorder (315.1)

- A. Mathematical ability, as measured by individually administered standardized tests, is substantially below that expected given the person's chronological age, measured intelligence, and age-appropriate education.
- B. Significantly interferes with academic achievement or activities of daily living that require mathematical ability.
- C. If a sensory deficit is present, the math difficulties are in excess of those usually associated with it.

Disorder of Written Expression (315.2)

- A. Writing skills, as measured by individually administered standardized tests (or functional assessments of writing skills), are substantially below those expected given the person's chronological age, measured intelligence, and age-appropriate education.
- B. Significantly interferes with academic achievement or activities of daily living that require the composition of written texts.
- C. If a sensory deficit is present, the difficulties in writing skills are in excess of those usually associated with it.

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Appendix B1. Definitions of Selected Psychiatric Disorders: DSM IV Diagnostic Criteria (Continued)

Learning Disorder Not Otherwise Specified (315.9)

This category is for disorders in learning that do not meet criteria for any specific Learning Disorder. This category might include problems in all three areas (reading, mathematics, written expression) that together significantly interfere with academic achievement even though performance on tests measuring each individual skill is not substantially below that expected given the person's chronological age, measured intelligence, and age-appropriate education

Oppositional Defiant Disorder (313.81)

- A. Pattern of negativistic, hostile, and defiant behavior lasting at least 6 months, during which four (or more) of the following are present:
 - (1) often loses temper
 - (2) often argues with adults
 - (3) often actively defies or refuses to comply with adults' requests or rules
 - (4) often deliberately annoys people
 - (5) often blames others for his or her mistakes or misbehavior
 - (6) is often touchy or easily annoyed by others

- (7) is often angry and resentful
- (8) is often spiteful or vindictive

- B. The disturbance in behavior causes clinically significant impairment in social, academic, or occupational functioning.
- C. The behaviors do not occur exclusively during the course of a Psychotic or Mood Disorder.
- D. Criteria are not met for Conduct Disorder, and, if the individual is age 18 years or older, criteria are not met for Antisocial Personality Disorder.

*Behavior must occur more frequently than is typically observed in individuals of comparable age and developmental level.

Post Traumatic Stress Disorder (PTSD; 309.81)

- A. The person has been exposed to a traumatic event in which both of the following were present:
 - (1) the person experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others
 - (2) the person's response involved intense fear, helplessness, or horror. Note: In children, this may be expressed instead by disorganized or agitated behavior
- B. The traumatic event is persistently reexperienced in one (or more) of the following ways:
 - (1) recurrent and intrusive distressing recollections of the event, including images, thoughts, or perceptions. Note: In young children, repetitive play may occur in which themes or aspects of the trauma are expressed.
 - (2) recurrent distressing dreams of the event. Note: In children, there may be frightening dreams without recognizable content.
 - (3) acting or feeling as if the traumatic event were recurring (includes a sense of reliving the experience, illusions, hallucinations, and dissociative flashback episodes, including those that occur on awakening or when intoxicated). Note: In young children, trauma-specific reenactment may occur.
 - (4) intense psychological distress at exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event
 - (5) physiological reactivity on exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event
- C. Persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness (not present before the trauma), as indicated by three (or more) of the following:
 - (1) efforts to avoid thoughts, feelings, or conversations associated with the trauma
 - (2) efforts to avoid activities, places, or people that arouse recollections of the trauma
 - (3) inability to recall an important aspect of the trauma
 - (4) markedly diminished interest or participation in significant activities
 - (5) feeling of detachment or estrangement from others
 - (6) restricted range of affect (e.g., unable to have loving feelings)
 - (7) sense of a foreshortened future (e.g., does not expect to have a career, marriage, children, or a normal life span)
- D. Persistent symptoms of increased arousal (not present before the trauma), as indicated by two (or more) of the following:
 - (1) difficulty falling or staying asleep
 - (2) irritability or outbursts of anger
 - (3) difficulty concentrating
 - (4) hypervigilance
 - (5) exaggerated startle response
- E. Duration of the symptoms is more than 1 month.
- F. Causes distress or impairment in functioning.

Appendix B1. Definitions of Selected Psychiatric Disorders: DSM IV Diagnostic Criteria (Continued)

Reactive Attachment Disorder of Infancy or Early Childhood (313.89)

- A. Markedly disturbed and developmentally inappropriate social relatedness in most contexts, beginning before age 5 years, as evidenced by either (1) or (2):
 - (1) persistent failure to initiate or respond in a developmentally appropriate fashion to most social interactions, as manifest by excessively inhibited, hypervigilant, or highly ambivalent and contradictory responses (e.g., the child may respond to caregivers with a mixture of approach, avoidance, and resistance to comforting, or may exhibit frozen watchfulness)
 - (2) diffuse attachments as manifest by indiscriminate sociability with marked inability to exhibit appropriate selective attachments (e.g., excessive familiarity with relative strangers or lack of selectivity in choice of attachment figures)
- B. Not Mental Retardation or Pervasive Developmental Disorder.
- C. Pathogenic care as evidenced by at least one of the following:
 - (1) persistent disregard of the child's basic emotional needs for comfort, stimulation, and affection
 - (2) persistent disregard of the child's basic physical needs
 - (3) repeated changes of primary caregiver that prevent formation of stable attachments (e.g., frequent changes in foster care)

Appendix B2. Conditions That May Be Confused with ADHD

Note: For confused or comorbid conditions, referral to specialist in these disorders is recommended. See Appendix B for DSM IV diagnostic criteria for conditions.

Anxiety Disorders	
Prevalence	26% (CI: 18%, 35%)
Overlapping Symptoms	<ul style="list-style-type: none"> • Poor concentration • Appear fidgety and/or agitated • Difficulty settling to sleep +/- Insomnia • Jumps from task to task • Both may have poor appetite
Distinguishing Symptoms of This Disorder	<ul style="list-style-type: none"> • School avoidance • Excessive performance or test-taking anxiety • Reluctance to participate in age-appropriate activities (sleep-overs, outings) • Excessive worry (e.g., school work, illness) • Over-concern about “adult matters” (e.g., finances, parental relationships, parental welfare) • Catastrophic thoughts (e.g., car accidents, kidnapping, break-ins) • Compulsive behaviors (e.g., hoarding, counting, ordering) • Nightmares, excessive worries/fears at bedtime • Physiological symptoms: racing heart beat, difficulty breathing, chest pain • Patient becomes “anxious” or has visual hallucinations in response to stimulants
Distinguishing Symptoms of ADHD	<ul style="list-style-type: none"> • ADHD symptoms should be present since early childhood. • Should not see significant symptoms of anxiety in uncomplicated ADHD.
Bipolar Disorder	
Prevalence	Diagnosis of Bipolar Disorder in children and adolescents is highly controversial; therefore, rates are unreliable. Lewinsohn et al. (1995) reported a lifetime prevalence of 1% for Bipolar Disorders in a large community sample of older adolescents.
Overlapping Symptoms	<ul style="list-style-type: none"> • Inattention, easily distracted • Motor activity • Sleep disturbance • Accident prone • Disruptive behavior • Hypertalkativeness
Distinguishing Symptoms of This Disorder	<p>Highly controversial diagnosis in children. Always refer to child psychiatrist if suspected.</p> <ul style="list-style-type: none"> • Mood swings; behavior is cyclical or erratic • Being kicked out of multiple daycare programs is a red flag. • Parents report the child has “no control” over behavior • Grandiosity (Exaggerated ideas of ability and importance). For example, the child may think they can teach the class better than the teacher” despite failing in school. • Severe aggression (especially toward adults); “rage attacks” • Hypersexuality- sexual jokes or language, inappropriately touching adults • Hallucinations • Severe insomnia • Extreme changes in energy levels and behavior • Rage attacks • Irrational ideas • Tangential speech, rapid/pressured speech • Extremely impulsive +/- self-endangering behavior • Extreme hyperactivity- esp. if climbs excessively or seems to be “fearless” • Intrusive behavior • Suicidal behavior in children under 13 is concerning and warrants urgent psychiatric evaluation <p style="text-align: center;">(continues on next page)</p>

Appendix B2. Conditions That May Be Confused with ADHD (Continued)

Bipolar Disorder (continued)	
Distinguishing Symptoms of ADHD	<ul style="list-style-type: none"> • ADHD symptoms should be present since early childhood, whereas, Bipolar Disorder typically occurs later (most commonly around puberty) • Problems are chronic and more consistent in ADHD rather than cyclical in Bipolar disorder • Aggression, if it occurs, is usually not severe in uncomplicated ADHD & generally related to frustration • Grandiosity, hypersexuality, and psychosis are NOT typical in ADHD • Sleep problems are generally not severe and rarely are cyclical in ADHD • In samples of prepubertal patients with Bipolar Disorder, almost 100% have co-morbid ADHD. In adolescent Bipolar sample, rates of co-morbid ADHD and Bipolar Disorder are 30-50%
Fetal Alcohol Syndrome(FAS)/ Alcohol-Related Neurobehavioral Disorder (ARND) [Note: ARND is also called Fetal Alcohol Effects (FAE) or partial FAS]	
Prevalence	<p>FAS: 0.33 cases per 1,000 live births</p> <p>ARND: Several times the magnitude of FAS cases.</p>
Overlapping Symptoms	<ul style="list-style-type: none"> • Poor academic performance • Inattention • Hyperactivity • Poor growth (not on stimulants) • Disruptive behavior
Distinguishing Symptoms of This Disorder	<ul style="list-style-type: none"> • Must have proven or strong suspicion of exposure to alcohol in utero • +/- Growth deficiencies • +/- Skeletal deformities (especially microcephaly) • +/- Facial abnormalities (short palpebral fissures, long/flat philtrum, thin upper lip; flat midface, ptosis; nearsightedness; strabismus; short upturned nose; cleft palate; micrognathia; low-set or poorly formed ears • +/- Organ deformities (heart, genitourinary) • CNS: mental retardation; learning disabilities; short attention span- look for “soft” neurological signs • May preferentially respond to Dexedrine or Adderall versus Ritalin. May require high stimulant dose and/or multiple psychotropic medication (including antipsychotics or mood stabilizer) at high doses to control symptoms • Often needs special education services.
Distinguishing Symptoms of ADHD	<ul style="list-style-type: none"> • Characteristic facial features of FAS are not present in ADHD or ARND • Aggression, if it occurs, usually is not severe in uncomplicated ADHD; however, may be more severe in some patients with FAS/ARND • Most patients have average (or higher) IQ; whereas, many patients with FAS have MR • Appetite and growth problems are less severe • Most children with uncomplicated ADHD are otherwise healthy; whereas, children with severe FAS often have many medical problems and often appear unhealthy
Learning disorders: Reading, Mathematics, Language, Articulation disorders, Written +/-Receptive	
Prevalence	<p>Not known; however, the CDC (1987) estimated 5%-10%</p>
Overlapping Symptoms	<ul style="list-style-type: none"> • Both have a higher prevalence in males: 3-5:1 • Both can have very poor handwriting and poor reading comprehension • Poor school performance, may not be evident immediately • Often dislike and/or avoid school
Distinguishing Symptoms of This Disorder	<ul style="list-style-type: none"> • Look for specific areas of academic difficulty • Definitive diagnosis made by psychoeducational testing (neuropsychological testing may be beneficial)
Distinguishing Symptoms of ADHD	<ul style="list-style-type: none"> • Although children with either condition may have variable performance ability, children with ADHD more obviously perform better at tasks they enjoy.

Appendix B2. Conditions That May Be Confused with ADHD (Continued)

Major Depressive Disorder	
Prevalence	Preadolescence: 1-5%, Adolescence: 5-10% Prior to puberty the gender ratio for depressive disorders is 1:1. After puberty the ratio is 2:1 ratio for females to males, which continues into adulthood.
Overlapping Symptoms	<ul style="list-style-type: none"> • Poor concentration • Difficulty settling to sleep +/- insomnia • Poor self-esteem • Indecision • May appear fidgety and/or agitated • +/- Poor appetite
Distinguishing Symptoms of This Disorder	<ul style="list-style-type: none"> • Frequent/excessive sadness +/- tearfulness • Irritability, agitation, hostility, anger, moodiness • Lack of enthusiasm, poor motivation, constant boredom • Extreme sensitivity to rejection, poor self esteem • Suicidal ideation or self-injurious behavior • Sad themes in play/drawings • Feelings of hopelessness, worthlessness, or excessive guilt • Change in school performance or behavior: decreased grades, change in pattern of socialization, withdrawal from activities • Neurovegetative changes: (1) sleep (2) appetite (3) energy • +/- life stressors: relationship break-up, parental divorce, bereavement, chronic illness, etc. • Frequent physical complaints, e.g., headaches, stomachaches • Suicidal behavior in children under 13 (a concerning symptom that warrants psychiatric evaluation)
Distinguishing Symptoms of ADHD	<ul style="list-style-type: none"> • ADHD symptoms should be present since early childhood before onset of depression. • Symptoms of ADHD are consistent and chronic; although there may be a gradual increase in symptoms with increasing expectations at school/work • There may be poor self-esteem in children with untreated ADHD. However, if sadness and tearfulness are daily or if there is self-injurious behavior or suicidal ideation think about depression. • Depression may be co-morbid with ADHD • Sleep difficulty is generally characterized by trouble settling to sleep and early awakening rather than severe initial insomnia or middle awakening • Poor PO intake can be related to inattention and hyperactivity at meals
Oppositional Defiant Disorder	
Prevalence	35% (CI: 27%, 44%)
Overlapping Symptoms	<ul style="list-style-type: none"> • Fail to follow directions • May appear to ignore others • Disruptive behavior
Distinguishing Symptoms of This Disorder	<ul style="list-style-type: none"> • Pattern of negativistic, hostile, and defiant behavior: angry, argumentative • Refuses to comply with adults' requests • Blames others, vindictive • Especially has difficulty interacting with parents and authority figures • Family and social history are very important, e.g., depression, abuse
Distinguishing Symptoms of ADHD	<ul style="list-style-type: none"> • ADHD symptoms should be present since early childhood. • Children with ADHD often do not follow directions well; however, this is due to forgetfulness, distractibility, rather than refusal. • Over time, children with untreated or residual ADHD symptoms may dislike and/or avoid school or tasks/situations that require sustained attention or sustained sitting.

Appendix B2. Conditions That May Be Confused with ADHD (Continued)

Post Traumatic Stress Disorder (PTSD)	
Prevalence	15%– 40% of children have experienced at least one traumatic event in their lifetime. Of these, 5-10% have PTSD.
Overlapping Symptoms	<ul style="list-style-type: none"> • Hyperactivity or agitation • Memory and attentional difficulties • Difficulty settling to sleep +/- Insomnia
Distinguishing Symptoms of This Disorder	<ul style="list-style-type: none"> • Must have history of trauma • Hypervigilance • Nightmares • Flashbacks • Feeling detached or estranged • Reenactment of trauma in play, drawings, or verbalizations. • May see speech disturbances, poor sleep, poor appetite and other physiologic symptoms
Distinguishing Symptoms of ADHD	<ul style="list-style-type: none"> • ADHD symptoms should be present since early childhood. • Note that children with ADHD often have parents with ADHD who may have had difficult lives (unwanted pregnancy, substance abuse, MVA) because of untreated ADHD. Think about the possibility of primary PTSD or co-morbid ADHD + PTSD.
Reactive Attachment Disorder (RAD)	
Prevalence	Experts in RAD estimate that this disorder has been misdiagnosed as Bipolar Disorder or Attention Deficit Disorder in 40 to 70 percent of cases.
Overlapping Symptoms	<ul style="list-style-type: none"> • Both may be “overly sociable” and/or hypertalkative • Difficulty sleeping • Poor growth • Disruptive behavior • Poor social skills
Distinguishing Symptoms of This Disorder	<ul style="list-style-type: none"> • History of neglect, abuse, separation from parents, early severe chronic illness, multiple caretakers • Either: Indiscriminate friendliness with strangers, e.g., hugs strangers • Or: Withdrawal/aloofness with others with extreme mistrust of nearly everyone. • “Hoarding” food or belongings is a red flag • May see night-time wandering +/-night-time binge eating • May have a wasted/pale appearance- “waif-like” • Often are emotionally detached and may have restricted or superficial expression of emotions • These children may be quite “needy” of attention and tend to tire-out caretakers •
Distinguishing Symptoms of ADHD	<ul style="list-style-type: none"> • Persons with untreated or poorly treated ADHD are at increased risk for difficult and chaotic lives (unwanted pregnancy, substance abuse, MVA). Therefore, children with RAD are also at increased risk of ADHD by heredity. RAD may look like ADHD, but there may also be co-morbid ADHD + RAD.

Appendix B3. Special Patient Populations

<p>Preschool age (3-5 year olds)</p>	<p><u>Diagnosis</u></p> <ul style="list-style-type: none"> • May be difficult to determine whether hyperactivity, impulsivity, and inattention are due to normal developmental variation. <p><u>Treatment/referral</u></p> <ul style="list-style-type: none"> • Some patients with severe symptoms may require medication. • Parent education and training is important • Referral to practitioners with expertise in developmental pediatrics and/or child psychiatric disorders is recommended for diagnosis and treatment.
<p>Closed head injury</p>	<p><u>Diagnosis</u></p> <ul style="list-style-type: none"> • Patients with head injury (and static encephalopathy from other etiologies) are at increased risk for impulsivity and inattention. • There are reported cases of young children that developed (permanent) symptoms consistent with ADHD after severe head injury, encephalitis, or brain tumor. <p><u>Co-morbidity</u></p> <ul style="list-style-type: none"> • Watch for co-morbid seizures. • Watch for aggression, personality changes, mood and anxiety symptoms. <p><u>Treatment/referral</u></p> <ul style="list-style-type: none"> • Patients may respond to stimulant treatment only or may require other medications, e.g., antipsychotic medication (risperidone) or mood stabilizers (carbamazepine, valproic acid). • Referral to practitioners with expertise in developmental pediatrics, child psychiatric disorders, and/or neurologic disorders is recommended for assistance with diagnosis and treatment. • Encourage special education services and IEP development
<p>Mentally retarded patients</p>	<p><u>Diagnosis</u></p> <ul style="list-style-type: none"> • Data are limited regarding the diagnosis and treatment of ADHD in MR patients- relatively more information exists for autistic disorders. • Diagnosis must take into account the maturity and developmental challenges of the patient. • ADHD can co-occur with mild-moderate MR. • ADHD is difficult to diagnose with severe to profound MR. • ADHD (especially inattentive type) is difficult to diagnose with low average or borderline IQ. <p><u>Co-Morbidity</u></p> <ul style="list-style-type: none"> • Watch for co-morbid seizures. • Watch for personality changes, mood and anxiety symptoms. • Watch for aggression, irritability, hypomania, and hallucinations, especially if using stimulants. <p><u>Treatment/Referral</u></p> <ul style="list-style-type: none"> • MR patients with ADHD may respond well to stimulant treatment, however, some patients may become irritable with stimulant treatment. • Clonidine (Catapres®) and guanfacine (Tenex®) may be more helpful than stimulants for some patients with MR as the main problems are often hyperactivity and impulsivity. • All MR patients should have an IEP to facilitate appropriate educational curriculum and services. • Referral to practitioners with expertise in developmental pediatrics and/or child psychiatric disorders is recommended.
<p>Fetal Alcohol Syndrome (FAS) and Alcohol-Related Neurobehavioral Disorder (ARND)</p> <p>[Note: ARND is also called Fetal Alcohol Effects (FAE) or partial FAS]</p>	<p><u>Diagnosis</u></p> <ul style="list-style-type: none"> • A genetics referral may be helpful in diagnosis. • Some centers have multidisciplinary clinics for diagnosis where treatment may also be provided. • Many (get %) patients with FAS have symptoms consistent with ADHD. (call Sheila Gahagan/Keiran O'Malley). <p><u>Co-Morbidity</u></p> <ul style="list-style-type: none"> • Patients with FAS have a higher incidence of cardiac and renal problems (take care when prescribing psychotropic medications). • Mood symptoms are common. <p><u>Treatment/Referral</u></p> <p>FAS/ARND patients with ADHD may respond to stimulant treatment but they may require higher doses than typical ADHD patients or may require other medications, e.g., antipsychotic medication (risperidone) or mood stabilizers (carbamazepine, valproic acid).</p>

Appendix B3. Special Patient Populations (continued)

FAS and ARND (continued)

- There is emerging evidence that FAS/ARND patients may respond preferentially to amphetamine versus methylphenidate (cite O'Malley)
- Patients often require psychoeducational testing and an IEP. They may require special education services due to math and/or language learning disorders or MR.
- FAS is a *static* encephalopathy- cognitive deficits usually do *not* substantially improve with time.
- Referral to a practitioner with expertise in genetics, developmental pediatrics, neurology, and/or child psychiatric disorders is recommended for assistance with diagnosis and treatment.

13 years – Adult

Diagnosis

- ADHD is a chronic condition that extends across developmental phases and may persist into adulthood.
- Murphy & Barkley (1996) estimated that 2-4% of adults have ADHD.
- Data are emerging regarding diagnosis and treatment of affected adults.

Co-Morbidity

- Diagnosis in adulthood is often confounded by co-morbid diagnoses, e.g., mood disorders, substance abuse disorders.

Treatment/Referral

- No specific guidelines are available regarding medication discontinuation, however, most persons with ADHD benefit from continuing medication throughout high school. Approximately 1/3 of affected individuals benefit from medication treatment into adulthood.
- More difficult to diagnose ADHD retrospectively in adults for whom the illness was previously undiagnosed.
- No data are available on drug therapy in pregnancy.

Substance Abusing Patients

Treatment

- Medication treatment for ADHD has been demonstrated to reduce the risk of subsequent substance use disorders.
- Medication treatment of co-morbid ADHD and substance use disorders is possible but patients require careful monitoring. Non-controlled substances may be useful (e.g., bupropion, atomoxetine).
- Stimulant medications are commonly abused, therefore, most are schedule II medications. True physiological dependence is rare and usually does not occur unless very high doses are used.
- Talk about substances of abuse and caffeine.

Appendix B4. Overview of Complimentary and Alternative Medicine Associated with ADHD

Therapy	Use	Dose	Side Effects	Evidence
General				
Expressive (sensory integration, occupational therapy, music, dance, art)	ADHD and neurodevelopmental disorders		None	Anecdotal
Diet restriction (Feingold, red dye, sugars) Megavitamins	ADHD			Most controlled studies show no benefits or limited benefits only for small groups of children
Neurofeedback (EEG biofeedback)	ADHD, Tics, Seizures	20-40 sessions	None	Small studies suggest some benefit
Opometric vision training	ADHD		None	No systematic data
Supplements: ADHD				
Ginkgo biloba	Antioxidant Improves blood flow. Small benefit to adult cognitive function.	120-240 mg/d (Adult)	Headache, dizziness, arrhythmias, hypotension, GI upset (nausea, vomiting, diarrhea), restlessness, cutaneous hyper-sensitivity. Avoid in bleeding disorders.	One open label study in 36 children who received combination herbal given BID x 4 weeks <ul style="list-style-type: none"> ▪ Improvement in Conners' ADHD index at 4 weeks ▪ 14% of subjects reported adverse effects related to study medication
Fish oil (omega-3, EPA, DHA)	hyperlipidemia, hypertriglyceridemia, hypertension	500-1000 mg/d (Adult)	Flatus, halitosis, heartburn, (high doses): nausea, loose stools, (doses > 3gm/d): Avoid in bleeding disorders, (long-term) weight gain	One blinded RCT in 63 children who received DHA (345 mg/d) x 4 months showed no statistically significant improvement in any objective or subjective measure of ADHD symptoms
Evening primrose oil (linolenic, gamma linoenic acid)		500mg 3-6x/d (Adult)	High dose or chronic use: Nausea, diarrhea, headache	Two blinded placebo control crossover studies suggest some behavioral improvement
Supplements: Sleep disorder				
Melatonin (N-acetyl-5-methoxytryptamine)	Sleep disorders	3 mg	Sleepiness, fatigue, headache. Possible proconvulsant with multiple neurologic disabilities. May suppress puberty.	One RCT in 25 children with ADHD and chronic insomnia (5 mg melatonin) <ul style="list-style-type: none"> ▪ Decreased sleep latency and increased total sleep time. One open label study in 24 children with ADHD who received 3 mg melatonin <ul style="list-style-type: none"> ▪ Statistically significant decrease in time to falling asleep reported after short- and long-term use