**Attention-Deficit Hyperactivity Disorder**

**Patient population.** Children and young adults age 3 to 30 years. Considerations for preschool children (3-5) and adults (18-30) are 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 – a U.S. community prevalence of 6-8% that is more common in boys [C]. In at least 30% of diagnosed children ADHD continues into adulthood, with 3-4% of adults meeting criteria for ADHD [C].
- **Primary care provider.** Most children with ADHD receive care through primary care physicians.

**Diagnosis**

- **Types.** Diagnosis is based on the DSM-V criteria (see Table 1) [D]. The three main types are primary hyperactive, primary inattentive, and combined.
- **Multiple sources.** No specific test can make the diagnosis. Input from both parents and teachers or other source is required. Some psychological rating tools are useful but are not diagnostic (e.g., Vanderbilt, Connors; see Figure 1, Tables 1 & 2, and Appendix A1). If a learning problem is suspected, consider neuropsychiatric testing for intelligence testing (IQ) and learning disorders.
- **Confused and associated conditions.** Diagnosis is complicated by overlapping symptoms or co-occurrence of other disorders (e.g., anxiety disorders, bipolar disorder, obstructive sleep apnea, fetal alcohol syndrome, major depressive disorders, learning disorders, oppositional defiant disorder, post traumatic stress disorder, reactive attachment disorder; see Appendices B1 & B2).

**Treatment (See Table 4)**

**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 (Tables 5-7) [IA*].
- Atomoxetine is a secondary choice [IA]. (One reported side effect is suicidal thinking.)
- Other medications may be used alone or in combination depending upon the ADHD type, response to therapy 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 7) [IIA].
- Comorbid conditions may require additional treatment (e.g., for depression) and consideration of referral to a mental health specialist.

**Non-pharmacologic interventions**

- Age-appropriate behavioral interventions at home: education and support [IB]; parent interventions including routines, clear limits and positive reinforcement for target behaviors (for children); consider family therapy; cognitive behavioral techniques for adults [IB] (see Table 8 and Appendix A2).
- School interventions: children with ADHD may qualify for a 504 education plan or special education services with individualized education plan (IEP) [ID] (see Appendices A3 & A4).

**Special Populations or Circumstances**

- Special considerations apply to: 3-5 year olds, adolescents and adults, head-injured, intellectually disabled/autistic, fetal alcohol syndrome, and 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, there is no proof of efficacy (e.g., individually tailored hypoallergenic diets, essential fatty acids, flax seed) [IIIB*]; studies have shown the Feingold diet and modifying sugar consumption have no effect [IIIB].

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

*Strength of recommendation:*

- I = generally should be performed; II = may be reasonable to perform; III = generally should not be performed.

*Level of evidence supporting a diagnostic method or an intervention:*

- A=randomized controlled trials; B=controlled trials, no randomization; C=observational trials; D=opinion of expert panel.
## Table 1. DSM-V Diagnostic Criteria for ADHD

A. A persistent pattern of inattention and/or hyperactivity-impulsivity that interferes with functioning or development, as characterized by (1) and/or (2):

1. **Inattentive:** Six (or more) of the following symptoms have persisted for at least 6 months to a degree that is inconsistent with developmental level and that negatively impacts directly on social and academic/occupational activities:

   **Note:** The symptoms are not solely a manifestation of oppositional behavior, defiance, hostility, or failure to understand tasks or instructions. For older adolescents and adults (age 17 and older), at least five symptoms are required.

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

2. **Hyperactivity and impulsivity:** Six (or more) of the following symptoms have persisted for at least 6 months to a degree that is inconsistent with developmental level and that negatively impacts directly on social and academic/occupational activities:

   **Note:** The symptoms are not solely a manifestation of oppositional behavior, defiance, hostility, or a failure to understand tasks or instructions. For older adolescents and adults (age 17 and older), at least five symptoms are required.

   a. Often fidgets with or taps hands or feet or squirms in seat.
   b. Often leaves seat in situations when remaining seated is expected (e.g., leaves his or her place in the classroom, in the office or other workplace, or in other situations that require remaining in place).
   c. Often runs about or climbs in situations where it is inappropriate. (Note: In adolescents or adults, may be limited to feeling restless.)
   d. Often unable to play or engage in leisure activities quietly.
   e. Is often “on the go,” acting as if “driven by a motor” (e.g., is unable to be or uncomfortable being still for extended time, as in restaurants, meetings; may be experienced by others as being restless or difficult to keep up with).
   f. Often talks excessively.
   g. Often blurts out an answer before a question has been completed (e.g., completes people’s sentences; cannot wait for turn in conversation).
   h. Often has difficulty waiting his or her turn (e.g., while waiting in line).
   i. Often interrupts or intrudes on others (e.g., butts into conversations, games, or activities; may start using other people’s things without asking or receiving permission; for adolescents and adults, may intrude into or take over what others are doing).

B. Several inattentive or hyperactive-impulsive symptoms were present prior to age 12 years.

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

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

E. The symptoms do not occur exclusively during the course of schizophrenia or another psychotic disorder and are not better explained by another mental disorder (e.g., mood disorder, anxiety disorder, dissociative disorder, personality disorder, substance intoxication or withdrawal).
Specify whether:

314.01 (F90.2) Combined presentation: If both Criterion A1 (inattention) and Criterion A2 (hyperactivity-impulsivity) are met for the past 6 months.

314.00 (F90.0) Predominantly inattentive presentation: If Criterion A1 (inattention) is met but Criterion A2 (hyperactivity-impulsivity) is not met for the past 6 months.

314.01 (F90.1) Predominantly hyperactive/impulsive presentation: If Criterion A2 (hyperactivity-impulsivity) is met and Criterion A1 (inattention) is not met for the past 6 months.

Specify if:

In partial remission: When full criteria were previously met, fewer than the full criteria have been met for the past 6 months, and the symptoms still result in impairment in social, academic, or occupational functioning.

Specify current severity:

Mild: Few, if any, symptoms in excess of those required to make the diagnosis are present, and symptoms result in no more than minor impairments in social or occupational functioning.

Moderate: Symptoms or functional impairment between “mild” and “severe” are present.

Severe: Many symptoms in excess of those required to make the diagnosis, or several symptoms that are particularly severe, are present, or the symptoms result in marked impairment in social or occupational functioning.
Figure 1. Overview of Diagnosis and Treatment of ADHD in Patients Age 4-18 years *

Patient identified with signs or symptoms suggesting ADHD. See Table 2

Perform diagnostic evaluation for ADHD and evaluate or screen for other/coexisting conditions. See Table 3

Yes

Diagnosis of ADHD? See Table 1

No

Other condition? Yes

Apparent typical or developmental variation?

Yes

Inattention and/or hyperactivity/impulsivity problems not rising to DMS-IV diagnosis. Provide education addressing concern (e.g., expectations for attention as a function of age). Enhanced surveillance

No

Evaluate or refer as appropriate

Provide education addressing concern (e.g., triggers for inattention or hyperactivity) and behavior management strategies or school-based strategies. Enhanced surveillance

Yes

Coexisting conditions?

Yes

Assess impact on treatment plan. Further evaluation/referral as needed

Coexisting disorder preclude primary care management?

Yes

Follow-up and establish co-management plan

No

Provide education to family and child re: concerns (e.g., triggers for inattention or hyperactivity) and behavior-management strategies or school-based strategies.

Establish Management Team:
- Identify as child with special health care needs
- Collaborate with family, school, and child to identify target goals
- Establish team including coordination plan

Begin Treatment with one or multiple options. Treatment depends on age. See Table 4
- Medication
- Behavior management
- Collaboration

No

Symptoms improve?

Yes

Follow-up for chronic care management at least 2x/year

Reevaluate to confirm diagnosis and/or provide education to improve adherence.

Reconsider treatment plan including changing of the medication or dose, adding a medication approved for adjuvant therapy, and/or changing behavioral therapy.

No

Coexisting disorder? No

Provide education

See Table 1

Inattention and/or hyperactivity/impulsivity problems not rising to DMS-IV diagnosis. Provide education addressing concern (e.g., expectations for attention as a function of age). Enhanced surveillance

*The overall sequence of evaluation and treatment of adults is similar, see the text details specific to adults.
Table 2. Screen for AD/HD

**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?

**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

Table 3. Information Sources for Evaluation for ADHD

<table>
<thead>
<tr>
<th>Family (parents, guardian, other frequent caregivers):</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Chief concerns</td>
</tr>
<tr>
<td>• History of symptoms (e.g., age of onset and course over time)</td>
</tr>
<tr>
<td>• Family history</td>
</tr>
<tr>
<td>• Past medical history</td>
</tr>
<tr>
<td>• Psychosocial history</td>
</tr>
<tr>
<td>• Review of systems</td>
</tr>
<tr>
<td>• Validated ADHD instrument</td>
</tr>
<tr>
<td>• Evaluation of coexisting conditions</td>
</tr>
<tr>
<td>• Report of function, both strengths and weaknesses</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>School (and important community informants):</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Concerns</td>
</tr>
<tr>
<td>• Validated ADHD instrument</td>
</tr>
<tr>
<td>• Evaluation of coexisting conditions</td>
</tr>
<tr>
<td>• Report on how well patients function in academic, work, and social interactions</td>
</tr>
<tr>
<td>• Academic records (e.g., report cards, standardized testing, psychoeducational evaluations)</td>
</tr>
<tr>
<td>• Administrative reports (e.g., disciplinary actions)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Child/Adolescent (as appropriate for child’s age and developmental status):</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Interview, including concerns regarding behavior, family relationships, peers, school</td>
</tr>
<tr>
<td>• For adolescents: validated self-report instrument of ADHD and coexisting conditions</td>
</tr>
<tr>
<td>• Report of child’s self-identified impression of function, both strengths and weaknesses</td>
</tr>
<tr>
<td>• Clinician’s observations of child’s behavior</td>
</tr>
<tr>
<td>• Physical and neurologic examination</td>
</tr>
</tbody>
</table>

Note: From ADHD: Clinical Practice Guideline for the Diagnosis, Evaluation, and Treatment of Attention-Deficit/Hyperactivity Disorder in Children and Adolescents, American Academy of Pediatrics, Nov. 2011

Table 4. Treatment Options for ADHD

For pre-school aged children, first line is behavior therapy. If not significantly improved, prescribe methylphenidate.

For elementary school aged children and adolescents (≥ 6 years of age), first line is methylphenidate. Pharmacological treatment improves symptoms. Behavioral management techniques help modify behavior.

**Medication** (ADHD only and past medical or family history of cardiovascular disease considered)
- Initiate treatment
- Titrate to maximum benefit, minimum adverse effects
- Monitor target outcomes

**Behavior management** (developmental variation, problem or ADHD)
- Identify service or approach
- Monitor target outcomes

**Collaborate with school** to enhance supports and services (developmental variation, problem, or ADHD)
- Identify changes
- Monitor target outcomes

Note: Adapted from ADHD: Clinical Practice Guideline for the Diagnosis, Evaluation, and Treatment of Attention-Deficit/Hyperactivity Disorder in Children and Adolescents, American Academy of Pediatrics, Nov. 2011
Table 5. First Line Drug Therapy for ADHD

<table>
<thead>
<tr>
<th>Generic Name</th>
<th>Brand Name, Dosage Strength</th>
<th>Onset of Action (min)</th>
<th>Duration of Effect on Behavior (hrs)</th>
<th>Usual Prescribing Schedule Starting dose – Maximum Recommended Dose</th>
<th>30-day Cost1</th>
<th>Drug Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stimulants: Short-Acting (Immediate-Release)2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Methylphenidate | Ritalin® 5, 10, 20 mg | 20 to 30 | 3 to 6 | 5-20 mg BID-TID. Increase dose by 5-10 mg/d weekly, max 60 mg/d. | $8-19 | • Take 30 minutes before meals  
• Methyl® chewable tablets  
• Sudden death and pre-existing structural cardiac abnormalities or other serious heart problems |
| | Methylin® 5, 10, 20 mg | 20 to 30 | 3 to 6 | | $8-19 | |
| | Methylin™ oral solution 5 mg/5 ml, 10 mg/5 ml | | | | $135-193 | |
| | 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. | $18-61 | • 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, 15, 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. | $85 | |
| Dextroamphetamine | Dexedrine® 5, 10 mg | 20 to 60 | 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. | $14-27 | • Take with/after meals ± 30 minutes |
| | ProCentra 5mg/ml oral solution | | | | NA | |
| | | | | | $306-612 | |
| | | | | | $480 per 16 oz | |
| **Stimulants: Intermediate-Acting (Sustained-/Extended-Release)2** | | | | | | |
| Methylphenidate | Ritalin-SR® 20 mg | 60 to 90 | 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. | $45-128 | • Take with/after meals ± 30 minutes  
• Supplementation with short-acting MPH may still be necessary  
• Do not crush/chew/ divide |
| | Metadate® ER 20 mg | 60 to 180 (highly variable) | | | $72-215 | |
| Dextroamphetamine | Dexedrine Spansules® 5, 10, 15 mg | 60 to 90 (highly variable) | 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 | NA | • Take with/after meals ± 30 minutes  
• 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>
<thead>
<tr>
<th>Generic Name Brand Name, Dosage Strength</th>
<th>Onset of Action (min)</th>
<th>Duration of Effect on Behavior (hrs)</th>
<th>Usual Prescribing Schedule Starting dose – Maximum Recommended Dose</th>
<th>30-day Cost1 Generic</th>
<th>Brand</th>
<th>Drug Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stimulants: Long-Acting (Once-Daily)2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Methylphenidate³ 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. | $125 | $148-303 | • Take with/after meals ± 30 minutes  
• Do not crush/chew/divide  
• Capsule contents may be sprinkled on applesauce⁴ |
| 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 | $155-260 | • 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. | $158-181 | $195-411 | • Do not crush/chew/divide  
• Tablet shell may appear in stool |
| Daytrana® 10, 15, 20, 30 mg patch | 3 hours | 10-12 | 10 mg applied to hip area, titrate upwards weekly | Generic not available | $191 | • Remove patch after 9 hours  
• Anorexia, insomnia, tics more common  
• Use if cannot take oral meds |
| Quillivant XR® 25mg/5ml (5mg/ml) | 4 hours | 12 | 20 mg once daily in the morning, titrate up weekly in increments of 10 mg to 20 mg, max 60mg | Generic not available | $210 | • For ages 6 and above  
• Once-daily liquid  
• Abuse and dependence warnings  
• Avoid use in patients with known structural cardiac abnormalities |
| Dexmethylphenidate Focalin XR® 5, 10, 15, 20, 30, 40 mg caps | 30 | 12 | 5-40 mg, increase dose by 5 mg weekly | Generic not available | $178-205 | • Do not take with antacids  
• Can be sprinkled on applesauce but not crushed, chewed |
| Lisdexamfetamine Vyvanse® 20, 30, 40, 50, 60, 70 mg caps | 2 hours | 10 | 30 mg, increase by 20 mg weekly to 70 mg max | Generic not available | $169 | • Capsule can be opened and contents dissolved in water |
| 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. | $50 | $231 | • Take with/after meals ± 30 minutes  
• Capsule contents may be sprinkled on applesauce⁴ |
Table 5. First Line Drug Therapy for ADHD, continued

<table>
<thead>
<tr>
<th>Generic Name Brand Name, Dosage Strength</th>
<th>Onset of Action (min)</th>
<th>Duration of Effect on Behavior (hrs)</th>
<th>Usual Prescribing Schedule Starting dose – Maximum Recommended Dose</th>
<th>30-day Cost&lt;sup&gt;1&lt;/sup&gt;</th>
<th>Drug Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atomoxetine (Strattera®)&lt;sup&gt;3&lt;/sup&gt; 10, 18, 25, 40, 60, 80, 100 mg</td>
<td>Slow onset</td>
<td>~24</td>
<td>≤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</td>
<td>&gt;70 kg 40 mg/day; increase after a minimum of 3 days to 80 mg/day, max 100 mg/d.</td>
<td>Generic not available</td>
</tr>
</tbody>
</table>

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

<sup>1</sup> For brand drugs, Average Wholesale Price minus 10%. AWP from Amerisource Bergen Wholesale Catalog7/20/2012 and Red Book Online 7/20/2012. For generic drugs, Maximum Allowable Cost plus $3 from BCBS of Michigan MAC List, 7/16/2012.

<sup>2</sup> Stimulants are not recommended for children < 3 years old

<sup>3</sup> May in rare instances cause prolonged and sometimes painful erections known as priapism. Healthcare professionals should talk to male patients and their caregivers to make sure they know the signs and symptoms of priapism and stress the need for immediate medical treatment should it occur. Younger males, especially those who have not yet reached puberty, may not recognize the problem or may be embarrassed to tell anyone if it occurs.

<sup>4</sup> The applesauce should not be warm; mixture of drug and applesauce should be consumed immediately, and should not be stored for future use.

<sup>5</sup> For the brand drug Concerta, in November 2014 the FDA removed the AB-rating of therapeutic equivalence for generics made by manufacturers Mallinckrodt, AvKARE, and Kremers Urban. Pharmacies can not automatically substitute a generic equivalent for Concerta. By May 2015 these generics will either be confirmed to be bioequivalent to Concerta or they will be voluntarily withdrawn from the market.

<sup>6</sup> 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. Precautions for Stimulants and Non-Stimulants Used in Treatment of ADHD

<table>
<thead>
<tr>
<th>Generic Name</th>
<th>[Brand Name]</th>
<th>Drug Class Side Effects/Monitoring Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stimulants</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| All stimulants | | - Cardiovascular risk: Prior to prescribing stimulants all patients should be screened for syncope with exercise, history of structural/congenital heart defects and a family history of sudden unexpected cardiovascular death. Patients with a positive screen to one of these 3 questions should be considered for further evaluation, such as an EKG, prior to beginning stimulant therapy.  
  - 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  
  - Avoid decongestants  
  - Rare: visual hallucinations, seizures.  
  - Rare: may cause prolonged and sometimes painful erections (priapism). |
| Methylphenidate | | |
| Non-Stimulants | | |
  - 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 of children and adolescents 9.05).  
  - Rare: may prolonged and sometimes painful erections (priapism). |

1 Theoretical potential for GI obstruction with Concerta® (tablet is non-deformable); do not use in patients with severe GI narrowing.
Table 7. Second Line Drugs for Treatment of ADHD  

<table>
<thead>
<tr>
<th>Medication</th>
<th>Indications</th>
<th>Dose Schedule</th>
<th>Range</th>
<th>Cost*</th>
<th>Drug Class Side effects / Comments</th>
</tr>
</thead>
</table>
| **Buproprion** | ADHD with intolerance to stimulants (esp. due to decreased appetite) | **Children 8-12 years:** 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 | 75 to 300 mg/d | $17-20 generic $72-287 brand | • 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 years old |
| Wellbutrin ® | ADHD with depression, aggression, irritability | **Adolescents:** 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 | | | |
| Wellbutrin SR ® | Smoking cessation | **Frequency (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 | | | |
| Wellbutrin XL® | In consultation with a child psychiatrist, may be used for: Mood lability Aggression, Depression | | | | |

*Cost**: \$17-20 generic \$72-287 brand \$16-49 generic \$118-238 brand \$236-328 brand
### Table 7. Second Line Drugs for Treatment of ADHD, continued

<table>
<thead>
<tr>
<th>Medication</th>
<th>Indications</th>
<th>Dose Schedule</th>
<th>Range</th>
<th>Cost*</th>
<th>Drug Class Side effects / Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Antidepressants (continued)</strong></td>
<td></td>
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</tr>
<tr>
<td><strong>Antihypertensives</strong></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
| **Clonidine** | ADHD + tics | Initial: 0.05 mg HS | 0.05-0.2 mg/d | $5-13 generic | - 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 years old |
| Catapres ® or generic 0.1, 0.2, 0.3 mg tablets | ADHD + Post traumatic stress disorder (PTSD) | Increase: 0.05 mg every 3 to 7 days | | $75-200 brand | |
| Available as a patch | PTSD | Frequency: 3 to 4 doses/day for ADHD, but may be given just at HS for PTSD, insomnia | | | |
| Kapvay (extended release) | Insomnia, Oppositionality | Must be taken daily, caution parents not to give prn if using for insomnia | | | |
| | Hyperarousal, Aggression | Maximum effect may take several weeks | | | |
| | | Start and stop slowly | | | |
| | | Initial: 0.1 mg HS increase in 0.1 mg increments every 7 days | | | |
| | | Frequency: 2 doses per day for ADHD (either split equally or with the higher split dosage given at bedtime); maximum: 0.4 mg/day | | | |
| **Guanfacine** | ADHD + tics | Initial: 0.5 mg HS | 0.5 to 3 mg/d | $7-16 generic | - Sedation, dizziness, nausea, orthostatic hypotension, insomnia, agitation, headaches, stomach aches, enuresis  
- Monitor blood pressure  
- Baseline EKG is advisable  
- Consider referral to child psychiatry for use in children <5 yrs old |
| Tenex ® or generic 1.2 mg tablets (limited data available) | ADHD + PTSD | Increase: 0.5 mg/week | | $78-230 brand | |
| | PTSD | Give as one to two doses/day | | | |
| | Insomnia, Oppositionality | Takes several days to weeks to take effect | | | |
| | Hyperarousal, Aggression | | | | |
| Intuniv (long acting) 1,2,3,4 mg | Initial 1mg in AM, increase by 1 mg/wk, max 4 mg/d | 1-4 mg/day | | | |
| | | Somnolence is common  
Recommended dose may be too low for adolescents | | | |

(Continued on next page)
### Table 7. Second Line Drugs for Treatment of ADHD, continued

<table>
<thead>
<tr>
<th>Medication</th>
<th>Indications</th>
<th>Dose Schedule</th>
<th>Range</th>
<th>Cost* Drug Class</th>
<th>Side effects / Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Risperidone</strong></td>
<td>ADHD + tics</td>
<td>Initial: 0.5 mg HS (0.25 if &lt; 20 kg)</td>
<td>0.5 to 2 mg/d</td>
<td>$30-38 generic</td>
<td>• 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,</td>
</tr>
<tr>
<td><strong>Generic</strong></td>
<td>ADHD + aggression</td>
<td>Increase: 0.5 mg BID after 3 to 7 days and then by 0.5 mg/day up to 1 mg BID</td>
<td></td>
<td>$219-330 brand</td>
<td>• Sedation tends to decrease over time</td>
</tr>
<tr>
<td><strong>0.25, 0.5, 1, 2, 3, 4 mg tablets</strong></td>
<td>ADHD + mood swings</td>
<td>Frequency: 1 - 2 doses/day for aggression/severe mood swings, but may be given just at HS.</td>
<td></td>
<td></td>
<td>• Monitor weight, glucose, cholesterol, triglycerides, and liver function studies at least yearly.</td>
</tr>
<tr>
<td><strong>Available as orally disintegrating tablets</strong> (Risperdal M-tab - no generic) in 0.5, 1, and 2 mg</td>
<td>ADHD + severe insomnia, aggression, and/or hyperactivity</td>
<td>Must be taken daily. Maximum effect may take 1 - 2 weeks</td>
<td></td>
<td></td>
<td>• Baseline liver function panel advisable</td>
</tr>
<tr>
<td><strong>Available as a liquid 1 mg/cc</strong></td>
<td></td>
<td>Start and stop slowly</td>
<td></td>
<td></td>
<td>• Consider referral to child psychiatry, especially if more than 1-2 months treatment is required, and/or in children &lt; 5 yrs old.</td>
</tr>
<tr>
<td><strong>Trazodone</strong></td>
<td>ADHD + insomnia</td>
<td>Initial: 25 mg q HS</td>
<td>25 to 200 mg/d</td>
<td>$4-6 generic</td>
<td>• Sedation, dizziness, orthostatic hypotension.</td>
</tr>
<tr>
<td><strong>Generic</strong></td>
<td>ADHD + Hyperactivity and/or Aggression</td>
<td>Increase: 25 mg/week up to 200 mg per day.</td>
<td></td>
<td></td>
<td>• Monitor blood pressure and heart rate: baseline, after dose adjustment, and at follow-up.</td>
</tr>
<tr>
<td><strong>50, 100 mg tablets</strong></td>
<td></td>
<td>Give as single dose or as divided doses up to three doses/day</td>
<td></td>
<td></td>
<td>• Consider referral to child psychiatry for use in children &lt;5 yrs old.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Takes several days to weeks to take effect</td>
<td></td>
<td></td>
<td>• Fluoxetine, sertraline (other CYP3A4 inhibitors) may increase serum levels of trazodone</td>
</tr>
</tbody>
</table>

For brand drugs, Average Wholesale Price minus 10%. AWP from Amerisource Bergen Wholesale Catalog 7/20/2012 and Red Book Online 7/20/2012. For generic drugs, Maximum Allowable Cost plus $3 from BCBS of Michigan MAC List, 7/16/2012.
Table 8. Types of Intervention for ADHD

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pharmacotherapy</td>
<td>See above.</td>
</tr>
<tr>
<td>Psychoeducation and Support</td>
<td>Have printed materials handy to distribute to patients, families, and schools regarding diagnosis, medications, and treatment/support services. Be prepared to present this information to schools and community agencies. (See internet sources for handouts in text section on “Behavioral management.”)</td>
</tr>
<tr>
<td>Parent Skills Training</td>
<td>Such training may occur in formal groups and classes, through reading books and through individual counseling.</td>
</tr>
<tr>
<td>Family Therapy</td>
<td>This may be particularly useful for families with very disruptive children, families with adults who suffer from ADHD and/or complicated psychosocial circumstances.</td>
</tr>
<tr>
<td>ADHD Support Groups</td>
<td>These groups may be available in your local area through CHADD (Children and Adults with Attention Deficit Disorder) or other local organizations identified by community mental health or your local Intermediate School District (ISD). 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.</td>
</tr>
<tr>
<td>Advocacy Groups</td>
<td>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).</td>
</tr>
<tr>
<td>Social Skills Training</td>
<td>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, etc.</td>
</tr>
<tr>
<td>Cognitive Behavioral Therapy</td>
<td>This work often focuses on becoming more reflective, learning to stop and think before acting or speaking and learning to improve problem solving skills.</td>
</tr>
<tr>
<td>School Consultations/Interventions</td>
<td>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, etc.</td>
</tr>
<tr>
<td>Alternative/Complementary Treatments</td>
<td>See below.</td>
</tr>
</tbody>
</table>

Clinical Background

Clinical Problem and Current Dilemma

Prevalence and Impact

Attention deficit hyperactivity disorder (ADHD) is the most commonly diagnosed behavioral disorder of childhood. Birth-cohort based surveys show a prevalence of approximately 7.5%. School and office based surveys are somewhat lower [C]. It is more commonly diagnosed among boys. The combined subtype is the most common. Observational studies show some gender differences in subtypes: in girls the inattentive subtype is more common. Symptoms persist into adulthood for 30% to 70% of patients. Current estimates indicate that approx. 3-4% of adults meet diagnostic criteria for ADHD.

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 motor vehicle accidents, substance abuse, and school drop out [B]. These patterns continue for adults with untreated ADHD, including effects on educational attainment and impairment in work performance, social functioning, emotional and marital adjustment, driving record, and financial management.

Some children with ADHD may qualify for special education services under the OHI (otherwise health
impairment) 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. Hyperkinetic disorder (ICD-10) uses a stricter definition than DSM. For children, 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%), United Kingdom (5%) 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 performance at school/work 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.

Diagnostic Concerns

Some experts see ADHD as under-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. Evaluation of children requires observational information from classroom teacher and parents for children. Evaluation of adults may include information from another person who knows the individual well or parental information and school documentation from childhood is helpful. Currently, ADHD is a behaviorally based diagnosis 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 in children has not demonstrated any obvious ill effects, through observational data [C]. Little formal long term data are available. 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 have 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 meaningful problem for which the provider must be alert. Stimulant treatment of the disorder has been associated with decreased substance abuse [C]. 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, 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 often persists 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

Diagnostic criteria and evaluation. The criteria for ADHD in the Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSM-V) were established for children. (See Table 1.) The DSM criteria for ADHD are presently being reworked to make them more applicable to adults. Proposed changes include changing the age of onset of symptoms, rewording the symptoms to encompass adult
domains of functioning and changing the number of symptoms required to make the diagnosis.

An overview of evaluation and diagnosis of children and adolescents is presented in the top half of Figure 1 and in Tables 2 and 3. The overall sequence is similar for adults.

Children and adolescents. Any child 4-18 years old who presents to their primary care provider with inattention, hyperactivity, impulsivity, academic underachievement, or behavior problems (Table 2) should prompt an evaluation for ADHD. The criteria (Table 1) are used to make the diagnosis.

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

Review the social and medical history of the patient’s family and, for children and adolescents, the patient’s growth and development history.

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 patient’s attention span, amount of fidgeting, and (for children) parental interactions can all be observed over several visits. Absence of hyperactivity in the office does not rule out the diagnosis.

For children, standardized rating scales for parent- and teacher-report are strongly recommended. A variety of rating scales are available and some are free of charge; however, many are copyrighted and must be purchased, e.g., Conners Rating Scales (see Appendix A1).

For teenagers, teacher rating scales may be used. However, they are less reliable due to lack of prolonged observation.

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.

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.

Adults. Most adult patients had ADHD symptoms during childhood, but many were not diagnosed. Adult ADHD patients may have graduated from high school, but are having a difficult time with more demanding activities in adulthood, e.g., studies in college, holding on to a job, or managing other tasks and relationships. Often adult patients become aware of their own symptoms when their child is first diagnosed.

Requesting ADHD medication for “performance enhancement” in college or the workforce does not meet criteria for prescribing medication. Adult patients need to demonstrate that their symptoms are causing them to fail in some aspect of their life.

For adults, only four core symptoms may be necessary in DSM V, rather than six (see Table 1). Adult diagnosis is based upon the condition having been present in childhood/young adulthood, although retrospectively.

Gender differences often exist in psychiatric co-morbidities. Men have a higher incidence of antisocial behaviors and alcohol abuse. Women experience more associated dysthymia, panic disorder, anxiety and phobias than men.

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.

A new diagnosis of the condition should be based upon the core symptoms having been present during childhood and persisting. Assessment of areas of functioning that are impacted should include work, daily activities, social relationships, and psychological and physical well-being. Co-morbidities (i.e. substance abuse, depression, hearing impairment, sleep apnea, thyroid disease) are more common and often complicate the diagnosis. Timing of the onset of symptoms is important, i.e. inattentiveness that occurs after onset of depression is less likely to be caused by ADHD. A familial pattern is frequently present. Self-assessment instruments are often used.

For adults, self-report is more likely to be relied upon than rating scales completed by others. A few rating scales are available to help diagnose ADHD in adults (see Appendix A1). While they provide structure in the diagnostic process, there is scant data regarding specificity and sensitivity of these scales in adults. Most are based on DSM V criteria or are adaptations of scales originally developed for children. Formal neuropsychological testing for adults may be very useful, but is not diagnostic.

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
psychiatric disorders that may be confused with or co-occur with behavioral comorbidity. See Appendix B2 for selected disorders.

Conversely, patients with untreated (or inadequately treated) ADHD are at higher risk for psychiatric and medical problems. More complex and difficult to treat. One reason for this is that conditions exist, academic and behavioral problems may be 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**

An overview of treatment is presented in the bottom half of Figure 1 and Table 4. The goal of treatment is to improve symptoms and maintain school performance, social interaction, self-worth/self-esteem, and an opportunity for successful learning. Treatment may be considered successful when it improves school/work performance and relationships, decreases struggles, relieves frustration and anger and improves the poor self-image that these individuals may have developed.

Preschool children (age < 6 years) Behavior therapy is the first line of treatment [A]. If behavioral interventions do not provide significant improvement and moderate-to-severe functional disturbances continue, methylphenidate may be prescribed. If evidence-based behavioral treatments are not available, clinicians need to weigh the risks of starting medication at an early age against the harm of delaying diagnosis and treatment.

School age children, adolescents, and adults (age ≥ 6 years). A treatment plan for ADHD should include both pharmacologic and behavioral components. Pharmacologic treatment improves core symptoms [A]. Behavioral management techniques can address and modify behavior, which is helpful for all children, particularly those with challenging behavior in circumstances such as:

- During periods poorly covered by medications (stimulants – later in the day)
- Those requiring lower doses due to side effects
- The 5%-20% of patients who do not respond to medication approaches.

**Pharmacologic treatment.** The treating physician must decide the strategy of pharmacologic treatment based on the circumstances of the individual patient with input from the family and patient (if possible), keeping in mind the patient’s activities and goals. Typically, the first line agents are stimulants (methylphenidate, dextroamphetamine, and mixed amphetamine salts). Atomoxetine, guanfacine, and clonidine are non-stimulant medications approved by the FDA for treatment of ADHD. Other non-stimulant medications used for ADHD are some antidepressants (buproprion, trazodone) and occasionally atypical antipsychotics (e.g., risperidone, aripiprazole) or mood stabilizers (e.g., carbamazepine). 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 5-7 provide an overview of dosing, cost, side effects and other information for first line and second line agents, respectively.

**Stimulants** are the best researched [A], safest and the most effective medication for this purpose. Stimulants improve the core symptoms of inattention, impulsivity and hyperactivity. They also improve the individual’s ability to follow rules, decrease emotional over-reactivity and improve relationship with peers and family members, thereby improving self-control, 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 demonstrated. Studies have shown that stimulants do not change underlying cognitive ability, although academic performance may improve. Decreased risk of substance abuse has been seen in patients with ADHD who are treated with stimulants versus those not treated with stimulants.

Stimulants are categorized as Schedule II controlled substances because they have the potential for abuse and dependence. Multiple studies have shown that children taking stimulants to treat ADHD do not develop dependence or signs of addiction [B]. Multiple studies also suggest that children taking stimulants to treat their ADHD actually reduce their risk for addiction to illicit drugs. These medications do carry a black box warning about abuse potential.
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.

Two major categories of stimulants are available for the treatment of ADHD: methylphenidate and amphetamine salts (and their isomers and pro-drugs). Both medications are available in various formulations (see Table 5).

Mixed amphetamine salts (Adderall), dextroamphetamine (Dexedrine), and lisdexamfetamine (Vyvanse) have demonstrated equivalent efficacy to methylphenidate (MPH). MPH and mixed amphetamine salts are both considered first-line agents. The decision regarding which agent a clinician first prescribes should be made on the basis of individual preferences of the clinician and the family.

Both types of stimulants are available in several short-, intermediate-, and long-acting formulations. There is a wide variation in individual responses. Unlike many medications, the dosage of stimulants is less weight dependent. Suboptimal doses of stimulant medication may result in inconsistent or incomplete coverage through the day and inadequate control of symptoms. Management of these medications is complex and failures are often due to improper doses rather than the ineffectiveness of the medication.

Treatment is generally initiated with a long-acting preparation of methylphenidate. The patient should be informed that some long-acting preparations have to be swallowed whole. Time of onset of action for the long-acting medications is usually 30 minutes with duration of action varies by product.

Ritalin® LA, and Metadate® CD 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.

Daytrana® is a transdermal delivery system applied to the hip area for 9 hours. It can cause skin irritation and sensitization to methylphenidate. It is useful for those who cannot take oral medication or need early removal of the patch due to insomnia.

The intermediate-acting forms of MPH (Ritalin-SR®, Methyltin® 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.

Supplementation with a single small dose of a short-acting (immediate-release) product may still be prescribed, 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.

Mixed amphetamine salts are the second choice for therapy. Adderall® XR has a bead delivery system with a proportion released initially and the rest about four hours later. It has fewer adrenergic side effects than methylphenidate. 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.

Lisdexamfetamine (Vyvanse®) is a pro-drug which releases the dextroamphetamine by hydrolysis after ingestion. Its theoretical advantage is less potential for abuse or overdose toxicity.

Starting stimulant therapy. Target goals have to be defined for each individual accounting for their age (during childhood), school or work environments, home environment, educational and athletic expectations, and specific after school or work activities. Cultural factors that affect the patient’s health care also need to be considered. Goals should be realistic and achievable.

Since dose is not weight dependent, start with the lowest dose. Generally the relationship between dose and response levels is linear. Increase the dose on a weekly interval until the desired change in behavior and academic performance is achieved or the patient develops undesirable side effects.

During the first month of treatment, titration may involve weekly or biweekly follow-up either by visits or by phone calls with a visit by 4 weeks. Patients can be instructed to start with a low dose and then to increase the dose after one week if no side effects have been observed. They can call into the office to notify you of how the change went. It is not uncommon to make 2-3 changes in one month’s time when initiating therapy.

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). After the dose has been established, the patient may be seen for follow-up 2-3 times per year.

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 or develops side effects with the one
stimulant, try a different stimulant. 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.

Maintaining stimulant therapy. ADHD is a full time disease. A second dose of a short acting medication given in the afternoon or evening may benefit individuals that are having difficulty completing their homework or other work later in the day. This also helps those individuals having difficulties in relationships with peers and family members, as well as improving participation in extracurricular activities. For the majority of patients it is important to continue the medication on weekends and holidays. This gives the parents and family members an opportunity to observe the effects of the medication.

Several studies have found that adolescents and young adults with ADHD have more traffic violations, motor vehicle accidents and suspended licenses than those without the diagnosis. Some studies demonstrate that appropriate treatment of the ADHD with stimulant medication can decrease these risks. Anticipatory guidance should be given to parents with teenagers and to young adults regarding their disease, its treatment, and driving so that extra care can be given to avoid motor vehicle incidents.

Side effects of stimulants. 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. Abdominal pain, headache, irritability and sleep problems may also occur. 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.

Before starting the medication it is important to obtain a history of the patient’s eating and sleeping patterns, family history of tics and Tourette’s 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. Presence of tics is not a contraindication for taking stimulants. The decision to stop or modify stimulant dose needs to be individualized.

Rare patients may appear to develop Tourette’s disorder when on stimulants; in actuality 50% of the patients with Tourette’s Disorder also have ADHD which may present 2 to 3 years before the tics appear. It is believed that stimulants do not cause Tourettes, which is an inherited disorder, it simply unmasks the condition. This usually occurs in elementary school age or adolescence.

Controversies about suppression of growth in patients on stimulants have still not been resolved. Analysis of the MTA study after 3 years revealed some growth suppression in patients on continuous medication compared to a smaller growth suppression in patients not on continuous medication. However, a modest reduction in height and weight initially might attenuate over time, leading to no change in predicted adult height. 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.

Concerns have been raised about the risk of sudden cardiac death in patients on stimulants. The AAP in collaboration with the AHA put out a statement regarding careful screening of pediatric patients for family history of sudden cardiac death, hypertrophic cardiomyopathy or long QT syndrome or a personal history of heart disease, palpitations, syncope, or seizures [B]. The screening evaluation should include a thorough cardiovascular examination. An EKG is not mandatory but should be left to the discretion of the treating physician [D]. Two recent reviews demonstrate no evidence that using stimulants increases serious cardiovascular risk.

Methylphenidate products, may in rare instances cause prolonged and sometimes painful erections known as priapism. If not treated right away, priapism can lead to permanent damage to the penis. Priapism can occur in males of any age and happens when blood in the penis becomes trapped, leading to an abnormally long-lasting and sometimes painful erection.

Strattera (atomoxetine), has also been associated with priapism in children, teens, and adults. Priapism appears to be more common in patients taking atomoxetine than in those taking methylphenidate products.

Long-term management of stimulants. Visits should occur on a monthly basis until optimal response is consistent. Subsequently during the first year of treatment visits should occur every three months. Then visits should occur at least two times per year until stable long term, then periodically as determined appropriate.

Laboratory tests are not necessary except for patients on multiple psychotropic medications e.g., LFTs for depakote, glucose for risperdal. At each visit, the physician should check height, weight, heart rate, blood pressure, 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 co-morbid 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. The medication is often discontinued 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 e.g., change in school or job, divorce or remarriage. Termination of medication can be planned if missed dosages do not result in behavior problems. If symptoms do not recur, the patient can remain off the medication.

Misuse of stimulants. “Misuse” is using the medication without a prescription. This does not imply abuse. Stimulants are misused by 5-35% of college-age individuals. Many of these individuals are likely using these medications for the purpose of increasing their concentration and attentiveness rather than for “getting high.” Studies report 16% or more children with ADHD have been asked by a peer to trade, sell or give them their stimulant medication. This increases to 23% with college students.

Explain to adolescents and young adults that they will likely be asked to share their medication with a friend or acquaintance. Note that sharing or “dealing” their medications is a felony. Role play or discussing strategies to deal with this situation may be helpful.

Stimulants are controlled substances. Patients suspected of trading/selling them or abusing them should undergo the same monitoring procedures used for more frequently abused prescription drugs. Procedures are detailed in the UMHS clinical guideline “Managing Chronic Non-Terminal Pain in Adults, Including Prescribing Controlled Substances.” Some key aspects are summarized below.

- **Watch for drug seeking behaviors.** Watch for patterns of early refills, multiple contacts about stimulants, multiple sources of stimulants, young adults not previously diagnosed who are seeking stimulants. People seeking to abuse these medications are more likely to request short-acting Ritalin or Adderall as it is difficult to abuse the long acting preparations.

- **Pill counts.** Schedule follow-up visits earlier than when refills are due to check that medication use over time matches prescribing.

- **Check actual use with urine testing.** If diversion is suspected, check for presence/absence of stimulants in urine by ordering gas chromatography/mass spectroscopy testing (GCMS, at UMHS “Drug6” for charge of $136).

- **Check for other prescriptions for stimulants,** Search local state prescription monitoring programs (e.g., MAPS in Michigan, [https://sso.state.mi.us](https://sso.state.mi.us)) for stimulant and other controlled substance prescriptions.

- **Establish and enforce conditions for continued prescribing.** Discuss conditions that patients must meet in order to continue prescribing stimulants and formalize them in a “Controlled Substance Treatment Agreement.”

**Atomoxetine (Strattera®).** Atomoxetine is a 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 is typically 1.4 mg/kg/day; rarely 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 6 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. Atomoxetine does produce desired behavior changes, but does not help with focusing. It is particularly useful for patients with comorbid disorders, especially anxiety or the potential for substance abuse.

The FDA recommends that children and adolescents being treated with atomoxetine be closely monitored for clinical worsening, such 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. A black box warning regarding suicidal ideation was added in 2005. 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. Other adverse effects can include sleepiness and liver damage, which is reversible with medication discontinuation. LFT’s should be obtained at the first symptom/sign of liver dysfunction. Atomoxetine should be discontinued in patients with clinical (e.g., jaundice, RUQ tenderness) or laboratory evidence of liver injury, and should not be restarted.

**Antihypertensives.** The alpha-2 adrenergic agonists, clonidine (Catapres®) and guanfacine (Tenex®, Intuniv®) are also non-stimulants approved by the FDA for treatment of ADHD. They may be beneficial as alternatives or adjuncts to stimulants, but they have been studied in 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 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 Tourette's disorder.

**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.

**Antipsychotics.** Risperidone in combination with stimulants has been shown to be useful in treatment-resistant aggression in children with ADHD. Adverse effects include hyperglycemia, weight gain, insomnia and prolactin elevation. Aripiprazole (Abilify®) may be useful with comorbid bipolar disorder.

**Behavioral management.** Behavioral management should be considered as a part of the treatment plan for ADHD at all ages with a focus on parent education and training and classroom interventions. Psychological interventions (i.e. talk therapy) have not demonstrated efficacy for ADHD symptoms.

The Multimodal Treatment of ADHD (MTA) study of children [A] sought to assess the benefit of medication, behavior, and combination treatment. Evolving MTA findings have been inconsistent. Initial results at 24 months demonstrated an advantage for pharmacologic treatments compared with behavioral treatments alone and no significant improvements for the combination of behavioral and medication approaches. (Some experts questioned the analytic approaches used in the MTA at the time.) Subsequent follow-up at 3, 6 and 8 years have not sustained support for one intervention over another.

Parents, teachers and individuals with ADHD need adequate education about the condition to understand the medical basis and how the diagnosis explains much of the behavioral difficulties and needs. This education will help them view behavioral interventions as step-wise approaches to building skills that will help improve function at school, home or on the job. In addition, behavioral interventions facilitate families working together with educators and doctors for long-term treatment success.

Behavioral targets for intervention depend on the individual’s age and needs. Parents and teachers of children and adolescents should expect that new intervention and training needs will emerge with increasing age and educational level or demands. Social skills, developing methods for self-monitoring and learning how to keep track of time should be included for all age groups. In general, interventions should target behaviors one-at-a-time with a positive approach. Limitations of behavioral therapy are that it needs to be continued for long periods and can be costly.

Recommendations for behavioral management are available through the following and other sources:

- CHADD (Children and Adults with Attention Deficit Disorder) Fact Sheets [http://www.chadd.org/](http://www.chadd.org/)

Many sites provide helpful handouts for parents, teachers, and young adults with ADHD. See Appendix A2 for a brief review of tips for home and school for children and young adults.

Behavioral treatment programs include parent training, peer social skills training, family counseling, classroom interventions and intensive peer interventions in recreational settings (see Table 8). Each of these has shown some benefit for children with ADHD /B/. Providers of such training can include mental health professionals, developmental behavioral pediatricians, school personnel and primary care providers. Psychological interventions, including cognitive-behavioral therapy have not been widely thought efficacious for ADHD in children but with potential benefit in adolescents and young adults [B].

Parents and teachers often work with a behavioral consultant or psychologist with the intent of behavioral interventions to shape and reinforce desired behaviors while diminishing undesirable behaviors. Studies suggest that behavioral treatment provides benefit as long as the treatments are maintained. An additional strategy is an educational coach for older children until young adulthood.

Consistency with counseling is important and counseling may 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, teen pregnancies and school dropouts.

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

As with medication choices, it is important to recognize if other conditions are co-morbid with ADHD. Screening for co-morbid conditions is important over time. If co-morbid conditions are found, work with a psychologist, child psychiatrist and/or developmental behavioral pediatrician might be especially helpful.
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 or individuals with ADHD can request an assessment 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 individuals 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 should consider specialist consultation to assist in the diagnosis and treatment of ADHD in the following populations:

- Preschool age (3 to 5 year)
- Head-injured patients
- Intellectually disabled and/or patients with autistic-spectrum disorders
- Fetal Alcohol Syndrome (FAS) and Alcohol-Related Neurobehavioral Disorder
- Substance-abusing patients
- Older adult patients (31 years +)

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

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-V, changes in special education legislation and improved recognition by providers.

Children with ADHD are over-medicating. 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

Parents should not rely upon dietary changes to the exclusion of other, more effective therapies for ADHD.

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. Children with atopic disease may have a higher response rate to diets that eliminate artificial colorings and preservatives.

Short-term open-label trials of other restriction diets have shown benefit. However, these studies suffer from compliance problems.

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]. A prospective observational study correlated more “junk food” in the diet at age 4-1/2 with more hyperactive behaviors that had a modest persistence at age 7 [C]. While there is no consistent evidence that removing refined sugar from the diet improves ADHD, encouraging a healthy diet is sensible.

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.
times a week. A double-blind RCT of essential fatty acids supplement vs. placebo found no benefit. Daily flax seed oil (1/2 tablespoon or ground up flax seed (1 tablespoon) is a source of essential fatty acids.

Complimentary / Alternative Medicine (CAM)

Appendix B4 lists common CAM therapies used by families for ADHD and related problems. 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.

Regarding some specific CAM therapies:

- Homeopathy – a Cochrane review of homeopathy found this treatment had no significant impact on the severity, core symptoms, or related outcomes for children with ADHD.
- Chamomile or lavender teas or baths have not been studied but are used.
- Supplements vary in purity and potency. St. John’s wort, Echinacea, Valerium root, Ginkgo biloba, and pycnogenol are the most commonly tried herbs. Contamination with heavy metals has been reported as well as a 10 – 1000 fold variability in potency by lot. An RCT of St. John’s wort demonstrated no benefit. Pycnogenol is considered “possibly ineffective” in the Cochran Database and Natural Products Database.
- 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 update began with results of the literature search performed in 2002 to develop the initial guideline released in 2005. The literature search for this update used keywords that were very similar to those used in the previous search. However, instead of beginning the search with literature in 2002, the guideline team accepted the search strategy and results for the search performed through April 2006 for the AACAP Practice Parameter for the Assessment and Treatment of Children and Adolescents with Attention-Deficit/Hyperactivity Disorder.

The search for this update was conducted prospectively using the major keywords of: attention deficit disorder with hyperactivity, humans age 3-30, clinical guidelines, controlled clinical trials, cohort studies, English language, and published 1/1/07/1/1/10 on Medline. Additional key words for specific searches included: symptoms (academic underachievement, behavior problems, classroom behavior, classroom interventions, degree of functional impairment, evidence of school work, frequent disciplinary events, hyperactivity, impulsivity, inattention, learning patterns, poor concentration, poor task completion, social adjustment), commonly associated/coexisting conditions (learning/language disorder, child abuse, medication side effects, oppositional defiant disorder, conduct disorder, anxiety, depression), commonly confused conditions/differential diagnosis (learning disorder, intellectual disability, mood/anxiety disorder, abuse, developmental delay, static encephalopathy, pervasive Development disorder, autism spectrum, absence seizures, sleep disorder, substance abuse) evaluation and testing (vision exam, hearing exam, growth chart, developmental review, neurological exam, chronic physical or mental disorders), rating scales for ADHD, qualitative EEG and functional MRI, other EEG, cognitive behavioral therapy, behavioral interventions (set limits, establish routines, provide positive reinforcement), parental intervention (parenting class, family therapy), alpha-II agonists (clonidine, tenex), antidepressents – wellbutrin, effexor, tricyclics (imipramine, nortryptiline, desiprime), stimulants (adderall, concerta, daytrana, dexedrine, destro-amphetamine, focolin, metadate, methylphenidate, ritalin, vyvanse), modafanil, strattera, transitional and longitudinal care for adults (since 10/1/02), and nutritional supplements and diet (since 10/1/02).

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 controlled 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:

American Academy of Child and Adolescent Psychiatry – Practice parameter for the assessment and treatment of children and adolescents with attention-deficit/hyperactivity disorder, 2007


Measures of Clinical Performance

At this time no major national programs have clinical performance measures specifically for ADHD diagnosis and treatment, including the Centers for Medicare & Medicaid Services (Clinical Quality Measures for financial
incentives for Meaningful Use of certified Electronic Health Record technology, Quality measures for Accountable Care Organizations) and the National Committee for Quality Assurance: (Healthcare Effectiveness Data and Information Set –HEDIS).

Regional programs that have clinical performance measures for treating ADHD include the following.

Blue Cross Blue Shield of Michigan: Physician Group Incentive Program clinical performance measures (PGIP)

Blue Care Network [HMO]: clinical performance measures (BCN)

The measures are summarized below

Follow-up after initiating ADHD medication. Percentage of patients aged 6-12 years (and 13-17 years [PGIP]) with a starting ambulatory prescription dispensed for ADHD medication who had a follow-up visit with a practitioner with prescribing authority during the 30 day initiation phase. (PGIP, BCN)

Follow-up during continuation and maintenance phase. Percentage of patients 6-12 and 13-17 years of age at the time that ambulatory prescription for ADHD medication was started, who remained on the medication for at least 9 months and who, after the 30 day initiation period, had at least two additional follow-up visits in the following 9 months (i.e. months 2-10 following treatment initiation).

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, Christner, Bierman, Felt, Harrison, and Kochhar) nor the consultant (Dr. Streetman) has such a relationship.

Review and Endorsement

Drafts of this guideline were reviewed in clinical conferences and by distribution for comment within departments and divisions of the University of Michigan Medical School to which the content is most relevant: Child and Behavioral Health, Family Medicine, General Pediatrics, and Child and Adolescent Psychiatry. The Executive Committee for Clinical Affairs of the University of Michigan Hospitals and Health Centers endorsed the final version.

Acknowledgments

The following individuals are acknowledged for their contributions to previous major versions of this guideline:


Annotated References

(Review old and new references for those to include)


A review of evidence (1998-2009) and detailed recommendations regarding diagnosis and treatment of ADHD.


This is review of ADHD summarizes the steps of evaluation, and behavioral and medication management.


The AMA Council on Scientific Affairs addresses the evidence regarding possible over-prescription or patient misuse of stimulant therapy.


A review of evidence regarding the relationship of diet to ADHD with recommendations for dietary approaches to treatment when medications fail or patient/parental preference.

This landmark long-term randomized controlled trial compares stimulant therapy, behavioral therapy, or both with standard community care.


This analysis explores ADHD subgroups within the MTA study. It demonstrates the importance of behavioral management, in addition to stimulant therapy, for children with ADHD plus anxiety.


Additional 10 month follow-up of the MTA study demonstrates the benefits of intensive medical management for ADHD symptoms which begin to diminish over time.


Reviews the evidence for psychosocial treatments for ADHD and suggests that parent training, classroom management and intensive peer-focused treatments are useful.


Describes the assessment and treatment of children and adolescents with attention-deficit/hyperactivity disorder based on a systematic review of current evidence and clinical consensus of experts.


This article summarizes known information and provides practical recommendations regarding the diagnosis and treatment of ADHD in adults.


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.


Cooper WO, Habel LA Sox CM, et al. ADHD drugs and serious cardiovascular events in children and young adults. NEJM 2011; 365;1896-1904


These reviews examine the risk of cardiovascular events in children and adults taking ADHD drugs (particularly stimulants) and found no evidence that these drugs increase cardiovascular risk.
Appendix A  Management Tools
   A1  Behavioral Rating Scales
   A2  Tips for Parents of Children with ADHD
   A3  ADHD and Educational Rights
   A4  Special Education and Evaluation Terms

Appendix B  Differential Diagnosis and Treatment Resources
   B1  Definitions of Selected Psychiatric Disorders: DSM V Diagnostic Criteria
   B2  Conditions That May Be Confused with ADHD
   B3  Special Patient Populations
   B4  Overview of Complimentary and Alternative Medicine Associated with ADHD
## Appendix A1. Behavioral Rating Scales

<table>
<thead>
<tr>
<th>Tool</th>
<th>Psychometrics</th>
<th>Company</th>
<th>Cost</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scales for Children and Adolescents</strong></td>
<td></td>
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<tr>
<td>Conners – 3</td>
<td>Good</td>
<td>Multi-Health Systems, Inc.</td>
<td>Kit</td>
<td>On-line (-3 and –EC) or paper forms available (all). Normed by year of age and gender, for 2-18 years. Available in English, Spanish, French (Canadian). On all scales, behavior is rated from 0 to 3 based on strength of endorsement for a particular behavior. Separate tests are given for parents, teachers, or self report (12-18).</td>
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<tr>
<td>Comprehensive Teacher’s Rating Scale</td>
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<td></td>
<td>Forms</td>
<td>$32/50</td>
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<tr>
<td>Parent</td>
<td></td>
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<tr>
<td>Teacher</td>
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<td></td>
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<tr>
<td>Self-report</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child Behavior Checklist (CBCL)</td>
<td>Good</td>
<td>Achenbach System of Empirically Based Assessment</td>
<td></td>
<td>12 items. Behavior is rated from 0 to 3 based on strength of endorsement for a particular behavior. Available in Spanish. Can be scored with hand-scored profiles and templates or with computer programs. Eight behavioral domains: Withdrawn, Somatic Complaints, Anxious/Depressed, Social Problems, Thought Problems, Attention Problems, Delinquent Behavior, and Aggressive Behavior. Normative data from large, representative US sample (N=1,753, 6-18 years, 40 states, all race &amp; income). Normed by gender and age (4-11 and 12-18 years). Scales are part of an ADHD Tool Kit developed by the AAP for primary care providers for children. Separate forms for evaluation and follow-up. Not age or gender normed.</td>
</tr>
<tr>
<td>Parent Report (6-18 years)</td>
<td>Demonstrated reliability and validity.</td>
<td>1 South Prospect St. Burlington, VT 05401-3456</td>
<td>Phone: 802-656-2602</td>
<td><a href="http://www.aseba.org">www.aseba.org</a></td>
</tr>
<tr>
<td>Teacher Report Form (6-18 years)</td>
<td>Non-Specific to ADHD, but allows assessment of co-morbid problems.</td>
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<tr>
<td>Preschool Form (1-5 years)</td>
<td>Widely used.</td>
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<tr>
<td>Youth Self Report (YSR; 11-18 years)</td>
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<tr>
<td>Vanderbilt Assessment Scale</td>
<td>Good sensitivity and specificity</td>
<td>Bright Futures – <a href="http://www.brightfutures.org/mentalhealth/pdf/professionals/bridgets/adhd.pdf">http://www.brightfutures.org/mentalhealth/pdf/professionals/bridgets/adhd.pdf</a></td>
<td>Free</td>
<td>Scales are part of an ADHD Tool Kit developed by the AAP for primary care providers for children. Separate forms for evaluation and follow-up. Not age or gender normed.</td>
</tr>
<tr>
<td>Parent Informant</td>
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<td>Parent (#46)</td>
<td></td>
<td><a href="http://www.hes-inc.com/">www.hes-inc.com/</a></td>
<td>Forms</td>
<td>$33/50</td>
</tr>
<tr>
<td>Teacher (#60)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ADDES-S Secondary Age Student</td>
<td>Good sensitivity and specificity</td>
<td>Hawthorne Educational Systems, Inc.</td>
<td>Kits</td>
<td>Good for evaluation. Administration 15 minutes. Requires manual to score.</td>
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<tr>
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<td></td>
<td><a href="http://www.hes-inc.com/">www.hes-inc.com/</a></td>
<td>Forms</td>
<td>$33/50</td>
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<tr>
<td>Teacher (#60)</td>
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## Appendix A1. Behavioral Rating Scales (continued)

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<th>Company</th>
<th>Cost</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Moderate sensitivity</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Low specificity</td>
<td></td>
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<tr>
<td><strong>Conners Adult ADHD Rating Scales</strong></td>
<td>Good specificity and</td>
<td>Multi-Health Systems, Inc.</td>
<td>Kit $118-193</td>
<td>Adult scales for either self-report or observer ratings. Various versions available.</td>
</tr>
<tr>
<td></td>
<td>specificity and</td>
<td><a href="http://www.mhs.com">http://www.mhs.com</a></td>
<td>Forms $27-29/25</td>
<td>Asks about childhood and adult histories. DSM V criteria plus items about emotional lability.</td>
</tr>
<tr>
<td></td>
<td>specificity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Wender Utah Rating Scale</strong></td>
<td>Good specificity and</td>
<td><a href="http://www.neurotransmitter.net/Wender_Utah.doc">www.neurotransmitter.net/Wender_Utah.doc</a></td>
<td>Free</td>
<td>Measures severity of symptoms in adults with ADHD using Utah criteria. Useful to assess mood lability symptoms.</td>
</tr>
<tr>
<td></td>
<td>specificity</td>
<td></td>
<td></td>
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</tbody>
</table>

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 Individuals with ADHD

### General Tips for Parents of Children
- Become educated about ADHD. Resources include your child’s doctor and evidence-based websites including:
  - Children and Adults with ADHD (CHADD);
  - American Academy of Pediatrics (AAP);
  - American Academy of Child and Adolescent Psychiatry (AACAP);
  - National Institutes of Mental Health (NIMH).
- Help your child become educated about ADHD at a level appropriate to age and developmental stage in order to promote adherence to treatment recommendations.
- Remember, parents are the best teachers; schedule one-on-one time with your child every day.
- Keep schedules and routines stable day to day; including eating and sleeping.
- Be a model of calm and respectful interactions.
- Ask your child’s doctor to summarize the care plan for your child including targeted academic and behavioral goals.
- Discuss behavioral targets with other family members to improve uniform approaches.
  - Use frequent positive reinforcement for appropriate behaviors.
  - Selectively ignore minor negative behaviors.
  - Provide immediate, constructive feedback for the targeted inappropriate behaviors.
  - Monitor frequency of targeted behaviors at baseline and in response to intervention.
- If behavioral areas remain a struggle, seek out parent behavioral training resources.

### Younger Children
- Routines are very important
- 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. 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.

### School-age Child at Home
- Invite peers one at a time to reduce stimulation, encourage friendship and allow you to provide feedback. 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 or educational coach.
- Be aware of those long-term assignments and discuss a timeline.
- Communicate regularly 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.

### Child and Adolescent at School
- 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
- Teach self-monitoring and self-reinforcement skills
- Establish a system of daily communication

### Older Adolescent and Young Adult
- Work on organization, time management and self-motivation strategies.
- Maximize supportive assistive technologies.
- Further self education on ADHD to assist in self-advocacy for accommodations in college and on the job
- Consider CBT and other counseling
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 and reauthorized in 2004), provides children age 3 to 21 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) 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.

REED and RTI
Many school districts around the country are adopting a review and intervention approach before entering into an evaluation under an IEP. School teams will conduct a Review of Existing Educational Data, termed REED and provide targeted support over a period. A Response to Intervention, termed RTI, will then determine if the need has been addressed or if further evaluation for special education services is needed.

Appendix A4. Special Education and Evaluation Terms

<table>
<thead>
<tr>
<th>Special Education Terms</th>
<th>Intelligence Tests</th>
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<tbody>
<tr>
<td>IEP</td>
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<td>IEPC</td>
<td>K-ABC</td>
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<tr>
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<td>SB-4</td>
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<td>WJ-R</td>
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<td>OHI</td>
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<td>SLD</td>
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<td>EI</td>
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<td>Section 504</td>
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<td>IDEA</td>
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<td>REED</td>
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<tr>
<th>Section 504</th>
<th>National Rehabilitation Act (1973)</th>
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<tr>
<td>IDEA</td>
<td>Individuals with Disabilities Act (1997)</td>
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<tr>
<td>REED</td>
<td>Review Existing Education Data</td>
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<tr>
<td>RTI</td>
<td>Response to Intervention</td>
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<tr>
<th>Achievement Tests</th>
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<td>WJ-R</td>
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<td>PIAT-R</td>
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<td>WRAT-R</td>
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<td>WIAT</td>
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Appendix B1. Definitions of Selected Psychiatric Disorders: DSM-V Diagnostic Criteria

**Anxiety Disorders**

**Generalized Anxiety Disorder (GAD) (300.02)**

A. Excessive anxiety and worry (repetitive expectation), 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 individual 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 having been present for more days than not for the past 6 months):

- Restlessness or feeling keyed up or on edge.
- Being easily fatigued.
- Difficulty concentrating or mind going blank.
- Irritability.
- Muscle tension.
- Sleep disturbance (difficulty falling or staying asleep, or restless, unsatisfying sleep).

D. The anxiety, worry, or physical symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.

E. The disturbance is not attributable to the physiological effects of a substance (e.g., a drug of abuse, a medication) or another medical condition (e.g., hyperthyroidism).

F. The disturbance is not better explained by another mental disorder (e.g., anxiety or worry about having panic attacks in panic disorder, negative evaluation in social anxiety disorder [social phobia], contamination or other obsessions in obsessive-compulsive disorder, separation from attachment figures in separation anxiety disorder, reminders of traumatic events in posttraumatic stress disorder, gaining weight in anorexia nervosa, physical complaints in somatic symptom disorder, perceived appearance flaws in body dysmorphic disorder, having a serious illness in illness anxiety disorder, or the content of delusional beliefs in schizophrenia or delusional disorder).

**Panic Attacks Specifier**

Note: Symptoms are presented for the purpose of identifying a panic attack; however, panic attack is not a mental disorder and cannot be coded. Panic attacks can occur in the context of any anxiety disorder as well as other mental disorders (e.g., depressive disorders, posttraumatic stress disorder, substance use disorders) and some medical conditions (e.g., cardiac, respiratory, vestibular, gastrointestinal). When the presence of a panic attack is identified, it should be noted as a specifier (e.g., “posttraumatic stress disorder with panic attacks”). For panic disorder, the presence of panic attack is contained within the criteria for the disorder and panic attack is not used as a specifier.

An abrupt surge of intense fear or intense discomfort that reaches a peak within minutes, and during which time four (or more) of the following symptoms occur:

Note: The abrupt surge can occur from a calm state or an anxious state.

1. Palpitations, pounding heart, or accelerated heart rate.
2. Sweating.
3. Trembling or shaking.
4. Sensations of shortness of breath or smothering.
5. Feelings of choking.
6. Chest pain or discomfort.
7. Nausea or abdominal distress.
9. Chills or heat sensations.
10. Paresthesias (numbness or tingling sensations).
11. Derealization (feelings of unreality) or depersonalization (being detached from oneself).
12. Fear of losing control or “going crazy.”

Note: Culture-specific symptoms (e.g., tinnitus, neck soreness, headache, uncontrollable screaming or crying) may be seen. Such symptoms should not count as one of the four required symptoms.

**Obsessive-Compulsive Disorder (300.3)**

A. Presence of obsessions, compulsions, or both:

Obessions are defined by (1) and (2):

1. Recurrent and persistent thoughts, urges, or images that are experienced, at some time during the disturbance, as intrusive and unwanted, and that in most individuals cause marked anxiety or distress.
2. The individual attempts to ignore or suppress such thoughts, urges, or images, or to neutralize them with some other thought or action (i.e., by performing a compulsion).

Compulsions are 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 individual 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 anxiety or distress, or preventing some dreaded event or situation; however, these behaviors or mental acts are not connected in a realistic way with what they are designed to neutralize or prevent, or are clearly excessive.
      - Note: Young children may not be able to articulate the aims of these behaviors or mental acts.

B. The obsessions or compulsions are time-consuming (e.g., take more than 1 hour per day) or cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.

C. The obsessive-compulsive symptoms are not attributable to the physiological effects of a substance (e.g., a drug of abuse, a medication) or another medical condition.

D. The disturbance is not better explained by the symptoms of another mental disorder (e.g., excessive worries, as in generalized anxiety disorder; preoccupation with appearance, as in body dysmorphic disorder; difficulty discarding or parting with possessions, as in hoarding disorder; hair pulling, as in trichotillomania [hair-pulling disorder]; skin picking, as in excoriatio [skin-picking] disorder; stereotypies, as in stereotypic movement disorder; ritualized eating behavior, as in eating disorders; preoccupation with substances or gambling, as in substance-related and addictive disorders; preoccupation with having an illness, as in illness anxiety disorder; sexual urges or fantasies, as in paraphilic disorders; impulses, as in disruptive, impulse-control, and conduct disorders; guilty ruminations, as in major depressive disorder; thought insertion or delusional preoccupations, as in schizophrenia spectrum and other psychotic disorders; or repetitive patterns of behavior, as in autism spectrum disorder).

Specify if:
- With good or fair insight: The individual recognizes that obsessive-compulsive disorder beliefs are definitely or probably not true or that they may or may not be true.
- With poor insight: The individual thinks obsessive-compulsive disorder beliefs are probably true.
- With absent insight/delusional beliefs: The individual is completely convinced that obsessive-compulsive disorder beliefs are true.

Specify if:
- Tic-related: The individual has a current or past history of a tic disorder.

**Separation Anxiety Disorder (309.21)**

A. Developmentally inappropriate and excessive fear or anxiety concerning separation from those to whom the individual is attached, as evidenced by at least three of the following:
1. Recurrent excessive distress when anticipating or experiencing separation from home or from major attachment figures.
2. Persistent and excessive worry about losing major attachment figures or about possible harm to them, such as illness, injury, disasters, or death.
3. Persistent and excessive worry about experiencing an untoward event (e.g., getting lost, being kidnapped, having an accident, becoming ill) that causes separation from a major attachment figure.
4. Persistent reluctance or refusal to go out, away from home, to school, to work, or elsewhere because of fear of separation.
5. Persistent and excessive fear of or reluctance about being alone or without major attachment figures at home or in other settings.
6. Persistent reluctance or refusal to sleep away from home or to go to sleep without being near a major attachment figure.
7. Repeated nightmares involving the theme of separation.
8. Repeated complaints of physical symptoms (e.g., headaches, stomachaches, nausea, vomiting) when separation from major attachment figures occurs or is anticipated.

B. The fear, anxiety, or avoidance is persistent, lasting at least 4 weeks in children and adolescents and typically 6 months or more in adults.

C. The disturbance causes clinically significant distress or impairment in social, academic, occupational, or other important areas of functioning.

D. The disturbance is not better explained by another mental disorder, such as refusing to leave home because of excessive resistance to change in autism spectrum disorder; delusions or hallucinations concerning separation in psychotic disorders; refusal to go outside without a trusted companion in agoraphobia; worries about ill health or other harm befalling significant others in generalized anxiety disorder; or concerns about having an illness in illness anxiety disorder.
Appendix B1. Definitions of Selected Psychiatric Disorders: DSM V Diagnostic Criteria (Continued)

<table>
<thead>
<tr>
<th>Anxiety Disorder Not Otherwise Specified (300.00)</th>
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<td>This category applies to presentations in which symptoms characteristic of an anxiety disorder that cause clinically significant distress or impairment in social, occupational, or other important areas of functioning predominate but do not meet the full criteria for any of the disorders in the anxiety disorders diagnostic class. The unspecified anxiety disorder category is used in situations in which the clinician chooses not to specify the reason that the criteria are not met for a specific anxiety disorder, and includes presentations in which there is insufficient information to make a more specific diagnosis (e.g., in emergency room settings).</td>
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<th>Bipolar Disorders</th>
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<tr>
<td>For a diagnosis of bipolar I disorder, it is necessary to meet the following criteria for a manic episode. The manic episode may have been preceded by and may be followed by hypomanic or major depressive episodes.</td>
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**Manic Episode**

A. A distinct period of abnormally and persistently elevated, expansive, or irritable mood and abnormally and persistently increased goal-directed activity or energy, lasting at least 1 week and present most of the day, nearly every day (or any duration if hospitalization is necessary).

B. During the period of mood disturbance and increased energy or activity, three (or more) of the following symptoms (four if the mood is only irritable) are present to a significant degree and represent a noticeable change from usual behavior:

1. Inflated self-esteem or grandiosity.
2. Decreased need for sleep (e.g., feels rested after only 3 hours of sleep).
3. More talkative than usual or pressure to keep talking.
4. Flight of ideas or subjective experience that thoughts are racing.
5. Distractibility (i.e., attention too easily drawn to unimportant or irrelevant external stimuli), as reported or observed.
6. Increase in goal-directed activity (either socially, at work or school, or sexually) or psychomotor agitation (i.e., purposeless non-goal-directed activity).
7. Excessive involvement in activities that have a high potential for painful consequences (e.g., engaging in unrestrained buying sprees, sexual indiscretions, or foolish business investments).

C. The mood disturbance is sufficiently severe to cause marked impairment in social or occupational functioning or to necessitate hospitalization to prevent harm to self or others, or there are psychotic features.

D. The episode is not attributable to the physiological effects of a substance (e.g., a drug of abuse, a medication, other treatment) or to another medical condition.

**Note:** A full manic episode that emerges during antidepressant treatment (e.g., medication, electroconvulsive therapy) but persists at a fully syndromal level beyond the physiological effect of that treatment is sufficient evidence for a manic episode and, therefore, a bipolar I diagnosis.

**Note:** Criteria A–D constitute a manic episode. At least one lifetime manic episode is required for the diagnosis of bipolar I disorder.

**Hypomanic Episode**

A. A distinct period of abnormally and persistently elevated, expansive, or irritable mood and abnormally and persistently increased activity or energy, lasting at least 4 consecutive days and present most of the day, nearly every day.

B. During the period of mood disturbance and increased energy and activity, three (or more) of the following symptoms (four if the mood is only irritable) have persisted, represent a noticeable change from usual behavior, and have been present to a significant degree:

1. Inflated self-esteem or grandiosity.
2. Decreased need for sleep (e.g., feels rested after only 3 hours of sleep).
3. More talkative than usual or pressure to keep talking.
4. Flight of ideas or subjective experience that thoughts are racing.
5. Distractibility (i.e., attention too easily drawn to unimportant or irrelevant external stimuli), as reported or observed.
6. Increase in goal-directed activity (either socially, at work or school, or sexually) or psychomotor agitation.
7. Excessive involvement in activities that have a high potential for painful consequences (e.g., engaging in unrestrained buying sprees, sexual indiscretions, or foolish business investments).

C. The episode is associated with an unequivocal change in functioning that is uncharacteristic of the individual when not symptomatic.

D. The disturbance in mood and the change in functioning are observable by others.

E. The episode is not severe enough to cause marked impairment in social or occupational functioning or to necessitate hospitalization. If there are psychotic features, the episode is, by definition, manic.

F. The episode is not attributable to the physiological effects of a substance (e.g., a drug of abuse, a medication, other treatment).
The dysphoria in grief is likely to decrease in intensity over days to weeks and occurs in waves, the so-called pangs of grief.

In distinguishing grief from a major depressive episode (MDE), it is useful to consider that in grief the predominant affect is not caused by the loss itself, but rather by the cultural norms for the expression of distress in the context of loss. The episode of grief is not attributable to the physiological effects of a substance or another medical condition.

**Note:** Criteria A–C constitute a major depressive episode. Major depressive episodes are common in bipolar I disorder but are not required for the diagnosis of bipolar I disorder.

### 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.

**Note:** Do not include symptoms that are clearly attributable to another medical condition.

1. Depressed mood most of the day, nearly every day, as indicated by either subjective report (e.g., feels sad, empty, or hopeless) or observation made by others (e.g., appears tearful). *(Note: In children and adolescents, can be irritability mood.)*
2. Markedly diminished interest or pleasure in all, or almost all, activities most of the day, nearly every day (as indicated by either subjective account or observation).
3. Significant weight loss when not dieting or weight gain (e.g., a change of more than 5% of body weight in a month), or decrease or increase in appetite nearly every day. *(Note: In children, consider failure to make expected weight gain.)*
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 or inappropriate guilt (which may be delusional) nearly every day (not merely self-reproach or guilt about being sick).
8. Diminished ability to think or concentrate, or indecisiveness, nearly every day (either by subjective account or as observed by others).
9. Recurrent thoughts of death (not just fear of dying), recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan for committing suicide.

B. The symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.

C. The episode is not attributable to the physiological effects of a substance or another medical condition.

**Note:** Criteria A–C constitute a major depressive episode. Major depressive episodes are common in bipolar I disorder but are not required for the diagnosis of bipolar I disorder.

**Note:** Responses to a significant loss (e.g., bereavement, financial ruin, losses from a natural disaster, a serious medical illness or disability) may include the feelings of intense sadness, rumination about the loss, insomnia, poor appetite, and weight loss noted in Criterion A, which may resemble a depressive episode. Although such symptoms may be understandable or considered appropriate to the loss, the presence of a major depressive episode in addition to the normal response to a significant loss should also be carefully considered. This decision inevitably requires the exercise of clinical judgment based on the individual’s history and the cultural norms for the expression of distress in the context of loss.

In distinguishing grief from a major depressive episode (MDE), it is useful to consider that in grief the predominant affect is feelings of emptiness and loss, while in MDE it is persistent depressed mood and the inability to anticipate happiness or pleasure. The dysphoria in grief is likely to decrease in intensity over days to weeks and occurs in waves, the so-called pangs of grief.

These waves tend to be associated with thoughts or reminders of the deceased. The depressed mood of a MDE is more persistent and not tied to specific thoughts or preoccupations. The pain of grief may be accompanied by positive emotions and humor that are uncharacteristic of the pervasive unhappiness and misery characteristic of a major depressive episode. The thought content associated with grief generally features a preoccupation with thoughts and memories of the deceased, rather than the self-critical or pessimistic ruminations seen in a MDE. In grief, self-esteem is generally preserved, whereas in a MDE, feelings of worthlessness and self-loathing are common. If self-derogatory ideation is present in grief, it typically involves perceived failings vis-à-vis the deceased (e.g., not visiting frequently enough, not telling the deceased how much he or she was loved). If a bereaved individual thinks about death and dying, such thoughts are generally focused on the deceased and possibly about “joining” the deceased, whereas in a major depressive episode such thoughts are focused on ending one’s own life because of feeling worthless, undeserving of life, or unable to cope with the pain of depression.

**Bipolar I Disorder**

A. Criteria have been met for at least one manic episode (Criteria A–D under “Manic Episode” above).

B. The occurrence of the manic and major depressive episode(s) is not better explained by schizoaffective disorder, schizophrenia, schizophreniform disorder, delusional disorder, or other specified or unspecified schizophrenia spectrum and other psychotic disorder.
Appendix B1. Definitions of Selected Psychiatric Disorders: DSM V Diagnostic Criteria (Continued)

Major Depressive Disorder

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.

Note: Do not include symptoms that are clearly attributable to another medical condition.

1. Depressed mood most of the day, nearly every day, as indicated by either subjective report (e.g., feels sad, empty, hopeless) or observation made by others (e.g., appears tearful). (Note: 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 (as indicated by either subjective account or observation).

3. Significant weight loss when not dieting or weight gain (e.g., a change of more than 5% of body weight in a month), or decrease or increase in appetite nearly every day. (Note: In children, consider failure to make expected weight gain.)

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 or inappropriate guilt (which may be delusional) nearly every day (not merely self-reproach or guilt about being sick).

8. Diminished ability to think or concentrate, or indecisiveness, nearly every day (either by subjective account or as observed by others).

9. Recurrent thoughts of death (not just fear of dying), recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan for committing suicide.

B. The symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.

C. The episode is not attributable to the physiological effects of a substance or to another medical condition.

Note: Criteria A–C represent a major depressive episode.

Note: Responses to a significant loss (e.g., bereavement, financial ruin, losses from a natural disaster, a serious medical illness or disability) may include the feelings of intense sadness, rumination about the loss, insomnia, poor appetite, and weight loss noted in Criterion A, which may resemble a depressive episode. Although such symptoms may be understandable or considered appropriate to the loss, the presence of a major depressive episode in addition to the normal response to a significant loss should also be carefully considered. This decision inevitably requires the exercise of clinical judgment based on the individual’s history and the cultural norms for the expression of distress in the context of loss.

In distinguishing grief from a major depressive episode (MDE), it is useful to consider that in grief the predominant affect is feelings of emptiness and loss, while in MDE it is persistent depressed mood and the inability to anticipate happiness or pleasure. The dysphoria in grief is likely to decrease in intensity over days to weeks and occurs in waves, the so-called pangs of grief. These waves tend to be associated with thoughts or reminders of the deceased. The depressed mood of MDE is more persistent and not tied to specific thoughts or preoccupations. The pain of grief may be accompanied by positive emotions and humor that are uncharacteristic of the pervasive unhappiness and misery characteristic of MDE. The thought content associated with grief generally features a preoccupation with thoughts and memories of the deceased, rather than the self-critical or pessimistic ruminations seen in MDE. In grief, self-esteem is generally preserved, whereas in MDE feelings of worthlessness and self-loathing are common. If self-derogatory ideation is present in grief, it typically involves perceived failings vis-à-vis the deceased (e.g., not visiting frequently enough, not telling the deceased how much he or she was loved). If a bereaved individual thinks about death and dying, such thoughts are generally focused on the deceased and possibly about “joining” the deceased, whereas in MDE such thoughts are focused on ending one’s own life because of feeling worthless, undeserving of life, or unable to cope with the pain of depression.

1. The occurrence of the major depressive episode is not better explained by schizoaffective disorder, schizophrenia, schizophreniform disorder, delusional disorder, or other specified and unspecified schizophrenia spectrum and other psychotic disorders.

2. There has never been a manic episode or a hypomanic episode.

Note: This exclusion does not apply if all of the manic-like or hypomanic-like episodes are substance-induced or are attributable to the physiological effects of another medical condition.
### 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 intellectual disability, 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 intellectual disability, 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 intellectual disability. 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; intellectual disability 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 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. Difficulties learning and using academic skills, as indicated by the presence of at least one of the following symptoms that have persisted for at least 6 months, despite the provision of interventions that target those difficulties:

1. Inaccurate or slow and effortful word reading (e.g., reads single words aloud incorrectly or slowly and hesitantly, frequently guesses words, has difficulty sounding out words).
2. Difficulty understanding the meaning of what is read (e.g., may read text accurately but not understand the sequence, relationships, inferences, or deeper meanings of what is read).
3. Difficulties with spelling (e.g., may add, omit, or substitute vowels or consonants).
4. Difficulties with written expression (e.g., makes multiple grammatical or punctuation errors within sentences; employs poor paragraph organization; written expression of ideas lacks clarity).
5. Difficulties mastering number sense, number facts, or calculation (e.g., has poor understanding of numbers, their magnitude, and relationships; counts on fingers to add single-digit numbers instead of recalling the math fact as peers do; gets lost in the midst of arithmetic computation and may switch procedures).
6. Difficulties with mathematical reasoning (e.g., has severe difficulty applying mathematical concepts, facts, or procedures to solve quantitative problems).

B. The affected academic skills are substantially and quantifiably below those expected for the individual’s chronological age, and cause significant interference with academic or occupational performance, or with activities of daily living, as confirmed by individually administered standardized achievement measures and comprehensive clinical assessment. For individuals age 17 years and older, a documented history of impairing learning difficulties may be substituted for the standardized assessment.

C. The learning difficulties begin during school-age years but may not become fully manifest until the demands for those affected academic skills exceed the individual’s limited capacities (e.g., as in timed tests, reading or writing lengthy complex reports for a tight deadline, excessively heavy academic loads).

D. The learning difficulties are not better accounted for by intellectual disabilities, uncorrected visual or auditory acuity, other mental or neurological disorders, psychosocial adversity, lack of proficiency in the language of academic instruction, or inadequate educational instruction.

E. Note: The four diagnostic criteria are to be met based on a clinical synthesis of the individual’s history (developmental, medical, family, educational), school reports, and psychoeducational assessment.

Coding note: Specify all academic domains and subskills that are impaired. When more than one domain is impaired, each one should be coded individually according to the following specifiers.

Specify if:

315.00 (F81.0) With impairment in reading:
Word reading accuracy
Reading rate or fluency
Reading comprehension

Note: Dyslexia is an alternative term used to refer to a pattern of learning difficulties characterized by problems with accurate or fluent word recognition, poor decoding, and poor spelling abilities. If dyslexia is used to specify this particular pattern of difficulties, it is important also to specify any additional difficulties that are present, such as difficulties with reading comprehension or math reasoning.

315.2 (F81.81) With impairment in written expression:
Spelling accuracy
Grammar and punctuation accuracy
Clarity or organization of written expression

315.1 (F81.2) With impairment in mathematics:
Number sense
Memorization of arithmetic facts
Accurate or fluent calculation
Accurate math reasoning
**Note:** *Dyscalculia* is an alternative term used to refer to a pattern of difficulties characterized by problems processing numerical information, learning arithmetic facts, and performing accurate or fluent calculations. If dyscalculia is used to specify this particular pattern of mathematic difficulties, it is important also to specify any additional difficulties that are present, such as difficulties with math reasoning or word reasoning accuracy.

Specify current severity:

**Mild:** Some difficulties learning skills in one or two academic domains, but of mild enough severity that the individual may be able to compensate or function well when provided with appropriate accommodations or support services, especially during the school years.

**Moderate:** Marked difficulties learning skills in one or more academic domains, so that the individual is unlikely to become proficient without some intervals of intensive and specialized teaching during the school years. Some accommodations or supportive services at least part of the day at school, in the workplace, or at home may be needed to complete activities accurately and efficiently.

**Severe:** Severe difficulties learning skills, affecting several academic domains, so that the individual is unlikely to learn those skills without ongoing intensive individualized and specialized teaching for most of the school years. Even with an array of appropriate accommodations or services at home, at school, or in the workplace, the individual may not be able to complete all activities efficiently.

**Unspecified Neurodevelopmental Disorder (315.9)**

This category applies to presentations in which symptoms characteristic of a neurodevelopmental disorder that cause impairment in social, occupational, or other important areas of functioning predominate but do not meet the full criteria for any of the disorders in the neurodevelopmental disorders diagnostic class. The unspecified neurodevelopmental disorder category is used in situations in which the clinician chooses *not* to specify the reason that the criteria are not met for a specific neurodevelopmental disorder, and includes presentations in which there is insufficient information to make a more specific diagnosis (e.g., in emergency room settings).
Oppositional Defiant Disorder (313.81)

A. A pattern of angry/irritable mood, argumentative/defiant behavior, or vindictiveness lasting at least 6 months as evidenced by at least four symptoms from any of the following categories, and exhibited during interaction with at least one individual who is not a sibling.

Angry/Irritable Mood
1. Often loses temper.
2. Is often touchy or easily annoyed.
3. Is often angry and resentful.

Argumentative/Defiant Behavior
4. Often argues with authority figures or, for children and adolescents, with adults.
5. Often actively defies or refuses to comply with requests from authority figures or with rules.
6. Often deliberately annoys others.
7. Often blames others for his or her mistakes or misbehavior.

Vindictiveness
8. Has been spiteful or vindictive at least twice within the past 6 months.

Note: The persistence and frequency of these behaviors should be used to distinguish a behavior that is within normal limits from a behavior that is symptomatic. For children younger than 5 years, the behavior should occur on most days for a period of at least 6 months unless otherwise noted (Criterion A8). For individuals 5 years or older, the behavior should occur at least once per week for at least 6 months, unless otherwise noted (Criterion A8). While these frequency criteria provide guidance on a minimal level of frequency to define symptoms, other factors should also be considered, such as whether the frequency and intensity of the behaviors are outside a range that is normative for the individual’s developmental level, gender, and culture.

B. The disturbance in behavior is associated with distress in the individual or others in his or her immediate social context (e.g., family, peer group, work colleagues), or it impacts negatively on social, educational, occupational, or other important areas of functioning.

C. The behaviors do not occur exclusively during the course of a psychotic, substance use, depressive, or bipolar disorder. Also, the criteria are not met for disruptive mood dysregulation disorder.

Specify current severity:
- **Mild**: Symptoms are confined to only one setting (e.g., at home, at school, at work, with peers).
- **Moderate**: Some symptoms are present in at least two settings.
- **Severe**: Some symptoms are present in three or more settings.

Post Traumatic Stress Disorder (PTSD; 309.81)

Note: The following criteria apply to adults, adolescents, and children older than 6 years. For children 6 years and younger, see corresponding criteria below.

A. Exposure to actual or threatened death, serious injury, or sexual violence in one (or more) of the following ways:
1. Directly experiencing the traumatic event(s).
2. Witnessing, in person, the event(s) as it occurred to others.
3. Learning that the traumatic event(s) occurred to a close family member or close friend. In cases of actual or threatened death of a family member or friend, the event(s) must have been violent or accidental.
4. Experiencing repeated or extreme exposure to aversive details of the traumatic event(s) (e.g., first responders collecting human remains; police officers repeatedly exposed to details of child abuse).
   - **Note**: Criterion A4 does not apply to exposure through electronic media, television, movies, or pictures, unless this exposure is work related.

B. Presence of one (or more) of the following intrusion symptoms associated with the traumatic event(s), beginning after the traumatic event(s) occurred:
1. Recurrent, involuntary, and intrusive distressing memories of the traumatic event(s).
   - **Note**: In children older than 6 years, repetitive play may occur in which themes or aspects of the traumatic event(s) are expressed.
2. Recurrent distressing dreams in which the content and/or affect of the dream are related to the traumatic event(s).
   - **Note**: In children, there may be frightening dreams without recognizable content.
3. Dissociative reactions (e.g., flashbacks) in which the individual feels or acts as if the traumatic event(s) were recurring. (Such reactions may occur on a continuum, with the most extreme expression being a complete loss of awareness of present surroundings.)
   - **Note**: In children, trauma-specific reenactment may occur in play.
4. Intense or prolonged psychological distress at exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event(s).
5. Marked physiological reactions to internal or external cues that symbolize or resemble an aspect of the traumatic event(s).
C. Persistent avoidance of stimuli associated with the traumatic event(s), beginning after the traumatic event(s) occurred, as evidenced by one or both of the following:
   1. Avoidance of or efforts to avoid distressing memories, thoughts, or feelings about or closely associated with the traumatic event(s).
   2. Avoidance of or efforts to avoid external reminders (people, places, conversations, activities, objects, situations) that arouse distressing memories, thoughts, or feelings about or closely associated with the traumatic event(s).

D. Negative alterations in cognitions and mood associated with the traumatic event(s), beginning or worsening after the traumatic event(s) occurred, as evidenced by two (or more) of the following:
   1. Inability to remember an important aspect of the traumatic event(s) (typically due to dissociative amnesia and not to other factors such as head injury, alcohol, or drugs).
   2. Persistent and exaggerated negative beliefs or expectations about oneself, others, or the world (e.g., “I am bad,” “No one can be trusted,” “The world is completely dangerous,” “My whole nervous system is permanently ruined”).
   3. Persistent, distorted cognitions about the cause or consequences of the traumatic event(s) that lead the individual to blame himself/herself or others.
   4. Persistent negative emotional state (e.g., fear, horror, anger, guilt, or shame).
   5. Markedly diminished interest or participation in significant activities.
   6. Feelings of detachment or estrangement from others.
   7. Persistent inability to experience positive emotions (e.g., inability to experience happiness, satisfaction, or loving feelings).

E. Marked alterations in arousal and reactivity associated with the traumatic event(s), beginning or worsening after the traumatic event(s) occurred, as evidenced by two (or more) of the following:
   1. Irritable behavior and angry outbursts (with little or no provocation) typically expressed as verbal or physical aggression toward people or objects.
   2. Reckless or self-destructive behavior.
   3. Hypervigilance.
   4. Exaggerated startle response.
   5. Problems with concentration.
   6. Sleep disturbance (e.g., difficulty falling or staying asleep or restless sleep).

F. Duration of the disturbance (Criteria B, C, D, and E) is more than 1 month.

G. The disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.

H. The disturbance is not attributable to the physiological effects of a substance (e.g., medication, alcohol) or another medical condition.

Specify whether:
- With dissociative symptoms: The individual’s symptoms meet the criteria for posttraumatic stress disorder, and in addition, in response to the stressor, the individual experiences persistent or recurrent symptoms of either of the following:
  1. Depersonalization: Persistent or recurrent experiences of feeling detached from, and as if one were an outside observer of, one’s mental processes or body (e.g., feeling as though one were in a dream; feeling a sense of unreality of self or body or of time moving slowly).
  2. Derealization: Persistent or recurrent experiences of unreality of surroundings (e.g., the world around the individual is experienced as unreal, dreamlike, distant, or distorted).

Note: To use this subtype, the dissociative symptoms must not be attributable to the physiological effects of a substance (e.g., blackouts, behavior during alcohol intoxication) or another medical condition (e.g., complex partial seizures).

Specify if:
- With delayed expression: If the full diagnostic criteria are not met until at least 6 months after the event (although the onset and expression of some symptoms may be immediate).

Posttraumatic Stress Disorder for Children 6 Years and Younger

A. In children 6 years and younger, exposure to actual or threatened death, serious injury, or sexual violence in one (or more) of the following ways:
   1. Directly experiencing the traumatic event(s).
   2. Witnessing, in person, the event(s) as it occurred to others, especially primary caregivers.
   3. Learning that the traumatic event(s) occurred to a parent or caregiving figure.

Note: Witnessing does not include events that are witnessed only in electronic media, television, movies, or pictures.

B. Presence of one (or more) of the following intrusion symptoms associated with the traumatic event(s), beginning after the traumatic event(s) occurred:
   1. Recurrent, involuntary, and intrusive distressing memories of the traumatic event(s).
   2. Distracting or recurrent thoughts about the traumatic event(s).
   3. Current behavioral hyperalertness when exposed to stimuli that resemble an aspect of the traumatic event(s).

Note: Spontaneous and intrusive memories may not necessarily appear distressing and may be expressed as play
reenactment.

2. Recurrent distressing dreams in which the content and/or affect of the dream are related to the traumatic event(s).
   Note: It may not be possible to ascertain that the frightening content is related to the traumatic event.

3. Dissociative reactions (e.g., flashbacks) in which the child feels or acts as if the traumatic event(s) were recurring. (Such reactions may occur on a continuum, with the most extreme expression being a complete loss of awareness of present surroundings.) Such trauma-specific reenactment may occur in play.

4. Intense or prolonged psychological distress at exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event(s).

5. Marked physiological reactions to reminders of the traumatic event(s).

C. One (or more) of the following symptoms, representing either persistent avoidance of stimuli associated with the traumatic event(s) or negative alterations in cognitions and mood associated with the traumatic event(s), must be present, beginning after the event(s) or worsening after the event(s):

   Persistent Avoidance of Stimuli
   1. Avoidance of or efforts to avoid activities, places, or physical reminders that arouse recollections of the traumatic event(s).
   2. Avoidance of or efforts to avoid people, conversations, or interpersonal situations that arouse recollections of the traumatic event(s).

   Negative Alterations in Cognitions
   3. Substantially increased frequency of negative emotional states (e.g., fear, guilt, sadness, shame, confusion).
   4. Markedly diminished interest or participation in significant activities, including constriction of play.
   5. Socially withdrawn behavior.
   6. Persistent reduction in expression of positive emotions.

D. Alterations in arousal and reactivity associated with the traumatic event(s), beginning or worsening after the traumatic event(s) occurred, as evidenced by two (or more) of the following:

1. Irritable behavior and angry outbursts (with little or no provocation) typically expressed as verbal or physical aggression toward people or objects (including extreme temper tantrums).
2. Hypervigilance.
3. Exaggerated startle response.
4. Problems with concentration.
5. Sleep disturbance (e.g., difficulty falling or staying asleep or restless sleep).

E. The duration of the disturbance is more than 1 month.

F. The disturbance causes clinically significant distress or impairment in relationships with parents, siblings, peers, or other caregivers or with school behavior.

G. The disturbance is not attributable to the physiological effects of a substance (e.g., medication or alcohol) or another medical condition.

Specify whether:

- **With dissociative symptoms:** The individual’s symptoms meet the criteria for posttraumatic stress disorder, and the individual experiences persistent or recurrent symptoms of either of the following:
  1. **Depersonalization:** Persistent or recurrent experiences of feeling detached from, and as if one were an outside observer of, one’s mental processes or body (e.g., feeling as though one were in a dream; feeling a sense of unreality of self or body or of time moving slowly).
  2. **Derealization:** Persistent or recurrent experiences of unreality of surroundings (e.g., the world around the individual is experienced as unreal, dreamlike, distant, or distorted).

   Note: To use this subtype, the dissociative symptoms must not be attributable to the physiological effects of a substance (e.g., blackouts) or another medical condition (e.g., complex partial seizures).

Specify if:

- **With delayed expression:** If the full diagnostic criteria are not met until at least 6 months after the event (although the onset and expression of some symptoms may be immediate).
Appendix B1. Definitions of Selected Psychiatric Disorders: DSM V Diagnostic Criteria (Continued)

Reactive Attachment Disorder (313.89)

1. A consistent pattern of inhibited, emotionally withdrawn behavior toward adult caregivers, manifested by both of the following:
   1. The child rarely or minimally seeks comfort when distressed.
   2. The child rarely or minimally responds to comfort when distressed.

2. A persistent social and emotional disturbance characterized by at least two of the following:
   1. Minimal social and emotional responsiveness to others.
   2. Limited positive affect.
   3. Episodes of unexplained irritability, sadness, or fearfulness that are evident even during nonthreatening interactions with adult caregivers.

3. The child has experienced a pattern of extremes of insufficient care as evidenced by at least one of the following:
   1. Social neglect or deprivation in the form of persistent lack of having basic emotional needs for comfort, stimulation, and affection met by caregiving adults.
   2. Repeated changes of primary caregivers that limit opportunities to form stable attachments (e.g., frequent changes in foster care).
   3. Rearing in unusual settings that severely limit opportunities to form selective attachments (e.g., institutions with high child-to-caregiver ratios).

4. The care in Criterion C is presumed to be responsible for the disturbed behavior in Criterion A (e.g., the disturbances in Criterion A began following the lack of adequate care in Criterion C).

5. The criteria are not met for autism spectrum disorder.

6. The disturbance is evident before age 5 years.

7. The child has a developmental age of at least 9 months.

Specify if:

- **Persistent:** The disorder has been present for more than 12 months.

Specify current severity:

- Reactive attachment disorder is specified as **severe** when a child exhibits all symptoms of the disorder, with each symptom manifesting at relatively high levels.
**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 V diagnostic criteria for conditions.

<table>
<thead>
<tr>
<th>Prevalence</th>
<th>Anxiety Disorders</th>
</tr>
</thead>
<tbody>
<tr>
<td>26% (CI: 18%, 35%)</td>
<td><strong>Anxiety Disorders</strong></td>
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</table>

<table>
<thead>
<tr>
<th>Overlapping Symptoms</th>
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<tbody>
<tr>
<td>• Poor concentration</td>
<td></td>
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<tr>
<td>• Appear fidgety and/or agitated</td>
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<tr>
<td>• Difficulty settling to sleep +/- Insomnia</td>
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<tr>
<td>• Jumps from task to task</td>
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<tr>
<td>• Both may have poor appetite</td>
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<table>
<thead>
<tr>
<th>Distinguishing Symptoms of This Disorder</th>
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<tbody>
<tr>
<td>• School avoidance</td>
<td></td>
</tr>
<tr>
<td>• Excessive performance or test-taking anxiety</td>
<td></td>
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<tr>
<td>• Reluctance to participate in age-appropriate activities (sleep-overs, outings)</td>
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<tr>
<td>• Excessive worry (e.g., school work, illness)</td>
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<tr>
<td>• Over-concern about “adult matters” (e.g., finances, parental relationships, parental welfare)</td>
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<tr>
<td>• Catastrophic thoughts (e.g., car accidents, kidnapping, break-ins)</td>
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<tr>
<td>• Compulsive behaviors (e.g., hoarding, counting, ordering)</td>
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<tr>
<td>• Nightmares, excessive worries/fears at bedtime</td>
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<tr>
<td>• Physiological symptoms: racing heart beat, difficulty breathing, chest pain</td>
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<tr>
<td>• Patient becomes “anxious” or has visual hallucinations in response to stimulants</td>
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<tr>
<th>Distinguishing Symptoms of ADHD</th>
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<tbody>
<tr>
<td>• Should not see significant symptoms of anxiety in uncomplicated ADHD.</td>
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<thead>
<tr>
<th>Prevalence</th>
<th>Bipolar Disorder</th>
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<tr>
<td>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.</td>
<td><strong>Bipolar Disorder</strong></td>
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<table>
<thead>
<tr>
<th>Overlapping Symptoms</th>
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<tr>
<td>• Inattention, easily distracted</td>
<td></td>
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<tr>
<td>• Motor activity</td>
<td></td>
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<tr>
<td>• Sleep disturbance</td>
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<tr>
<td>• Accident prone</td>
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<tr>
<td>• Disruptive behavior</td>
<td></td>
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<tr>
<td>• Hypertalkativeness</td>
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<tr>
<th>Distinguishing Symptoms of This Disorder</th>
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<tbody>
<tr>
<td>Highly controversial diagnosis in children. Always refer to child psychiatrist if suspected.</td>
<td></td>
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<tr>
<td>• Mood swings; behavior is cyclical or erratic</td>
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<tr>
<td>• Being kicked out of multiple daycare programs is a red flag.</td>
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<tr>
<td>• Parents report the child has “no control” over behavior</td>
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<tr>
<td>• 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.</td>
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<tr>
<td>• Severe aggression (especially toward adults); “rage attacks”</td>
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<tr>
<td>• Hypersexuality- sexual jokes or language, inappropriately touching adults</td>
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<tr>
<td>• Hallucinations</td>
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<tr>
<td>• Severe insomnia</td>
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<tr>
<td>• Extreme changes in energy levels and behavior</td>
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<tr>
<td>• Rage attacks</td>
<td></td>
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<tr>
<td>• Irrational ideas</td>
<td></td>
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<tr>
<td>• Tangential speech, rapid/pressured speech</td>
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<tr>
<td>• Extremely impulsive +/- self-endangering behavior</td>
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<tr>
<td>• Extreme hyperactivity- esp. if climbs excessively or seems to be “fearless”</td>
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<tr>
<td>• Intrusive behavior</td>
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<tr>
<td>• Suicidal behavior in children under 13 is concerning and warrants urgent psychiatric evaluation</td>
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(continues on next page)
### Bipolar Disorder (continued)

- ADHD symptoms should be present since 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)

**Prevalence**
- **FAS:** 0.33 cases per 1,000 live births
- **ARND:** Several times the magnitude of FAS cases.

**Overlapping Symptoms**
- Poor academic performance
- Inattention
- Hyperactivity
- Poor growth (not on stimulants)
- Disruptive behavior

**Distinguishing Symptoms of This Disorder**
- 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: intellectual disability; 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**
- 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**
- Not known; however, the CDC (1987) estimated 5%-10%

**Overlapping Symptoms**
- 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**
- Look for specific areas of academic difficulty
- Definitive diagnosis made by psychoeducational testing (neuropsychological testing may be beneficial)

**Distinguishing Symptoms of ADHD**
- 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)

<table>
<thead>
<tr>
<th>Major Depressive Disorder</th>
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<tr>
<td><strong>Prevalence</strong></td>
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<td><strong>Overlapping Symptoms</strong></td>
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<tr>
<td><strong>Distinguishing Symptoms of This Disorder</strong></td>
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<th>Oppositional Defiant Disorder</th>
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<td><strong>Prevalence</strong></td>
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<td><strong>Overlapping Symptoms</strong></td>
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<td><strong>Distinguishing Symptoms of This Disorder</strong></td>
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<td><strong>Distinguishing Symptoms of ADHD</strong></td>
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### 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**
- Hyperactivity or agitation
- Memory and attentional difficulties
- Difficulty settling to sleep +/- Insomnia

**Distinguishing Symptoms of This Disorder**
- 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**
- 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**
- Both may be “overly sociable” and/or hypertalkative
- Difficulty sleeping
- Poor growth
- Disruptive behavior
- Poor social skills

**Distinguishing Symptoms of This Disorder**
- 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

- 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

<table>
<thead>
<tr>
<th>Preschool age (3-5 year olds)</th>
<th><strong>Diagnosis</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• May be difficult to determine whether hyperactivity, impulsivity, and inattention are due to normal developmental variation.</td>
</tr>
<tr>
<td><strong>Treatment/referral</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Some patients with severe symptoms may require medication.</td>
</tr>
<tr>
<td></td>
<td>• Parent education and training is important</td>
</tr>
<tr>
<td></td>
<td>• Referral to practitioners with expertise in developmental pediatrics and/or child psychiatric disorders is recommended for diagnosis and treatment.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Closed head injury</th>
<th><strong>Diagnosis</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Patients with head injury (and static encephalopathy from other etiologies) are at increased risk for impulsivity and inattention.</td>
</tr>
<tr>
<td></td>
<td>• There are reported cases of young children that developed (permanent) symptoms consistent with ADHD after severe head injury, encephalitis, or brain tumor.</td>
</tr>
<tr>
<td><strong>Co-morbidity</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Watch for co-morbid seizures.</td>
</tr>
<tr>
<td></td>
<td>• Watch for aggression, personality changes, mood and anxiety symptoms.</td>
</tr>
<tr>
<td><strong>Treatment/referral</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Patients may respond to stimulant treatment only or may require other medications, e.g., antipsychotic medication (risperidone) or mood stabilizers (carbamazepine).</td>
</tr>
<tr>
<td></td>
<td>• Referral to practitioners with expertise in developmental pediatrics, child psychiatric disorders, and/or neurologic disorders is recommended for assistance with diagnosis and treatment.</td>
</tr>
<tr>
<td></td>
<td>• Encourage special education services and IEP development.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Intellectually disabled patients</th>
<th><strong>Diagnosis</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Data are limited regarding the diagnosis and treatment of ADHD in MR patients- relatively more information exists for autistic disorders.</td>
</tr>
<tr>
<td></td>
<td>• Diagnosis must take into account the maturity and developmental challenges of the patient.</td>
</tr>
<tr>
<td></td>
<td>• ADHD can co-occur with mild-moderate MR.</td>
</tr>
<tr>
<td></td>
<td>• ADHD is difficult to diagnose with severe to profound MR.</td>
</tr>
<tr>
<td></td>
<td>• ADHD (especially inattentive type) is difficult to diagnose with low average or borderline IQ.</td>
</tr>
<tr>
<td><strong>Co-Morbidity</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Watch for co-morbid seizures.</td>
</tr>
<tr>
<td></td>
<td>• Watch for personality changes, mood and anxiety symptoms.</td>
</tr>
<tr>
<td><strong>Treatment/Referral</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• MR patients with ADHD may respond well to stimulant treatment, however, some patients may become irritable with stimulant treatment.</td>
</tr>
<tr>
<td></td>
<td>• 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.</td>
</tr>
<tr>
<td></td>
<td>• All MR patients should have an IEP to facilitate appropriate educational curriculum and services.</td>
</tr>
<tr>
<td></td>
<td>• Referral to practitioners with expertise in developmental pediatrics and/or child psychiatric disorders is recommended.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fetal Alcohol Syndrome (FAS) and Alcohol-Related Neurobehavioral Disorder (ARND)</th>
<th><strong>Diagnosis</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>[Note: ARND is also called Fetal Alcohol Effects (FAE) or partial FAS]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• A genetics referral may be helpful in diagnosis.</td>
</tr>
<tr>
<td></td>
<td>• Some centers have multidisciplinary clinics for diagnosis where treatment may also be provided.</td>
</tr>
<tr>
<td></td>
<td>• Many (get %) patients with FAS have symptoms consistent with ADHD. (call Sheila Gahagan/Keiran O’Malley).</td>
</tr>
<tr>
<td><strong>Co-Morbidity</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Patients with FAS have a higher incidence of cardiac and renal problems (take care when prescribing psychotropic medications).</td>
</tr>
<tr>
<td></td>
<td>• Mood symptoms are common.</td>
</tr>
<tr>
<td><strong>Treatment/Referral</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 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).</td>
</tr>
</tbody>
</table>
### 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

<table>
<thead>
<tr>
<th>Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADHD is a chronic condition that extends across developmental phases and may persist into adulthood.</td>
</tr>
<tr>
<td>Murphy &amp; Barkley (1996) estimated that 2-4% of adults have ADHD.</td>
</tr>
<tr>
<td>Data are emerging regarding diagnosis and treatment of affected adults.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Co-Morbidity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnosis is adulthood is often confounded by co-morbid diagnoses, e.g., mood disorders, substance abuse disorders.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Treatment/Referral</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
</tr>
<tr>
<td>More difficult to diagnose ADHD retrospectively in adults for whom the illness was previously undiagnosed.</td>
</tr>
<tr>
<td>No data are available on drug therapy in pregnancy.</td>
</tr>
</tbody>
</table>

### Substance Abusing Patients

<table>
<thead>
<tr>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medication treatment for ADHD has been demonstrated to reduce the risk of subsequent substance use disorders.</td>
</tr>
<tr>
<td>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).</td>
</tr>
<tr>
<td>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.</td>
</tr>
<tr>
<td>Talk about substances of abuse and caffeine.</td>
</tr>
</tbody>
</table>
### Appendix B4. Overview of Complementary and Alternative Medicine Associated with ADHD

<table>
<thead>
<tr>
<th>Therapy</th>
<th>Use</th>
<th>Dose</th>
<th>Side Effects</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expressive (sensory integration, occupational therapy, music, dance, art)</td>
<td>ADHD and neurodevelopmental disorders</td>
<td>None</td>
<td>None</td>
<td>Anecdotal</td>
</tr>
<tr>
<td>Diet restriction (Feingold, red dye, sugars) Megavitamins Neurofeedback (EEG biofeedback) Opometric vision training</td>
<td>ADHD, Tics, Seizures 20-40 sessions</td>
<td>None</td>
<td>None</td>
<td>Small studies suggest some benefit</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Supplements: ADHD</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ginkgo biloba</td>
<td>Antioxidant Improves blood flow. Small benefit to adult cognitive function.</td>
<td>120-240 mg/d (Adult)</td>
<td>Headache, dizziness, arrhythmias, hypotension, GI upset (nausea, vomiting, diarrhea), restlessness, cutaneous hyper-sensitivity. Avoid in bleeding disorders.</td>
<td>One open label study in 36 children who received combination herbal given BID x 4 weeks • Improvement in Conners’ ADHD index at 4 weeks • 14% of subjects reported adverse effects related to study medication</td>
</tr>
<tr>
<td>Fish oil (omega-3, EPA, DHA)</td>
<td>hyperlipidemia, hypertriglyceridemia, hypertension</td>
<td>500-1000 mg/d (Adult)</td>
<td>Flatus, halitosis, heatburn, (high doses): nausea, loose stools, (doses &gt; 3gm/d): Avoid in bleeding disorders, (long-term) weight gain</td>
<td>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</td>
</tr>
<tr>
<td>Evening primrose oil (linolenic, gamma linolenic acid)</td>
<td></td>
<td>500mg 3-6x/d (Adult)</td>
<td>High dose or chronic use: Nausea, diarrhea, headache</td>
<td>Two blinded placebo control crossover studies suggest some behavioral improvement</td>
</tr>
<tr>
<td><strong>Supplements: Sleep disorder</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Melatonin (N-acetyl-5-methoxytryptamine)</td>
<td>Sleep disorders</td>
<td>Melatonin 6-12Y: 3-6 mg PO at bedtime (scheduled, not PRN) Melatonin &gt; 12Y: 6-9 mg PO at bedtime</td>
<td>Sleepiness, fatigue, headache. Possible proconvulsant with multiple neurologic disabilities. May suppress puberty.</td>
<td>One RCT in 25 children with ADHD and chronic insomnia (5 mg melatonin) • Decreased sleep latency and increased total sleep time. One open label study in 24 children with ADHD who received 3 mg melatonin • Statistically significant decrease in time to falling asleep reported after short- and long-term use</td>
</tr>
</tbody>
</table>