Screening

- Clinicians should not universally screen children and adolescents for ADHD.
- Clinicians should evaluate children and adolescents for ADHD when they have signs, symptoms, or impairment suggestive of ADHD.

Diagnosis of ADHD

- As part of the evaluation and diagnosis of ADHD in children and adolescents, clinicians should use structured, validated rating scales,* and refer to and follow the DSM-IV diagnostic criteria (see Page 2).
- Clinicians should conduct a baseline physical assessment (including measurement of pulse, blood pressure, weight and height with the appropriate use of percentile charts) prior to initiating pharmacological therapy.
- Clinicians may recommend cardiac risk evaluation or consultations prior to prescribing psychostimulants for children and adolescents with ADHD with known cardiac abnormalities.
- Clinicians should not perform psychodiagnostic tests as part of ADHD evaluation in the absence of other indications.
- In the absence of signs or symptoms of atopy, clinicians should not refer children and adolescents with ADHD for allergy evaluation, as it is unlikely to change the diagnosis or treatment plan.

First-Line Treatment Options for ADHD

(see Table 1)

a) Clinicians should recommend stimulant medications methylphenidate, amphetamine mixed salts, or dextroamphetamine as first-line pharmacological treatment for children and adolescents diagnosed with ADHD (with or without comorbid conditions).

b) Clinicians, patients, parents and/or caregivers should collaboratively select first-line pharmacological treatment based on preferences, side effects and potential harms, pharmacokinetics (rapidity of onset, duration of action), cost, and formulary availability.

- Clinicians may recommend additional educational services offered outside of KP, such as through the school system, for children and adolescents diagnosed with ADHD.
- Cognitive behavioral therapy (CBT), family therapy, parent training, and social skills training are options for children or adolescents diagnosed with ADHD, with or without comorbidities, for whom drug treatment is contraindicated, not tolerated, or a decision has been made not to initiate drug therapy.

Combined Drug and Non-Drug Therapy

- For children and adolescents who are responding adequately to medication management, clinicians should not routinely add a clinic-based, non-drug intervention† for treating ADHD.
- Clinicians should not recommend dietary modifications and/or elimination diets‡ for the treatment of ADHD.

* The publicly available Vanderbilt ADHD Rating Scales are recommended as part of the evaluation and diagnosis of ADHD in children and adolescents. The following behavioral rating scales are options to be used in addition to the initial evaluation: Conners’ Rating Scales (the revised Conners’ Parent Rating Scale (CPRS-R), the revised Conners’ Teacher Rating Scale (CTRS-R), and the Conners’/Wells Self-Report of Symptoms rating scale (CASS)), Achenbach Scales: CBCL, TRF, YSR, ADHD Rating Scale – IV (ADHD RS-IV) (DSM-IV-based), Swan, Nolan, and Pelham Questionnaire (SNAP) (DSM-IV-based), and Achenbach and Vanderbilt behavioral rating scales can be utilized to assess some comorbid disorders.

† Examples of clinic-based, non-drug interventions are CBT, family therapy, and parent and social skills training.
‡ Elimination diets were introduced with the ‘Feingold theory’ which implied that artificial colorings, preservatives and cross-reacting natural salicylates were responsible for a variety of illnesses, including ADHD (BF Feingold, Why Your Child is Hyperactive, 1974).
ADHD Evaluation and Diagnosis Algorithm
Children and Adolescents with suspected ADHD

Clinicians should not universally screen children and adolescents for ADHD. Clinicians should evaluate children and adolescents for ADHD when they have signs, symptoms, or impairment suggestive of ADHD.

Refer to and follow the DSM-IV diagnostic criteria to evaluate:
- Onset and duration of core symptoms of ADHD (e.g., inattention, hyperactivity, and impulsivity).
- Behavior in several settings (e.g., school, work, home).
- Impairment in social, academic, or occupational functioning.
The publicly available Vanderbilt ADHD Rating Scales are recommended as part of the evaluation and diagnosis of ADHD.

Use at least one of the following behavioral rating scales:* – Vanderbilt ADHD Rating Scales: (VADRS, VADTRS) (preferred):
- Conners’ Rating Scales: CPRS-R, CTERS-R, CASS
- ADHD Rating Scale-IV: (ADHD RS-IV)†

Conduct a baseline physical assessment (including measurement of pulse, blood pressure, weight and height with the appropriate use of percentile charts) prior to initiating pharmacological therapy.
Clinicians may recommend cardiac risk evaluation or consultations prior to prescribing psychostimulants for children and adolescents with ADHD with known cardiac abnormalities.

Evaluate for comorbid psychiatric disorders and other conditions. The most common disorders coexisting with ADHD include:
- Disruptive Behavior Disorders (Oppositional Defiant Disorder, Conduct Disorder)
- Learning Disorders
- Mood Disorders (Depression, Bipolar Disorder)
- Tic Disorder
- Anxiety Disorders

The Vanderbilt Rating Scales are recommended for assessing symptoms associated with some common comorbid conditions.‡

Begin Treatment and Coordinate Management of Care, See Medication Management Algorithm.

Successful first-line medication trial(s)?

NO

Coordinate with subspecialty(s) for further evaluation and as indicated. See Medication Management Algorithm.

YES

Any significant additional comorbidities identified?

NO

YES

* DSM-IV-based.
† The recommendation is limited to the behavioral rating scales. Evaluation to determine a diagnosis of ADHD, while following the DSM-IV criteria, includes other components that were not addressed in the evidence-based guideline (i.e., physical, school and behavioral history (including history of substance abuse), parent and student interviews, and any additional material needed for an appropriate diagnosis).
‡ This recommendation is limited to global rating scales that are appropriate for use in the primary care setting. Additional evaluations, diagnostic testing, and examinations may be necessary for diagnosis. The Vanderbilt Rating Scales do not assess learning and tic disorders, because learning disorders require evaluation through academic testing in an educational setting, and tic disorders can be addressed through clinical presentation.
Second-Line Treatment Options for ADHD
(see Table 1)
a) After assessing for and addressing medication adherence and other conditions that might interfere with response, if not otherwise contraindicated, clinicians may recommend a different stimulant medication (in the same or different class) for patients who fail to adequately respond to or are intolerant of the initial stimulant.
b) If two or more first-line stimulant formulations are contraindicated, not tolerated, or ineffective, treatment options include:
1. Referral or consultation with a specialist, including child psychiatry, behavioral health, a behavioral pediatrician, or ADHD champion;
2. Stimulant treatment augmented with guanfacine or clonidine;
3. Guanfacine or clonidine monotherapy;
4. Atomoxetine (KP non-formulary medication).

• Warnings on hepatotoxicity and suicidality from atomoxetine exist. All ADHD drugs also have cardiovascular risk warnings. Instruct patients and caregivers to recognize signs and symptoms of liver dysfunction, cardiovascular risks, and suicidality. Liver function tests can be considered for patients prescribed atomoxetine.

Clinical Follow-up for ADHD Drug Therapy
a) Clinicians should recommend one in-person office visit with a practitioner with prescriptive authority for children and adolescents during the 30-day initiation phase of drug treatment for ADHD. (HEDIS measure)
b) Clinicians should recommend a minimum of two follow-up visits within 9 months after the 30-day initiation phase visit for children and adolescents continuing drug treatment for ADHD. One of the visits may be a telephone visit with a practitioner. More frequent follow-up visits may be conducted on a case-by-case basis. (HEDIS measure)
c) At all follow-up visits, clinicians should assess patients for adverse effects, adherence to treatment, and response to treatment. Clinicians should monitor for changes in core symptoms of ADHD (hyperactivity, impulsivity, and inattention), educational function, psychosocial function, and potential side effects, such as headaches, abdominal pain, and changes in height, weight, blood pressure, pulse, or eating and sleeping patterns.

### Diagnostic Criteria for Attention-Deficit/Hyperactivity Disorder (DSM-IV-TR, 2000)

A. Either (1) or (2):

(1) Six (or more) of the following symptoms of inattention have persisted for at least 6 months to a degree that is maladaptive and inconsistent with developmental level:

**INATTENTION**
- (a) often fails to give close attention to details or makes careless mistakes in schoolwork, work, or other activities
- (b) often has difficulty sustaining attention in tasks or play activities
- (c) often does not seem to listen when spoken to directly
- (d) often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (not due to oppositional behavior or failure to understand instructions)
- (e) often has difficulty organizing tasks and activities
- (f) often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (such as schoolwork or homework)
- (g) often loses things necessary for tasks or activities (e.g., toys, school assignments, pencils, books, or tools)
- (h) is often easily distracted by extraneous stimuli
- (i) is often forgetful in daily activities

(2) Six (or more) of the following symptoms of hyperactivity-impulsivity have persisted for at least 6 months to a degree that is maladaptive and inconsistent with developmental level:

**HYPERACTIVITY**
- (a) often fidgets with hands or feet or squirms in seat
- (b) often leaves seat in classroom or in other situations in which remaining seated is expected
- (c) often runs about or climbs excessively in situations in which it is inappropriate (in adolescents or adults, may be limited to subjective feelings of restlessness)
- (d) often has difficulty playing or engaging in leisure activities quietly
- (e) is often “on the go” or often acts as if “driven by a motor”
- (f) often talks excessively

**IMPULSIVITY**
- (g) often blurts out answers before questions have been completed
- (h) often has difficulty awaiting turn
- (i) often interrupts or intrudes on others (e.g., butts into conversations or games)

B. Some hyperactive-impulsive or inattentive symptoms that caused impairment were present before age 7 years.

C. Some impairment from the symptoms is present in two or more settings (e.g., at school [or work] and at home).

D. There must be clear evidence of clinically significant impairment in social, academic, or occupational functioning.

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

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Monitoring for Adverse Events

a) Clinicians should instruct patients, parents, and/or other caregivers about cardiovascular signs and symptoms (for any stimulant), or liver dysfunction, and suicidality (for atomoxetine). Patients, parents, or caregivers should seek medical attention should any of these signs and symptoms occur.

b) Clinicians may order liver function tests for patients prescribed atomoxetine.

- Clinicians should assess the continuing benefit and potential risk of pharmacological treatment at least every six months.

ADHD Medication Management Algorithm

Clinicians, patients, parents and/or caregivers should collaboratively select first-line pharmacological treatment based on preferences, side effects and potential harms, pharmacokinetics (rapidity of onset, duration of action), cost, and formulary availability.

Medication warranted and desired?

- YES
- NO

Consider increasing the dose if there is no immediate response to the medication started. If increasing the dose produces side effects or has no response, consider trying a second first-line medication.

Successful first-line medication trial(s)?

- YES
- NO

Clinicians should recommend stimulant medications methylphenidate, amphetamine mixed salts, or dextroamphetamine as first-line pharmacological treatment for children and adolescents diagnosed with ADHD (with or without comorbid conditions).

Second-line pharmacological treatment options:

a) After assessing for and addressing medication adherence and other conditions that might interfere with response, if not otherwise contraindicated, clinicians may recommend a different stimulant medication (in the same or different class) for patients who fail to adequately respond to or are intolerant of the initial stimulant.

b) If two or more first-line stimulant formulations are contraindicated, not tolerated, or ineffective, treatment options include:
   1. Referral or consultation with a specialist, including child psychiatry, behavioral health, a behavioral pediatrician, or ADHD champion;
   2. Stimulant treatment augmented with guanfacine or clonidine;
   3. Guanfacine or clonidine monotherapy;
   4. Atomoxetine (KP non-formulary medication).

Referral or consultation with a specialist, including child psychiatry, behavioral health, a behavioral pediatrician, or ADHD champion, is an option for children or adolescents with common comorbid conditions such as oppositional defiant disorder, conduct disorder, anxiety disorders, mood disorders, and tic disorder.

- Clinicians should not routinely recommend drug holidays for children and adolescents with ADHD. However, clinicians should consider the viewpoints of the patients, parents and/or other caregivers to identify the best pattern of use, which may include periods without drug treatment.

- If the benefits continue to outweigh the risks, clinicians should prescribe pharmacological treatment for ADHD for as long as it remains clinically effective.

- Clinicians may refer children and adolescents with ADHD and common comorbid conditions (e.g., oppositional defiant, conduct, anxiety, and tic disorders) for consultation with a specialist (e.g., a child psychiatrist, behavioral health specialist, behavioral pediatrician, or ADHD champion).
Overview of the Evidence on the Efficacy of the First-Line Stimulant Formulations

There is good evidence that methylphenidate and fair evidence that dexmethylphenidate, dextroamphetamine, mixed-amphetamine salts, lisdexamfetamine dimesylate, and modafinil are efficacious in reducing core symptoms of ADHD and, in some cases, other measures of educational and psychosocial function. The evidence on methylphenidate includes a well-designed meta-analysis on several available trials. The evidence on dexmethylphenidate, dextroamphetamine, mixed-amphetamine salts, lisdexamfetamine dimesylate, and modafinil includes a more limited number of trials. Although there is fair evidence that adverse events do occur in children with all of these drugs, with the exception of modafinil, the benefits were determined to outweigh the risk of harm for routine use.

Table 1: Medications Used in the Treatment of ADHD

<table>
<thead>
<tr>
<th>Drug (reference brand)</th>
<th>Est. Duration of Effect &amp; PEAK (hours)</th>
<th>Strength (mg)</th>
<th>Doses per Day</th>
<th>Usual Dose (labeled maximum dose)</th>
<th>Comments</th>
<th>Relative Cost*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SHORT-ACTING</strong></td>
<td></td>
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<tr>
<td>Amphetamine mixed salts (Adderall)</td>
<td>4 – 6 3</td>
<td>5, 7.5, 10, 12.5, 15, 20, 30</td>
<td>1 – 2</td>
<td>Initial dose 2.5–5 mg qAM or BID.</td>
<td>Generic available.</td>
<td>$</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Usual dose 5–20 mg qAM or BID (40 mg).</td>
<td>Duration is dose dependent.</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Duration rarely &gt; 5-6 hours.</td>
<td></td>
<td>$</td>
</tr>
<tr>
<td>Dextroamphetamine (Dexedrine; DextroStat)</td>
<td>4 – 6 1 – 3</td>
<td>5, 10</td>
<td>2 – 3</td>
<td>Initial dose 2.5–5 mg qAM-BID.</td>
<td>Generic available.</td>
<td>$</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Usual dose 5–15 mg BID or TID (40 mg).</td>
<td>Dose is generally ½ to ⅔ that of methylphenidate.</td>
<td></td>
</tr>
<tr>
<td>Methylphenidate (Ritalin; Methylin)</td>
<td>3 – 4 1 – 3</td>
<td>5, 10, 20</td>
<td>2 – 3</td>
<td>Initial dose 5 mg BID.</td>
<td>Generic available.</td>
<td>$</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>5–20 mg BID to TID (60 mg).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dexmethylphenidate (Focalin)</td>
<td>3 – 5 1.5 – 3</td>
<td>2.5, 5, 10</td>
<td>2</td>
<td>Initial dose 2.5 mg BID.</td>
<td>Generic available.</td>
<td>$$$</td>
</tr>
<tr>
<td>NON-FORMULARY</td>
<td></td>
<td></td>
<td></td>
<td>Usual dose 2.5 mg–10 mg BID (20 mg).</td>
<td>Dose is ⅔ that of methylphenidate.</td>
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<tr>
<td><strong>INTERMEDIATE-ACTING</strong></td>
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<tr>
<td>Methylphenidate sustained-release (Ritalin SR, Methylin ER, Metadate ER)</td>
<td>4 – 6 3.5</td>
<td>10, 20</td>
<td>1 – 2</td>
<td>Initial dose 10 mg qAM.</td>
<td>Generic available.</td>
<td>$</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Usual dose 20–40 mg qAM or 40 mg qAM &amp; 20 mg afternoon (60 mg).</td>
<td>Must be swallowed whole.</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Duration should correspond to the IR dose required over 8 hours.</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Duration rarely &gt; 5-6 hours.</td>
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</tbody>
</table>
### Table 1: Medications Used in the Treatment of ADHD Continued

<table>
<thead>
<tr>
<th>Drug (reference brand)</th>
<th>Est. Duration of Effect &amp; PEAK (hours)</th>
<th>Strength (mg)</th>
<th>Doses per Day</th>
<th>Usual Dose (labeled maximum dose)</th>
<th>Comments</th>
<th>Relative Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LONG-ACTING</strong></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Amphetamine mixed salts extended-release capsule (Adderall XR) (biphasic release: 50% IR, 50% SR) | 10–12 | 5, 10, 15, 20, 25, 30 | 1 | • Children 6–12: Initial 5 mg qAM; dosage may be increased in increments of 5–10 mg at weekly intervals to a maximum of 30 mg qAM.  
• Adolescents 13–17: Initial 10 mg qAM; dosage may be increased in increments of 5–10 mg at weekly intervals to a maximum of 40 mg qAM. | • Brand priced as generic.  
• Capsule may be opened and contents sprinkled on applesauce.  
• Capsule and contents must not be crushed or chewed.  
• Equivalent to total daily dose of Adderall IR given BID. | $$$ |
| Methylphenidate extended-release tablet (Concerta®) (biphasic release: 22% IR, 78% SR) | 8 – 12 (up to 24) | 18, 27, 36, 54 | 1 | • Children 6–12: Initial 18 mg qAM; dosage may be increased by 18 mg at weekly intervals to a maximum of 54 mg qAM.  
• Adolescents 13–17: Initial 18 mg qAM; dosage may be increased by 18 mg at weekly intervals to a maximum of 72 mg qAM not to exceed 2 mg/kg/day.  
• Conversion from IR methylphenidate:  
• 5 mg BID–TID = 18 mg qAM  
• 10 mg BID–TID = 36 mg qAM  
• 15 mg BID–TID = 54 mg qAM | • Brand priced as generic.  
• Tablet must be swallowed whole with liquids and must not be chewed, divided or crushed.  
• Contraindicated in patients with severe gastric narrowing.  
• Nondeformable tablet shell may appear in stool.  
• Bioavailability is similar to IR methylphenidate given TID. | $$$$ |
| Methylphenidate transdermal patch (Daytrana) NON-FORMULARY | 12 (when worn for 9 hrs) | 10 mg/9 h 15 mg/9 h 20 mg/9 h 30 mg/9 h | 1 | • Initial dose 10 mg/9 h; dose may be increased at weekly intervals.  
• Apply to alternating hip area 2 hours before effect is needed and remove 9 hours after application. | • Use may lead to contact sensitization.  
• Avoid exposing application site to direct external heat sources; increases drug release > 2-fold from the patch.  
• A noticeable effect may not occur until about 2 hours after application, which may be problematic when getting children ready for school in the morning. | $$$$ |
| Lisdexamfetamine capsule (Vyvanse) NON-FORMULARY | 8–10 | 20, 30, 40, 50, 60, 70 | 1 | • Children 6–12: Initial 30 mg qAM; dosage may be increased in increments of 20 mg at weekly intervals to a maximum of 70 mg qAM. | • Capsule may be opened and entire contents dissolved in water to form a solution. | $$ |

* Cost Legend  
$ ≤ $25/month  
$5 – $25/month  
$26 – $50/month  
$51 – 100/month  
$101 – 150/month  
≥ $150

Acquisition cost based on the following comparative daily doses:  
Methylphenidate 40 mg  
Dextroamphetamine 20 mg  
Amphetamine mixed salts 20 mg

(continued on next page)
<table>
<thead>
<tr>
<th>Drug (reference brand)</th>
<th>Est. Duration of Effect &amp; PEAK (hours)</th>
<th>Strength (mg) per Day</th>
<th>Usual Dose (labeled maximum dose)</th>
<th>Comments</th>
<th>Relative Cost*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SECOND-LINE AGENTS USED IN THE TREATMENT OF ADHD</strong></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
| Atomoxetine capsule (Strattera) | ≥ 10 – 12 | 10, 18, 25, 40, 60, 80, 100 | 1–2 | • ≤ 70 kg: Initial 0.5 mg/kg/day; increase after a minimum of 3 days to target dose of about 1.2 mg/kg/day given either as a single daily dose in morning or as evenly divided doses in morning and late afternoon/early evening (1.4 mg/kg/day or 100 mg/day, whichever is less).  
• > 70 kg: Initial 20-40 mg/day; increase after a minimum of 3 days as tolerated and as needed to target dose of ~ 80 mg/day given either as a single daily dose in morning or as evenly divided doses in morning and late afternoon/early evening (100 mg/day). | • Norepinephrine-reuptake inhibitor.  
• Not a controlled substance.  
• Second-line drug for patients in whom stimulants are poorly tolerated, ineffective, or contraindicated.  
• Do not open capsule.  
• Reduce dose in hepatic insufficiency, and may need to be reduced in CYP2D6 poor metabolizers.  
• Slower titration may reduce uncomfortable side effects. | $$$$$ - $$$$$$  
Giving 2 caps per day (e.g., 40 mg BID) effectively doubles the cost of therapy compared to 1 cap/day (e.g., 80 mg once daily). |
| Guanfacine extended release tablet (Intuniv) | ≥ 10 – 12 | 1, 2, 3, 4 | 1 | • Initial dose of 1 mg qAM and adjust in increments of no more than 1 mg/week.  
• Usual dose 1–4 mg qAM.  
• Consider dosing on a mg/kg basis. 0.05-0.08 mg/kg once daily up to 0.12 mg/kg once daily. | • A selective alpha2A-adrenergic receptor agonist.  
• Not a controlled substance.  
• Tablets must be swallowed whole and should not be crushed, chewed, or broken.  
• Do not administer with high-fat meals, because of increased exposure.  
• Approved for monotherapy and adjunct therapy to stimulants. | $$$$ |
| Clonidine extended-release tablets (Kapvay) | ≥ 10 – 12 | 0.1, 0.2 | 2 | • Initial dose of 0.1 mg qHS; increase by 0.1 mg per week. Divide doses qAM and qHS, with larger dose at bedtime.  
• Usual dose 0.1 to 0.2 mg BID, to a maximum of 0.4 mg.  
• Taper upon discontinuation by 0.1 mg every 3 to 7 days. | • A selective alpha2A-adrenergic receptor agonist.  
• Not a controlled substance.  
• Tablets must be swallowed whole and should not be crushed, chewed, or broken.  
• Due to differing pharmacokinetic profiles, mg-per-mg substitution of clonidine XR with other clonidine products is not recommended.  
• Approved for monotherapy and adjunct therapy to stimulants. | $$$$ - $$$$$$ |

* Cost Legend  
$ ≤ $25/month  
$ $$ = $26 - $50/month  
$ $$$ = $51 - $100/month  
$$$$$ = $101 - $150/month  
$$$$$$ ≥ $150  

Acquisition cost based on the following comparative daily doses:  
Methylphenidate 40 mg  
Dexamethylphenidate 20 mg  
Dextroamphetamine 20 mg  
Amphetamine mixed salts 20 mg