Child Medication Fact Book
for Psychiatric Practice

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“Practical, thorough, and easy to use—a must for all prescribers!”
—Fred R. Volkmar, MD
Child Study Center, Yale University School of Medicine

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Child Medication Fact Book

for Psychiatric Practice

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Introduction

HOW TO USE THIS BOOK
Medication information is presented in three ways in this book.

Chapter introductions: These are guides to general therapeutic categories of child psychopharmacology. There is natural overlap between these areas; however, we hope that our groupings are convenient for quick reference in everyday office practice.

Medication fact sheets: In-depth prescribing information for select medications (not all psychiatric medications are covered). There are 70 medication fact sheets in this book. Medications that fall into more than one category are included in each applicable chapter table, but each medication has only one fact sheet (placed in the chapter where we believe the medication is most commonly used). We have included most of the commonly prescribed and newer medications for which there is data and experience in children. These fact sheets include dosing, indications and common uses (both on and off label), side effects, mechanisms of action, recommendations for clinical monitoring, evidence, clinical pearls, and fun facts.

Quick-scan medication tables: These are located after the chapter introduction for each therapeutic category and list the very basics: generic and brand names, FDA-approved indications, strengths available, starting doses, and target doses. These tables contain most of the commonly prescribed psychiatric medications in pediatric practice.

CATEGORIES OF MEDICATIONS
We did our best to categorize medications rationally. However, in some cases a medication can fall into more than one category. In such cases, we placed the medication’s fact sheet in the therapeutic category for which it is most often used. If you’re having trouble finding a medication in a particular section, look in the index to find its page number.

MORE ON THE MEDICATION FACT SHEETS
The goal of these fact sheets is to provide need-to-know information that can be easily and quickly absorbed during a busy day of seeing patients. An important goal, therefore, is that all the information should fit on a single page. Please refer to the PDR (Physicians’ Desk Reference) when you need more in-depth information.

● For the most part, each fact sheet contains the following information:
  ● Both the brand and generic names.
  ● Generic availability, denoted with a [G] or (G).
  ● FDA-approved indications in kids and in adults.
  ● Off-label uses. We list the more common off-label uses, based on both the medical literature and our own clinical experience. Just because we list a potential use does not imply that we endorse a medication as being particularly effective for that use. We are simply alerting you to the fact that there is some evidence for efficacy or at least reports of use.
  ● Dosage forms, along with available strengths.
  ● Dosage guidance. We provide recommendations on how to dose medications; these are derived from a variety of sources, including package inserts, clinical trials, and common clinical practice. In other words, don’t be surprised when our dosing instructions are at odds with what you find in the PDR or other sources such as RxList.
  ● Lab monitoring recommendations. We include the usual routine monitoring measures for each medication. Of course, you may need to think beyond the “routine” if the clinical picture warrants it.
  ● Cost information. Pricing information for a 1-month supply of a common dosing regimen was obtained from the website GoodRx (www.goodrx.com), accessed in May 2018. These are the prices patients would have to pay if they had no insurance. Because of wide variations in price depending on the pharmacy, in this edition of the Child Medication Fact Book we list price categories rather than the price in dollars. The categories are:
    – $: Inexpensive: <$50/month
    – $$: Moderate: $50–$100/month
    – $$$: Expensive: $100–$200/month
    –$$$$$: Extremely expensive: >$500/month

Many patients have some type of insurance and are therefore not going to pay retail price, but rather a co-pay, which is usually less expensive. However, off-label uses of medications in child psychiatry are often not covered by insurance. Also, even when covered, the co-pays for medication can be high, particularly for high-deductible insurance plans. With no clear source for accurately predicting a co-pay, you can use the retail price as a clue. Meds that are very inexpensive may...
General Tips on Child and Adolescent Psychopharmacology

Over the course of a career, most of us realize that pediatric psychopharmacology is more art than science, and that much of the knowledge we’ve acquired over the years has come from our work with patients after completing residency and fellowship. Here are some hard-won tips and pearls that you might find useful in your practice.

ASSESSMENT, DIAGNOSIS, AND CASE CONCEPTUALIZATION

- **Target symptoms are king.** Most patients come to us with mixed symptoms from several diagnostic categories. Depression, for example, takes on myriad shapes in different patients, with the result that this one diagnosis can seem like many. While formal diagnosis is helpful for insurance and school advocacy, for treatment it is usually more practical to list and prioritize target symptoms. During the workup and ongoing follow-up, it is very helpful to have a running list of all the presenting and ongoing target symptoms, circling the ones that are the current focus. For instance, in one patient you might be targeting substance use, mood instability, and impulsivity, circling all three, while leaving issues of poor grades, tics, and peer relationships on the list but uncircled—intending to focus on them a bit down the line. Another patient with the same set of symptoms might have different issues to target.

- **Meds are the tail, not the dog.** Medications can be very helpful at times, even life-saving, but they cannot make up for an inadequate overall plan or placement. If a child is laboring under challenging or outright abrasive situations at home or school, pills do not fix that. For instance, a teen with moderate autism spectrum disorder was brought in for a medication evaluation for irritability and “acting out.” On evaluation, his treatment plan included “training for pre-vocational skills”—and his acting out turned out to be in part a rebellion from years of being subjugated to tasks such as sorting silverware. The answer in this case was to rethink the goals that had been imposed on the patient as part of the treatment plan, and not to provide chemical restraint.

- **Informed consent is your friend.** Use informed consent—diagnosis, target symptoms, discussion of options, etc—to guide rational treatment. See the appendices for additional tips on this process.

- **Good care demands time.** You know this, and you are probably fighting for time—time to see the patient; talk to family, therapists, and teachers; review records; call labs; and whatever else you need to do to care for your patient. When we are taken to task about care, we are asked such things as: “Did you call the lab?” “Did you contact the school?” “Did you call the lab?” “Did you call the lab?” We need time to do these things, and we deserve to be paid for that time too. Advocate for more time for all the elements of patient care.

- **Keep development in mind.** As you work with children, keep in mind that patterns of changes that occur developmentally are not the same in every child. For example, an active toddler does not necessarily have ADHD. A school-aged child with a vivid fantasy life is usually not psychotic.

- **Take it down (slowly) if it doesn’t work.** There is little point in keeping a medication at a robust dose if it is not having a clear positive impact. We often see people who have stayed on medications more out of habit than anything else. Get
ADHD Medications

Generally, in treating kids with ADHD, you should start with psychostimulants, since they are the most effective options. Second-line agents include atomoxetine, bupropion, and alpha agonists.

**STIMULANT RECOMMENDATIONS**

When choosing a stimulant, the first decision is between an amphetamine or methylphenidate preparation. Methylphenidates are often the go-to as they tend to be more easily tolerated and are as effective as amphetamines for most patients. The second decision is choosing between a long-acting or short-acting stimulant.

For kids who don’t like swallowing pills, there are various options. Some long-acting stimulants can be opened and sprinkled on food. There are also short- and long-acting liquid, chewable, and disintegrating brand-name options—though they are expensive and often require pre-authorization. Finally, another option for the pill-phobics is the Daytrana patch.

**The case for long-acting stimulants**

- More practical: It’s easier to take a single dose that lasts through the duration of a school day.
- Addresses acute tachyphylaxis: Response to stimulants diminishes rapidly, but most newer long-acting stimulants release an increasing amount of drug over the 6–12 hour course of the dose, which most people need for the medication to be effective. This avoids the need for multiple short-acting dosage bursts to maintain continued response.
- Decreased stimulant rebound: People sensitive to rebound irritability or worsening of ADHD symptoms often report a more attenuated rebound with long-acting stimulants.

**The case for short-acting stimulants**

- For situations where a child only requires a few hours of effect, such as a half day of school, an afternoon of completing homework, or a weekend activity.
- Minimizes appetite suppression during meals.
- May be less likely to interfere with sleep.

**DOSE EQUIVALENCES**

Some kids may need to try different stimulants, or stimulant formulations, before settling on the one that works best for them. The dose equivalents are fairly easy to remember.

1. From amphetamine to another amphetamine
   - With the exception of Vyvanse, all amphetamines, including Adderall IR and XR, are roughly equivalent in potency. For example, if a child is taking Dexedrine 10 mg TID, you can switch this to Adderall 15 mg BID or Adderall XR 30 mg QD. That said, some people believe that Dexedrine, being 100% dextroamphetamine, might be more potent than Adderall, which is 75% d-amphetamine and 25% l-amphetamine (eg, Dexedrine 30 mg/day may be closer to 40 mg/day of Adderall). In reality, the effect is likely negligible in most people.
   - Vyvanse is composed of both lysine and amphetamine, with amphetamine making up only about 30% of Vyvanse. This means that it’s much less potent than straight Dexedrine. So when switching from another amphetamine to Vyvanse, you have to at least **double the dose**, and sometimes more.

2. From methylphenidate to another methylphenidate
   - With the exception of Concerta and Focalin, all methylphenidate preparations are roughly equivalent in potency. Concerta, because of its complex delivery system, delivers less methylphenidate than implied by the mg amount you prescribe. The usual conversion percentage used is 83%, meaning that the body sees 83% of Concerta in methylphenidate equivalents. Thus, Concerta 18 mg is equivalent to methylphenidate 15 mg, 36 mg is equivalent to 30 mg, and so on.
   - Focalin is the dextro-isomer of methylphenidate, which is twice as potent as methylphenidate. Thus, use about half the dose when using Focalin.

3. From methylphenidate to an amphetamine (or vice versa)
   - Methylphenidate is roughly half as potent as amphetamine, so Ritalin 10 mg = Dexedrine 5 mg, etc. Consistent with this equivalency, child psychiatrists often dose methylphenidate at 1 mg/kg, whereas they dose amphetamine at 0.5 mg/kg. Conversely, if you’re switching from Dexedrine to Ritalin, you would need to double the dosage.
### TABLE 1: ADHD Medications

<table>
<thead>
<tr>
<th>Brand Name (Generic Name, if different than heading)</th>
<th>Available Strengths (mg except where noted)</th>
<th>Usual Pediatric Dosage Range (starting–max) (mg)</th>
<th>Duration of Action (hours)</th>
<th>Can It Be Split?</th>
<th>Ages Approved for ADHD</th>
<th>Delivery System/Notes (IR = immediate release, CR = controlled release, DR = delayed release, ER = extended release)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Methylphenidates</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Short-acting</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Focalin [G] (Dexmethylphenidate) 2001</td>
<td>2.5, 5, 10</td>
<td>2.5 BID–10 BID</td>
<td>3–4</td>
<td>Yes (not scored)</td>
<td>6–17</td>
<td>Tablet; D-enantiomer of Ritalin; 2x more potent than methylphenidate</td>
</tr>
<tr>
<td>Methylin CT [G] 2003</td>
<td>2.5, 5, 10</td>
<td>2.5 BID–20 TID</td>
<td>3–4</td>
<td>Yes</td>
<td>6–17, adults</td>
<td>Chewable, grape-flavored tablet</td>
</tr>
<tr>
<td>Methylin oral solution [G] 2002</td>
<td>5 mg/5 mL, 10 mg/5 mL</td>
<td>2.5 BID–20 TID</td>
<td>3–4</td>
<td>NA</td>
<td>6–17, adults</td>
<td>Clear, grape-flavored liquid</td>
</tr>
<tr>
<td>Ritalin [G] 1955</td>
<td>5, 10, 20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>IR tablet</td>
</tr>
<tr>
<td><strong>Intermediate-acting</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metadate ER [G] 1999</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Possibly more predictable because of wax matrix</td>
</tr>
<tr>
<td>Methylin ER [G] Branded generic of Ritalin SR 2000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Possibly more continuous than others in category</td>
</tr>
<tr>
<td>Ritalin SR [G] 1982</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CR tablet (less predictable because of wax matrix)</td>
</tr>
<tr>
<td><strong>Long-acting</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Focalin XR [G] (Dexmethylphenidate XR) 2005</td>
<td>5, 10, 20, 15, 20, 25, 30, 35, 40, 50, 60</td>
<td>5 QAM–30 QAM</td>
<td>8–12</td>
<td>Can be sprinkled; do not crush or chew</td>
<td>6–17, adults</td>
<td>Capsule of 50% IR beads &amp; 50% DR beads; mimics BID dosing; 2x more potent than methylphenidate</td>
</tr>
<tr>
<td>Concerta [G] 2000</td>
<td>18, 27, 36, 54</td>
<td>18 QAM–72 QAM</td>
<td>10–16</td>
<td>No</td>
<td>6–17, adults</td>
<td>CR tablet with 22% IR &amp; 78% DR; possibly more predictable because of wax matrix</td>
</tr>
<tr>
<td>Cotempla XR-ODT 2017</td>
<td>8.6, 17.3, 25.9</td>
<td>17.3 QAM–51.8 QAM</td>
<td>8–12</td>
<td>No</td>
<td>6–17</td>
<td>Orally disintegrating, ER with 25% IR &amp; 75% ER</td>
</tr>
<tr>
<td>Daytrana patch (Methylphenidate transdermal system) 2006</td>
<td>10, 15, 20</td>
<td>10 QAM–30 QAM</td>
<td>8–12</td>
<td>No</td>
<td>6–17, adults</td>
<td>CR patch; duration can be shortened by decreasing wear time; drug effects may persist for 5 hours after removal</td>
</tr>
<tr>
<td>Jornay PM 2018</td>
<td>20, 40, 60, 80, 100</td>
<td>20 QPM–100 QPM</td>
<td>8–12 after 10 hour delay in onset</td>
<td>Can be sprinkled; do not crush or chew</td>
<td>6–17, adults</td>
<td>ER capsule of DR beads; taken in evening between 6:30–9:30 pm</td>
</tr>
</tbody>
</table>

**Table notes:**
- [G] denotes generic availability
- [IR = immediate release, CR = controlled release, DR = delayed release, ER = extended release]

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AMPHETAMINE (Adzenys XR-ODT, Dyanavel XR, Evekeo) Fact Sheet

PEDIATRIC FDA INDICATIONS:
ADHD (Adzenys XR-ODT and Dyanavel XR: children >6; Evekeo: children >3).

ADULT FDA INDICATIONS:
ADHD (Adzenys XR-ODT); narcolepsy (Evekeo); obesity (Evekeo).

OFF-LABEL USES:
Treatment-resistant depression.

DOSAGE FORMS:
Tablets (Evekeo): 5 mg, 10 mg (scored).
ER orally disintegrating tablets (Adzenys XR-ODT): 3.1 mg, 6.3 mg, 9.4 mg, 12.5 mg, 15.7 mg, 18.8 mg.
ER oral suspension (Dyanavel XR): 2.5 mg/mL.

PEDIATRIC DOSAGE GUIDANCE:
⦁ Tablets (Evekeo):
  – Children 3–5: Start 2.5 mg QAM, increase in 2.5 mg/day increments weekly to maximum of 40 mg/day in divided doses.
  – Children 6–17: Start 5 mg QAM, increase in 5 mg/day increments weekly to maximum of 40 mg/day in divided doses.
⦁ ER ODT (Adzenys XR-ODT):
  – Start 6.3 mg QAM, increase in 3.1–6.3 mg/day increments weekly. Maximum of 18.8 mg/day (ages 6–12) or 12.5 mg/day (ages 13–17).
⦁ ER oral suspension (Dyanavel XR):
  – Start 2.5 mg–5 mg QAM, increase in 2.5–10 mg/day increments every 4–7 days. Maximum 20 mg/day.

MONITORING:
Weight, height, BP/P; ECG.

COST:$$$$

SIDE EFFECTS:
⦁ Most common: abdominal pain, decreased appetite, weight loss, insomnia, headache, nervousness.
⦁ Serious but rare: See class warnings in chapter introduction.

MECHANISM, PHARMACOKINETICS, AND DRUG INTERACTIONS:
⦁ Stimulant that inhibits reuptake of dopamine and norepinephrine.
⦁ Metabolized primarily via CYP2D6; t ½: 11 hours.
⦁ Avoid use with MAOIs, antacids.

EVIDENCE AND CLINICAL PEARLS:
⦁ FDA-approved, many studies, history of clinical efficacy and safety, & larger effect size than non-stimulants.
⦁ Racemic l-isomer is more potent than d-isomer in peripheral activity (more cardiovascular effects, tics).
⦁ There may be less appetite suppressant effects with racemic mixture compared to dextroamphetamine.
⦁ Divide IR (Evekeo) doses by 4–6 hour intervals.
⦁ Approximate equivalence doses of Adzenys XR-ODT and mixed amphetamine salts XR (Adderall XR) are: 3.1 mg = 5 mg, 6.3 mg = 10 mg, 9.4 mg = 15 mg, 12.5 mg = 20 mg.
⦁ Shake Dyanavel XR oral suspension for extended release. 2.5 mg/mL = 4 mg of mixed amphetamine salts.
⦁ Amphetamines are not interchangeable on a mg:mg basis. When switching, use a lowered dose and adjust.

FUN FACT:
The term “amphetamine” is the contracted form of the chemical “alpha-methylphenethylamine.” Its first pharmacologic use was when pharmaceutical company Smith, Kline and French sold amphetamine under the trade name Benzedrine as a decongestant inhaler.

BOTTOM LINE:
Newer formulations of an old drug come with a high price tag. Stick to the usual amphetamine products like mixed amphetamine salts unless liquid or ODT dosing is absolutely necessary.

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Antidepressants

In contrast to the data available for adults, the evidence for efficacy and safety of antidepressants in children is less robust. Nonetheless, some studies, specifically the TADS (The Treatment for Adolescents With Depression Study) and TORDIA (Treatment of Resistant Depression in Adolescents), have shown that SSRIs can work for depression in adolescents, especially when combined with cognitive behavioral therapy.

In general, when faced with a child or adolescent with depression who has not responded to psychotherapy, we recommend starting with fluoxetine, because it has the most evidence for efficacy and safety. Other first-line options include sertraline and escitalopram. Paroxetine has fallen out of favor due to concerns about suicidality as a possible side effect and significant withdrawal symptoms.

If the first SSRI trial fails, rotate to a different SSRI. An SNRI trial (either venlafaxine or duloxetine) is reasonable after 2 failed SSRIs. SNRIs tend to have more side effects than SSRIs and potentially severe discontinuation symptoms.

Try bupropion for patients that have comorbid depression and ADHD, but remember that in patients with eating disorders, this drug causes a lowered seizure threshold. Mirtazapine and trazodone can be helpful for depressed and anxious patients with insomnia—but mirtazapine can cause substantial weight gain.

When antidepressants are not working well enough on their own, you can use augmenting agents, including atypical antipsychotics, lithium, and thyroid supplementation. However, there is very little research evidence supporting this practice in the pediatric population.

We rarely use tricyclics in kids, because of possible cardiac toxicity and other side effects. Nonetheless, consider them for particularly severe and unresponsive cases, or for patients with comorbid OCD, enuresis, insomnia, migraines, or poorly controlled headaches.

SIDE EFFECTS AND CLASS WARNINGS

- Black box warning of suicidality: All antidepressant medications come with a black box warning based off of a meta-analysis that demonstrated a 2-fold increase in suicidal thinking or behaviors in patients under 25 years of age. No completed suicides were demonstrated, and the suicidal parameters encompassed a broad range of definitions, including parasuicidal thoughts and behaviors. While the black box warning is a significant consideration, the pros of antidepressant treatment outweigh the cons in the majority of patients. Prior to the black box warning in 2004, the rate of suicide in the adolescent and young adult population was gradually decreasing while the number of SSRI prescriptions was rising. After the warning was placed, the number of SSRI prescriptions in this population dropped and the suicide rate increased. That being said, close monitoring and follow-up is imperative, particularly in the early stages of starting antidepressant medications, given the rare but significant risk of increased suicidality.

- SSRIs:
  - The most common side effects of SSRIs include GI symptoms of nausea and diarrhea, which are typically transient and resolve for the majority of patients after several days. These can be minimized by starting with lower doses than usual.
  - Sleep disruptions and intense dreams can occur.
  - Children and adolescents are more sensitive to activation and restlessness than adults.
  - Citalopram and (to a lesser extent) escitalopram increase QTc in a dose-dependent manner.
  - Increased bleeds due to platelet inhibition can occur with SSRIs and other serotonergic antidepressants.
  - Gradual tapers are required (with the exception of fluoxetine, given its long half-life) to avoid discontinuation symptoms, which most often occur with paroxetine. While not dangerous, discontinuation syndrome can be extremely uncomfortable and may include nausea, diarrhea, "brain zaps," headache, and irritability, to name a few symptoms.

- SNRIs:
  - Given their potential to increase blood pressure, closer blood pressure monitoring is required.
  - Gradual tapers are also required, in light of SNRIs' significant withdrawal symptoms.

- Other side effect considerations:
  - Serotonin syndrome can occur, particularly when using multiple serotonergic agents or serotonergic supplements such as St. John's wort or SAMe; if it occurs, it will require discontinuation of offending medications or supplements. Symptoms often present within a day of starting medication and can include sweating, GI symptoms, hyperthermia, tachycardia, increased blood pressure, confusion, and tremors, and can be life threatening; they will require immediate assessment and supportive care.
  - Risks of hypomania and mania need to be considered.
  - Sexual side effects can occur, including delayed orgasm/ejaculation and decreased sexual drive, which may be of concern to some adolescents—bupropion and mirtazapine are less likely to cause these problems.
## TABLE 2: Antidepressants

<table>
<thead>
<tr>
<th>Generic Name (Brand Name)</th>
<th>Relevant FDA Indication(s) (Pediatric indications in bold)</th>
<th>Available Strengths (mg)</th>
<th>Usual Dosage Range (starting–max) (mg) Pediatric unless specified</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Selective serotonin reuptake inhibitor (SSRI)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Citalopram [G] (Celexa)</td>
<td>MDD</td>
<td>10, 20, 40, 10/5 mL</td>
<td>10–40</td>
</tr>
<tr>
<td>Escitalopram [G] (Lexapro)</td>
<td>MDD (12+ yrs), GAD</td>
<td>5, 10, 20, 5/5 mL</td>
<td>5–20</td>
</tr>
<tr>
<td>Fluoxetine [G] (Prozac)</td>
<td>MDD (8+ yrs), OCD (7+ yrs), panic disorder, bulimia, PMDD (as Sarafem)</td>
<td>10, 20, 40, 60, 20/5 mL</td>
<td>10–60</td>
</tr>
<tr>
<td>Fluoxetine DR [G] (Prozac Weekly)</td>
<td>MDD maintenance</td>
<td>90 DR</td>
<td>90 Qweek (adults)</td>
</tr>
<tr>
<td>Fluvoxamine [G] (Luvox brand discontinued; generic only)</td>
<td>OCD (8+ yrs)</td>
<td>25, 50, 100</td>
<td>50–300</td>
</tr>
<tr>
<td>Fluvoxamine ER [G] (Luvox CR)</td>
<td>OCD</td>
<td>100, 150 ER</td>
<td>100–300</td>
</tr>
<tr>
<td>Paroxetine [G] (Paxil)</td>
<td>MDD, OCD, panic disorder, social anxiety, GAD, PTSD, PMDD, menopausal hot flashes (as Brisdelle)</td>
<td>7.5 (Brisdelle), 10, 20, 30, 40, 10/5 mL</td>
<td>10–60</td>
</tr>
<tr>
<td>Paroxetine CR [G] (Paxil CR)</td>
<td>MDD, panic disorder, social anxiety, PMDD</td>
<td>12.5, 25, 37.5 ER</td>
<td>12.5–62.5</td>
</tr>
<tr>
<td>Sertraline [G] (Zoloft)</td>
<td>MDD, OCD (6+ yrs), panic disorder, PTSD, PMDD, social anxiety</td>
<td>25, 50, 100, 20/mL</td>
<td>12.5–200</td>
</tr>
<tr>
<td><strong>Serotonin norepinephrine reuptake inhibitor (SNRI)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Desvenlafaxine [G] (Khedezla, Pristiq)</td>
<td>MDD</td>
<td>25, 50, 100 ER</td>
<td>50–100 (adults)</td>
</tr>
<tr>
<td>Duloxetine [G] (Cymbalta)</td>
<td>MDD, GAD (7+ yrs) (also diabetic peripheral neuropathy, fibromyalgia, chronic musculoskeletal pain)</td>
<td>20, 30, 40, 60 DR</td>
<td>30–120</td>
</tr>
<tr>
<td>Venlafaxine [G] (Effexor brand discontinued; generic only)</td>
<td>MDD, GAD, social anxiety disorder, panic disorder</td>
<td>25, 37.5, 75, 100, 150, 225</td>
<td>37.5–75</td>
</tr>
<tr>
<td>Venlafaxine ER [G] (Effexor XR)</td>
<td>MDD, GAD, social anxiety disorder, panic disorder</td>
<td>37.5, 75, 150, 225 ER</td>
<td>37.5–225</td>
</tr>
<tr>
<td><strong>Tricyclic antidepressant (TCA)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amitriptyline [G] (Elavil brand discontinued; generic only)</td>
<td>MDD</td>
<td>10, 25, 50, 75, 100, 150</td>
<td>25–200</td>
</tr>
<tr>
<td>Clomipramine [G] (Anafranil)</td>
<td>OCD (10+ yrs)</td>
<td>25, 50, 75</td>
<td>25–200</td>
</tr>
<tr>
<td>Desipramine [G] (Norpramin)</td>
<td>MDD</td>
<td>10, 25, 50, 75, 100, 150</td>
<td>25–150</td>
</tr>
</tbody>
</table>

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**SAMPLE PAGES**

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BUPROPION (Wellbutrin) Fact Sheet [G]

PEDIATRIC FDA INDICATIONS:
None.

ADULT FDA INDICATIONS:
Major depression; seasonal affective disorder; smoking cessation (as Zyban).

OFF-LABEL USES:
ADHD; sexual dysfunction; bipolar depression.

DOSAGE FORMS:
• Tablets (G): 75 mg, 100 mg.
• SR tablets (G): 100 mg, 150 mg, 200 mg.
• ER tablets (G): 150 mg, 300 mg; Forfivo XL: 450 mg.
• ER tablets, hydrobromide salt formulation (Aplenzin): 174 mg, 348 mg, 522 mg (equivalent to 150 mg, 300 mg, 450 mg, respectively).

PEDIATRIC DOSAGE GUIDANCE:
• Depression (target dose 300 mg/day):
  – IR: Start 37.5 mg or 75 mg BID, ↑ to TID after >3 days; max dose 450 mg/day, 150 mg/dose; separate doses by at least 6 hours to minimize seizure risk.
  – SR: Start 100 mg QAM, ↑ to 100 mg BID as early as fourth day; max dose 400 mg/day, 200 mg/dose; separate doses by at least 8 hours to minimize seizure risk.
  – ER: Start 150 mg QAM, ↑ to 300 mg QAM as early as fourth day; max dose 450 mg QAM.
• Smoking cessation: Start 100 mg SR QAM, titrate as needed.

MONITORING:
No routine monitoring recommended unless clinical picture warrants.

COST:
IR/SR/ER: $; Forfivo: $$$$; Aplenzin: $$$$$

SIDE EFFECTS:
• Most common: agitation, insomnia, headache, nausea, vomiting, tremor, tachycardia, dry mouth, weight loss.
• Serious but rare seizures; risk higher with rapid and large dose increases and in patients at risk for seizures. Risk of seizure depends on dose and formulation: IR: 300 mg/day–450 mg/day (0.4%) vs 450 mg/day–600 mg/day (4%). Do not chew, divide, or crush SR or ER tablets as risk of seizures may be increased.

MECHANISM, PHARMACOKINETICS, AND DRUG INTERACTIONS:
• Dopamine and norepinephrine receptor uptake inhibitor.
• Metabolized primarily through CYP2B6; inhibits CYP2D6; t ½: 21 hours.
• Avoid use with MAOIs.

EVIDENCE AND CLINICAL PEARLS:
• Although used clinically by some child psychiatrists, support for bupropion’s efficacy in depression is based on 1 study in kids with comorbid ADHD and 1 open trial in adolescents with depression.
• For treatment of ADHD, a few head-to-head studies found bupropion to be equally effective as methylphenidate, but a large placebo-controlled trial found smaller effect sizes for bupropion.
• May be a particularly good option for kids with comorbid illness, such as ADHD or tobacco use disorder.
• There are only a few studies of bupropion for smoking cessation in adolescents. One study found bupropion provided no benefit when added to nicotine patches vs using patch alone. But another study showed improved quit rates (though lower than in adults) when combined with counseling vs counseling alone.
• Forfivo XL offers ease of use (1 pill a day) for patients taking 450 mg/day, but it is more expensive. Aplenzin brand could also be a 1-pill-a-day solution (522 mg is equivalent to 450 mg Wellbutrin) but otherwise doesn’t offer any real advantage as a different salt (hydrobromide).
• Give ER dose as early in the morning as possible to minimize insomnia.
• Bupropion can cause false-positive urine test results for amphetamines.

NOT-SO-FUN FACT:
There have been case reports of teenagers, prisoners, and others snorting crushed tablets (believing the substance to be a stimulant), with subsequent seizures.

BOTTOM LINE:
Not a first-line antidepressant in kids, but may be useful for kids whose depression is associated with fatigue and poor concentration. Absence of sexual side effects and weight gain make this an appealing option for some. Although not effective for anxiety disorders, it is effective for the anxiety that often accompanies depression. The seizure risk is not a concern for most patients when dosed appropriately.