

Upcoming Events....

- Visit our booth at Dawgtoberfest October 19th.
- Join us at the Barney's Health Fair in Augusta on November 18th.
- Get your dance on at the UGA Dance Marathon February 18-19th, 2012.

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About Us

The Student Society of Pediatric Advocates at UGA is the second nationally recognized student group by the Pediatric Pharmacy Advocacy group, an international organization comprised of over 700 members who are devoted to excellence in pediatric pharmacy. Our mission as a student group is to bring awareness to the proper use of medication therapy in pediatric populations through various service and education-based initiatives.



Founding Officers: Ashley H. Cribb,
Kayleigh Marx, Dr. Kalen Manasco,
Shreena Patel

Why pediatric pharmacy? Pharmacists play a vital role in pediatric medication selection, dosing, monitoring, and counseling across all venues of pharmacy practice, from a community or retail pharmacy to direct patient care in the hospital. Pediatric pharmacists are needed in all practice areas, and the options for specialized practice are virtually limitless.

SSPA at UGA is dedicated to the safety, happiness, and quick recovery of our pediatric patients. Through volunteerism, education, and professional outreach, we hope to spread our mission, as well as that of PPAG, throughout our community, all while having fun along the way!

Dosing for Safe and Effective Diphenhydramine Therapy in the Pediatric Population

Contributed by Andrea Sikora, 2013 Doctor of Pharmacy Candidate

Diphenhydramine is a cost-effective, over-the-counter medication with efficacy in a variety of indications. As such, diphenhydramine is often a go-to medication in the community setting for treatment of allergies, the common cold, and urticaria; however, because of its wide use and potentially fatal side effects in toxic concentrations, pharmacists must be familiar with the toxicities and clinical presentation of diphenhydramine overdose in children (*see Table 1*) as well as the counseling points to avoid such overdoses.

Written by Laura Leigh Stoudenmire, PharmD Candidate, Class of 2012

ADHD MEDICATIONS APPROVED FOR USE IN THE PEDIATRIC POPULATION					
Generic Name	Brand Name	Dosage Form	Children's Dosing <i>Per Facts and Comparisons</i>	Pharmacology	Clinical Pearls ^{*†}
amphetamine-dextroamphetamine	Adderall [®]	Tablet	<u>Initial Dose:</u> If 3-5 y.o.: 2.5 mg If > 5 y.o.: 5 mg once to twice daily	Non-catecholamine sympathomimetic amines with CNS stimulant activity	Adderall [®] tablets (immediate release) are approved in patients ≥ 3 years old. Contents of XR capsule may be sprinkled in applesauce; the sprinkled applesauce should be consumed immediately, not stored—do NOT crush or chew! <i>Dose Conversion:</i> Patients taking divided doses of immediate-release be switched to amphetamine ER at the same total daily dose taken once daily.
	Adderall XR [®]	Extended-release capsule	<u>Maximum Dose:</u> 40 mg/day <u>XR Initial Dose:</u> 10 mg in the morning <u>XR Maximum Dose:</u> 30 mg/day		
atomoxetine	Strattera [®]	Capsule	<u>Initial Dose:</u> If <70 kg: 0.5 mg/kg/day If > 70 kg: 40 mg/day <u>Maximum Dose:</u> 1.4 mg/kg/day or 100 mg/day, whichever is less	Selective norepinephrine reuptake inhibitor **non-stimulant**	Black Box Warning: Increased suicidal ideation in children and adolescents with ADHD. Manufacturer does not recommend opening of capsule—do NOT crush or chew. Interacts with strong CYP2D6 inhibitors (eg, fluoxetine, paroxetine, quinidine).
clonidine	Nexiclon XR [®]	Extended-release tablet and ER liquid	<u>Initial Dose:</u> 0.1 mg at bedtime <u>Maximum Dose:</u> 0.4 mg/day	Centrally acting α -2 agonist. Mechanism in ADHD not understood. **non-stimulant**	May be used as monotherapy or adjunctive therapy with stimulants. IR form not approved for ADHD. Also approved to treat hypertension.
dextroamphetamine	Dexedrine [®]	Extended-release capsule	<u>Initial Dose:</u> If 3-5 y.o.: 2.5 mg If > 5 y.o.: 5 mg once to twice daily	Non-catecholamine sympathomimetic amine with CNS stimulant activity	Both dosage forms approved in patients ≥ 3 years old.
	Dextrostat [®]	Tablets	<u>Maximum Dose:</u> Not established		

*Approved for use in children ≥ 6 y.o. unless otherwise noted.

†**Potential side effects of stimulant medications:** decreased appetite/anorexia, insomnia, anxiety, irritability, tachycardia

Generic Name	Brand Name	Dosage Form	Children's Dosing <i>Per Facts and Comparisons</i>	Pharmacology	Clinical Pearls ^{*,†}
guanfacine	Intuniv [®]	Extended-release tablet	<u>Initial Dose:</u> 1 mg/day <u>Maximum Dose:</u> Not established	Centrally acting α -2A agonist. Mechanism in ADHD not understood. **non-stimulant**	Immediate-release guanfacine is approved for hypertension treated in children May be used in combination with a stimulant medication. Side effects: hypotension, bradycardia, somnolence, drowsiness
lisdexamfetamine dimesylate	Vyvanse [®]	Capsule	<u>Initial Dose:</u> 30 mg in the morning <u>Maximum Dose:</u> 70 mg/day	Noncatecholamine sympathomimetic amine with CNS stimulant activity (prodrug of dextroamphetamine)	Capsule may be opened and the entire contents dissolved in a glass of water. If this is done, the solution should be consumed immediately; it should not be stored.
methamphetamine	Desoxyn [®]	Tablet	<u>Initial Dose:</u> 5 mg once - twice a day <u>Maximum Dose:</u> not established	Sympathomimetic amine with CNS stimulant activity; effects mediated by norepinephrine release and dopamine release at higher doses	Also indicated for the treatment of obesity in children \geq 12 years old.
methylphenidate	Concerta [®]	Long-acting tablet	<u>Initial Dose:</u> 18 mg/day <u>Maximum Dose:</u> 6-12 y.o.: 72 mg/day, not to exceed 2 mg/kg/day 13-17 y.o.: 54 mg/day	Mild CNS stimulant that is believed to block the reuptake of norepinephrine and dopamine into the presynaptic neuron and increase the release of these monoamines into the extraneuronal space.	Total dose of is released over 6-10 hours. Do NOT crush or chew
	Daytrana [®]	Patch	<u>Initial Dose:</u> 10 mg/day <u>Maximum Dose:</u> 30 mg/day????		Patch should be applied to the hip area using alternating sites 2 hours before an effect is needed and removed 9 hours after application.
	MetadateER [®]	Extended-release tablet	<u>Initial Dose:</u> 20 mg once daily in the morning before breakfast		Do NOT crush or chew.
	MetadateCD [®]	Extended-release capsule	<u>Maximum Dose:</u> 60 mg/day		
	Methylin [®]	Oral solution & chewable tablets	<u>Initial Dose:</u> 5 mg twice daily <u>Maximum Dose:</u> 60 mg/day		Doses should be taken before breakfast and lunch.
	Ritalin [®] Ritalin SR [®] Ritalin LA [®]	Tablet Extended-release tablet Extended-release Capsule	<u>Ritalin Initial Dose:</u> 5 mg twice daily (before breakfast and lunch) <u>Ritalin LA Initial Dose:</u> 10-20 mg once daily in the morning before breakfast <u>Maximum Dose:</u> 60 mg/day		Do NOT crush or chew SR or LA dosage forms. LA form mimics twice-daily administration of immediate-release methylphenidate. (50% released immediately and 50% released ~ 4 hours after administration.)

*Approved for use in children ³ 6 years old unless otherwise noted.

The above drugs may contain sucrose, sugar-spheres, aspartame, maltose, and/or phenylalanine

Studies have shown that mediating children with ADHD actually lowers their risk of substance abuse disorders. (Biederman, et al. 1999)

Want to get involved with SSPA?

- *Submit an article for the newsletter*
- *Volunteer at one of our upcoming events*
- *Attend our next meeting on November 15th at 6pm*

Promoting safe and effective medication therapy in pediatrics through education, volunteerism,

Contact us!
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Diphenhydramine Use in Pediatrics (Cont.)

While overdose in adults is nearly impossible without purposeful intent, accidental overdoses in children occur far more readily. Toxic blood levels are generally over 0.5 µg/mL, and fatality generally occurs over 8 µg/mL. Currently, there is no consensus on what constitutes a toxic dose but ranges have been reported between 5-17mg/kg for children both above and below 6 years old. Common mechanisms of overdose include therapeutic duplications (i.e. a parent administering Benadryl and Tylenol PM to a sick child), concomitant use of oral and topical diphenhydramine preparations (especially in the treatment of skin rash), and product instructions that allow for ranges in both the dose and the dosing interval. In counseling parents, pharmacists should emphasize using the lowest recommended dose and the longer dosing interval to avoid toxicity (see Table 2). Further, in some situations, halving the lowest recommended dose could also be a reasonable therapeutic choice.

For example, the recommendation for a child aged 6-12 years is 12.5-25mg every 4-6 hours. A pharmacist recommendation for a 10-year-old child could be 12.5mg every 6 hours and to titrate upwards based on symptoms. However, for a small 6 year old, recommending 6.25mg every 6 hours could also be a viable option. Counseling must also include explanation that other diphenhydramine-containing products, both topical and oral, should be avoided during therapy.

Table 1: Diphenhydramine Toxicity Signs & Symptoms
<i>Anticholinergic Syndrome</i> <ul style="list-style-type: none"> • Tachycardia • Dry skin and mucous membranes • Dilated pupils • Agitated delirium • Flushing • Low grade fever
<i>Cardiovascular & Respiratory</i> <ul style="list-style-type: none"> • Hypotension • QT interval prolongation • Respiratory depression
<i>CNS</i> <ul style="list-style-type: none"> • Incoordination • Dizziness • Confusion • Seizures • Hallucinations
<i>Gastrointestinal</i> <ul style="list-style-type: none"> • Nausea/Vomiting • Diarrhea • Urinary Retention
<i>Severe</i> <ul style="list-style-type: none"> • Rhabdomyolysis

Table 2: Pediatric Diphenhydramine Dosing	
Allergic Reactions or Motion Sickness Therapy	
<i>Age Group</i>	<i>Dose & Interval</i>
2 to <6 years	6.25 mg every 4-6 hours; maximum: 37.5 mg/day
6 to <12 years	12.5-25 mg every 4-6 hours; maximum: 150 mg/day
≥12 years	25-50 mg every 4-6 hours; maximum: 300 mg/day
Antitussive Therapy	
<i>Age Group</i>	<i>Dose & Interval</i>
2 to <6 years	6.25 mg every 4 hours; maximum: 37.5 mg/day
6 to <12 years	6 to <12 years: 12.5 mg every 4 hours; maximum: 75 mg/day
≥12 years	≥12 years: 25 mg every 4 hours; maximum: 150 mg/day

In conclusion, prevention and recognition of diphenhydramine toxicity is another example of the pharmacist's role in patient safety, both through recognizing the clinical presentation of toxicity and through patient education.