PEDIATRIC DOSING OF NONPRESCRIPTION COUGH AND COLD MEDICATIONS

Even with the recent changes in product labeling of nonprescription cough and cold products, many primary health care providers may still recommend these agents for use in the pediatric population. For nonprescription cough and cold products to be used safely in the pediatric population it is important for health care providers to be able to provide accurate dosing for these agents. This issue of CLIPs briefly summarizes an article that reviewed dosing of nonprescription cough and cold in the pediatric population. If you need further information, please contact the Samford University Drug Information Service at (205) 726-2659.


Voluntary and Regulatory Changes
- Due to reports of misuse leading to overdoses that resulted in adverse reactions and fatal events in infants, the manufacturers voluntarily recalled certain cough and cold medications.
- Due to the lack of evidence of the efficacy of cold and cough medications in children, the FDA recommended that cough and cold products not be used in children younger than 6 years old.

Antihistamines
- Antihistamines can help reduce symptoms associated with common colds (e.g., sneezing, rhinorrhea, and itching).
- Both first and second generation antihistamines are available in OTC formulations for children.
- Adverse effects of antihistamines include drowsiness, nervousness, insomnia, dry mouth, and dizziness.
- First generation antihistamines (chlorpheniramine, diphenhydramine, and brompheniramine) are associated with more sedation than second generation antihistamines (cetirizine and loratadine).
- Chlorpheniramine dosing for children ages 2 to 6 years is 0.35 mg/kg/day divided every 4 to 6 hours (maximum daily dose 6 mg).
- Diphenhydramine dosing for children ages 2 to 6 years is 5 mg/kg/day divided 6 hours, as needed (maximum daily dose 300 mg).
- Brompheniramine dosing for children ages 2 to 6 years is 1 mg every 4 to 6 hours.
- Cetirizine dosing for children ages 6 to 12 months 2.5 mg/day; ages 12 to 23 months, initially is 2.5 mg/day (may use 2.5 mg twice/day); ages 2 to 5 years, initially is 2.5 mg/day (may use 5 mg/day as a single or divided doses).
- Loratadine dosing for ages 2 to 5 years is 5 mg once/day.
- Diphenhydramine should not be used in neonates due to possible central nervous system effects.
- Parents should be warned against using antihistamines in children to induce sleep.

Decongestants
- Both systemic and nasal decongestants are available over the counter.
- Systemic decongestants are used for relief of nasal congestion, promote nasal drainage, and cough due to postnasal drip.
- Topical decongestants are used to relieve nasal and nasopharyngeal congestion.
- Adverse effects of decongestants include elevated blood pressure, tachycardia, palpitations, arrhythmia, restlessness, insomnia, anxiety, tremors, psychological disturbances, and hypersensitivity reactions.
- Phenylephrine nasal drops dosing for infants greater than 6 months is 1 to 2 drops of 0.16% solution in each nostril every 3 hours, as needed; for children under 6 years 2 to 3 drops of 0.125% solution in each nostril every 4 hours, as needed.

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• **Decongestants (continued)**
  - Phenylephrine oral dosing for ages 2 to 6 years is 2.5 mg every 4 hours or 3.75 mg every 6 hours (maximum daily dose 15 mg).
  - Pseudoephedrine dosing for children less than 12 years is 4 mg/kg/day every 6 hours (maximum daily dose 60 mg).

**Expectorants**
- Guaifenesin helps to loosen mucus and bronchial secretions and should be administered with a full glass of water.
- Adverse effects of guaifenesin include nausea, vomiting, dizziness, drowsiness, headache, and rash.
- Guaifenesin dosing for children less than 2 years is individualized, common dose is 25 to 50 mg every 4 hours (maximum daily dose 300 mg); ages 2 to 6 years 50 to 100 mg every 4 hours (maximum daily dose 600 mg).

**Antitussives**
- Nonprescription antitussives available include dextromethorphan, diphenhydramine, and in some states codeine.
- There is insufficient evidence supporting the use of codeine or dextromethorphan as an antitussive in the pediatric population.
- Adverse effects of dextromethorphan include drowsiness, dizziness, nausea, gastrointestinal upset, and abdominal discomfort.
- Overdoses of dextromethorphan can cause behavioral disturbances and respiratory depression.
- Dextromethorphan dosing is 1 mg/kg/day in 4 divided doses (maximum daily dose for ages 2 to 5 years is 30 mg).
- Diphenhydramine dosing for ages less than 6 years is 5 mg/kg/day divided every 6 hours (maximum daily dose 300 mg).

**Combination Products**
- Since many nonprescription cough and cold formulations contain more than one active ingredient it is important to consider the patient’s symptoms and select only products that contains appropriate ingredients to treat the presenting symptoms.

**Complementary and Alternative Therapies**
- Alternatives to the cough and cold medications include increased fluid intake, cool-mist humidifiers, nasal dilator strips (FDA-approved for ages ≥5 years), nasal aspiration or irrigation, and vitamin C.
- Two options for congestion in small children include clearing nasal mucus with a bulb syringe and soothing irritated nasal membranes with saline drops.
- Supplementation with vitamin C in children at doses of 0.2 g to 2 g may decrease the duration of the common cold.
- Studies have shown that vitamin C in doses of 1 g/day reduced cold duration by 18% compared to a 7% reduction in duration with doses of 0.2 g to 0.75 g/day.
- An even greater reduction in cold duration was seen with doses of 2 g/day (26%) when compared to doses of 1 g/day (6%).
- Adverse effects of vitamin C at doses greater than 1 g included nausea, vomiting, increased iron absorption, and diarrhea.

**Summary**
- Pharmacists can have an impact on improving the safe use of over-the-counter cough and cold products.
- Pharmacists are easily accessible to parents and have a great opportunity to provide counseling on accurate dosing of over-the-counter cough and cold products in the pediatric population.