



Medicating Young or Very Young Patients — Part II

Beatrice B. Turkoski

Having a sick child can be stressful for parents, even if the illness is a mild cold or gastrointestinal upset. Part of that stress may be related to uncertainty about when to seek professional help and when to choose an over-the-counter (OTC) medication. When choosing to use an OTC medication, parents are faced with another uncertainty—which agent to use. The variety of available agents, many with pictures of children on the labels or names that indicate “for children” makes a wise choice challenging. Knowledgeable nurses, who interact with sick children and their parents in any setting, can do much to relieve some of this uncertainty and stress by talking to parents about the treatment and medication choices they make. In the following discussion, examples of medications used to treat common problems in younger patients are discussed. Contraindications, safety concerns, potential drug-drug interactions, and safe administration guidelines are identified for each example. Part III of this series will address examples of medications used to treat more complicated childhood problems, such as asthma, allergy, attention-deficit disorders, and obesity.

A child's illness does not just affect the child who is sick. When children have chronic illnesses, the entire family may suffer (Jordan, 2005). Even when a child has a brief and relatively mild illness, family routines are disrupted and stress levels for parents increase. Often, part of that parental stress is related to concerns or uncertainty about medications used to treat their child's illness. Nurses who interact with sick children and their parents in any setting can do much to relieve some of this uncertainty and stress by talking to parents about any medication, including over-the-counter (OTC) medications used to treat their child. Educating parents about the purpose of the medication, proper administration, and what cautions to be aware of with medications will not only help reduce parental stress but may also avoid potential harm to the children involved.

In the first part of the following discussion, childhood pain and fever are addressed and examples of antipyretics and analgesics commonly used for children are identified. In a second section, national warnings about the use of cough and cold remedies for infants and small children are addressed and selected OTC cough and cold agents are discussed. The third section, looking at the

safe use of medications to treat childhood gastrointestinal problems, includes parental guidelines for avoiding dehydration. Drug action, cautions about use, and dosing guidelines are given for each example. For parental guidelines to help their child take their medication, see Table 1.

Section One—Pain and Fever

Pain is a universal experience that is a normal part of growing up. It is not an experience reserved for adults or something that comes with achieving a particular number of years. In fact, today we know what mothers have always known: that even the youngest of children, including neonates, experience pain. Since the mid 1970s, pediatric pain has gained considerable notice; assessment of pain in children has improved and some treatment protocols have been developed. There is, however, a need for more research, well-developed clinical guidelines, and more education about children's pain for both professionals and families (Howard, 2003).

Part of the difficulty in recognizing and treating pain in children is that children may express their pain differently from how adults express pain. Commonly used pain assessment tools depend on a child's ability to express how he or she feels when in pain and to subjectively rank that pain. Even the words used to describe pain differ between adults and children: throbbing, pounding, sharp, dull, acute, disseminated, and intermittent are all words commonly used by adults to describe pain that children, especially young children, may not use. Children may often exhibit signs of pain that an unfamiliar person would not recognize, and thus, a mother's assessment of changes in a child's behavior becomes a valuable part of pain assessment.

Another problematic aspect about pain in children is the lack of a clear understanding about how children at different stages of development may respond to pain. Pain assessment for adults covers a wide age range; pain in people beyond the age of pediatric care all the way to beyond mid-life is generally assessed in much the same way. Within the category of pediatrics, however, there are several rather distinct stages of maturation and as yet we have not clearly identified how pain is experienced

Beatrice B. Turkoski, RN, PhD, Graduate Faculty, Advanced Practice Nursing, Kent State University, College of Nursing, Kent, OH.

The author has no significant ties, financial or otherwise, to any company that might have an interest in the publication of this educational activity.

TABLE 1. ADMINISTERING MEDICATIONS TO CHILDREN

Taking medications is not “fun” for anyone, especially for children who may not understand that the medicine will help them feel better. Some children are very resistant to taking medications, and others may take it without complaint. Some of the following suggestions may be helpful.

Many children’s medications come as a liquid, with a spoon, dropper, or syringe, and today, most come in flavors that are acceptable to children. Do not use a common household spoon; sizes differ considerably. Learn to use the applicator that comes with the medication.

For very small children squirt small amounts at a time into the buccal pouch, wait until the child swallows, and then squirt in a little more until all the medication is administered. Be careful not to squirt the medicine forcefully to prevent choking.

Medications that taste bad:

1. Refrigerate the medicine—this may hide the taste.
(Not all medicine can be refrigerated—check with pharmacist first)
2. After giving the medicine, give juice or formula or a favorite cold drink.
3. Let the child suck a popsicle or something cold before you give the medicine
4. Some medicine can be given with food—check with pharmacist first.

If your child has trouble swallowing pills or capsules:

1. Check with the pharmacist to find out if the pill can be crushed, or chewed, or if the capsule can be opened and sprinkled on food, or if the medication comes in chewable form.
2. If the pill can be crushed or the capsule opened—mix with something soft and flavorful, like a spoonful of jelly or pudding, applesauce, or ice cream.
3. Use a favorite liquid to help the swallowing process.

Be truthful, sympathetic, and firm:

1. “I’m sorry, I know it tasted bad.”
2. “I know you don’t want to take this, but you have to take it to help you get well.”
3. Give your child a break, and in 5 minutes, attempt to give the medicine again.
4. Do not punish or scold, yell, or spank.

If your child vomits or spits out the medicine once, wait 10 minutes and repeat the dose.

Keep all medicines out of the reach of children (some medicines taste good or look like candy).

Do not share medicines between children or give your child “leftover” medicine.

Notify your healthcare provider:

1. If your child is taking the medicine and the problem does not seem to be improving.
2. If your child absolutely refuses to take the medication.
3. If your child appears to have an allergic reaction to the medicine—rash, swelling of lips or face, difficult swallowing, or difficulty breathing.

Children’s Hospital of Philadelphia (2007)

or expressed in the different stages of development (Howard, 2003).

Fever is probably the most common reason parents seek medical attention for their children. In fact, the term “fever phobia” was coined in 1980 to describe parental misconceptions and reactions to a child’s fever. Twenty years later, another study found that parents who still harbored misconceptions, misunderstanding, and fear of fever were using OTC antipyretics inappropriately and had inaccurate ideas about treating children’s fevers (Crocetti, Moghbeli, & Serwint, 2001). Many parents would benefit from education about childhood fevers in the five following areas:

1. *Identifying a fever.* Although fever is normally identified as anything over 98.6° F (oral) or 99.6° F (rectal), many physicians and pediatric references define a fever as an oral temperature above 99.4° F or a rectal temperature above 100.4° F.
2. *Understanding a fever.* Many parents thought of fever as an illness. Rather, fever is a normal body response to something that triggers the body’s

inflammatory defenses (Plaisance & Mackowiak, 2000).

3. *Understanding the dangers of fever.* A significant number of parents believed that if left untreated, a temperature could rise as high as 110° F, and many also believed that brain damage or fatalities would result. Actually, fever will not rise out of control to lethal levels if there are no other hyperthermic insults, such as dehydration or environmental dangers like closed hot automobiles (Kluger, 1992). One of the biggest dangers of high fevers is dehydration.
4. *Appropriate home treatment for a fever.* Parents in the 2001 “fever phobia” study thought that ice baths and alcohol rubs were an acceptable way to reduce fevers. Actually, ice baths will cause shivering and extreme discomfort, and alcohol has the potential to cause further dehydration and can be inhaled or absorbed through the skin. Today, the American Academy of Pediatrics (AAP) (2007a) recommends that when a child is allergic to anti-

pyretics, sponging with tepid water in a warm room may help reduce the fever as the water evaporates from the skin surface and cools the body. Of even more importance is knowledge about recognizing the signs of dehydration and the steps to take to prevent dehydration (see Table 2).

5. *Understanding the safe and effective use of medications.* What medication is appropriate, when medication should be used, and safe use of any medication (see Table 3).

MEDICATIONS FOR TREATING PAIN AND FEVER

The two primary oral agents used for treating pain and fever in young persons are acetaminophen (Tylenol) and

ibuprofen (Motrin and Advil). Aspirin, although it is an effective antipyretic, is not recommended for children because of the danger of Reye's syndrome (RS). RS can occur at any age but occurs primarily in children and generally occurs in conjunction with a viral infection, often developing 3 to 5 days after the onset of the viral illness. RS affects all organs of the body but is most harmful to the brain, causing an acute increase of pressure within the brain and, often, massive accumulations of fat in the liver and other organs. Symptoms of RS include persistent vomiting, listlessness, personality changes (such as irritability or combativeness), disorientation or confusion, delirium, convulsions, and loss of consciousness. In infants, vomiting does not always occur. The actual cause of RS is still unidentified. However, studies have shown that using aspirin or salicylate-containing medications to treat viral illnesses increases the risk of developing RS (National Institute of Neurological

TABLE 2. DEHYDRATION IN CHILDREN—GUIDELINES FOR PARENTS

Dehydration means the body does not have as much water and fluids as it should. Dehydration in sick children is often a combination of not eating or drinking anything while also losing fluid from vomiting, diarrhea, or fever. Infants and children are more susceptible to dehydration because of their smaller body weights and higher turnover of water and electrolytes. When severe dehydration is present, hospitalization may be necessary, but most mild dehydration can be treated at home.

First—Prevent Dehydration:

Begin replacing fluids in small amounts as soon as possible after each episode of vomiting or within 2–4 hours after diarrhea episode.

Use clear liquids and/or oral replacement therapy (ORT)—small amounts, frequently

ORT is available at most pharmacies (consult pediatrician or pharmacist)

Continue to feed the child if not vomiting.

Avoid cow's milk products with diarrhea

Chilled fluids or ice chips may be more palatable for older children.

Avoid apple juice, pear juice, and cherry juice—the high sorbitol sugar content may worsen diarrhea. White grape juice is a good alternative.

Signs of Dehydration—Notify Healthcare Professional

Dry mouth

Sunken eyes or fontanel, no tears

Little or no urine output for 6 hours or more

Poor skin turgor—skin that stays compressed when pinched

Fast, beating heart

Listlessness and inactivity

High fever

Extreme thirst

Notify Healthcare Professional

Infants: 5 yrs: If vomiting or diarrhea lasts longer than a few hours.

Children > 5 yrs: Vomiting that lasts over 12 hours.

Diarrhea has lasted longer than 5 days

Increased abdominal pain, bloating, or blood in the stools.

Increased fever, weakness, sleepiness, or irritability.

Food and Drug Administration, 1996; American Academy of Pediatrics, 2007c.

TABLE 3. PARENTAL GUIDELINES FOR SAFE USE OF MEDICATIONS FOR COMMON CHILDHOOD COMPLAINTS

1. Do not use *any* medications for children <2 years of age without the approval of your pediatrician or healthcare professional.
2. *Always*—if you are not sure about the directions for use of any medication (over-the-counter [OTC] or prescription) consult your pharmacist or healthcare professional.
3. *Always* read and follow the full instructions on the package insert with any OTC medication.
4. *Never* exceed the recommended dosage for age or weight.
5. *Never* administer more frequently than recommended or for longer periods of time than recommended.
6. When using more than one medication, *always* note the ingredients of each and do not choose any medication that has the same ingredients as any other medication—this may result in an overdose of the ingredient and can cause serious adverse effects.
7. When using more than one medication, *always* pay close attention to the dosing intervals (time between doses) and make a schedule for safe administration. For instance, if one drug is to be given every 4 hours and another every 6 hours, make a note of when each can be given. Consult your pediatrician, healthcare professional, or pharmacist for dosing and timing advice.
8. *Always* use exceptional caution when using any medication containing salicylates or subsalicylate—the use of salicylates has been linked to Reye's syndrome, which can be fatal.
9. *Always* notify your healthcare professional if an OTC medication does not appear to be working after a reasonable time (or the time on the package insert).
10. *Always* keep your child well hydrated. Dehydration in sick children is often a combination of not eating or drinking anything while also losing fluid from vomiting, diarrhea, or fever. Uncontrolled dehydration can be fatal in a very short period of time—especially to infants and small children.

Disorders and Stroke, 2007). Since parents do not usually know whether the fever is related to a virus infection, all parents need to be cautioned about not using aspirin or any salicylate-containing medications to treat childhood illnesses.

Many small studies have compared the efficacy of acetaminophen and ibuprofen; however, there is no conclusive evidence that one is more effective than the other when used appropriately. One benefit of acetaminophen is that it does come in rectal suppositories for a child who cannot swallow oral medications or one who is vomiting frequently. Both of these drugs are readily available without prescription (drug information references: Taketomo, Hodding, & Kraus, 2007; Turkoski, Lance, & Bonfiglio, 2006).

Acetaminophen

Acephen, Apra Children's, Genapap Children, Infantaire, Tylenol, Tylenol Children's with Flavor Creator, Tylenol Children's, Tylenol Infants, Tylenol Junior and others.

- Nonnarcotic analgesic, antipyretic (does not have antiinflammatory effects)
- Warnings/Cautions:
May have severe hepatic toxicity in overdose. Some products (Children's Tylenol chewable tablets) contain aspartame—avoid in patients with phenylketonuria. Use caution with dosage forms—infant drops are more concentrated (80 mg/0.8 mL) compared with children's suspension (160 mg/5 mL).
- Potential Drug/Drug Interactions:
Barbiturates, carbamazepine, phenytoin, isoniazid, rifampin, scopolamine, lamotrigine, zidovudine
- Adverse Reactions:
Rash; blood discraias; rare renal injury with chronic use
- Examples of Available Formulations:
Elixir—Children's: 160 mg/5 mL
Liquid: 160 mg/5 mL Suppository: 80 mg, 120 mg.
Solution—Infant: 80 mg/0.8 mL
Solution—Children: 160 mg/5 mL
Suspension—Infants 80 mg/0.8 mL
Suspension—Children: 160 mg/5 mL
Chewable Tablet—Children: 70 mg, 160 mg
Tablet 325 mg, 500 mg
Tablet, orally disintegrating (Meltaways): 80 mg, 160 mg
- Recommended Dose:
Neonates: Rectal—10–15 g/kg/6–8 hr as needed (with approval of pediatrician)
Infants and Children: 10–15 mg/kg every 4–6 hours as needed
Do not exceed 5 doses/24 hours.
Dosing by weight and age. Use of weight is preferable.

Wt. Lbs.	Age	Dose q 4–6 H PRN
6–11	0–3 mo	40 mg
12–17	4–11 mo	80 mg
18–23	1–2 yr	120 mg
24–25	2–3 yr	160 mg
36–47	4–5 yr	240 mg
48–59	6–8 yr	320 mg

60–71	9–10 yr	400 mg
72–95	11 yr	480 mg

Children > 12 yr (and adults) 325–650 mg every 4–6 H, or 1000 mg 3–4 times/day. Do not exceed 4 g/day

- Administration:
Oral—with food to reduce GI upset, shake suspension before use

Ibuprofen

Advil Children's, Advil Infants', Advil Junior, Motrin Children's, Motrin Infants', Motrin Junior strength, Motrin neoProfen

- Nonnarcotic analgesic, antiinflammatory agent, antipyretic
- Warnings/Cautions:
Use caution in presence of decreased renal or hepatic function, dehydration, anticoagulants. Long-term use (e.g., JRA)—monitor renal and hepatic function; CBC, and periodic ophthalmologic exams. Use caution with dosage forms—infant drops are more concentrated (50 mg/1 mL) compared to children's suspension (100 mg/5 mL)
- Potential Drug/Drug Interactions:
Digoxin, Methotrexate, lithium, ACE inhibitors, antihypertensive agents, furosemide, thiazides, aspirin, oral potassium
- Adverse Reactions:
Dizziness, drowsiness, headache; rash; GI upset, pain; anemia, inhibition of platelet aggregation; vision changes; tinnitus; acute renal failure
- Examples of Available Formulations:
Caplet: 200 mg Caplet—Junior Strength: 100 mg
Capsule: 200 mg Gelcap: 200 mg
Suspension—Children's: 100 mg/5mL
Suspension—Infants: 40 mg/mL
Tablet: 200 mg Tablet—Junior: 100 mg
Chewable Tablet—Children: 50 mg, 100 mg
Injection: 17.1 mg/mL (equivalent to ibuprofen 10 mg/mL)
- Recommended Dose:
Analgesic—infants and children: 4–10 mg/kg dose every 6–8 hours
Juvenile rheumatoid arthritis 6 mo–12 yr: 30–50 mg/kg/day in 4 doses
Antipyretic 6 mo–12 yr: Temperature <102.5° F (39° C) 5 mg/kg dose q 6–8 H:
Temperature > 102.5° F: 10 mg kg/dose q 6–8 H: maximum dose 40 mg/kg/24 hours.
Dosing by weight and age. Use of weight is preferable:

Wt. Lbs.	Age	Dose q 6–8 H PRN
12–17	6–12 mo	50 mg
18–23	12–23 mo	75 mg
24–35	2–3 yr	100 mg
35–47	4–5 yr	150 mg
48–59	6–8 yr	200 mg
60–71	9–10 yr	250 mg
72–95	11 yr	300 mg

- Administration:
Oral—with food to reduce GI upset, shake suspension before use

Section Two—Colds and Cough

According to the AAP (2007) children probably have more colds, or upper respiratory infections, than any other illness (APA, 2007b). However, before discussing examples of medications for colds, it is important to note that there is considerable concern about the use of OTC cold and cough remedies for infants and toddlers. For more than a decade the AAP has been sounding warnings about the dangers of using OTC cold and cough remedies for very young children. Recently, the Centers for Disease Control and Prevention (CDC) released a report identifying that during 2004 and 2005 more than 1,500 children <2 years of ages were seen in emergency departments for adverse effects associated with these medications and several infant deaths were related to these products (CDC, 2007). The AAP does not recommend the use of OTC cough and cold remedies in young children, and it is recommending that the Federal Food and Drug Administration (FDA) halt the marketing of cold and cough medications for children under the age of 5 years (City of Baltimore Health Department, 2007). Because the FDA has never approved dosing recommendations for young children and it is not known just how much of various ingredients are safe for very young children, the recommended use and dosing information about cough and cold products that follows focuses on medications for children over 2 years of age.

Colds are caused by viruses, and, therefore, no antibacterial medication will have any effect on a cold and most colds will go away by themselves without leading to anything worse. When a child's cold symptoms are not interrupting sleep or interfering with daily activities, there may be no need to use medication; adequate rest and fluids provide adequate support. However, when the symptoms of a cold, congestion, runny nose, or cough are bothersome, it is important to identify the appropriate OTC agent that will provide relief.

Helping parents understand that cold medications are not a cure for a cold but are rather to treat the bothersome cold symptoms is important. These medications can be either single agents or combinations, and all have side effects of which parents need to be aware. Nasal decongestants act to clear nasal passages and make it easier to breath through the nose, and most also have a drying effect to relieve slightly a runny nose. Generally, these will not make a child drowsy but rather may cause excitability. Cough suppressants act to suppress the cough reflex that is triggered by mucous or irritation in the throat or lungs. Expectorants are designed to loosen thick mucous, making it easier to cough up. There are combinations of these agents and combinations of any of these agents and antihistamine. There are numerous trade names for the single or combination agents; however, trade names are not as important to know as the ingredients in the medication. Selected examples in each class follow, with indications for use, dosing, and caution information (drug information references: Taketomo et al., 2007; Turkoski et al., 2006).

MEDICATIONS FOR TREATING COLDS AND COUGHS

Dextromethorphan (DM)

Delsym, Robitussin Pediatric Cough Suppressant, Sucrets

- **Cough suppressant** that acts by blocking the cough reflex center in the brain. Used to relieve symptomatic cough caused by minor viral upper respiratory tract infections. For children with an annoying cough from a dry itchy throat but not a lot of congestion, it may be used alone before bedtime if cough disturbs sleep.
- **Warnings/Caution:**
Not for use with persistent or chronic cough or for cough accompanying excessive secretions. If cough lasts more than a few days or is accompanied by fever or headache, notify healthcare professional.
- **Potential Drug/Drug Interactions:**
MAO inhibitors, haloperidol, and fluoxetine
- **Adverse Reactions:**
Nausea, drowsiness, dizziness
- **Examples of Available Formulations:**
Oral—liquid, liquid extended release (ER), lozenges, syrup
- **Recommended Dosages:**
Follow exact directions on packaging of individual agents.
2–6 yr: 2.5–7.5 mg q 4–6 h; ER: 25 mg BID (maximum: 30 mg/24 h).
7–12 yr: 5–10 mg q 4 h or 15 mg q 6–8 h; ER—60 mg BID (maximum 60 mg/24 H)
12 + yr & adult: 10–30 mg q 4–8 H; ER 60 mg BID (maximum 120 mg/24 h)

Guaifenesin

Robitussin, Organidin NR

- **Expectorant** that acts to stimulate respiratory tract secretions, thereby increasing respiratory fluid volumes and decreasing phlegm viscosity. When a child has a mild cough (only a few coughs per hour) and has chest congestion with mucous that is difficult to cough up, the mucous may be causing the cough.
- **Warnings/Cautions:**
May be used with other OTC cold or cough medication as long as guaifenesin is not already one of the ingredients.
- **Adverse Effects:**
Drowsiness, headache, rash, nausea, vomiting
- **Examples of Available Formulations:**
Liquid (Robitussin), tablet (Organidin NR)
- **Recommended Dosages:**
Follow exact directions on packaging of individual agents.
2–5 yr: 50–100 mg q 4 h (not to exceed 600 mg/day)
6–11 yr: 100–200 mg q 4 h (not to exceed 1.2 g/day)
12+ and adults: 200–400 mg q 4 h (not to exceed 2.4 g/day)

Pseudoephedrine

Sudafed

- **Decongestant**—acts to temporarily relieve symptoms of nasal congestion due to common cold and

upper respiratory allergies and also promotes nasal drainage. Directly stimulates alpha-adrenergic receptors of respiratory mucosa causing vasoconstriction; directly stimulates beta-adrenergic receptors causing bronchial relaxation. For children with nasal congestion but without itchy or runny nose. May interfere with sleep; best used alone during daytime.

- **Warnings/Cautions:**
Use with caution in presence of severe hypertension, arrhythmias, hyperthyroidism, diabetes.
- **Potential Drug/Drug Interactions:**
Additive effects with other sympathomimetics, MAO inhibitors, phenothiazines, tricyclic antidepressants.
- **Adverse Effects:**
Tachycardia, arrhythmias, central nervous system stimulation (nervousness, excitability, dizziness, insomnia, headache, seizures, hallucinations), nausea, vomiting, skeletal tremor, weakness, diaphoresis.
Nasal membranes may become too dry; saline nasal spray used throughout the day and a humidifier in bedroom at night may reduce the dryness.
- **Examples of Available Formulations:**
Oral—liquid drops, liquid gels, syrup, tablet, tablet ER.
- **Recommended Dosages:**
2–5 yr: 15 mg q 6 h (maximum dose 60 mg/24 h)
6–12 yr: 30 mg q 6 h (maximum dose 12 mg/24 h)
12+ and adult: 60 mg q 6 h (maximum dose 240 mg/24 h or ER 120 mg q 12 h)

Phenylephrine

Neo-Synephrine Nasal

- **Decongestant**—nose drops that acts as a vasoconstrictor for symptomatic relief of nasal and nasopharyngeal mucosal congestion.
- **Warnings/Cautions:**
Follow exact directions; do not exceed 3–5 day use; overuse can cause rebound nasal congestion.
- **Adverse Reactions:**
Restlessness, excitability, headache, dizziness
- **Examples of Available Formulations:**
Nasal drops: Neo-Synephrine (0.25%)
Nasal spray: Neo-Synephrine Nostril (0.25%)
- **Dosing Recommendations:**
1–6 yr: 2–3 drops q 4 h of 0.25% solution PRN
12+ yr and adults: 2–3 drops of 1–2 sprays q 4 h of 0.25% or 0.5% PRN

COMBINATION AGENTS

Antitussive and decongestant combinations of dextromethorphan and pseudoephedrine (Dimetapp Decongestant and Cough, Triaminic Throat Pain and Cough, Vick's Pediatric Formula 44 Cough & Congestion) help when there is a cough and thick mucous that is difficult to cough up. Adverse effects of both ingredients are possible. These may cause excitability and interfere with sleep; best used in daytime.

Expectorant combinations include guaifenesin and dextromethorphan (Robitussin DM) an expectorant and

an antitussive—helpful when there is a wet productive cough that is interfering with sleep or activity, but not a bothersome runny nose of chest congestion; guaifenesin and pseudoephedrine (Robitussin PE) an expectorant and a decongestant—helpful when there is nasal or chest congestion that is difficult to cough up; guaifenesin, pseudoephedrine, and dextromethorphan (Dimetapp Cold & Congestion and Robitussin CF) an expectorant, an antitussive, and a decongestant—helpful when there is nasal or chest congestion, a frequent cough and a runny nose.

Antihistamines (Chlorpheniramine, Diphenhydramine, Brompheniramine) are seldom used as single agents to treat the common cold, but when combined with decongestants (Benedryl Allergy Decongestant, Dimetapp Cold & Allergy, Triaminic Cold & Allergy, Sudafed Plus), they may be used to treat itchy runny nose and nasal congestion that is interfering with sleep (without a cough). Antihistamines are also combined with a decongestant and an antitussive (Triaminic Cold & Cough Soft Chews, Vick's NyQuil, Children's, Children's Dimetapp DM Cold and Cough). This combination addresses an itchy runny nose, nasal congestion, and frequent cough that are interfering with sleep. Combinations with antihistamines may be better for nighttime use because the antihistamine will usually make a child drowsy. However, side effects of antihistamines may include paradoxical central nervous system stimulation, especially in small children.

Section Three: Gastrointestinal Problems (Vomiting, Diarrhea, and Constipation)

Nausea and vomiting are not diseases but are rather symptoms of many different conditions. Many common childhood illnesses can cause vomiting, and usually it ends quickly without treatment. The timing and frequency of nausea or vomiting may indicate the cause. If nausea or vomiting appears after a particular medication, taking that medication with a light meal (toast or crackers) may help; if it only appears after bouts of coughing, a cough suppressant or decongestant may reduce the coughing. Often nausea can be relieved by eating small meals and resting quietly after eating.

Vomiting can quickly lead to dehydration, especially with very young children. At any age, replacing fluids lost in vomiting is important. A liquid diet of clear fluids will not only help prevent dehydration but will also be less likely than solid foods to trigger further vomiting. Today, there are commercial electrolyte solutions that can be recommended by a pediatrician or the pharmacist. If a child cannot tolerate frequent small amounts of replacement liquid or vomiting continues for more than a few hours for children under 6 or more than 24 hours with children over 6, a healthcare professional should be contacted. A pediatrician or family healthcare professional should also be contacted when vomiting is accompanied by a high fever, when there is abdominal pain or swollen abdomen, when there is blood or green bile in the vomit, or when diarrhea combined with vomiting lasts for more than a few hours. Common OTC agents used by adults for gastrointestinal (GI) upset are

not recommended for children without a professional consult.

Diarrhea can occur with or without vomiting and can be chronic or acute. As with vomiting, it is important to prevent dehydration and to maintain nutritional intake. Fluid replacement should begin within 4 to 6 hours after a diarrheal episode using clear liquids, white grape juice, ice chips, or commercially prepared oral-replacement therapy (ORT) available at most pharmacies (see Table 2).

A child should also eat as soon as possible after a bout of diarrhea, at least within 6 hours. A high-caloric diet (rice, wheat, potatoes, sorghum, corn, and chicken) has proven useful in slowing diarrhea. In fact, just about anything the child tolerates is fine, except for foods high in spices, sugar, or salt. Milk products may be held for 1 or 2 days for toddlers and older children. Infants can continue with regular formula diluted to half-strength; breast-fed infants should continue nursing (FDA, 1996). If the diarrhea persists for more than a few days, if it is accompanied with pain, or if there is blood in the stool, the child should be seen by a healthcare professional.

Most available OTC antidiarrheal medications on the market contain bismuth subsalicylate (Pepto Bismol, Kaopectate, Kapectolin, and Maalox Total Stomach Relief). These products should never be used in children with influenza, chickenpox, or other viral infections because of the risk of RS. Parents and caregivers should always contact their pediatrician before using any OTC antidiarrheal agents with infants or toddlers, and extreme caution should be exercised when using any of these agents with older children (drug information references: Taketomo et al., 2007; Turkoski et al., 2006)

Bismuth

Kaopectate, Kapectolin, Pepto-Bismol

- Antidiarrheal used for symptomatic treatment of mild, nonspecific diarrhea. Absorbs extra water in the large intestine, forms a protective coating on the intestinal mucosa, appears to have antisecretory and antimicrobial effect against bacterial and viral pathogens.
- Warnings/Cautions:
Contains bismuth subsalicylate—use with caution and follow dosage instructions closely. If diarrhea persists beyond 48 hours, a professional should be consulted. Do not use for more than 48 hours. Do not use in presence of high temperature, blood in stool, abdominal pain, appendicitis.
- Adverse Effects:
Central nervous system changes (anxiety, confusion, slurred speech, headache); constipation or impaction; muscle spasms, weakness, tinnitus. Gray stool or tongue—normal. Report immediately any central nervous system changes along with nausea and vomiting.
- Examples of Available Formulations:
Caplets, liquids.
- Dosing Recommendations
There are limitations on available information. Specific product labeling should be consulted and followed closely.

Constipation is a common problem with children and can be chronic or acute. Constipation often occurs when a child does not drink enough fluids, get enough dietary fiber (fruits, vegetables, whole-grain cereal), or get enough exercise. Functional constipation occurs when children (at any age) ignore the urge to have a bowel movement for many different reasons—not wanting to interrupt activities or not wanting to use a public restroom at school. In these cases, bowel habit training or retraining may be necessary. Some children will have difficulty with bowel movements into adolescence and maintenance therapy with laxatives may be necessary. Most experts recommend that laxatives should only be given to children with a professional's approval (National Institutes of Health, 2006).

Several laxative agents are available for temporary use with older children or on the recommendation of a pediatrician: Bulk cathartics stimulate evacuation by increasing the bulk of the stool (Metamucil, Citrucel, FiberCon); lubricating cathartics soften the feces and facilitate easier passage through the bowel (mineral oil, glycerin suppositories); stool softeners (Colace, Dulcolax stool softener, Phillips Liquid Gels) soften the stool for easier transport and evacuation; osmotic cathartics increase the water content in the feces (Milk of Magnesia, polyethylene glycol [PEG]); and stimulant cathartics (Dulcolax, Ex-Lax, Senokot) that cause increased peristalsis and move the stool through the bowel faster. Stimulant cathartics act much faster than the others; they are harsher and may cause dependency; they are not recommended for children (Constipation Guideline Committee, 2006). Discussions about two examples of two OTC laxatives that are frequently used for short-term relief of constipation follow (drug information references: Taketomo et al., 2007; Turkoski et al., 2006).

Mineral Oil

Agoral Plain, Milkinol, Zymenol, Fleet Mineral Oil Enema

- Lubricant laxative used for the temporary relief of constipation or to remove fecal impaction. Eases passage of stool by decreasing water absorption, softens stool, and lubricates the intestine.
- Warnings/Cautions:
Oral form should be avoided in children under 4 because of the risk of aspiration. Anal leakage indicates dose too high or need for disimpaction. Do not use in presence of abdominal pain, nausea, or vomiting. Do not use enema in case of rectal bleeding. Parents must be fully instructed on administering an enema.
- Adverse Reactions:
Nausea, vomiting, diarrhea, abdominal cramps, anal itching, anal seepage. Liquid pneumonitis with aspiration.
- Examples of Available Formulations:
Oral emulsion, jelly, or liquid. Rectal enema.
- Dosage Recommendations:
Oral—5–11 yr: 5–15 mL/day or in divided doses—should not be used > 1 wk.
>12 yr/adults: 15–45 mL/day or in divided doses—should not be used > 1 wk

Rectal—2–11 yr: 30–60 mL as single dose
>12 yr/adults: contents of 1 retention enema
(60–150 mL) per day as single dose.

Magnesium Hydroxide

Milk of Magnesia (MOM)

- Osmotic laxative that promotes bowel evacuation by causing osmotic retention of fluid, which distends the colon and produces increased peristaltic activity when taken orally.
- **Warnings/Cautions:**
Intestinal obstruction, impactions, perforation, appendicitis, abdominal pain
- **Adverse Reactions:**
Diarrhea, abdominal cramps, gas formation
- **Recommended Dosage:**
2–5 yr: 5–15 mL/day, once or in divided doses
6–11 yr: 15–30 mL/day, once or in divided doses.
> 12 yr/adults: 30–60 mL/day, once or in divided doses.

Magnesium Hydroxide and Mineral Oil

Haley's M-O

- **Recommended Dosage:**
2–5 yr: 6–18 mL/day, once or in divided doses
6–11 yr: 18–36 mL/day, once or in divided doses
> 12 yr/adults: 30–45 mL/day, once or in divided doses

The use of any laxative without professional consult should never exceed a few days at one time and should never be on a continual or frequent basis. Chronic constipation requires a professional evaluation to ascertain if the constipation is a symptom of a serious problem.

Conclusion

Medicating children can be a real challenge for parents. When parents of children with a common childhood problem stand in the aisle of any drug store, they are faced with several different products, many of which have pictures of infants or children on the boxes and many that have “for children” or “for infants” in the name. Choosing a safe medication for their child can be like finding their way through a complicated maze. Nurses interacting with children and parents in any healthcare setting should be alert for opportunities to help educate parents about common childhood complaints, the safe use of medications, and the warning signs when professional consults are necessary. This is especially important when there has been little empirical research about efficacy and safety of use for children. See Table 3 for medication guidelines to review with parents.

In part three of this series, examples of prescription medications used to treat childhood problems such as asthma, attention deficit hyperactivity disorder, and allergy will be discussed. Because obesity is a recognized

problem in pediatrics today, part three will also look at the various approaches to treating childhood obesity.

REFERENCES

- American Academy of Pediatrics. (2007a). Fever—making your child comfortable. Retrieved February 28, 2007, from www.aap.org/patiented/fevercomfort.htm
- American Academy of Pediatrics. (2007b). Common colds and young children. Retrieved February 25, 2007, from www.aap.org/patiented/coldsandyoungchild.htm
- American Academy of Pediatrics. (2007c). Treating diarrhea and dehydration. Retrieved February 28, 2007, from www.aap.org/pubed/ZZZAHYUYQ7C.htm?&sub_cat=107
- Children's Hospital of Philadelphia (2007). Your Child's Health: Medications. Philadelphia: Author. Retrieved February 10, 2007 from http://www.chop.edu/consumer/your_child/wellness_index.jsp?id=-8824.
- City of Baltimore Health Department. (2007). Citizen petition to Food and Drug Administration. Retrieved March 10, 2007, from www.baltimorehealth.org/news.html
- Centers for Disease Control and Prevention. (2007). Infant deaths associated with cough and cold medications—two states, 2005. *Morbidity and Mortality Weekly Report*, 56(1), 1–4.
- Constipation Guideline Committee. (2006). Evaluation and treatment of constipation in infants and children: Recommendations of the North American Society for Pediatric Gastroenterology, Hepatology and Nutrition. *Journal of Pediatric Gastroenterology and Nutrition*, 43(3), e1–e13.
- Crocetti, M., Moghbeli, N., & Serwint, J. (2001). Fever phobia revisited: Have parental misconceptions about fever changed in 20 years? *Pediatrics*, 107, 1241–1246.
- Food and Drug Administration Consumer Magazine. (1996). Preventing dehydration in children. Bethesda, MD: U.S. Food and Drug Administration. Retrieved February 16, 2007, from www.fda.gov/fdac/features/696_kids.html
- Howard, R. (2003). Current status of pain management in children. *JAMA*, 290, 2464–2469.
- Jordan, A. (2005). The impact of pediatric chronic pain on the family. *The Pediatric Pain Letter*, 7(1), 5–8. Retrieved February 25, 2007, from <http://pediatric-pain.ca/ppl/index.html>
- Kluger, M. (1992). Fever revisited. *Pediatrics*, 90, 846–850.
- National Institutes of Health. (2006). *Constipation in Children*. NIH Publication #04-4633. Retrieved March 1, 2007, from <http://digestive.niddk.nih.gov/ddiseases/pubs/constipationchild/index.htm>
- National Institute of Neurological Disorders and Stroke. (2007). NINDS Reye's Syndrome Information Page. Bethesda, MD: Author. Retrieved March 10, 2007, from www.ninds.nih.gov/disorders/reyes_syndrome/reyes_syndrome.htm
- Plaisance, K., & Mackowiak, P. (2000). Antipyretic therapy: Physiologic rationale, diagnostic implications, and clinical consequences. *Archives of Internal Medicine*, 160, 449–456.
- Taketomo, C., Hodding, J., & Kraus, D. (2007). *Pediatric dosage handbook* (13th ed.). Hudson, OH: LexiComp.
- Turkoski, B., Lance, B., & Bonfiglio, M. (2006). *Drug information handbook for advanced practice nursing* (7th ed.). Hudson, OH: Lexi Comp.