



An In-Depth Look at Keeping Young Children Safe Around Medicine

March 2013




Every parent knows it's important to store medicine up and away from children, but every year more than

500,000 parents

and caregivers call a poison control center because a child got into medicine or because they were given the wrong dose of medicine. That's one call every minute of every day.

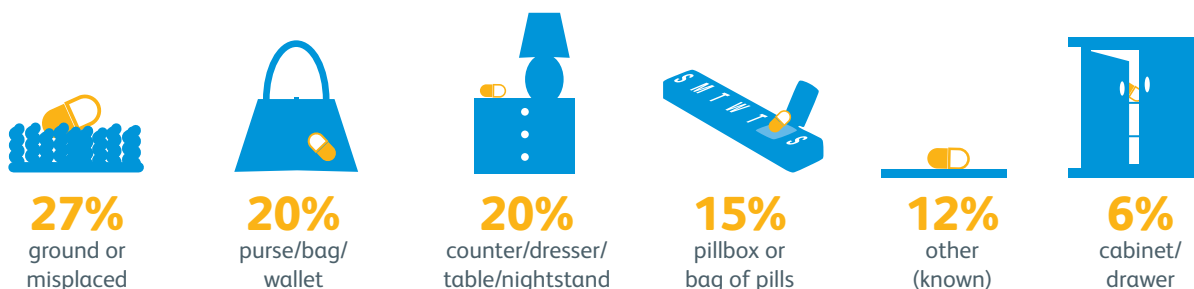


In 2011, more than **67,000 kids** were treated in an emergency room for medicine poisoning. That's one child every 8 minutes.

 = 1,000

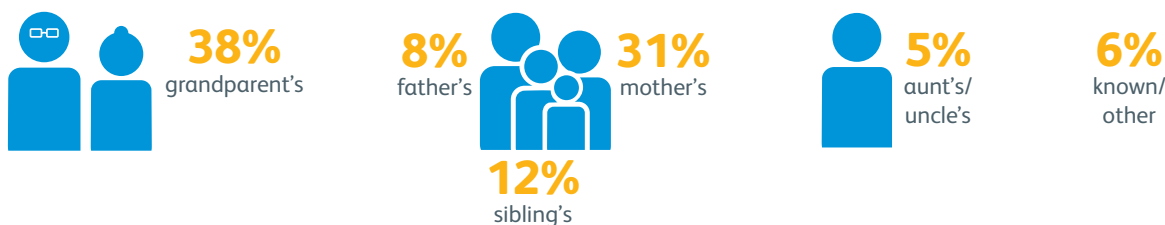


Where are children finding medicine?



(2011 emergency room visits; of the 14% of cases known.)

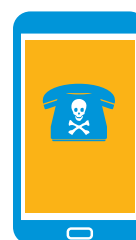
86% of emergency room visits for medicine poisoning were due to the child getting into adult medicine.



(Of the 24% of cases known.)

Put your medicines up and away every time you use them and put the poison control center number in your phone:

1-800-222-1222



**SAFE
KIDS
WORLDWIDE™**

Executive Summary

Medications are a vital part of everyday life, helping us to get well and to stay healthy. Households today may keep a wide range of medicines on hand. For the most part, parents and caregivers know that medicines should be stored up and away to keep them out of the reach of young children, and that medicine should be given responsibly. Despite this, however, we are seeing a dramatic increase in the number of young children who are seen in emergency departments (EDs) after an accidental exposure to medicine—up 30% over the last decade alone.¹ Every 61 seconds, a parent or caregiver calls a poison control center after a young child gets into medication, or is given the wrong dose of medicine.² While not all of these situations are life-threatening, a significant proportion of them are serious. In 2011, more than 67,000 young children were seen at emergency departments after an accidental medication exposure.¹

So how are children getting into medications? If parents and caregivers know the importance of medicine safety, is there a gap between knowledge and behavior? Are there situations or medicines that are common in accidental exposures to medicine? To help answer these questions, Safe Kids analyzed existing data from the U.S. Consumer Product Safety Commission and uncovered new insights into the risk factors for accidental medication exposure and dosing errors. We found that in 67% of these ED cases, the medication was left within reach of the child, such as in a purse, on a counter, or under a sofa cushion.¹ Also, while poison control center data shows that children often get into pediatric medicines, such as children's vitamins or children's



allergy medication, we discovered that in 86% of the serious cases seen in EDs, a child had gotten into an adult's medicine. In fact, we found that in 7 out of 10 cases, a child ingested medication belonging to the mother or a grandparent.¹ This means that despite good intentions, medicines belonging to a child's most trusted caretaker are posing a serious risk. It also points to locations within the reach of a child that caregivers may not be thinking about when they consider the safe storage of medicine.

This report is the second in a series of reports produced for the Safe Storage, Safe Dosing, Safe Kids campaign, a national initiative launched by Safe Kids Worldwide® in March 2012.³ In our first report, we investigated the current state of the problem, and we provided ways that parents and caregivers, industry, the health care community and government could work together to prevent accidental medication exposures. In this report, we explore trends in unsupervised medication exposures and dosing errors, and provide greater insight into the risk factors related to these incidents.

Safe Kids is highlighting the issue of medication safety and providing parents and caregivers with practical and proven tips to keep children safe when giving and storing medicine. We encourage parents to keep medicines up and away and out of sight each and every time, even when it seems more convenient to keep it handy on the counter or nightstand. We want to give parents strategies to remember when to give medicines, and to feel comfortable working with other caregivers to make sure that medicines are given at the right time and in the right amount. Finally, we want to remind parents that putting guests' bags, purses and coats up and away not only keeps visitors' belongings out of the reach of curious kids, but also keeps their children from getting into potentially harmful medicines. We understand that giving medicine to children can be challenging, especially when a child isn't feeling well—but keeping medicines safe and secure shouldn't be.

What the Data Says

Accidental medication exposures are a large and growing problem.

Medications play an important role in keeping children and adults healthy. However, there can be serious consequences when a medication is taken by a child unsupervised. In 2011, almost half of fatal poisonings reported to poison control centers that occurred in young children involved over-the-counter (OTC) and prescription (Rx) medications, including analgesics (pain medicine), cold and cough medicines, and antihistamines (Figure 1).² Among calls to poison control centers, more than a third were because of medication, more than any other substance, in children ages 5 and under (Figure 2).²

Medications represent a growing proportion of accidental poisoning deaths in young children. From 2000 to 2010, the proportion of poisoning deaths attributed to medications grew from 40% to 64% (Figure 3).⁴

Using data from the U.S. Consumer Product Safety Commission's National Electronic Injury Surveillance System (NEISS), we found that in 2011, more than 67,700 children were seen in emergency departments for accidental medication exposures, and 12,390 of these children required hospitalization.^{1 5} That means that every day, 185 children go to the ED for accidental unsupervised ingestions and dosing errors, and 34 of those children, almost one-fifth, will have to be hospitalized. We found that one group of children in particular was at risk—children ages 1 to 2 years old.

Children ages 13 to 24 months are most frequently seen in emergency departments after getting into a medication, accounting for

68% of these medication-related visits for young children (Figure 4). Children ages 12 months or younger represented 9% of visits, children age 3 years accounted for 16% and children age 4 years represented 7%.¹

Over the last decade, the number of young children ages 4 and under seen in emergency departments for accidental medication exposures increased by 29.8% (Figure 5). Even more alarming, the proportion of these exposures that required hospitalization increased by 53% during that time period.¹

What are the factors putting young children at risk for accidental medication exposures? Using the CPSC narratives from each ED visit in 2011, we took a closer look at the circumstances of accidental medication exposures, to better understand how children are getting into medications.

Whose medicine was taken?

While we think of parents and caregivers as being careful about putting their own medicines up and away, we were surprised to learn that in 86% of cases where information was available, the medication involved belonged to an adult (Figure 6).¹

We know that the majority of adults take medication or vitamins on a regular basis. A telephone survey found that 82% of adults had taken at least one medication or vitamin in the past week, and that 29% took five or more.⁶ Parents and caregivers need to be extra vigilant. In 69% of cases where we have information about whose medication was taken, the medication belonged to a grandparent or the child's mom.¹ Based on the small sample of data where details about location were available, we suspect that many

of these accidental medication exposures may occur outside of the child's own home, such as at the home of a relative or neighbor. Additionally, visitors bringing medications into the home may be leading to some of these incidents. Further research in this area is needed.

A 5-year-old boy got into his grandmother's weekly pill container and swallowed some of her medicine. He had an altered mental state, was vomiting, and started seizing in the emergency department. He required hospitalization.

— hospital record reported in CPSC NEISS

Location, location, location.

Where the child found the medicine is an important factor in accidental medication exposures. We found that in almost 7 out of 10 (67%) cases, the medicine was left within a child's reach. In 40% of cases, it was left on a counter, table or nightstand or in a purse or bag, and in 27% of cases the child found the medication on the floor or in another place where it had been accidentally left, such as under a sofa cushion. In only 6% of cases, the medication was put away in a cabinet, drawer or medicine cabinet—indicating that putting medicine up and away and out of sight is a relatively effective way to keep medicine out of the reach of children.¹

We heard in focus groups that parents and grandparents may leave medications out in a more convenient place when they are giving medicines on a schedule to their children. Many children are given medication on a regular basis. A telephone survey found that 56% of children had been given at least one medication or vitamin in the seven days

FIGURE 1

In 2011, for children ages 5 and under, pharmaceuticals (OTC and Rx) were involved in 48% of fatal poisonings that were reported to poison control centers.²

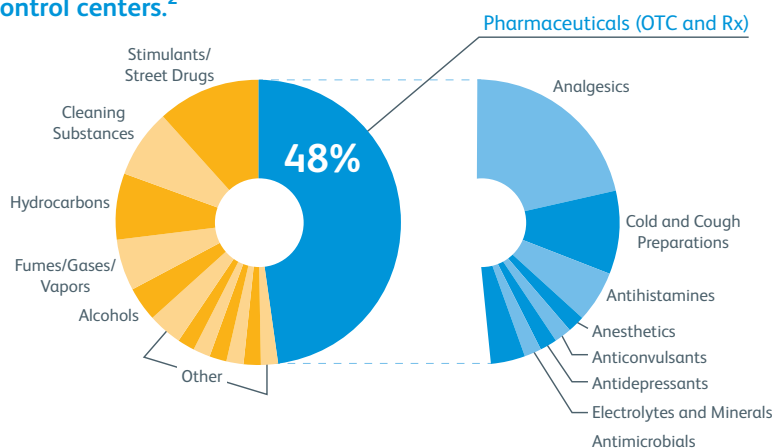


FIGURE 3

More poisoning deaths involved medication in 2010, compared to 2000, in children ages 5 and under.⁴

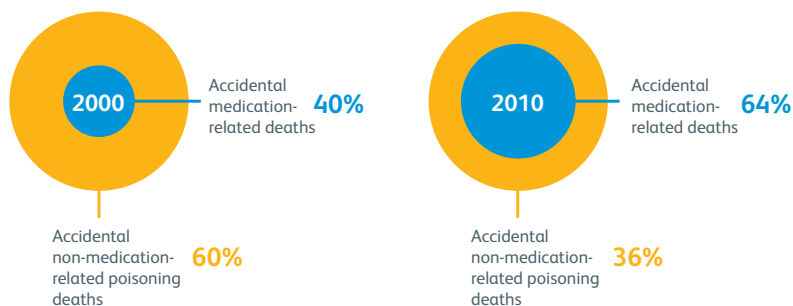


FIGURE 5

The number of emergency department visits for accidental medication exposures has increased by 30% over the last ten years, and the percentage of children requiring hospitalization has increased by 53%, among children ages 4 and under.¹

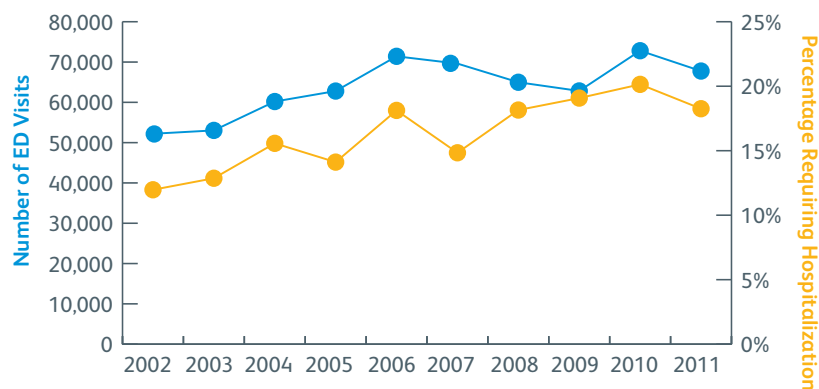


FIGURE 2

Pharmaceuticals (OTC and Rx) account for the majority of poison control center exposure calls for children ages 5 and under.²

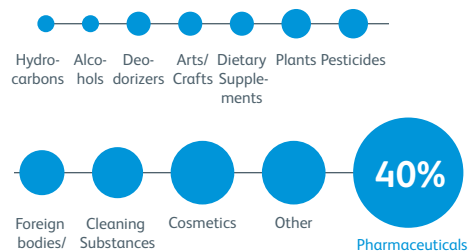


FIGURE 4

Children ages 13-24 months represent 68% of all medication-related ED visits among young children ages 4 and under, 2002-2011.¹

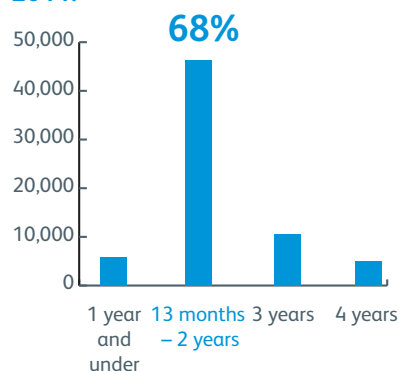
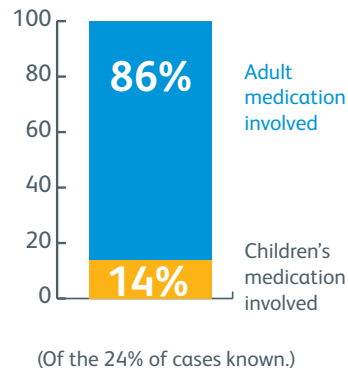


FIGURE 6

Where noted, adult medications were most commonly involved in medication exposure-related ED visits for children ages 4 and under in 2011.¹



before the interview, and that 21% had been given at least one prescription medication during the past week.⁶ Other parents and grandparents set their own medications out in pill boxes or pill containers on nightstands and dressers, and in purses or bags, so that their medicine is in a convenient place to help them remember to take it. They are aware that this could be dangerous if a child got into the medicine, but they wanted to keep their medicine in an easy

and memorable place. So while parents and caregivers are putting medicine up and away to store it, when they need to keep it handy, it might get left out in a place that a child could easily reach it.

Medications most frequently involved in poison control center exposure calls. Data from poison control centers can also improve our understanding of the circumstances of medication exposures. In 2011, there were 518,442 calls for medication

exposures in children ages 5 and under.² The top ten categories of medication involved in medication exposure calls for children ages 5 and under are below (Table 1).² Parents may not think about some of the products on this list as medicine; for example, diaper rash products and children's vitamins may be left out in a handy place. However, these products have active ingredients and the potential for serious consequences if large quantities are swallowed.

Table 1

Top 10 Medications Involved in Pediatric Exposures, 2011²

Medications	Number of exposures in children ages 5 and under	% of all medication exposures in children ages 5 and under
Ibuprofen, both children's and adult's (Brand names: Advil [®] , Motrin [®])	46,384	8.9%
Diaper rash products (Brand names: DESITIN [®] , Calmoseptine [®])	38,117	7.4%
Children's acetaminophen (Brand names: TYLENOL [®] , Feverall [®])	28,034	5.4%
Children's vitamin tablets without iron or fluoride	20,946	4.0%
Other antihistamines, excluding cough and cold preparations, both children's and adult	19,711	3.8%
Systemic antibiotic preparations (oral, intravenous, intramuscular)	16,093	3.1%
Calcium and calcium salts (Brand names: Citracal [®] , Viactiv [®])	13,334	2.6%
Diphenhydramine alone, both children's and adult (Unknown if OTC or Rx) (Brand names: Benadryl [®] , PediaCare Children's Allergy [®])	11,497	2.2%
Laxatives	10,613	2.0%
Homeopathic agents	9,331	1.8%



We analyzed medication exposure trends between 2007 and 2011. Among over-the-counter medicines, there has been a statistically significant decline of 4.3% in the proportion of exposure calls involving children's and adult cough and cold medicines over the last five years. However, there has also been a statistically significant increase in the proportion of exposures due to children's vitamins. We will be following this possibly growing trend.^{2 7 8 9 10}

There are many reasons for the decline in the proportion of exposures due to cough and cold medicine in children ages 5 and under. In 2008, the Food and Drug Administration (FDA) made a public statement that cold and cough medicines should not be used in children under the age of 2 because serious and potentially life-threatening side effects can occur. Beginning in 2007, many manufacturers voluntarily withdrew infant cough and cold products. Then beginning in late 2008, many manufacturers voluntarily relabeled pediatric cough/cold products to include language to not be given to children under 4 years of age.^{11 12} Since fewer

products were being sold, we suspect that these medicines were not as common in houses so the potential exposure to children was reduced. While other factors may have contributed to the decline, the FDA's recommendation and industry's voluntary actions have resulted in a reduction to the number of exposures involving cough and cold products in children.

Prescription medicines are important to consider as well, as they are responsible for a considerable number of serious injuries and deaths. Medication-related poisoning deaths among young children most often involve products such as opioids (prescription painkillers) and cardiovascular medications.³ For prescription medicines, the proportion of calls involving cardiovascular drugs and opioids has increased since 2008. We are concerned by this increase, and we will be keeping an eye on this serious and growing trend.^{2 7 8 9 10}

Medication exposures caused by dosing errors. Of the 518,442 medicine-related calls to poison control centers for children ages 5 and under, 13% were for a

dosing error.² Among more serious emergency department visits, an estimated 5% are a result of dosing errors.¹³ While the consequences of dosing errors for over-the-counter medicines may be relatively minor, many prescription medicines require exact doses.

From poison control centers, we know that errors related to timing and measurement account for 31% and 30% of dosing errors, respectively, in children ages 5 and under (Figure 7).² Errors related to timing include inadvertently giving the medicine twice (15,904 calls) and giving the medication doses too close together (5,518 calls). Measurement errors include confusing the units of measure (6,241 calls) and giving the incorrect dose (13,099 calls). From the focus groups, we heard mothers speak about the challenge of getting distracted when giving medicine to their children, if the phone rings or another child needs help, as well as the challenge of multiple caregivers giving medication and the need for clear communication about when a child has already been given a dose.

FIGURE 7

Timing of dose leads to the greatest number of dosing errors in children ages 5 and under.²



The National Poison Data System (NPDS) collects data from 57 poison centers in the U.S. Each year, the American Association of Poison Control Centers (AAPCC) publishes a report of key findings from the

NPDS about the number and kinds of calls that they received and the poisons and medications involved. In 2011 alone, there were more than 2.3 million calls made to poison centers for poisoning exposures.

Calls to poison centers are free and confidential, and poison centers are available 24 hours per day, 7 days a week. Make sure to keep the toll-free number, 1-800-222-1222, posted in your house and saved in your phone.

Table 2

Benefits and Potential Effects of Common Medicines

Medicine	Benefits	Potential effects if misused*
Diaper rash products	Soothe a baby's irritated skin	Lung damage if inhaled; nausea, vomiting, diarrhea ¹⁹
Eye drops and nasal sprays	Relieve dry and itchy eyes, alleviate symptoms of a stuffy nose	Vomiting, slowed heart rate, lethargy, coma ²⁰
Antihistamines	Used to treat runny noses and itchy eyes from allergies	Seizures, hallucinations ²¹
Multivitamins with iron	Provide vitamins and minerals for a healthy body	Damage to stomach and intestinal lining ²²
Cold and cough medicines	Relieve symptoms from a cold, like coughing, stuffy nose or fever	Seizures, high blood pressure, hallucinations, coma, nausea, vomiting, liver damage ²³



*The quantity involved in a medication exposure to result in these effects varies depending on the child's age, weight and other health factors. Call your local poison control center (1-800-222-1222) if a child gets into medicine, or if a dosing error happens.



The Importance of Federal Funding for Medication Safety

Several of our partners in medication safety receive federal funding. Poison control centers, which receive funding from the U.S. Health Resources and Services Administration, save tax payer dollars. Why? Close to 90 percent of poison control center calls involving children ages 5 and under are resolved over the phone. That lets a parent avoid a costly trip to the emergency department, and reduces healthcare costs by more than \$1.8 billion every

year. As part of the PROTECT Initiative, the Centers for Disease Control and Prevention, in collaboration with key partners, devised the "Up and Away" education and awareness program that reminds families of the importance of safe medicine storage practices.¹⁸ Safe Kids continues to be a strong voice for appropriate federal funding for these important agencies, whose education, outreach and expertise in managing poisonings keep our children safe around medicine.

A 2-year-old girl ate between two and seven loose pills that were placed in a trashcan by a guest visiting at her grandmother's house. The girl felt sleepy and couldn't walk straight. She required hospitalization.

— hospital record reported in CPSC NEISS

SAFE STORAGE TIPS

- Always store medicines and vitamins up and away and out of sight of children after every use.
- Always put the medicine away between dosings. Don't be tempted to "keep them handy," such as on a counter or nightstand, or in a purse, backpack, or briefcase.
- To help remember to take your medicines or vitamins when they are no longer out in plain view, you can send yourself an e-mail or set the alarm on your watch or cell phone.
- Buy child-resistant packages when available and securely close them every time.
- Remind and offer to help babysitters, houseguests and visitors to keep purses and bags that contain medicine up and away when they visit your home.

SAFE DOSING TIPS

- Always read and follow the label when giving medicines.
- Use the dosing device packaged with the medications, so you don't end up giving too much or too little medication.
- Make sure that you don't give your child multiple medicines with the same active ingredient.
- When multiple caregivers are giving medicine, make sure to communicate when doses are given. Leave a message taped to the bottle with the time and dose given, or send a text message to the next caregiver giving a dose.

SAFE DISPOSAL TIPS

- To safely dispose of most medications, pour the medication into a sealable plastic bag. If medication is a solid (pill, liquid capsule, etc.), add water to dissolve it.
- Add kitty litter, sawdust, coffee grounds (or any material that mixes with the medication and makes it less appealing for children and pets to eat) to the plastic bag.
- Remove any instructions and personal information from the bottle or packaging.
- The Food and Drug Administration says that a small number of medications are so dangerous that they should still be flushed down the toilet. A full list of these medications is available on their website.¹⁶
- Another way to dispose of medicines is through medication take-back programs. Check for approved U.S. state and local collection medication disposal locations on the National Take-Back Initiative website.¹⁷



SAFE SENIORS TIPS

- If they are able, older adults who might have children visiting their homes should request and use child-resistant medication bottles.
- If physical limitations require easy-open containers or weekly pill boxes, it is especially important to keep them up and away and out of the sight of children.
- We know that medicines are often kept in plain view to remind adults to take a medication. Consider other types of reminders, such as setting an alarm on a cell phone or leaving a note on a highly visible place such as the refrigerator.

Smart Strategies for Parents

Through our research, we identified five strategies that parents and caregivers can follow to keep children safe around medicines.

Return medicines up and away and out of sight every time. We know that in 67% of ED visits for an accidental medicine exposure, the child got into medicine that was left within their sight and reach.¹ Medicines that are taken daily, like blood pressure medicine or a vitamin, or medicines like a fever reducer that are kept handy for an upcoming dose, should be put away in a place that isn't visible or accessible to young children. To remind yourself when to give or take a medication, set a cell phone reminder, give the medication at the same time every day, or write a note to yourself and leave it somewhere you look often, like on the refrigerator door.

Give medicines safely, and know what is in your child's medicine. Measuring and timing errors while giving medicine to young children are the leading causes of dosing-related calls to poison control centers each year.² Parents and

caregivers can communicate about dosing by leaving a note about when the medicine was given, and how much. Double-check the information on the label before every use to make sure that the right amount is given. The label will also provide you with the active ingredients. You don't need to know what every ingredient does; just knowing if an ingredient is in another medicine could prevent a potentially dangerous double-dose. If you have questions, follow the label's advice to contact your child's physician. Another resource for information is your pharmacist who knows the medications that you and your family take, and can tell you about possible interactions. Information about medication uses and possible drug side effects is also available online. We use the National Institutes of Health's MedlinePlus site, which also has an app.^{14 15} The local poison control center can quickly tell you if two medications might interact. Keep the free and confidential number **1-800-222-1222** handy by posting it in your house and saving it in your phone.

Take a look around your home and places where your child spends time. Young children love to explore, but sometimes they can get in trouble. We know that children ages 13 months to 2 years account for almost 7 out of 10 ED visits related to accidental medicine exposures.¹ Children this age aren't able to get into high up cabinets. Instead, they're picking things up from the floor and other places within reach. Even products that don't seem like medicine such as diaper care and rash products or rubbing alcohol could cause serious harm if swallowed by a child. Look around your home through the eyes of a child for all of the places that medicine is stored, including bags, purses, nightstands and dressers. Make sure that all medicines are stored up and away and out of sight.

"My daughter's like a little vacuum cleaner; she sucks up everything on the floor. She usually gives stuff to me, but who's to say that if she found a pill, she'd give it to me?"

— A mom in one of our focus groups

Making a Medication Conversation Less Awkward Some parents find it natural to ask about medication storage with visitors and when visiting others' homes. But others find it socially awkward. To avoid a potentially uncomfortable conversation with a visitor, try one of these:

"I have a toddler/wayward dog/crazy cat who gets into everything. Here, let me protect your bag/coat/briefcase by putting it away."

"Thank you for babysitting this afternoon. My child is really adventurous—so let's store your backpack in the closet."

"So glad you're here to visit for the weekend. Can I show you where to put your things to keep them safe? Our child is going through that phase when she/he just wants to get into everything."

Be alert to other people's medication. Initial research indicates that children are getting into medicine outside of their own homes, such as when visiting a relative's or neighbor's home.¹ We know that in 43% of ED cases, children got into medication belonging to a relative such as an aunt, uncle or grandparent.¹ In addition to having a conversation with people whose homes your child visits, also pay attention to where visitors in your home are keeping their medicines. Our focus groups revealed that caregivers are unlikely to tell visitors where to safely store their medicines while visiting.

To help make these potentially awkward conversations easier, see our tips below. Show visitors a high-up place where they can put their purse or coat, and gently remind them that with a curious child in the home, it's best to keep it up high and out of sight.

Safely dispose of expired or unused medicine. Wondering what to do with the prescription pain medicine that you had filled for an operation four years ago? To safely dispose of medicine, add the medicine to kitty litter, sawdust or coffee grounds in a plastic bag, add water if the medicine is a pill or capsule, and throw it away. A small number of medicines, like oxycodone and fentanyl, can be very harmful or even deadly to children with only one dose. The FDA publishes a list of these medicines on its



website.¹⁶ Because of the potential for unintentional harm or abuse, these medicines should be flushed down the toilet so young children and other people don't take them. Another way to dispose of expired or unused medicine is through local medicine Take-Back programs. Find a local medication take-back event on the U.S. Drug Enforcement Agency's website.¹⁷

Conclusion

We know that parents, grandparents and caregivers do their best to keep their children safe around medicine. Yet, surprisingly, each year more than 67,000 young children are seen in EDs for accidental medication exposures, and the number of these ED visits has increased 30% in the last decade.¹ How is this happening? From data collected by poison control center calls, we know that many children are

getting into children's medicine, such as vitamins and children's pain and fever reducers.² However, among children seen in EDs, medicine belonging to an adult was involved an overwhelming 86% of the time. Children oftentimes get into medicine left on a kitchen or bathroom counter, in a purse or bag, or found on the ground.¹ In terms of giving medicine safely to children, the greatest problems arise from timing, such as giving doses too close together, and measurement, like confusing the units of measure.² Throughout this report, we presented many practical and proven ways that parents and caregivers can keep children safe when storing, using or disposing of medicine. By continuing to encourage parents and caregivers to safely store and use medicine, we hope that injuries caused by medication exposures will become a problem of the past.

Focus Group Methodology Focus groups were held in October 2012 and January 2013. The 2012 focus groups were moms and grandparents with supervision duties of at least once a month, with children or grandchildren ages 5 and under. The 2013 focus groups were moms who had both children ages 5 and under as well as older children. We held groups of low literacy caregivers, new moms, and

experienced moms who had older children. All participants must have administered medication to their child/grandchild within the past three months.

CPSC Methodology Data for our analysis was collected from the publicly-available data housed on the U.S. Consumer Product Safety Commission National Electronic Injury

Surveillance System (NEISS) website.⁵ Safe Kids Worldwide analyzed data from January 1, 2002 to December 31, 2011 of cases involving children ages 4 and under, where a product code for medication was listed. We reviewed every narrative in 2011 and coded information about the circumstances of the incident, where available.

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