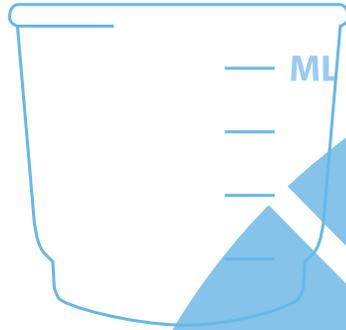




Safe Storage, Safe Dosing, Safe Kids

A Report to the Nation on Safe Medication





About 165 young kids — or roughly four school busloads of children — are seen in emergency rooms after getting into medications every day in the U.S.¹

Executive Summary

About 165 young kids every day – or roughly four school busloads of children – are seen in emergency rooms after getting into medications in the U.S.¹

Every single one of those trips to the ER could have been prevented.

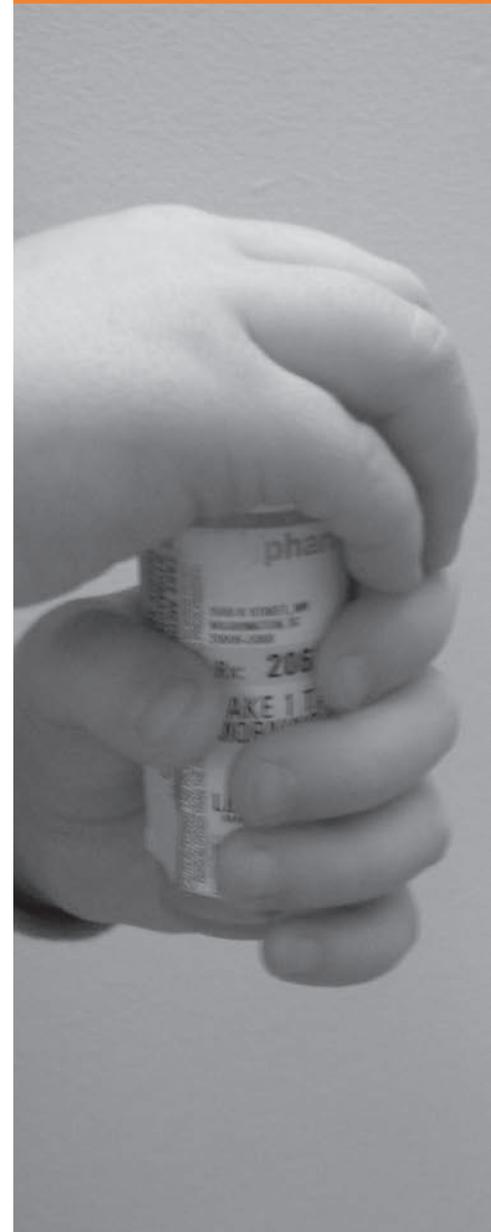
And while the death rate among children from poisoning has been cut in half since the late 1970s, medication deaths as a percentage of all child poisoning deaths have nearly doubled.²

What's responsible for this disturbing trend? There are many reasons: more medications than ever are in the home, including prescription and over-the-counter pharmaceuticals, dietary supplements, vitamins, and herbals; the pace of today's lifestyle means that medications may not be properly stored immediately after every use; a rise in multi-generational households in which children may now have greater access to grandparents' medications; working and single parents relying on multiple caregivers, who may not coordinate closely on the timing of children's dosages; and formulation of children's medications that are designed to taste good and may entice children to take them when unsupervised. And, of course, kids are curious and young children especially love to put things in their mouths.

Ingenuity and innovation have developed medications that save and extend lives, diminish pain and cure diseases. These medications are abundantly available in the U.S. As with most innovations that bring positive change, however, there are risks associated with more and more medications entering the marketplace and the home. Safe Kids Worldwide is naturally most concerned about the threat that even the best medications may have to our children. Medications can become life-threatening when they are not safely stored and get into the hands and mouths of curious children or when children receive the wrong dose of a medication that is supposed to help them feel better.

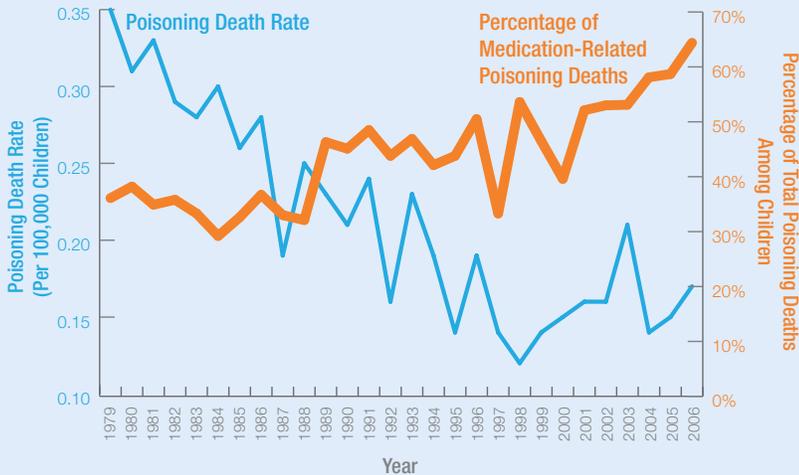
How can we reduce the threat? Consider this: among young children, 95% of unintentional medication overdose visits to emergency departments are caused by a child ingesting medication while unsupervised and approximately 5% are due to dosing errors made by caregivers.³ So ultimately, safe storage and safe dosing mean safe kids. And, by continuing the progress we have made through packaging and labeling improvements, providing dosing information and educating children's caregivers, we can reduce medication-related poisoning deaths, calls to poison control centers and trips to the emergency room even further.

Medications are the leading cause of child poisoning today.¹³



KIDS AND UNINTENTIONAL MEDICATION OVERDOSES IN THE U.S. BY THE NUMBERS

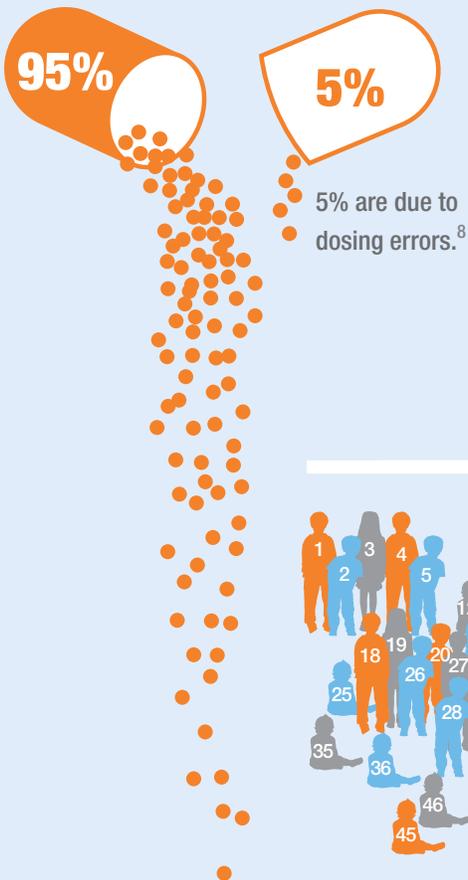
While the death rate among children from poisoning has been cut in half since the late 1970s, medication deaths as a percentage of all child poisoning deaths have nearly doubled.¹⁰



23% (541,765) of cases managed by poison control centers involved medication-related poisonings among children ages 5 and under.⁹

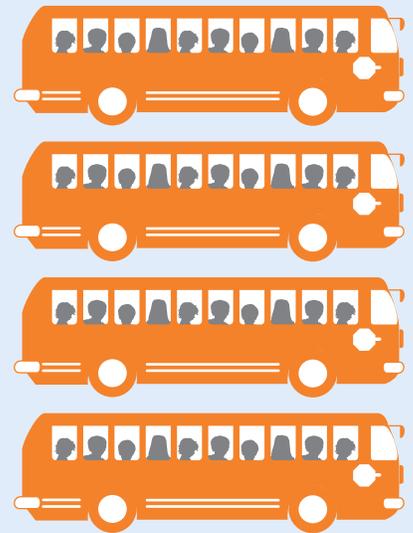
POISON HOTLINE 1-800-222-1222

95 percent of medication-related ER visits among children under age 5 are due to a child ingesting medication while unsupervised.⁷



165 young children per day (roughly four busloads) are brought to the ER after taking medications on their own.⁶

60,000 young children are treated in the ER due to accidental unsupervised medication ingestions each year.⁵



56 children ages 14 and under die each year from unintentional medication overdoses.⁴

PREVENTABILITY: 100%

Safe Kids Worldwide decided to examine this issue and researched historical trends in morbidity and mortality of unintentional medication overdoses among children ages 14 and under. This report shines a spotlight on the challenge of unintentional medication overdoses among children and offers solutions intended to reverse the trends. We highlight the role that parents and other caregivers, industry, governments, the medical community and non-profit organizations can play in improving medication safety through safe storage and safe dosing.

It is essential for all stakeholders to join forces and deliver consistent messages to reverse the most troubling trend we found:

The death rate from poisoning overall has decreased, but the percentage of deaths due to medications is increasing.¹⁰

From 1979 to 2006, the poisoning death rate was cut in half, declining from 0.35 to 0.17 per 100,000 children.¹¹ Yet, among all child poisoning deaths the number attributable to medications increased from 36% to 64%.¹² Medications are the leading cause of child poisoning deaths today.¹³

The new Safe Kids national initiative – *Safe Storage, Safe Dosing, Safe Kids* – is designed to help prevent medication-related exposures, injuries and deaths in children. At both the national level and through its powerful U.S. network of 600 coalitions and chapters, Safe Kids will educate parents, grandparents and caregivers about the behavioral changes they need to make related to safe medication storage and dosing. This public education will be accomplished through a strategy involving community events at the grassroots level, traditional and social media outreach at the national level and partnership with the *Up and Away and Out of Sight* educational program, led by the Centers for Disease Control (CDC) and a coalition of private sector and professional partners.

As advocates for kids, Safe Kids also will work at the national and local levels to maintain the structure and stabilize funding for poison control centers, equip our coalitions and chapters with advocacy tools to highlight the effectiveness of poison control centers, and encourage industry innovation in pharmaceutical labeling and packaging. We will urge federal agencies to maintain a high level of commitment to medication safety and to help us reach parents and caregivers about this urgent issue.

Safe Storage, Safe Dosing, Safe Kids. A simple message for an enormous challenge and preventable problem.



Children's Medication Safety: An Overview

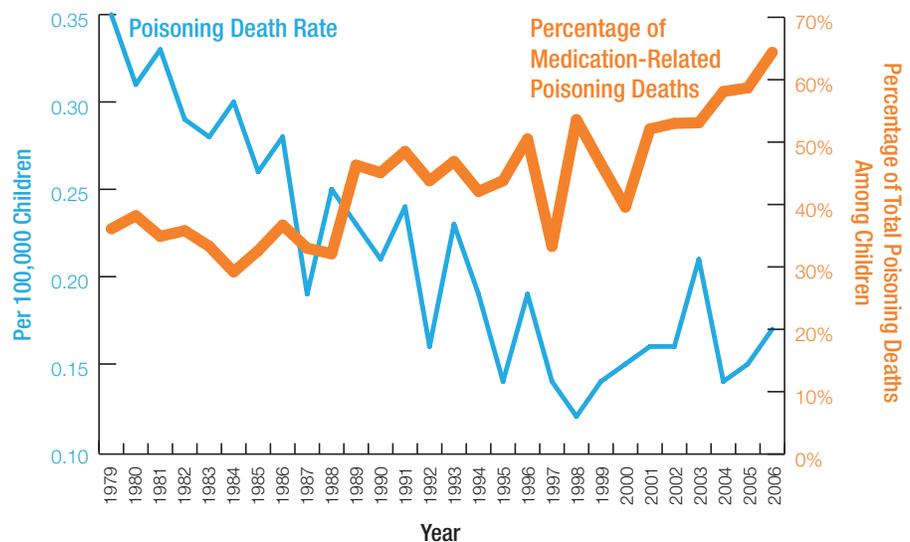
A half century ago, parental education in the U.S. to promote safe storage and dosing of medications was scant, and few poison control centers were available to offer medical advice. Government agencies to safeguard children such as the U.S. Consumer Product Safety Commission (CPSC) had not yet been instituted, and child-resistant packaging for dangerous substances was just starting to be implemented.

Although there is still more to be done, today the picture is much brighter. A nationally coordinated system of poison control centers has been established, great strides have been made in the field of toxicology, educational messages on poison safety have been shared around the country, and industry has created safer storage containers for toxic substances.

While the child poisoning death rate in the U.S. has steadily declined over the last several decades, a growing proportion of these deaths are due to medication, including prescription and over-the-counter pharmaceuticals, dietary supplements, vitamins, and herbals. The time trend in Figure 1 shows that from 1979 to 2006, the poisoning death rate declined from 0.35 to 0.17 per 100,000 children.¹⁴ During the same period, the number of poisoning deaths attributable to medications increased from 36% to approximately 64%.¹⁵



Figure 1. Poisoning Death Rate Among Children and the Percentage of Child Poisoning Deaths Involving Medication 1979-2006, Children Ages 14 and Under



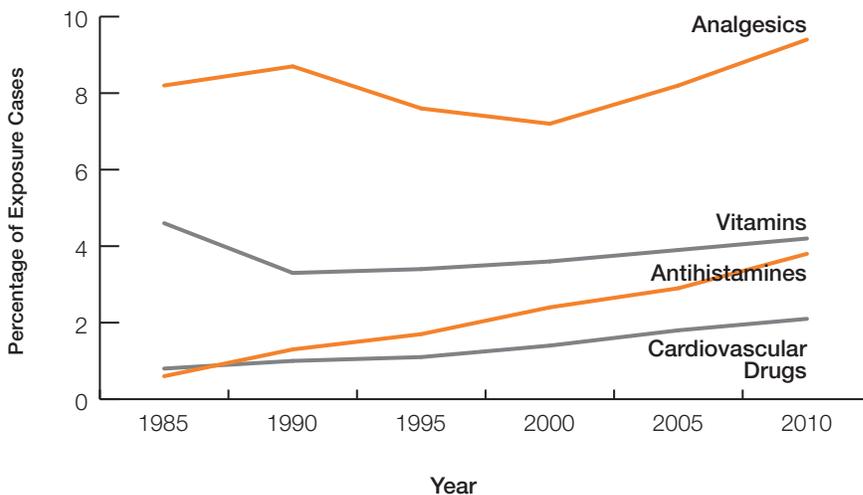
Note: Non-medication-related poisoning ICD-9 underlying cause of death codes are E860-E869 and ICD-10 underlying cause of death codes are X45-X49. Medication-related poisoning ICD-9 underlying cause of death codes are E850-E858 and ICD-10 underlying cause of death codes are X40-X44. Sources: Centers for Disease Control and Prevention, National Center for Health Statistics. Compressed Mortality File 1979-1998 Archive and Compressed Mortality File 1999-2006. CDC WONDER Online Database. Available from: <http://wonder.cdc.gov>. Accessed February 29, 2012.

Despite the many advances made in medication safety over the years, such as the advent of and requirement for child-resistant packaging on most medications and other toxic substances,¹⁶ medications are the leading cause of child poisoning today.^{17 18} Each year, more than 500,000 children ages 5 and under experience a potential poisoning related to medications¹⁹ and more than 60,000 are treated in emergency departments due to accidental medication exposure or overdose.²⁰ Currently, more children are brought to emergency departments for unintentional medication overdoses than for motor vehicle occupant injuries.²¹ Among young children, one of every 150 2-year-olds is being sent to the emergency department for an unintentional medication overdose.^{22 23} Among children under age 5, 95% of these visits are caused by unsupervised accidental ingestions and approximately 5% by dosing errors made by caregivers.²⁴



Figure 2 demonstrates the rising trend in the percentage of child poison exposure calls to poison control centers involving select medications. Medication-related poisoning deaths among children ages 5 and under now most frequently involve exposure to medications such as opioid analgesicsⁱ and cardiovascular medications.^{25 26} Analgesics, antihistamines and sedatives, among other medications, are involved in half of all poisoning-related fatality cases among young children reported to poison control centers, as shown in Figures 3 and 4.²⁷

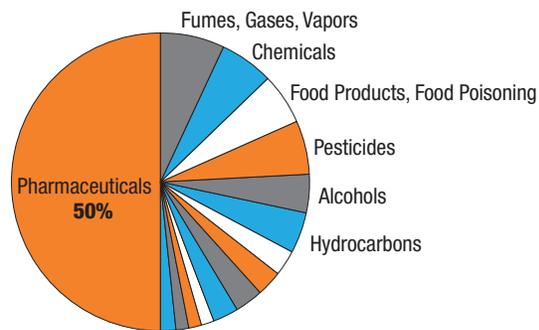
Figure 2. Percentage of Pediatric Exposure Cases Involving Pharmaceuticals, 1985-2010, Children Ages 5 and Under



Note: Based on calls to poison control centers

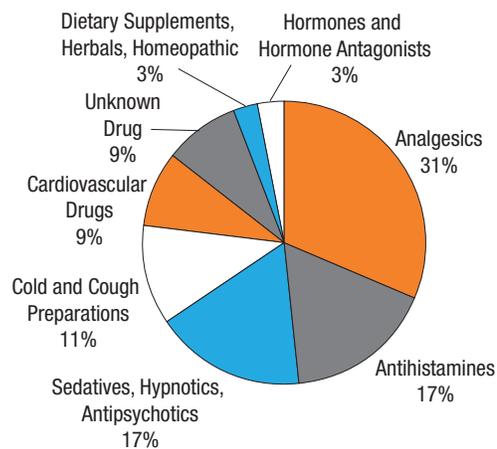
ⁱ Analgesics are prescription and over-the-counter pain medications. Opioid analgesics are those that act on the central nervous system intended to treat moderate to severe pain.

Figure 3. Substances Involved in Fatal Poisonings 2010, Children Ages 5 and Under



Note: Based on calls to poison control centers

Figure 4. Pharmaceuticals Involved in Fatal Poisonings 2010, Children Ages 5 and Under



Note: Based on calls to poison control centers

The stunning advances made in the development of medications mean that there are more of them in American homes. With the aging population in the U.S., not only are more adults taking over-the-counter and prescription medications, but more adults are taking multiple medications.²⁸ Over 80% of adults take at least one medication in a given week.²⁹ In the span of only a few years, use of metoprolol (a medication used to treat high blood pressure and heart conditions) has increased almost five-fold and prescriptions for drugs such as oxycodone, morphine and methadone have increased between 159 and 559 percent, depending on the drug.³⁰ Similarly, more medications (such as anti-diabetic medication and medications for attention-deficit disorder) are being prescribed to younger adults and children, who may be less aware of the risks their medications pose to young children.³¹

The increase in multi-generational households in our society³² and grandparents bringing medications into a child's environment also pose a risk; one study demonstrated that up to 20% of pediatric poisonings involve a grandparent's medication.³³ Lastly, the rise in single-parent households during the 1990's³⁴ may mean children are under the watch of multiple caregivers, potentially increasing the risk of medication errors (e.g., multiple dosing, dosing too frequently, use of multiple medications that contain the same or similar ingredients).

These factors point in one direction: a range of stakeholders must educate, innovate and advocate if we are to reverse the trend of unintended harm to children due to improper storage or dosing of medications.

Multifaceted Strategy Required

Safe storage and safe dosing of medications will save lives and prevent unnecessary trips for children to emergency rooms. To keep children safe, behavior must change on many levels. Adults and organizations who are responsible for the health and well-being of kids, including parents, grandparents, and child care providers, the pharmaceutical industry, health care professionals, pharmacies, retailers and the government, must work together to keep kids safe. Safe Kids proposes specific roles for each of these sectors here, and in the following section, we present our plan to improve safe storage and safe dosing behaviors.

The Role of Parents, Grandparents, Childcare Providers and Other Caregivers

Everyone who cares for children must do all they can to protect them from harm. This includes becoming familiar with common safe medication storage practices and coordinating the child's care to ensure they are receiving the proper dosage at the right time.

Practice Safe Storage and Safe Dosing and Know Who to Call for Help. Safe storage and safe dosing of medication are critical. Nearly all young children who are brought to the emergency room due to an unintentional medication overdose got into the medication when a caregiver wasn't looking. Medications may look like candy and in some instances are flavored to make them more appealing, thus making safe storage all the more essential.





The new *Up and Away and Out of Sight* educational program, led by the CDC and a coalition of partners, is an example of proactive efforts to educate parents and other caregivers about medication safety.³⁵ The campaign is part of a public-private partnership, the *PROTECT Initiative*, which aims to keep children safe from unintentional medication overdoses through efforts focusing on improved medication packaging and labeling and caregiver education.³⁶ The *Up and Away and Out of Sight* campaign reminds parents and caregivers to take several important actions to keep kids safe:

- Store medications in a safe location out of sight and reach of young children (even if another dose needs to be given in a few hours).
- Never refer to medication as candy.
- Ask guests to keep coats, purses and bags that have medications up and away and out of sight when they are in your home.
- Close child-resistant caps on medication bottles every time.

Also, adults must always read labeling instructions and use the dosing device that comes with the medication. Parents should never use kitchen utensils to dispense medication as they are not accurate measurements and introduce potential for confusion between units of measure (e.g. teaspoons for tablespoons).

Another important step that caregivers should take is to program the Poison Help number (1-800-222-1222) into their home and cell phones so they will have easy access to their local poison control center if a child has had an unsafe exposure. Parents should also know to call 911 if a child is in acute medical distress – is unconscious, seizing or not breathing.

Coordinate Among Caregivers. The changing family structures and home environments of children today mean that caregivers need to take extra precautions to safeguard their children around medication. With children moving between home, school, and childcare and under the care of parents, grandparents and other caretakers, the risk of multiple dosing may become an issue. Caregivers must be diligent and coordinate with one another to ensure children are getting their right medications, at the right time, and in the right dosage, and that the medications are always returned to their safe storage location after each and every use.

The Role of Industry

Pharmaceutical manufacturers, pharmacies and retailers must continue to play a pivotal role in medication safety. When a baby is sick, caregivers do their best to care for and console the child. But when it comes to giving a child medication, good intentions are not always enough. Each business in the supply chain, from manufacturer to retail outlet, can assist caregivers in multiple ways, including conducting further research on medication dosing errors, eliminating sources of confusion, developing innovative child-resistant packaging and improving communications relating to medication safety.

Conduct More Research. Which medication to give, how much and how often can be perplexing to caregivers. To minimize the confusion, pharmaceutical manufacturers could conduct more research on the behavior, presence and sources of confusion among caregivers. Continued tracking of common types and reasons for medication errors, along with determination of what products are most commonly associated with errors, will help identify where further improvements can be made in their products, packaging and labeling. Ultimately, industry must work with government to help ensure consistency in label instructions and dosing devices, and track the results.^{37 38}

Improve Child-Resistant Packaging. Undoubtedly, one of the most effective efforts for reducing child poisoning has been the development and use of child-resistant packaging for medications, and pharmaceutical manufacturers should continue to make improvements. Child-resistant does not mean child-proof, and some motivated children will still be able to gain access to medication given enough time and persistence.⁴⁰ Existing regulations for child-resistant packaging require that 80% of children less than 5 years of age be unable to open the package within 10 minutes.⁴¹ Additional features, such as devices that limit the amount of medication a child could be exposed to while unsupervised, are also options for exploration.

Despite these methods to prevent children from ingesting medications, adults who improperly secure a safety cap or store medications in pill boxes can bypass or compromise the integrity of child-resistant packaging.⁴² Enhancement of current child-resistant packaging and improved dosage delivery devices is a field where pharmaceutical manufacturers can continue to innovate. Child-resistant packaging only works when the product is kept in its original packaging. It is important that innovative packaging solutions are both user-friendly (for seniors, for example) and child-resistant.

Moving Toward a Standard Dosing Recommendation

While there is more research to be done, steps are being taken by many in the medical community to reduce dosage errors by improving the consistency of dosage volumes. The American Academy of Pediatrics recently announced its recommendation that dosing for all liquid prescription medications be metric-based, using milliliters (mL).³⁹



Educate and Understand Stakeholder Needs. Pharmaceutical manufacturers must continue to reach out directly to both health care professionals and caregivers through diverse communication channels. A survey found that two-thirds (68%) of adults say they have seen information provided by pharmaceutical companies in television advertisements.⁴³ In addition, one in five adults (22%) seeks medication safety information from pharmaceutical-sponsored Web sites.⁴⁴ A commitment to using these and other communications channels to promote safe medication use and storage, while providing avenues for adults to ask questions so that manufacturers can better understand the reasons for medication errors or accidental ingestions, will enable manufacturers to both educate caregivers and identify and address root causes of unintentional medication overdoses among children.

The Role of the Health Care Community

The entire health care community, from individual physicians to pharmacists to national health organizations, can impact the safety of children around medications. Those in the health care community can educate caregivers via one-on-one advice in a doctor's office or through pharmacist and community-wide outreach, advocacy on medication safety-related policy, and use of poison control centers.

Make Parent Education a Priority. Physicians and other health care providers are in a unique position to make medication safety a priority. They should start by informing parents about the many misconceptions and behaviors that increase the risk of unintentional medication overdose among children, such as the potential risks associated with common medications like acetaminophen, vitamins or cough and cold medications.^{46 47} Physicians must reinforce the message that safe dosing and storage practices have the potential to save lives. Being reminded of the seriousness of medications and the importance of reading and following the dosing label at a child's check-up will encourage parents to be extra careful the next time they reach into the medicine cabinet.

Send Home Safety Instructions. Pharmacies and pharmacists serve as essential components in the medication safety chain. Pharmacists must continue to provide critical oversight to make sure that the medication we take is appropriate and safe—in terms of medication type, dosage, potential drug interactions and medical contraindication.⁴⁸ Additionally, as the last point of contact before a prescription medication is brought into the home, pharmacists must ensure that patients understand how to properly take and store a medication both for the patient's safety and the safety of others in the home. It is estimated that nearly half of prescriptions taken in the U.S. are used improperly and 96% of



Hospital admissions from unintentional medication overdoses in children under age 6 increased 36% from 2001 to 2008.⁴⁵



patients do not ask questions about the medications they are receiving.⁴⁹ Pharmacists themselves and educational medication safety messages on display in the pharmacy serve as other resources for reducing unintentional medication overdoses.

Engage in Community-wide Outreach. Community-wide outreach and education in medication safety has been an essential component of prevention efforts over the last fifty years and must continue.⁵⁰ Organizations and agencies, such as the American Association of Poison Control Centers, American Academy of Pediatrics, American Medical Association, the Children’s Safety Network, American Pharmacists Association, Safe Kids Worldwide, CDC, CPSC, the Health Resources and Services Administration and the FDA undertake educational outreach, targeting their messages to key audiences.^{51 52 53} An annual campaign active for 50 years now, National Poison Prevention Week, has increased awareness of poison-prevention methods in communities around the country by distributing educational materials, hosting educational events in several languages, and conducting poison safety workshops, among other activities.⁵⁴

Community-wide outreach by the medical community must continue to address medication safety from various angles while giving increased attention to the wide variations in health literacy. In the U.S. today, 93 million adults, or 43% of the adult population, read at or below basic literacy levels.⁵⁵ When it comes to medication, parents with below-basic health literacy are three times more likely to report having difficulty understanding the label instructions on over-the-counter medications.⁵⁶ Therefore, all medication safety materials should meet plain language standards (i.e., one and two syllable words, ample white space, and simple illustrations) in order to be understood by all caregivers.⁵⁷ Development of medication safety messages and dissemination of that information with greater involvement from retailers, pharmacies and the media can be used to increase the impact of community outreach.

Advocate for better labeling and dosing instructions. Major medical organizations can be a powerful, positive influence on policies relating to medication safety. Advocacy for better medication labeling and dosing instructions is a key activity that the medical community should undertake at the federal or state level. Medical professionals should volunteer to testify about, or serve as media spokespersons for, medication safety issues in their communities. For example, 92% of pediatricians surveyed said they personally support labeling pediatric single-ingredient acetaminophen packages with dosing instructions for children under 2 years of age, instructions that are currently not allowed by the FDA.^{58 59}



The Value of Poison Control Centers

Poison control centers are effective and efficient. Second only to childhood immunization programs, the poison control center network enables significant cost savings in public health delivery.⁶⁶ In 2010, more than 71% of exposure cases reported to poison control centers were managed at the site of exposure (most often the patient's residence), reducing unnecessary emergency transport and emergency department visits.^{67 68} A study by the Pacific Institute for Research and Evaluation estimated that poison control centers yield a societal cost savings of \$320 at an average cost of just \$43 per call.⁶⁹ These economic data speak volumes as to the efficiency of poison control centers in saving lives and dollars.

Use Poison Control Centers. Parents aren't the only ones calling poison control centers. Almost 50% of the associated calls to poison control centers for children receiving emergency care for unintentional medication overdose originate from emergency departments.⁶⁰ The poison control center network, composed of 57 centers across the nation, provides free, direct assistance, a service that medical professionals should take full advantage of as it benefits society in two ways.⁶¹

First, the network reduces medical costs by fostering more efficient and effective care. Consultation with a poison control center by medical staff has been shown to decrease the length of stay for patients admitted to a health care facility from approximately 6.5 days to 3.5.⁶² This results in an average saving of more than \$2,000 per patient.⁶³ Second, calls to poison control centers by medical professionals contribute to public health surveillance conducted by the poison control center network.⁶⁴ Information provided to poison control centers by health care providers and others is used to monitor emerging trends, such as pediatric poisoning, in real-time.⁶⁵

The Role of Government

Governments, at both the federal and state levels, have a critical role to play in medication safety.ⁱⁱ The federal role includes:

- Regulating the pharmaceutical industry in an effective manner;
- Bringing sustainability to the poison control center system nationwide by preserving the integrity of the decentralized structure and providing predictable and reasonable funding levels;
- Monitoring medication-related morbidity and mortality using public health surveillance data, such as the National Vital Statistics System (NVSS) and the National Electronic Injury Surveillance System (NEISS);
- Providing leadership on public health education programs such as the CDC-led *Up and Away and Out of Sight* educational program and the FDA's Safe Use Initiative,⁷⁰ as well as in setting an agenda for public health and safety. A good example of this is the U.S. Department of Health and Human Services' (DHHS) *Healthy People 2020* objectives for the nation which proposes a 10% reduction in number of emergency department visits for medication overdoses among children under 5 by 2020;⁷¹ and
- Leading the advancement of plain language standards on medications and promoting medication disposal programs.

ⁱⁱ The federal government's role goes back, at least, to the early 1900's with the passage of the 1906 Pure Food and Drugs Act. It was not until the 1930's that the FDA took its name.

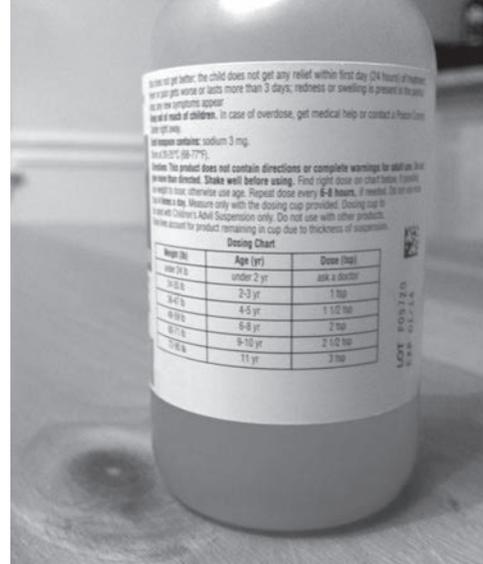
Require Plain Language Labeling and Instructions. According to DHHS, 59.2% of the parents reported difficulty understanding over-the-counter medication labels.⁷² Health literacy is a key focus for the federal Food and Drug Administration.⁷³ The FDA should study the effectiveness of its regulations, the directions provided by pharmacists and prescription labels and over-the-counter medication labels. This should include the use of plain language and other best practices to help consumers better understand how to give their kids medication in a safe way.

Appropriately Fund the Poison Control Center System. Poison control centers have played a critical role in reducing medication-related fatalities among children. Given their success, it is hard to understand why their funding levels are at risk. Recent estimates suggest that \$150 million is required for the poison control center network's operations, a small price given the cost savings they provide (see sidebar at left).⁷⁴ Unfortunately, finding funding at this level continues to be a challenge. The network is currently funded by a “patchwork” of 29 sources, including federal grants, state budgets, institutional organizations such as universities, private organizations, hospital in-kind support, industry contracts and charitable giving. The sustainability of the system is at risk.^{75 76}

Congress passed the *Poison Control Center Enhancement and Awareness Act of 2000* (“Enhancement Act,” reauthorized in 2003 and 2008) to improve the financial stability of the centers.^{77 78 79} The Congressional effort was laudable but never realized when the appropriations process took place. Even though the *Enhancement Act* authorized spending of \$28.6 million,⁸⁰ appropriations were cut to \$18.8 million for fiscal year 2012.⁸¹ The cuts stand in the face of the savings in health care dollars attributable to the centers. States have also cut or completely eliminated the budgets of poison control centers.ⁱⁱⁱ

Keep the Regional Poison Control Center Structure. In addition to cuts to the governmental portion of funding, some favor consolidating the multi-regional structure of 57 poison control centers into fewer centers or just one poison control bureaucracy. One of the reasons why the centers are so successful is that there is a diversity of expertise and knowledge in the regional centers. For example, a toxicologist at the Rocky Mountain Poison and Drug Center will know what to do because of a spider bite, while an urban poison control center will have greater expertise, in ever-changing, illicit “designer” drugs.

ⁱⁱⁱ For example, for the second year in a row, the Pennsylvania Governor recommended elimination of funding for poison control centers for the 2013 fiscal year. Borys Krawczyeniuk, “A look at the losers in Corbett’s budget.” Times-Tribune, February 8, 2012. Louisiana eliminated its poison control center in the 1980’s but restored it because it recognized how they save tax dollars—it is fortunate that the restoration occurred before Hurricane Katrina and the BP oil spill. The New York Times, March 3, 2011. New Mexico has seen a 29 percent reduction in state support for three years through 2011. American Association of Poison Control Centers, press release, April 13, 2011.

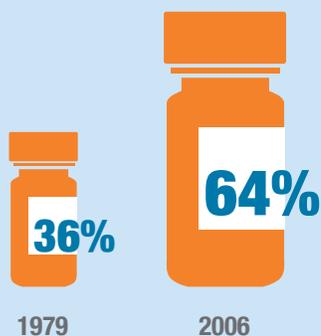


Why is one of the most the most widely recommended medications for children missing dosing instructions for infants 6 to 23 months?

For parents with a sick infant, acetaminophen is commonly recommended to help alleviate pain caused by colds and teething, and to reduce fever. However, there is no recommended dosing guidance on the acetaminophen bottle for children under age 2. Instead, the guidance is to “Ask a Doctor.” This lack of dosing information may make it difficult for a parent without access to a health care provider to administer the right dose of acetaminophen to a sick child, and can lead to dosing errors that can put a child’s health in jeopardy.

Safe Kids has been investigating this issue and discovered that there have been efforts for nearly 25 years to convince the FDA to allow dosing information for children aged 6 to 23 months. In fact, in May 2011, a national advisory committee made up of pediatricians and public health specialists unanimously recommended that the FDA allow labeling instructions on acetaminophen for children 6 to 23 months. There is wide support for establishing dosing guidelines for acetaminophen for children as young as 6 months old. The FDA has not accepted this recommendation as of March 2012.

Percent of poisoning deaths attributable to medications.⁸³



Poison control centers should not be consolidated into one facility, or just a few facilities. This would destroy a valuable repository of diverse expertise. Moreover, “smart” consolidation is taking place in an organic way without prodding from the federal government. For example, the Rocky Mountain Poison and Drug Center now handles calls from Montana, Colorado, Hawaii, Idaho and Nevada.⁸²

Conduct Education Campaigns. In public health, government has proven to be one of the most effective educators to help parents, grandparents and caregivers keep their children safe. As noted earlier, the CDC and a wide range of public and private-sector partners are taking on this role with the *Up and Away and Out of Sight* educational program. The program delivers a very simple message: put medications in places where children can’t get to them.⁸⁴

Foster Medication Disposal Programs. With more and more medications being used, more and more medications are left unused, sitting in homes, backpacks and handbags. But what to do with them? To avoid contaminating the water supply, unused medications must never be disposed of in a sink, toilet, or storm drain. It is recommended they be placed in household trash (sometimes mixed with an undesirable substance such as used coffee grinds or kitty litter), sealed in an unrecognizable container that is not accessible to children or pets.^{85 86} An even better approach is for parents and caregivers to take advantage of effective programs such as Operation Medicine Drop,⁸⁷ run by pharmacies and/or community groups (including Safe Kids coalitions and chapters) in collaboration with law enforcement agencies (e.g., the federal Drug Enforcement Administration).⁸⁸

The Path Forward

Children and adults are living far longer and healthier lives because of the advances in medication, and yet completely preventable, unintentional poisoning by medication among young children is increasing. We must be persistent in communicating this fact and providing tools and resources to empower parents and other caregivers to change behaviors that put kids at risk. We also must advocate creating policies that support improved packaging, labeling and disposal of medications. This is not wishful thinking. Over the last 50 years, we have seen a dramatic reduction in fatal poisonings among children.⁸⁹

Undoubtedly this reduction was due in large part to the expert consultation services provided by poison control centers, advancements in the field of toxicology, improvements in product packaging and immense public education and awareness campaigns. Despite these great achievements, the next step is to completely eliminate preventable harm due to medication overdoses. As we continue to progress in child medication safety, collaboration and cooperation will be critical to successfully tackling child medication safety in homes, local communities and at a national level.

Safe Kids Worldwide is committed to working in partnership with all sectors of society – parents, healthcare professionals, federal agencies, legislators, the media, retailers, and manufacturers – to keep our children safe and healthy. To that end, over the next three years Safe Kids Worldwide will:

- Continue its efforts to change medication safety behavior and reverse the rising trend by raising awareness among parents and caregivers of young children about the simple steps they can take to promote medication safety, including safe storage and proper dosing practices, building on the work of the CDC's *Up and Away and Out of Sight* and *PROTECT* initiatives.
- Encourage pharmaceutical industry efforts to innovate further in making medications safer (i.e., continue to make improvements in child-resistant packaging, improve labeling instructions to reduce caregiver confusion and minimize accidental exposure, and support manufacturers in their efforts in educating parents and caregivers about the importance of keeping their medications out of children's hands).
- Urge the FDA to develop improved labeling standards (i.e., allow proper dosing instructions for children ages 6 to 23 months on single-ingredient liquid acetaminophen packaging and improve instruction standards that meet plain language needs).





- Advocate for stabilization of funding for the regional poison control centers nationwide to ensure that all families continue to have access to this essential public health service at both the national and local levels, as well as sustain the network's role as a resource for the medical community.
- Mobilize our 600 Safe Kids coalitions and chapters to continue to educate parents and caregivers in community venues about safe medication practices, conduct outreach to traditional and social media outlets to spread these vital messages, and urge legislators to continue to invest resources in keeping poison control centers fully staffed and funded.

Together with our partners, Safe Kids Worldwide is dedicated to eliminating pediatric unintended accidental overdoses and medication dosing errors as well as strengthening the poison control center infrastructure in case these tragedies still occur. Our message for the path forward?

Safe Storage, Safe Dosing, Safe Kids.

References

- 1 Centers for Disease Control and Prevention. Put Your Medicines Up and Away and Out of Sight. Centers for Disease Control and Prevention Website. Available from: <http://www.cdc.gov/features/medicationstorage/>. Accessed February 9, 2012.
- 2 Centers for Disease Control and Prevention. CDC WONDER Compressed Mortality File, Underlying Cause-of-Death. Centers for Disease Control and Prevention Website. Available from: <http://wonder.cdc.gov/mortSQL.html>. Accessed February 15, 2012.
- 3 Budnitz DS, Salis S. Preventing medication overdoses in young children: an opportunity for harm elimination. *Pediatrics*. 2011; 127(6): e1597-e1599.
- 4 Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. Web-based Injury Statistics Query and Reporting System (WISQARS). National Center for Injury Prevention and Control Website. Available from: <http://www.cdc.gov/injury/wisqars/index.html>. Accessed February 28, 2012.
- 5 Centers for Disease Control and Prevention. Put Your Medicines Up and Away and Out of Sight. Centers for Disease Control and Prevention Website. Available from: <http://www.cdc.gov/features/medicationstorage/>. Accessed February 9, 2012.
- 6 Centers for Disease Control and Prevention. Put Your Medicines Up and Away and Out of Sight. Centers for Disease Control and Prevention Website. Available from: <http://www.cdc.gov/features/medicationstorage/>. Accessed February 9, 2012.
- 7 Budnitz DS, Salis S. Preventing medication overdoses in young children: an opportunity for harm elimination. *Pediatrics*. 2011; 127(6): e1597-e1599.
- 8 Budnitz DS, Salis S. Preventing medication overdoses in young children: an opportunity for harm elimination. *Pediatrics*. 2011; 127(6): e1597-e1599.
- 9 Bronstein AC, et al. 2010 annual report of the American Association of Poison Control Centers' National Poison Data System (NPDS): 28th annual report. *Clin Toxicol*. 2011; 49: 910-941.
- 10 Centers for Disease Control and Prevention. CDC WONDER Compressed Mortality File, Underlying Cause-of-Death. Centers for Disease Control and Prevention Website. Available from: <http://wonder.cdc.gov/mortSQL.html>. Accessed February 15, 2012.
- 11 Centers for Disease Control and Prevention. CDC WONDER Compressed Mortality File, Underlying Cause-of-Death. Centers for Disease Control and Prevention Website. Available from: <http://wonder.cdc.gov/mortSQL.html>. Accessed February 15, 2012.
- 12 Centers for Disease Control and Prevention. CDC WONDER Compressed Mortality File, Underlying Cause-of-Death. Centers for Disease Control and Prevention Website. Available from: <http://wonder.cdc.gov/mortSQL.html>. Accessed February 15, 2012.
- 13 Centers for Disease Control and Prevention. CDC WONDER Compressed Mortality File, Underlying Cause-of-Death. Centers for Disease Control and Prevention Website. Available from: <http://wonder.cdc.gov/mortSQL.html>. Accessed February 15, 2012.
- 14 Centers for Disease Control and Prevention. CDC WONDER Compressed Mortality File, Underlying Cause-of-Death. Centers for Disease Control and Prevention Website. Available from: <http://wonder.cdc.gov/mortSQL.html>. Accessed February 15, 2012.
- 15 Centers for Disease Control and Prevention. CDC WONDER Compressed Mortality File, Underlying Cause-of-Death. Centers for Disease Control and Prevention Website. Available from: <http://wonder.cdc.gov/mortSQL.html>. Accessed February 15, 2012.
- 16 U.S. Consumer Product Safety Commission. Poison Prevention Packaging: A Guide for Healthcare Professionals. Washington, DC: U.S. Consumer Product Safety Commission; 2005.
- 17 Budnitz DS, Lovegrove MC. The last mile: taking the final steps in preventing pediatric pharmaceutical poisonings. *J Pediatr*. 2012; 160 (2): 190-192.
- 18 Schillie SF, et al. Medication overdoses leading to emergency department visits among children. *Am J Prev Med*. 2009; 37 (3): 181-187.
- 19 Bond GR, Woodward RW, Ho M. The growing impact of pediatric pharmaceutical poisoning. *J Pediatr*. 2011; 160(2): 265-270.
- 20 Centers for Disease Control and Prevention. Put Your Medicines Up and Away and Out of Sight. Centers for Disease Control and Prevention Website. Available from: <http://www.cdc.gov/features/medicationstorage/>. Accessed February 9, 2012.
- 21 Bond GR, Woodward RW, Ho M. The growing impact of pediatric pharmaceutical poisoning. *J Pediatr*. 2011; 160(2): 265-270.
- 22 Budnitz DS, Lovegrove MC. The last mile: taking the final steps in preventing pediatric pharmaceutical poisonings. *J Pediatr*. 2012; 160 (2): 190-192.
- 23 Budnitz DS, Salis S. Preventing medication overdoses in young children: an opportunity for harm elimination. *Pediatrics*. 2011; 127(6): e1597-e1599.
- 24 Budnitz DS, Salis S. Preventing medication overdoses in young children: an opportunity for harm elimination. *Pediatrics*. 2011; 127(6): e1597-e1599.

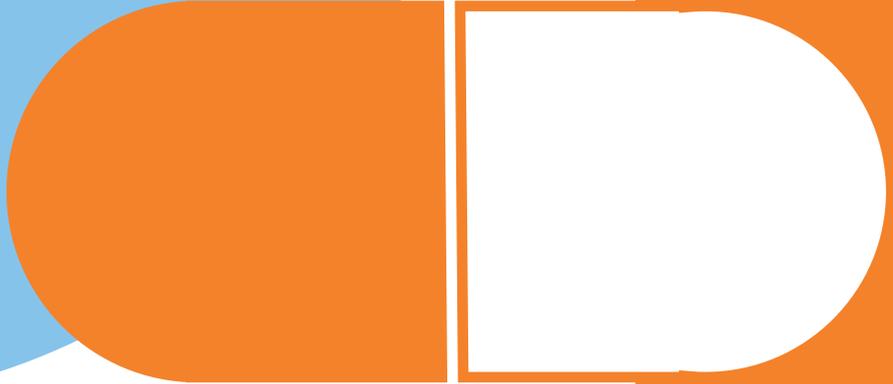
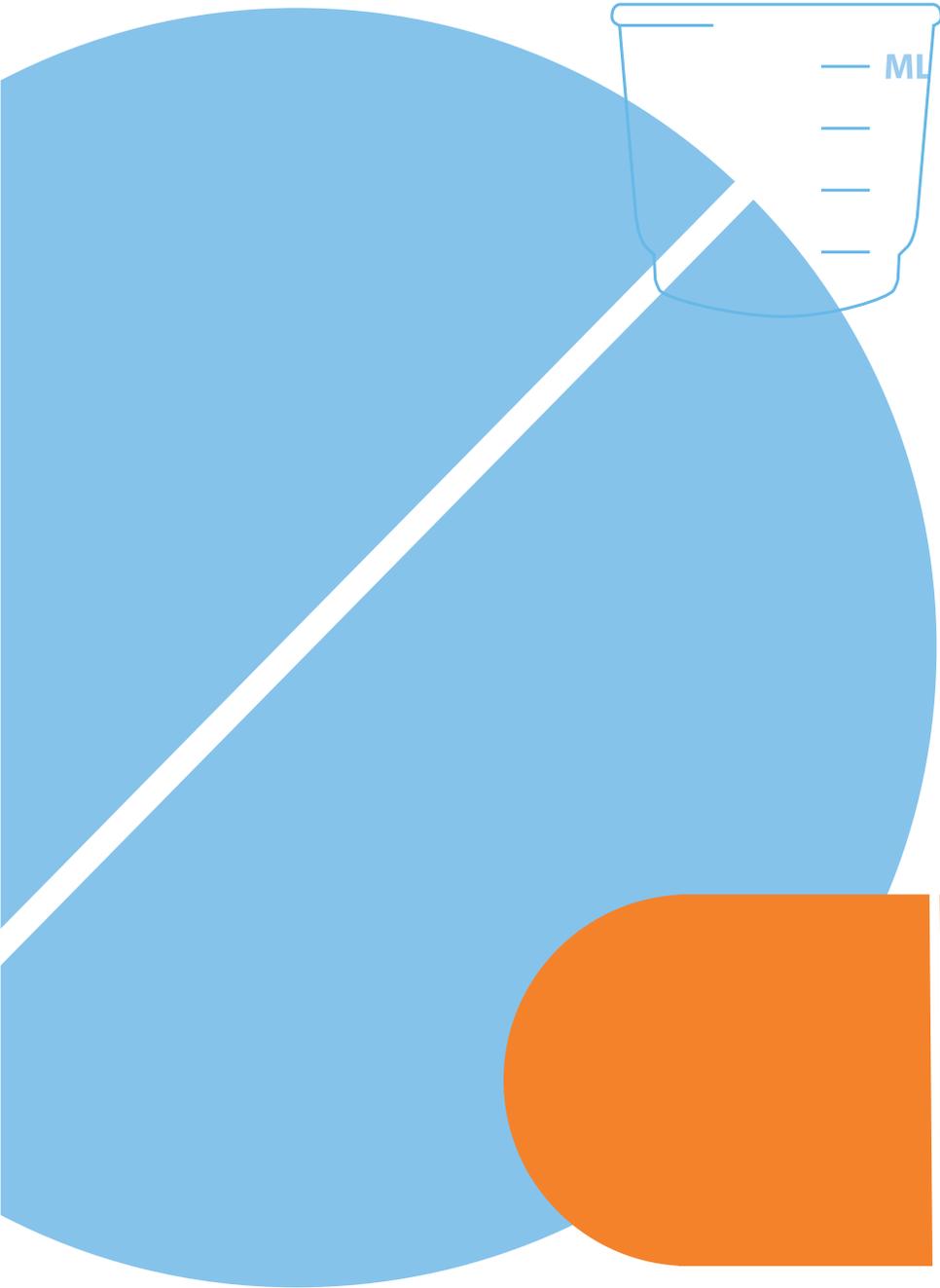
- 25 Bond GR, Woodward RW, Ho M. The growing impact of pediatric pharmaceutical poisoning. *J Pediatr.* 2011; 160(2): 265-270.
- 26 Bronstein AC, et al. 2010 annual report of the American Association of Poison Control Centers' National Poison Data System (NPDS): 28th annual report. *Clin Toxicol.* 2011; 49: 910-941.
- 27 Bronstein AC, et al. 2010 annual report of the American Association of Poison Control Centers' National Poison Data System (NPDS): 28th annual report. *Clin Toxicol.* 2011; 49: 910-941.
- 28 Bond GR, Woodward RW, Ho M. The growing impact of pediatric pharmaceutical poisoning. *J Pediatr.* 2011; 160(2): 265-270.
- 29 Slone Epidemiology Center at Boston University. Patterns of Medication Use in the United States, 2006, A Report from the Slone Survey. Boston University Website. Available from: <http://www.bu.edu/slone/SloneSurvey/AnnualRpt/SloneSurveyWebReport2006.pdf>. Accessed March 1, 2012.
- 30 Bond GR, Woodward RW, Ho M. The growing impact of pediatric pharmaceutical poisoning. *J Pediatr.* 2011; 160(2): 265-270.
- 31 Bond GR, Woodward RW, Ho M. The growing impact of pediatric pharmaceutical poisoning. *J Pediatr.* 2011; 160(2): 265-270.
- 32 AARP Public Policy Institute. Multigenerational Households are Increasing. AARP Public Policy Institute Website. Available from: <http://assets.aarp.org/rgcenter/ppi/econ-sec/fs221-housing.pdf>. Accessed February 9, 2012.
- 33 McFee RB, Caraccio TR. "Hang up your pocketbook"- an easy intervention for the granny syndrome: grandparents as a risk factor in unintentional pediatric exposures to pharmaceuticals. *J Am Osteopath Assoc.* 2006; 106(7): 405-411.
- 34 Population Reference Bureau. The Rise- and Fall- of Single-Parent Families. Population Reference Bureau Website. Available from: <http://www.prb.org/Articles/2001/TheRiseandFallofSingleParentFamilies.aspx>. Accessed February 16, 2012.
- 35 Centers for Disease Control and Prevention. Put Your Medicines Up and Away and Out of Sight. Centers for Disease Control and Prevention Website. Available from: <http://www.cdc.gov/features/medicationstorage/>. Accessed February 3, 2012.
- 36 Center for Disease Control and Prevention. The PROTECT Initiative: Advancing Children's Medication Safety. Centers for Disease Control and Prevention Website; 2011. Available from: http://www.cdc.gov/MedicationSafety/protect/protect_Initiative.html. Accessed March 1, 2012.
- 37 U.S. Department of Health and Human Services, Food and Drug Administration. Guidance for Industry: Dosage Delivery Devices for Orally Ingested OTC Liquid Drug Products. Silver Spring, MD: Food and Drug Administration; May 2011.
- 38 Consumer Healthcare Products Association. Voluntary Codes and Guidelines of the Consumer Healthcare Products Industry. Consumer Healthcare Products Association Website. Available from: http://www.chpa-info.org/scienceregulatory/Voluntary_Codes.aspx#volumetricmeasure. Accessed February 3, 2012.
- 39 Paul IM, Yin SH. Out with teaspoons, in with metric units: pediatricians urged to prescribe liquid medications in mLs only. *AAP News.* 2012; 33(3).
- 40 Rogers GB. The effectiveness of child-resistant packaging for Aspirin. *Arch Pediatr Adolesc Med.* 2002; 156: 929-933.
- 41 U.S. Consumer Product Safety Commission, Office of Compliance. Requirements Under the Poison Prevention Packaging Act, 16 C.F.R. 1700. Washington, DC: U.S. Consumer Product Safety Commission; 2001.
- 42 Budnitz DS, Salis S. Preventing medication overdoses in young children: an opportunity for harm elimination. *Pediatrics.* 2011; 127(6): e1597-e1599.
- 43 Eyeforpharma. Internet among most trusted source of health information. Eyeforpharma Website. Available from: <http://social.eyeforpharma.com/marketing/internet-among-most-trusted-sources-health-information>. Accessed February 12, 2012.
- 44 Eyeforpharma. Internet among most trusted source of health information. Eyeforpharma Website. Available from: <http://social.eyeforpharma.com/marketing/internet-among-most-trusted-sources-health-information>. Accessed February 12, 2012.
- 45 Bond GR, Woodward RW, Ho M. The growing impact of pediatric pharmaceutical poisoning. *J Pediatr.* 2011; 160(2): 265-270.
- 46 Bond GR, Woodward RW, Ho M. The growing impact of pediatric pharmaceutical poisoning. *J Pediatr.* 2011; 160(2): 265-270.
- 47 Tzimenatos L, Bond GR, Pediatric Therapeutic Error Study Group. Severe injury or death in young children from therapeutic errors: a summary of 238 cases from the American Association of Poison Control Centers. *Clin Toxicol.* 2009; 47(4): 348-354.
- 48 Pfizer Inc. Your Pharmacist: A Partner in Drug Safety. Pfizer Inc Website; 2009. Available from: http://www.pfizer.com/files/health/medicine_safety/4-4_Your_Pharmacist.pdf. Accessed February 23, 2012.
- 49 Robert Wood Johnson Foundation. California Pilot Program Creates Rx Fact Sheets, Ads to Inform Customers. Robert Wood Johnson Foundation Website; April 2004. Available from: <http://www.rwjf.org/reports/grr/041745.htm>. Accessed February 27, 2012.

- 50 Committee on Poison Prevention and Control, Board on Health Promotion and Disease Prevention. Forging a Poison Prevention and Control System. Washington, DC: Institute of Medicine of the National Academies; 2004, pg. 214.
- 51 Committee on Poison Prevention and Control, Board on Health Promotion and Disease Prevention. Forging a Poison Prevention and Control System. Washington, DC: Institute of Medicine of the National Academies; 2004,.
- 52 Health Services and Resources Administration. National Poison Prevention Week Planner. Rockville, MD: Health Resources and Services Administration; January 2011.
- 53 U.S. Food and Drug Administration. Statement for National Poison Prevention Week: FDA Committed to Addressing Growing National Overdose Problem. U.S. Food and Drug Administration Website; 2010. Available from: <http://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/ucm204962.htm>. Accessed March 1, 2012.
- 54 Poison Prevention Week Council. About Council Members. Poison Prevention Week Council Website. Available from: http://www.poisonprevention.org/about_members.htm. Accessed February 1, 2012.
- 55 National Center for Education Statistics. National Assessment of Adult Literacy (NAAL). U.S. Department of Education. Available from: <http://nces.ed.gov/naal>. Accessed February 11, 2012.
- 56 Yin SH, et al. The health literacy of parents in the United States: a nationally representative study. *Pediatrics*. 2009; 124: S289-S298.
- 57 Proliteracy Website. Available from: <http://www.proliteracy.org>. Accessed February 11, 2012.
- 58 Temple AR. Labeling Improvements for Pediatric Acetaminophen Products. Food and Drug Administration Website. Available from: <http://www.fda.gov/downloads/AdvisoryCommittees/CommitteesMeetingMaterials/Drugs/DrugSafetyandRiskManagementAdvisoryCommittee/UCM171602.pdf>. Accessed February 10, 2012.
- 59 Goodwin J. FDA Advisers Urge Infant Doses for Kids' OTC Fever Relievers: Would better protect those under 2 who use products like Children's Tylenol, experts say. Health Day Website. Available from: <http://consumer.healthday.com/Article.asp?AID=653057>. Accessed February 18, 2012.
- 60 Bond GR, Woodward RW, Ho M. The growing impact of pediatric pharmaceutical poisoning. *J Pediatr*. 2011; 160(2): 265-270.
- 61 Bronstein AC, et al. 2010 annual report of the American Association of Poison Control Centers' National Poison Data System (NPDS): 28th annual report. *Clin Toxicol*. 2011; 49: 910-941.
- 62 Artalejo L III, et al. The Value of the Poison Control Center: Report of a Working Group of Poison Control Center Representatives Convened April 2007-February 2008. Health Resources and Services Administration Poison Control Program; March 2008.
- 63 Artalejo L III, et al. The Value of the Poison Control Center: Report of a Working Group of Poison Control Center Representatives Convened April 2007-February 2008. Health Resources and Services Administration Poison Control Program; March 2008.
- 64 Artalejo L III, et al. The Value of the Poison Control Center: Report of a Working Group of Poison Control Center Representatives Convened April 2007-February 2008. Health Resources and Services Administration Poison Control Program; March 2008.
- 65 Artalejo L III, et al. The Value of the Poison Control Center: Report of a Working Group of Poison Control Center Representatives Convened April 2007-February 2008. Health Resources and Services Administration Poison Control Program; March 2008.
- 66 Artalejo L III, et al. The Value of the Poison Control Center: Report of a Working Group of Poison Control Center Representatives Convened April 2007-February 2008. Health Resources and Services Administration Poison Control Program; March 2008.
- 67 Bronstein AC, et al. 2010 annual report of the American Association of Poison Control Centers' National Poison Data System (NPDS): 28th annual report. *Clin Toxicol*. 2011; 49: 910-941.
- 68 Artalejo L III, et al. The Value of the Poison Control Center: Report of a Working Group of Poison Control Center Representatives Convened April 2007-February 2008. Health Resources and Services Administration Poison Control Program; March 2008.
- 69 Pacific Institute of Research and Evaluation. Injury Prevention: What Works: A Summary of Cost-Outcome Analysis for Injury Prevention Programs (2010 Update). Waltham, MA: Children's Safety Network; 2010.
- 70 Moskowitz DB. FDA's New Campaign: Safe Drug Use. UBM Media Website; December 2009. Available from: <http://dbt.consultantlive.com/formulary-decisionmaking/content/article/1145628/1507565>. Accessed February 11, 2012.
- 71 Budnitz DS, Salis S. Preventing medication overdoses in young children: an opportunity for harm elimination. *Pediatrics*. 2011; 127(6): e1597-e1599.
- 72 Yin SH, et al. The health literacy of parents in the United States: a nationally representative study. *Pediatrics*. 2009; 124(3): S289-S298.
- 73 U.S. Food and Drug Administration. Opportunities for Collaboration. U.S. Food and Drug Administration Website; December 16, 2011. Available from: <http://www.fda.gov/Drugs/DrugSafety/SafeUseInitiative/ucm188762.htm#healthliteracy>. Accessed March 2, 2012.

- 74 American Association of Poison Control Centers. Poison Centers at the Forefront in Identifying New Public Health Threats. American Association of Poison Control Website; January 2012. Available from: <http://www.aapcc.org/dnn/NewsandEvents/NewsMediaResources.aspx>. Accessed February 3, 2012.
- 75 Committee on Poison Prevention and Control, Board on Health Promotion and Disease Prevention. Forging a Poison Prevention and Control System. Washington, DC: Institute of Medicine of the National Academies; 2004.
- 76 Dart RC. The secret life of America's poison centers. *Ann Emerg Med*. 2012; 59:62-66.
- 77 Poison Control Center Enhancement and Awareness Act. February 2000. 106th Congress Public Law 174. Available from: <http://www.gpo.gov/fdsys/pkg/PLAW-106publ174/html/PLAW-106publ174.htm>. Accessed January 30, 2012.
- 78 Poison Control Center Enhancement and Awareness Act Amendments of 2003. 108th Congress Public Law 108-194. December 19, 2003. Available from: <http://www.gpo.gov/fdsys/pkg/PLAW-108publ194/pdf/PLAW-108publ194.pdf>. Accessed January 31, 2012.
- 79 Poison Center Support, Enhancement, and Awareness Act of 2008. 110th Congress Public Law 110-337. October 8, 2008. Available from: <http://www.gpo.gov/fdsys/pkg/PLAW-110publ377/pdf/PLAW-110publ377.pdf>. Accessed January 31, 2012.
- 80 Poison Center Support, Enhancement, and Awareness Act of 2008. 110th Congress Public Law 110-337. October 8, 2008. Available from: <http://www.gpo.gov/fdsys/pkg/PLAW-110publ377/pdf/PLAW-110publ377.pdf>. Accessed January 31, 2012.
- 81 American Association of Poison Control Centers. Congress Cuts Poison Center Funding by \$3 Million. American Association of Poison Control Centers Website. Available from: <http://capwiz.com/aapcc/issues/alert/?alertid=59091501&PROCESS=Read+More>. Accessed March 2, 2012.
- 82 Hudson W. In poison emergencies, who'll answer your call?. *CNN Health*; March 22, 2011. Available from: <http://www.cnn.com/2011/HEALTH/03/22/poison.control.risk.closure/index.html>. Accessed March 2, 2012.
- 83 Centers for Disease Control and Prevention. CDC WONDER Compressed Mortality File, Underlying Cause-of-Death. Centers for Disease Control and Prevention Website. Available from: <http://wonder.cdc.gov/mortSQL.html>. Accessed February 15, 2012.
- 84 Centers for Disease Control and Prevention. Put Your Medicines Up and Away and Out of Sight. Centers for Disease Control and Prevention Website. Available from: <http://www.cdc.gov/features/medicationstorage/>. Accessed February 11, 2012.
- 85 McNeil PPC, Inc. Proper disposal of unused medications. McNeil PPC, Inc Website. Available from: <http://www.tylenoprofessional.com/tips-for-proper-use.html>. Accessed February 11, 2012.
- 86 U.S. Food and Drug Administration. How to Dispose of Unused Medicines. U.S. Food and Drug Administration Website; 2011. Available from: <http://www.fda.gov/ForConsumers/ConsumerUpdates/ucm101653.htm>. Accessed March 1, 2012.
- 87 Operation Medicine Drop Website. Available from: <http://www.operationmedicinedrop.com>. Accessed February 11, 2012.
- 88 U.S. Department of Justice, Drug Enforcement Administration. National Take-back Initiative. Drug Enforcement Administration Website. Available from: http://www.deadiversion.usdoj.gov/drug_disposal/takeback/. Accessed March 1, 2012.
- 89 Cann HM, Neyman DS, Verhulst HL. Control of accidental poisoning: a progress report. *J Am Med Assoc*. 1958;168:717-24.

Suggested Citation:

Baker JM, Mickalide AD. Safe storage, safe dosing, safe kids: a report to the nation on safe medication. Washington, DC: Safe Kids Worldwide, March 2012.





Safe Kids Worldwide gratefully acknowledges McNeil Consumer Healthcare,
whose support made this report possible.

Safe Kids Worldwide
1301 Pennsylvania Avenue, NW
Suite 1000
Washington, D.C. 20004
202.662.0600

www.safekids.org

© 2012 Safe Kids Worldwide